EFFECTS OF SKEWED DISTRIBUTIONS IN INDIVIDUAL MEASUREMENT X AND MOVING RANGE (n=2) MR CONTROL CHARTS

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CHAPTER I

THE PROBLEM AND ITS SETTING

INTRODUCTION

Control charts were originally developed by Dr. Walter A. Shewhart in order to determine if a sequence of data (measurements) obtained from an industrial process may be used for predictions of what this process will yield in the future. Shewhart reached the brilliant conclusion that it would be desirable and possible to set limits upon the natural variation of any process, so that fluctuations within these limits could be readily explained by chance or common causes, but any variation outside these limits would indicate the presence of special or assignable causes of variation in the process. When special causes are present, prediction is not feasible due to the presence of sources of uncontrolled variation. When only common causes are present, the process is said to be in state of statistical control (SOSC) and prediction is feasible. According to Shewhart (16, p. 6), "A phenomenon will be said to be controlled when, through the use of past experience, we can predict, at least within limits, how the phenomenon may be expected to behave in the future."

Any quality characteristic of an industrial process can be studied by some type of control chart which has limits of variation based on the inherent or natural variability of the process. If the quality characteristic is measurable, it is common practice to organize the data in a rational manner in order to monitor the level and dispersion of the values generated by the process under study. Normally samples or subgroups of four or five measurements are taken and the average $\overline{X}$ and the range R of the subgroup are calculated to measure level and variability, respectively. Then, a series of such $\overline{X}$ and R values are plotted in graphs in order to construct the $\overline{X}$ and R control charts.

The setting of limits on the average $\overline{X}$ control chart and range R control chart is based on the assumption of normal distribution underlying the process in study. For the average control chart the assumption is justified by the central limit theorem. The normal assumption is introduced into the $\overline{X}$ and R control charts through the use of the control chart constants A_2, D_3, and D_4. Many researches have been done to justify the robustness of the average $\overline{X}$ and range R control charts when the underlying distribution is non-normal.

In some cases, the use of the average and range control charts is not appropriate because natural subgrouping is not possible. This might happen when the process is too slow in producing results being operationally impractical to wait until a subgroup of four or five can be formed, or when each measurement represents a given condition of a batch at a given time. Under these circumstances the logical subgroup size is n=1 and a combination of individual measurement X and moving range MR based on two consecutive observations can be used to monitor the level and dispersion of the process simultaneously. This is accomplished by constructing a control chart for individuals and a control chart for the moving range of two consecutive items. After all subgroups based on two consecutive observations are formed, the moving range MR for each subgroup and the average moving range $\overline{MR}$ for all subgroups are calculated. Then, one can set the upper control limit for the moving range control chart UCL_{MR} using the equation $D_4\overline{MR}$

(the lower control limit for the moving range n = 2 MR control chart does not exist). If there are MRs > UCL_{MR} the delete and revise procedure should be applied one time and the average moving range $\overline{MR}$ and the UCL_{MR} recalculated. From the revised average moving range of two consecutive measurements $\overline{MR}$, one can estimate the standard deviation of the process σ using $\hat{\sigma} = \frac{\overline{MR}}{d_2}$. This estimate is likely to be only slightly affected by uncontrolled variation in individuals due to special causes. Then, one can set the control limits for the individual measurement control chart using $\bar{X} \pm 3\frac{\overline{MR}}{d_2}$.

The assumption of normality underlying the process is more critical for the individual measurement X control chart because the effect of the central limit theorem is not present. In addition, it is a well-known fact that many of the distributions encountered in our every-day experience cannot be described as normal distributions. Chemical, economical, biological, and physical factors have distributions which are commonly skewed in character. One of the commonest causes of non-normality is that the distribution may be unable to go beyond a certain point, such as zero. According to Burr (2, p. 67), "The Pearson type III family of distributions can be used as a second approximation of practical data when asymmetry is present." However, the individual measurement X and moving range n = 2 MR control charts are used widespread in industry under the blind assumption of normality. According to Duncan (1, p.400), "Control charts for individuals must be very carefully interpreted if the process shows evidence of marked departure from normality. In such cases, the multiples of σ used to set control limits might be better derived from other distributions for which the percentage points have been computed." Not too much work has been done to justify the validity of the widespread use of the individual measurement X and moving range n = 2 MR control charts in industry when the underlying process distribution is non-normal.

GENERAL STATEMENT OF THE RESEARCH PROBLEM

This creative component research attempts to evaluate the effects of skewed distributions represented by the Pearson type III family of distributions with location parameter c = 0 (gamma distributions) on the control limits for individual measurement X and moving range n = 2 MR control charts.

The objectives of the study are stated as follows:

(1) Evaluate the performance of the individual measurement X and moving range n = 2 MR control charts, using the control chart constants d_2, d_3, and D_4 under the assumption of normality, when the underlying distribution is Pearson type III family of distributions with location parameter c = 0 (gamma distributions) so often encountered in industry.

(2) Determine empirical functions $f(\alpha, \beta)$ for the control chart constants d_2, d_3, and D_4 when the process distribution can be approximated by a Pearson type III distribution with location parameter c = 0, shape parameter α, and scale parameter β.

(3) Compare the performance of the individual measurement X and moving range n = 2 MR control charts, using the normal control chart constants, with the performance of these control charts using the Pearson type III c = 0 control chart constants evaluated in objective two, when 10, 30, and 50 data values are available from an unknown process distribution.

STATEMENT OF THE HYPOTHESES

The first hypothesis is that individual measurement X and moving range n = 2 MR control charts, through the values of the normal curve control chart constants d_2, d_3, and D_4 used in the calculation of the control limits, work well for practical purposes in industry when the underlying process distribution can be approximated for a Pearson type III distribution with location parameter c = 0 (gamma distribution). For the X control chart, practical purpose in industry means a minimum average run length (ARL) of 100 without run rules when the process is in state of statistical control (no shifts) and maximum average run lengths (ARLs) of 43.9, 6.3, and 2 without run rules when the process is under shifts in the process average of 1, 2, and 3 process standard deviations, respectively. For the n = 2 MR control chart, practical purpose in industry means a minimum average run length (ARL) of 100 without run rules when the process is in control.

The second hypothesis is that the individual measurement X and moving range n = 2 MR control charts, using gamma control chart constants, have better performance than the control charts using the normal curve control chart constants, when 10, 30, and 50 data values are available from an unknown process distribution. Better performance means less empirical false alarm rate in control (X and MR control charts) and power of detection (X chart), for shifts in the process average of 1 and 2 sigma, at least equal to the theoretical power using the normal assumption (0.0228 and 0.1587 respectively for shifts in the process average of 1 and 2 sigma).

THE DELIMITATIONS

The study is limited to the effects of non-normality on the control limits for individual measurement X and moving range $n = 2$ MR control charts when the underlying process distribution is approximated for a Pearson type III distribution with $c = 0$.

The study will not address composite distributions (mixtures) as a severe test to evaluate the effects of non-normality because the consideration of a mixture of processes in a control chart is outside the good use of the control chart technique.

The evaluation of the type I error (α') does not include the effects of run rules. It means that only a point outside control limits is considered a signal.

The evaluation of the average run length (ARL) considers only shifts in the process average. It means that no shifts in the process standard deviation σ are considered.

In the evaluation of the performance of the individual measurement X control chart, using the Pearson type III $c = 0$ (gamma) bias correction factor d_2, only the probability of type I error and two shifts in the process average (1 and 2 sigma) are considered.

In the evaluation of the performance of the moving range $n = 2$ MR control chart, using the gamma control chart constant D_4, only the probability of type I error is considered.

The quality characteristic X under study cannot take negative values. This is due to the fact that the Pearson type III family of distributions with location parameter $c = 0$

(gamma distributions) does not take negative values. The range is $(0, +\infty)$.

THE DEFINITION OF TERMS

- Central limit theorem: Let $X_1, X_2, \ldots, X_n$ be a random sample from a distribution with mean "μ" and standard deviation "σ". Then, if "n" is sufficiently large, the sample average has approximately a normal distribution with mean "μ" and standard deviation "$\sigma/\sqrt{n}$". The larger the value of "n" the better the approximation.
- Population or Process: The totality of the set of items, units, measurements, etc., real or conceptual, that is under consideration or study.
- Sample or subgroup: A group of units, or portion of material, taken from a large collection of units, or quantity of material, which serves to provide information that can be used as a basis for judging the quality of the larger quantity (population), or as a basis for action on the larger quantity or on the production process.
- Random sample: A sample that contains independent observations selected from the same population or universe.
- Pearson type III family of distributions: This is a particular type of the Pearson system of distributions which was developed to cover different combinations of curve-shape characteristics α_3 and α_4, where $2\alpha_4 - 3\alpha_3^2 - 6 = 0$. According to Burr (2, p. 67), the Pearson type III of distributions can be used as a second approximation to practical data when asymmetry is present. The normal curve is

considered as at least a first approximation to practical data if there is one mode and if the frequencies decrease on both sides with something like symmetry. Type III distributions with location parameter c = 0 are gamma distributions which go from a J-shaped curve with range (0,+∞) to a bell-shaped curve with range (0,+∞).

- Skewness (α_3): It is a measure for curve shape designed to measure the extent to which the distribution is unsymmetrical around the mode. For normal data $\alpha_3=0$. It is defined as the ratio between the third central moment and the standard deviation to the third power.
- Kurtosis (α_4): It is a second measure for curve shape, supplementing skewness, and it basically measures the relative rapidity of the frequencies to approach zero. For normal data $\alpha_4=3$. It is defined as the ratio between the fourth central moment and the standard deviation to the fourth power.
- Range: It is an order statistic; that is, its measure depends on the ordering of the individual values in a sample or subgroup, which serves as a measure of dispersion mainly in the quality control field. It is the difference between the largest and smallest values of the sample or subgroup.
- Moving range n = 2 MR: It is the successive differences between the individual values. It represents the short-term variation for a sequence of individual values.
- Control chart: A graphical chart with control limits and plotted values of some statistical measure for a series of samples or individual values. It is a tool created by Walter Shewhart in order to detect the presence of uncontrolled variation. It helps people to understand when they can make predictions regarding future

observations safely and when they cannot do so.

- Individual measurement X control chart: It is a control chart for evaluating the process level in terms of a single observation per sample used when rational subgrouping is not appropriate.
- Moving range n = 2 MR control chart: It is a control chart for evaluating the variability within a process in terms of the range of the latest two observations in which the current observation has replaced the oldest of the previous two observations.
- Control limits: Limits on a control chart based on the data or standards given which are used as criteria for action or for judging the significance of variations between samples or individual values.
- d_2: A bias correction factor, varying with the sample size n, used to convert ranges into σ.
- d_3: A bias correction factor, varying with the sample size n, used to transform ranges into σ_R .
- D_4: Control chart constant, varying with the sample size n, used to calculate the upper control limit for range R and moving range MR control charts.
- E_2: Control chart constant, varying with the sample size n, used to set control limits for the individual measurement X control chart.
- Robustness: Even though the data used to compute the control limits come from a non-normal distribution, the individual measurement X and moving range n = 2 MR control charts based on the normal theory are capable of identifying non-

random variation with not too much type I error (false alarm rate).

- Run length: The run length of any control procedure is the number of sampling periods or subgroups before an out-of-control signal is given on the control chart.
- Average run length (ARL): It is the average number of subgroups or samples taken before an out-of-control condition is given on the control chart. It is a measure of control chart performance. A large ARL is desired when the process is stable or in control, and a small ARL (quick detection) otherwise.
- Average run length curve: It is a curve that shows the performance of a particular control chart under different shifts in the process average.
- Type I error (false alarm rate): It is the probability of thinking that the process is unstable when it really is stable. In other words, it is the probability of looking for problems when nothing has happened

ABBREVIATIONS AND NOTATION

Symbol	Term	Definition
μ	Population or process mean	
σ or σ_X	Population or process standard deviation	
X	Observed value or observation	
$\overline{X}$	Sample or subgroup average	$\sum X_i/n$
s	Sample or subgroup standard deviation	$\sum(X_i-\overline{X})^2/(n-1)$
R	Sample or subgroup range	$X_{max.}-X_{min.}$
σ_R	Standard deviation of the theoretical distribution of ranges	$d_3\sigma$

$\overline{R}$	Average range	$\sum R_i/N$
MR	Moving range n = 2	$\lvert X_{i+1}-X_i \rvert$
$\overline{MR}$	Average moving range	$\sum MR_i/(N-1)$
n	Sample or subgroup size	
N	Number of samples or subgroups	
k	Number of individual observations	
k'	Number of new individual observations	
α_3	Skewness parameter	$\int [(X - \mu)^3/\sigma^3]f(x)dx$
α_4	Kurtosis parameter	$\int [(X - \mu)^4/\sigma^4]f(x)dx$
a_3	Skewness statistic	$\sum (X_i-\overline{X})^3/ns^3$
a_4	Kurtosis statistic	$\sum (X_i-\overline{X})^4/ns^4$
α	Shape parameter gamma distribution	
β	Scale parameter gamma distribution	
c	Location parameter Pearson type III distribution	
α'	Type I error (false alarm rate)	
ARL	Average Run Length	1 / P or 1 / P'
P	Probability of detection X chart	Prob. $(UCL<X<LCL)$
P'	Probability of detection MR chart	Prob. $(MR>UCL_{MR})$
IID	Independent and identical distributed	
U (0, 1)	Uniform distribution between 0 and 1	
X (α, β)	Gamma distribution with parameters α and β	
R^2	Coefficient of determination	$1-[\Sigma(y_i - \hat{y}_i)^2/\Sigma(y_i - \bar{y})^2]$

X chart	Individual measurement control chart	
MR chart	Moving range of n = 2 control chart	
SOSC	State of statistical control	
UCLx	Upper control limit for individuals	$\overline{X}+3\overline{MR}/d_2$
LCLx	Lower control limit for individuals	$\overline{X}-3\overline{MR}/d_2$
CLx	Center line for individuals	$\overline{X}$
UCL_{MR}	Upper control limit for moving ranges	$D_4\overline{MR}$
CL_{MR}	Center line for moving ranges	$\overline{MR}$
d_2	Bias correction factor	$\overline{R}/\sigma$ or $\overline{MR}/\sigma$
d_3	Bias correction factor	σ_R / σ
D_4	Control chart constant	$1 + 3d_3/d_2$
E_2	Control chart constant	$3 / d_2$

ASSUMPTIONS

- Average run lengths of a minimum of 100 for both control charts (X and MR),when the process is in a state of statistical control, are quite acceptable in industry for practical purposes. It means that people in industry are willing to accept a maximum risk of 1 % (1 / 100).
- There is not correlation between individual measurements (batches).
- The widespread use in industry of individual measurement X and moving range n = 2 MR control charts will continue in the future.

THE IMPORTANCE OF THE STUDY

The importance of this thesis research is to create the quantitative foundations to support the widespread use in industry of the individual measurement X and moving range n = 2 MR control charts.

CHAPTER II

REVIEW OF THE LITERATURE

An overview of the literature relevant to the research objectives is presented in this chapter. Also, related research efforts are reviewed. This chapter is divided into seven sections. They are:

2.1 An historical overview of quality control and the control chart technique.

2.2 A discussion of the basis of control charts.

2.3 A description of the main types of variables control charts, their control limits, and related formulas.

2.4 A discussion about the estimation of the process standard deviation σ required to set control limits for the $\overline{X}$ chart and X chart.

2.5 A discussion of the estimation of the range standard deviation σ_R required to set control limits for the R chart and MR (n=2) charts.

2.6 Estimation of the bias correction factors d_2 and d_3 used to evaluate the control chart constants A_2, D_3, D_4, and E_2.

2.7 Identification and discussion of previous researches related to the effects of non-normality in control charts.

2.1 Quality Control and Control Charts - An Historical Overview

Quality Control includes efforts to manage quality and maintain assurance of continued high quality of products and services. The word quality here refers to customer satisfaction through the fitness of a product or service for its intended use. It means customer satisfaction by providing products or services which meet customer needs (product features) and are free from deficiencies (conformance to requirements). This definition of quality and others are discussed in detail in Juran (10), Crosby (11), ANSI/ASQC Standard A3 (12), and Juran and Gryna (13).

Even though most of the developments in quality control are fairly recent, the need for it has existed for a long time. The need for inspection of manufactured products has been around since processes and factories that produce these products have existed. Before the industrial revolution, workers and artisans inspected their own work. However, as work became more complicated and specialized, inspectors were hired to inspect the work of others. In this way, production workers left the responsibility for quality up to the inspector. As industries became larger and larger, the inspection job became too much for inspectors. Therefore, the technology of Quality Control was developed to design tools and techniques which have helped inspectors and quality control personnel to do their job.

According to Wadsworth, et al. (14, p. 6), "From 1925 to 1941, the development of quality control and quality assurance methodology was remarkable. In the December issue of *The Journal of the American Statistical Association*, Shewhart set the tone with his paper: The Application of Statistics as an Aid in Maintaining Quality of a Manufactured Product." In this paper, Shewhart (15) introduced the control chart concept.

The control chart is one of the earliest techniques developed in the quality control field. When control charts are employed in their original form, they are called Shewhart charts. Dr. Walter Shewhart developed control charts in order to determine if a sequence of data (measurements) obtained from an industrial process may be used for predictions of what this process will yield in the future. Shewhart reached the brilliant conclusion that it would be desirable and possible to set limits based upon the natural variation of any process, so that fluctuations within these limits could be readily explained by chance or common causes, but any variation outside these limits would indicate the presence of special or assignable causes of variation. When special causes are present, prediction is not feasible due to the presence of sources of uncontrolled variation. When only common causes are present, the process is said to be in state of statistical control (SOSC) and prediction is feasible. According to Shewhart (16, p. 6), "A phenomenon will be said to be controlled when, through the use of past experience, we can predict, at least within limits, how the phenomenon may be expected to behave in the future. Here it is understood that prediction within limits means that we can state, at least approximately, the probability that the observed phenomenon will fall within the given limits."

2.2 The Basis of Control Charts

As stated in 2.1, control charts were developed by Dr. Walter Shewhart in 1925 to determine if a sequence of observations obtained from an industrial process may be used for prediction of what this process will yield in the future. It means that the control chart technique represents a scientific basis for prediction.

The basis of all control charts is the following: Any varying quantity (whether an individual measurement X, an average $\overline{X}$, a sample standard deviation s, a range R, a moving range MR, a fraction defective p, or a count on the number of defects c) forms a distribution if chance causes alone are present. Any such distribution has a mean and a standard deviation. According to Burr (2, p. 92), "Quite regardless of the shape of the distribution (unless extremely badly behaved), there will be, by chance causes only, very few points outside of the band between the mean minus three standard deviations and the mean plus three standard deviations. Hence, having set such limits, we have a band of normal variability for the statistical measure in question." Then, when a point falls outside this three sigma band, it is a much better bet to think that the point is due to the presence of special causes of variation than to think that the point is due to chance (common) causes alone. On the other hand, when a point falls inside the 3σ band, one can safely say that there is not evidence that an assignable (special) cause of variation is present and the process is said to be in state of statistical control (SOSC).

The primary concern of statistical control is predictability. According to Wheeler and Chambers (17, p. 38). "A process is predictable when it is in a state of statistical control, and it is unpredictable when it is not in state of statistical control ... Since the decision is to be based on past experiences, it follows that one will need to begin with data generated by the phenomenon in question. When a reasonable amount of these data have been accumulated, they are used to calculate appropriate limits. If the historical data fall within these limits, and if data collected after the limits have been calculated also stay within these historical limits, then it becomes reasonable to make a prediction regarding future observations."

The control chart technique is a powerful tool for making more fruitful people's efforts in stabilizing and controlling industrial processes at desired levels of performance.

2.2.1 The basis for establishing control limits

Any quality characteristic of an industrial process can be represented by a distribution function f (x). Therefore, according to Shewhart (16, p. 275), "Knowing the distribution function f (x), it is possible, in general, to find a distribution function f_θ (θ, n) for a given statistic θ calculated from samples of size n such that the integral

$$P = \int_{\theta_1}^{\theta_2} f_\theta (\theta, n) \, d\theta$$

gives the probability that the statistic θ will have a value lying within the limits θ_1 and θ_2." However, people normally do not know f (x) and f_θ (θ, n) in sufficient detail to set up such control limits.

As a consequence, Shewhart says (16, p. 276) that the basis for establishing such allowable limits on the variability of sample statistics must be empirical. Under such conditions, Shewhart states (16, p. 276) that it seems reasonable to choose limits θ_1 and θ_2 on some statistic θ such that the associated probability P is economic. It means, according to Shewhart (16, p. 276), that "if more than one statistic is used, then the limits on all the statistics should be chosen so that the probability of looking for trouble when any one of the chosen statistics fall outside its own limits is economic."

Shewhart stresses (16, p. 276) that one must find a balance between the advantages of increasing the value of P through reduction in the probability of looking for trouble when none exist (type I error) and the disadvantages occasioned by failing to detect troubles when they really exist (type II error).

For all these reasons, Shewhart recommends (16, p. 277) a symmetrical range characterized by limits

$$\bar{\theta} \pm t\sigma_{\theta}$$

symmetrically spaced in reference to $\bar{\theta}$. Experience indicates that t = 3 seems to be an acceptable economic value.

According to Wheeler and Chambers (17, p. 60), "The strongest justification of three sigma limits is the empirical evidence that three sigma limits work well in practice ... that they provide effective action limits when applied to real world data."

Wheeler and Chambers (17) use part three of the Empirical Rule to empirically justify the selection of t = 3. Part three of the Empirical Rule states that given an homogeneous set of data, approximately 99% to 100% of the data will be located within three sigma units on either side of the average, regardless of the distribution function of the data. In order to evaluate the robustness of part three of the Empirical Rule, Wheeler and Chambers (17) use six different probability models: uniform, triangular, normal, the Burr distribution, chi-square, and exponential. The results showed that only for the chi-square distribution (98.6%) and exponential distribution (98.2%), the percentage of the data within three sigma units on either side of the average is scarcely less than the 99% to 100% stated in part three of the Empirical Rule. Therefore, Wheeler and Chambers (17, p. 64) conclude that "No matter how skewed, no matter how heavy-tailed, virtually all of the distribution will fall within three standard deviations of the mean ... Since data which display statistical control are, by definition, reasonably homogeneous, part three of the Empirical Rule provides an explanation why the control chart technique with t = 3 will yield very few false alarms. At the same time, when a point falls outside 3σ limits it is very likely to be due to the presence of an assignable cause of variation."

2.2.1.1 Standard given

According to ANSI/ASQC Standard A1 1978 (18, p. 1), "Control chart with standard given is a control chart whose control limits are based on adopted standard values applicable to the statistical measure plotted on the chart." This type of control chart is used to discover whether observed values of X, $\overline{X}$, p, c, etc., for samples differ from standard values X_0, $\overline{X}_0$, p_0, c_0, etc., by an amount greater than should be attributed to chance alone.

According to the ASTM special technical publication 15D (19, p. 75), "The standard value X_0, $\overline{X}_0$, p_0, c_0, etc., may be an experienced value based on representative prior data, or an economic value established on consideration of needs of service and costs of production, or a desired or aimed-at value designated by specifications."The problem with this method of setting control limits at $\overline{\theta}_0 \pm 3\sigma_\theta$ is that people almost never know the standard value of the mean $\overline{\theta}_0$ and standard deviation σ_θ of the statistic θ. Therefore, this method is rarely used in industry to set control limits for the statistical measure plotted on the chart.

2.2.1.2 No standard given

According to ANSI/ASQC Standard A1 1978 (18, p. 1), "Control chart with no standard given is a control chart whose control limits are based on the sample or subgroup data plotted on the chart." These control charts are based entirely on the data from the samples being evaluated. This type of control chart is used to determine whether observed values of X, $\overline{X}$, R, MR, etc., for a series of samples or subgroups vary among themselves by an amount greater than should be attributed to chance alone.

In this thesis research, control charts with no standard given are the ones to be considered because, normally in industry, control limits are based on data rather than on standards.

2.3 Shewhart Control Charts based on Variables Data

Any quality characteristic of an industrial process can be studied and analyzed by some type of Shewhart control chart which has limits of variation based on the inherent or natural variability of the process. If the quality characteristic is measurable (variable), it is common practice to organize the data in a rational manner (rational subgroups) in order to monitor the level and dispersion of the values of the quality characteristic generated by the process in study. Usually, subgroups of n observations are taken and the average $\overline{X}$ and the range R of the subgroup are calculated to measure level and variability, respectively. Then, a series of such $\overline{X}$ and R values are plotted in a time series with control limits to construct the average $\overline{X}$ and range R control charts.

The idea behind the use of subgroups to monitor the process in study is to minimize the sources of variation within a subgroup in order to make the control charts more sensitive to changes in the level and dispersion of the process (tighter control limits). According to the ASTM special technical publication 15D (19, p. 76), "One of the essential features of the control chart method is what is referred to as breaking up the data into rationally chosen subgroups called rational subgroups; that is, classifying the observations under consideration into subgroups or samples, within which the variation may be considered on engineering grounds to be due to nonassignable chance causes only, but between which the differences may be due to assignable causes whose presence is suspected or considered possible."

2.3.1 $\overline{X}$ and R control charts

The variable control charts that are most commonly used are average, or $\overline{X}$ charts, and range, or R charts. According to Duncan (1, p. 381), "When control is undertaken by using variables instead of attributes, it usually takes the form of employing an $\overline{X}$ chart to control the average of the process and an R chart to control the general variability of the process. The two taken together will give reasonably good control of the whole process."

Normally, samples or subgroups of four or five measurements are taken and the average $\overline{X}$ and the range R of the subgroups are calculated. In fact, these two statistics ($\overline{X}$ and R) are the ones actually used to monitor the process. Individual measurements X are primarily used to get values for the subgroup average and the subgroup range.

2.3.1.1 $\overline{X}$ charts

An $\overline{X}$ chart is a control chart for evaluating the process level or subgroup differences in terms of the subgroup average $\overline{X}$. According to ANSI/ASQC Standard A1-1978 (18, p. 3), "Averages are generally used for the purpose of determining whether there are differences between subgroup levels."

The setting of limits on the average $\overline{X}$ control chart is based on the assumption of normality justified by the central limit theorem. The normal assumption is introduced into the $\overline{X}$ charts through the use of the control chart constants d_2 and A_2. The central line is set at

$$CL_{\bar{X}} = \bar{\bar{X}}$$

where $\bar{\bar{X}}$ is the average of all the data.

The control limits $UCL_{\bar{X}}$ and $LCL_{\bar{X}}$ are set at $\pm 3\,\hat{\sigma}_{\bar{X}}$ from $\bar{\bar{X}}$

$$UCL_{\bar{X}} = \bar{\bar{X}} + 3\,\hat{\sigma}_{\bar{X}}$$

$$LCL_{\bar{X}} = \bar{\bar{X}} - 3\,\hat{\sigma}_{\bar{X}}$$

where $\hat{\sigma}_{\bar{X}}$ is an estimate of $\sigma_{\bar{X}}$ derived from the data.

Due to the central limit theorem

$$\hat{\sigma}_{\bar{X}} = \hat{\sigma}_X \;/\; \sqrt{n}$$

where $\hat{\sigma}_X$ is an estimate of the process standard deviation σ_X derived from the data. It is shown in section 2.4 below that $\hat{\sigma}_X$ is equal to $\bar{R}$ / d_2. Factor d_2 is the bias correction factor used in estimating the process standard deviation using the average sample range as a measure of dispersion.

Then,

$$UCL_{\bar{X}} = \bar{\bar{X}} + 3\,(\,\hat{\sigma}_X \,/\, \sqrt{n}\,) = \bar{\bar{X}} + 3\,(\,\bar{R} \,/\, d_2\sqrt{n}\,)$$

where $3 \,/\, d_2\sqrt{n}$ is known as the control chart constant A_2.

Therefore,

$$UCL_{\bar{X}} = \bar{\bar{X}} + A_2\,\bar{R}$$

In the same way

$$LCL_{\bar{X}} = \bar{\bar{X}} - A_2\bar{R}$$

2.3.1.2 R charts

An R chart is a control chart for evaluating the variability within a process in terms of the subgroup range R. According to ANSI/ASQC Standard A1-1978 (18, p. 3), "Ranges of the individual observations within the subgroup or sample are used to estimate the variability from chance causes within short time intervals and ordinarily should not include assignable causes. These ranges serve to estimate the inherent variability within an essentially unchanging process." Ranges are usually easier to compute than sample standard deviations but they are not recommended for n > 10.

The setting of limits on the R chart is based on the assumption of normality underlying the process in study. The normal assumption is introduced into the R charts through the use of the control chart constants d_2, d_3, and D_4. The central line is set at

$$CL_R = \bar{R}$$

where $\bar{R}$ is the average of the subgroup ranges.

The control limits UCL_R and LCL_R are set at $\pm 3\,\hat{\sigma}_R$ from $\bar{R}$

$$UCL_R = \bar{R} + 3\,\hat{\sigma}_R$$

$$LCL_R = \bar{R} - 3\,\hat{\sigma}_R$$

where $\hat{\sigma}_R$ is an estimate of the range standard deviation σ_R derived from the data. It is shown in section 2.5 below that $\hat{\sigma}_R = d_3\ \hat{\sigma}_X = (d_3 / d_2)\,\bar{R}$. Factor d_3 is the bias correction factor used in estimating the range standard deviation.

Then,

$$UCL_R = \bar{R} + 3\,\hat{\sigma}_R = \bar{R} + 3\,(d_3 / d_2)\,\bar{R} = \bar{R}\,[\,1 + 3\,(d_3 / d_2)\,]$$

where $1 + 3\,(d_3 / d_2)$ is known as the control chart constant D_4.

Therefore,

$$UCL_R = D_4\bar{R}$$

In the same way

$$LCL_R = \bar{R} - 3\,\hat{\sigma}_R = \bar{R} - 3\,(d_3 / d_2)\,\bar{R} = \bar{R}\,[\,1 - 3\,(d_3 / d_2)\,] = D_3\bar{R}$$

where $1 - 3\,(d_3 / d_2)$ is known as the control chart constant D_3.

For $n \leq 6$ the lower control limit for the range LCL_R does not exist.

2.3.2 Individual measurement X and moving range n = 2 MR control charts

In some cases, the use of the average and range control charts is not appropriate because natural subgrouping is not possible. This might happen when the process is too slow in producing results, being operationally impractical to wait until a subgroup of four or five can be formed, or when each measurement represents a given condition of a batch at a given time. Under these circumstances the logical subgroup size is n=1 and a combination of individual measurements X and moving ranges MR based on two consecutive observations can be used to monitor the level and dispersion of the process, respectively.

2.3.2.1 Control chart for individual observations (X chart)

An X chart is a control chart for evaluating the process level in terms of a single observation per visit to the process. According to Wadsworth, et al. (14, p. 143), "Their use is generally reserved for process and product characteristics for which it is impractical or unreasonable to replicate observations and to form subgroups of observations to aid the study of process variation."

The setting of limits on the individual measurement X control chart is based on the assumption of normality underlying the process under study. The normal assumption is introduced into the X chart through the use of the control chart constants d_2 and E_2. The central line is set at

$$CL_X = \bar{X}$$

where $\bar{X}$ is the average of all the data.

The control limits UCL_X and LCL_X are set at ± 3 $\hat{\sigma}_X$ from $\bar{X}$

$$UCL_X = \bar{X} + 3\,\hat{\sigma}_X$$

$$LCL_X = \bar{X} - 3\,\hat{\sigma}_X$$

where $\hat{\sigma}_X$ is an estimate of the process standard deviation σ_X derived from the data. It is shown in section 2.4 below that $\hat{\sigma}_X$ is equal to $\overline{MR} / d_2$. Factor d_2 is the bias correction factor used in estimating the process standard deviation using the moving range (n=2) as a measure of dispersion.

Then,

$$UCL_X = \bar{X} + 3\,(\overline{MR} / d_2)$$

where $3 / d_2$ is known as the control chart constant E_2.

Therefore,

$$UCL_X = \bar{X} + E_2\,\overline{MR}$$

In the same way

$$LCL_X = \bar{X} - 3\,(\overline{MR} / d_2) = \bar{X} - E_2\,\overline{MR}$$

2.3.2.2 Moving range n = 2 MR control charts

A moving range n = 2 MR control chart is a chart for evaluating the variability within a process in terms of the range of the latest two observations in which the current observation has replaced the older of the previous two observations.

The setting of limits on the MR chart is based on the assumption of normality underlying the process under study. The normal assumption is introduced into the MR chart through the use of the control chart constants d_2, d_3, and D_4. The central line is set at

$$CL_{MR} = \overline{MR}$$

where $\overline{MR}$ is the average of the k - 1 moving ranges formed of n = 2.

The upper control limit UCL_{MR} is set at 3 $\hat{\sigma}_{MR}$ above the central line $\overline{MR}$

$$UCL_{MR} = \overline{MR} + 3\,\hat{\sigma}_{MR}$$

where $\hat{\sigma}_{MR}$ is an estimate of the moving range standard deviation for n = 2 (σ_{MR}) derived from the data. It is shown in section 2.5 below that $\hat{\sigma}_{MR} = d_3\,\hat{\sigma}_X = (d_3 / d_2)\,\overline{MR}$. Factor d_3 is the bias correction factor used in estimating the moving range standard deviation for n = 2.

Then,

$$UCL_{MR} = \overline{MR} + 3\,\hat{\sigma}_{MR} = \overline{MR} + 3\,(d_3 / d_2)\,\overline{MR} = \overline{MR}\,[\,1 + 3\,(d_3 / d_2)\,]$$

where $1 + 3\,(d_3 / d_2)$ is known as the control chart constant D_4.

Therefore,

$$UCL_{MR} = D_4\,\overline{MR}$$

Due to the fact that the lower control limit for the range does not exist for $n \le 6$, the lower control limit for the moving range with n = 2 does not exist.

The values of the bias correction factors d_2 and d_3 and the values of the control chart constants A_2, D_3, D_4, and E_2, when the underlying process distribution is assumed normal, are given in Appendix A. This table is reproduced from ANSI/ASQC Standard A1-1978 (18, p. 13).

In section 2.6 below, the meaning of the bias correction factors d_2 and d_3 is explained in detail. The other control chart constants used in this creative component research (A_2, D_3, D_4, and E_2) derive from the two bias correction factors d_2 and d_3.

2.4 Estimation of the Process Standard Deviation required to set control limits for the $\bar{X}$ and X charts.

In small samples or subgroups, the standard deviation and the range are likely to vary together. Thus, if the sample standard deviation is large, the sample range is also likely to be large. If the sample standard deviation is small, the sample range is likely to be small, too. However, in large subgroups, the occurrence of one extreme value will cause the sample range to be large, but it may have much less effect on the sample standard deviation. Therefore, if one is interested in finding an estimate of the process standard deviation, the sample range may often be employed as a substitute for the standard deviation with little loss in efficiency for small subgroup sizes. Grubbs and Weaver (21, p. 224-225) state that "The range should not be used when the sample size is greater than about 15 or 20. The reason for this is due to the practical loss in the efficiency of the range as compared to the standard deviation for sample sizes greater than about 10." Thus, the sample range is not recommended to estimate the process standard deviation for subgroup size $n > 10$.

A table which provides the efficiency of the estimator $\hat{\sigma}$ based on the sample range statistic was published by David (20, p. 185). From the table, David states that "the efficiency of $\hat{\sigma}$ seems to be adequate for $n \leq 12$ and very good for the small sample sizes (typically $n = 5$) generally used in quality control work." Mathematical statisticians define the most efficient estimator $\hat{\theta}$ of a parameter θ as the estimator that has the minimum variance. The efficiency of any other unbiased estimator is defined as the ratio of the variance of the sampling distribution of the efficient estimator to the variance of the sampling distribution of the other estimator. David (20, p. 185) defines the efficiency of $\hat{\sigma}$ based on the sample range statistic as:

$$\text{eff}(\hat{\sigma}) = \text{Var } S' / \text{Var } \hat{\sigma}$$

where S' is the unbiased root mean square estimator of σ.

The sample range, in addition to being nearly as efficient as the sample standard deviation for small samples ($n \leq 10$), is easy to calculate. For that reason, it is usually preferred to the standard deviation in quality control analysis.

In statistical quality control, the average subgroup range is used to estimate the process standard deviation. However, the average range is a biased estimator of σ. Therefore, a bias correction factor (d_2), as a function of the subgroup size n, is required to get an unbiased estimator of the process standard deviation σ based on the average subgroup range.

$$\hat{\sigma} = \bar{R} / d_2$$

According to Grubbs and Weaver (21, p. 224), "A measure of the true variation in a lot could be estimated by simply taken the difference between the largest and smallest observations in a sample of n items and dividing the range obtained by a factor which depends on the sample size. Although the sample standard deviation is a more efficient estimate of dispersion, it may be desirable from a practical standpoint to use the range in view of its simplicity and since only a slight loss in efficiency is suffered in the case of small samples."

This estimator $\hat{\sigma} = \bar{R} / d_2$ of the process standard deviation σ based on the average subgroup range has been also emphasized in the quality control literature by Shone (22), Nelson (23), and Masuyama (24).

In cases where natural subgrouping is not possible, because the process is too slow in producing results being operationally impractical to wait until a subgroup of four or five can be formed or because each measurement represents a given condition of a batch at a given time, the logical subgroup size is n=1. In this situation, a combination of individual measurement X and moving range MR based on two consecutive observations can be used to monitor the level and dispersion of the process simultaneously. When subgroup size n = 1, the subgroup range is impossible to be evaluated. Therefore, the process standard deviation σ required to set control limits for the X chart cannot be estimated using the equation

$$\hat{\sigma} = \bar{R} / d_2$$

According to Cryer and Ryan (25, p. 187), "The standard approach to estimating sigma for an individual observation control chart is to use moving ranges of two consecutive observations." From the average moving range of two consecutive measurements $\overline{MR}$, one can easily estimate the process standard deviation σ by using the equation

$$\hat{\sigma} = \overline{MR} / d_2$$

This estimate is likely to be slightly affected by uncontrolled variation in individuals due to special causes. In this regard, Keen and Page (26, p. 13) state that "a rapid estimate of the standard deviation of a distribution that is nearly normal can be obtained by regarding the mean successive differences between adjacent readings, arranged in order of collection, as an approximation of the mean range of two. This method was suggested by Mr. W. J. Jennett for control chart work carried out in the MO Valve Company Ltd. in 1942, and has since been used extensively in The General Electric Company Ltd. The calculation of the standard deviation is made in three steps: (1) take the differences between the consecutive values, (2) average the differences (ignoring sign), and (3) regarding them as ranges in random samples of two, divide the mean difference by the bias correction factor d_2 (n = 2) = 1.128."

2.5 Estimation of the Range Standard Deviation σ_R required to set control limits for the R chart and MR (n = 2) charts.

Considering moving ranges of two consecutive measurements MR as ranges R in random samples of two (n = 2), the setting of control limits for the MR (n = 2) chart can be seen as a particular case of the R chart with n = 2. Therefore, in this section, only the estimation of the range standard deviation σ_R is discussed.

As described in sections 2.3.1.2 (p. 23) and 2.3.2.2 (p. 26), the setting of limits on the R chart and MR chart is based on the general Shewhart equations:

$$UCL_R = \bar{R} + 3\ \hat{\sigma}_R$$

$$LCL_R = \bar{R} - 3\ \hat{\sigma}_R$$

where $\hat{\sigma}_R$ is an estimate of the range standard deviation σ_R derived from the data.

The estimator $\hat{\sigma} = \bar{R}\ /\ d_2$ is a biased estimator of the range standard deviation.

Therefore, a bias correction factor (d_3), as a function of the subgroup size n, is required to get an unbiased estimator of the range standard deviation σ_R based on the process standard deviation.

$$\hat{\sigma}_R = d_3 \ \hat{\sigma} = (d_3 / d_2) \ \bar{R}$$

In the same way

$$\hat{\sigma}_{MR} = d_3 \ \hat{\sigma} = (d_3 / d_2) \ \overline{MR}$$

2.6 Estimation of the Bias Correction Factors d_2 and d_3 used to evaluate the control chart constants A_2, D_3, D_4, and E_2.

The difficulty in the estimation of the bias correction factors d_2 and d_3 is that the distribution of the sample range does not have a particular probability distribution which represents it. According to Burr (28, p. 636-637) "Formidable difficulties of approximation are usually involved in finding the density function and the first four moments of the range. This is especially true when the population distribution function, F(x) can only be expressed in terms of an integral." In this regard, Grant (41, p. 86) states that for the distribution of the range no simple formula gives either $\bar{R}$ or $\sigma_{R.}$. However, theory fully defines the expected distribution of R when the parent population is normal. According to Duncan (1, p. 126) "Fortunately, tables of the distribution of the relative range $W = \bar{R} / \sigma$ have been worked out for a normal universe." In addition, the sample range distribution is greatly affected by the shape of the parent distribution. According to Hartley (32, p. 334), "extensive investigations have shown that its random sampling distribution is markedly dependent on the parental population." In the same way, Shewhart (16, p. 202) states that "We do not know the distribution function of the range ... there is a marked influence of the functional form of the universe upon the distribution function of the ranges."

As mentioned in chapter I (in the definition of terms), the range is an order statistic which serves as a measure of dispersion mainly in the quality control field. It is the difference between the largest and smallest values of the sample or subgroup. Because of its simplicity, the sample range is often used instead of the sample standard deviation as an estimator of the process standard deviation. David (20), Grubbs and Weaver (21), Shone (22), Nelson (23), Masuyama (24), Cryer and Ryan (25), Keen and Page (26), and others have used the sample range, the sample mean range, the sample moving range of two consecutive observations, and the average sample moving range of two consecutive measurements as estimators of the process standard deviation in normal theory tests.

Since the early paper by Tippett (1925), interest in the distribution of sample ranges and associated applications has steadily grown. In his paper, Tippett (27) states that "It has not been found possible to write down the distribution of ranges in any useful form, so the procedure has been to find those constants involving the first four moments." Values of the bias correction factors $d_2 = \bar{R} / \sigma$ and $d_3 = \sigma_R / \sigma$ were found by Tippett (27) for all sample sizes from two to one thousand when the underlying process distribution is normal.

According to Burr (28, p. 636), "Since the first paper by Tippett (27), the distribution of ranges from independent observations from a normal distribution has been well covered." Pearson (29, 1926), Pearson (30, 1932), Pearson (31, 1942), Hartley (32, 1942), Harter (33, 1960), and others have showed interest in the range and its properties including quality control applications. All this work has generated tables giving the standardized mean values (d_2) and the standardized standard deviation (d_3) of the range from random samples drawn from the normal distribution as well as tables of the probability integral of the range.

The effect of non-normality on the mean range has been experimentally studied by Pearson (34, 1928) and Shone (22, 1949). Pearson (35, 1950) has summarized earlier empirical studies on the effect of non-normality on the range and concluded that the range may be used with the appropriate adjustment (d_2) for a normal population as an estimator of the process standard deviation, provided that samples of not more than 10 observations are taken. David (36, 1954) derived some exact results regarding the mean and probability integral of the range in samples from a number of non-normal populations such as the rectangular, exponential and others. Cox (37, 1954) got a general picture of the effect of process kurtosis on the mean and coefficient of variation of the range in small samples and assessed the effect of non-normality on the common applications of the range.

As mentioned before, Burr (28, p. 636-637) states that "Formidable difficulties of approximation are usually involved in finding the density function and the first four moments of the range. This is especially true when the process distribution function, F(x), can only be expressed in terms of an integral. When, however, F(x) can be given in closed form, the calculations become more feasible." Burr (28), using 81 distributions from the Burr system of distributions $F(x) = 1 - (1 + x^c)^{-k}$ for $x \geq 0$ and c, k > o, evaluated the four moments (μ_R, σ_R, $\alpha_{3:R}$, $\alpha_{4:R}$) for the corresponding 81 range distributions generated from the 81 parent distributions.

Due to the complexity in finding the density function and the four moments of the range mentioned by Burr (28), and due to the fact that d_2 and d_3 have been tabulated when the parent population is normal, the quality control field has centered its attention only in the use of the normal d_2 and d_3 bias correction factors. These normal bias correction factors are used in the process of setting control limits for the $\bar{X}$ chart, R chart, X chart, and MR (n = 2) control charts.

It is one of the objectives of this thesis research to evaluate the performance of these normal d_2 and d_3 bias correction factors when the underlying process distribution is a Pearson type III with location parameter c = 0. In addition, another objective of this study is to find the empirical (approximate) values of d_2 and d_3 when the process distribution is approximated by a Pearson type III with c = 0.

2.7 Previous researches - Effects of non-normality in control charts.

Researches in this field have been mainly concentrated on the effects of non-normality in the average $\bar{X}$ and range R control charts where the central limit theorem plays an important role in the assumption of normality.

2.7.1 Niemann's experimental thesis

Niemann (38) in an unpublished master thesis studied the effect of lack of symmetry of the population upon the control chart constants. The population sampled is approximately a Pearson type III curve. In his experiment, 4000 samples of $n = 4$ each were drawn with replacement. The values of the mean, standard deviation, and range were calculated for each subgroup and the results tabulated. Then, the values of the control chart constants were approximated and compared with the corresponding values for the normal curve control chart constants for $n = 4$. Comparison of the two set of limits indicates similarity, although the subgroup size is small ($n = 4$) and the process distribution is quite skewed.

Niemann's general conclusion is that if control chart constants for the normal curve are used, when the process distribution is non-normal through lack of symmetry, tighter control limits should be observed. Thus, it is slightly more likely for assignable causes to be indicated when none exist (type I error). Therefore, it is also a bit more difficult to get a process into a perfect state of statistical control than if the unknown correct constants are used.

This experimental study is described in Burr (2, p. 163-165). According to Burr (2, p. 163), "This experimental thesis has given us good grounds for confidently using the normal curve constants even for moderately non-normal populations. For J-shaped or very strongly skewed populations, the normal curve constants probably cannot be much relied upon."

2.7.2 Irving Burr's research

Irving Burr (39, 1967) published a paper in which he discusses the effect of non-normality on the control chart constants. He presents a set of tables where the values of eight control chart constants (d_2, d_3, A_2, E_2, and D_1-D_4) are exactly calculated for 28 different non-normal distributions given by different combinations of skewness and kurtosis. Burr states (39, p.563) that "a literature search, involving about 100 papers, revealed that the sampling distribution for ranges is known for only a very few populations, of which only the normal distribution is of any appreciable practical importance ... the present article provides information on the effects of various practical degrees of non-normality upon the control chart constants for $\bar{X}$ and R charts."

From the 81 non-normal distributions considered by Burr (28), 28 distributions are selected by Burr (39) in this study to cover to some extent a wide band of the plane α_3 (skewness) - α_4 (kurtosis). In reference (28), Burr calculates E (R), σ_R, $\alpha_{3:R}$, and $\alpha_{4:R}$ for the 81 sampling distributions of ranges corresponding to the 81 non-normal parent populations chosen. This allows Burr to obtain the control chart constants required for three standard deviation control charts for measurements. The first two constants d_2 and d_3 (bias correction factors) were evaluated using the equations:

$$d_2 = E(R) / \sigma = \bar{R} / \sigma$$

$$d_3 = \sigma_R / \sigma$$

The last six constants (A_2, E_2, and D_1-D_4) were all determined from d_2 and d_3 using the equations:

$$A_2 = 3 / d_2\sqrt{n}$$

$$E_2 = 3 / d_2$$

$$D_1 = d_2 - 3d_3$$

$$D_2 = d_2 + 3d_3$$

$$D_3 = 1 - 3 (d_3 / d_2)$$

$$D_4 = 1 + 3 (d_3 / d_2)$$

From the values of the control chart constants obtained, Burr (39, p. 567) concludes that "study of constants given in Tables I to IV reveals that they are quite stable, in some cases surprisingly so, as for example A_2. Thus we can use the ordinary normal curve control chart constants unless the population is markedly non-normal. When it is, the tables provide guidance on what constants to use."

2.7.3 Schilling's and Nelson's research

As mentioned before, the setting of limits on $\bar{X}$ control charts are based on the assumption of normality justified by the central limit theorem. This theorem states that the distribution of sample means will approach the normal distribution for large sample sizes. Schilling and Nelson (40) address the questions, "How large?" and "To what approximation?"

According to Schilling and Nelson (40, p. 183), "By numerically inverting the appropriate characteristic functions, tables are provided which show the manner of approach to normality for various underlying distributions and sample sizes. Also, sample sizes are given such that, at selected points, the sum of the tail areas of the distribution of sample means will be within given values." They investigated nine different populations such as rectangular, right triangular, gammas with $\beta=1$ and $\alpha=1/2$, 1, 2, 3, and 4, symmetric bimodal, and asymmetrical bimodal.

The results of this study indicate that the approach to normality of the distribution of sample means is slower than is often indicated in the literature, especially for the exponential and mixed distributions. In relation with applications to control charts for the mean $\bar{X}$, Schilling and Nelson (40, p. 187) state that "If the risk of a false signal is held to 0.3% for a three sigma control chart, samples of considerable size would be required to be plotted for the exponential (n = 166) and asymmetric bimodal distributions (n = 47) ... The risk of 0.003 for three sigma control charts is often quoted on the basis of normal theory; 0.3% should however not be considered sacrosanct. When used with non-normal distributions, reasonably small probabilities of a type I error should suffice for construction of the chart. Experience over the years has shown 3σ limits with small sample sizes to be of utmost practical value. Examination of Table 1 (p. 186-187) indicates that such charts assure the risk of a false signal to be 1.4% or less when plotting subgroups of size 4 or more, over all the distributions studied. A maximum risk of 1 in 72 for the most extreme case studied (gamma with α=1/2) seems to imply that samples of this size are sufficient for most practical applications."

2.7.4 Individual measurement X and moving range n = 2 MR control charts

For the individual measurement X and moving range n = 2 MR control charts, no work was found that addresses the effects of non-normality on these control charts.

CHAPTER III

GENERAL PROCEDURE

3.1 Objective one. The first objective is to evaluate the performance of the individual measurement and moving range n=2 MR control charts, using the control chart constants d_2, d_3, and D_4 under the assumption of normality, when the underlying distribution is the Pearson type III family of distributions with location parameter c=0 (gamma distributions) so often encountered in industry.

PROCEDURE I

The detailed procedure designed to accomplish objective one is the following:

1. Forty gamma distributions are selected using different combinations of shape parameter α and scale parameter β in order to have a representative set of gamma distributions which go from J-shaped curves to bell-shaped curves approximating the normal distribution as α increases.

Ten values of the shape parameter α are selected. They are:

$$\alpha = 0.5,\ 1,\ 1.5,\ 2,\ 3,\ 4,\ 5,\ 10,\ 50, \text{ and } 100$$

Four values of the scale parameter β are selected. They are:

$$\beta = 0.5,\ 1,\ 5, \text{ and } 10$$

2. Generate ten thousand (10,000) random variates for each gamma distribution indicated in step one of this procedure.

General gamma random variates are more complicated to generate than other continuous distributions because the distribution function has no simple closed form for which one can find an inverse in order to use the inverse transform method. However, given Y ~ gamma distribution (α, β=1), any gamma distribution (α, β) can be easily obtained by letting $X = \beta Y$. Therefore, if one can generate a gamma distribution (α, β=1), more general gamma distributions (α, β) can be easily generated using the equation $X = \beta Y$ indicated above.

The algorithm to be used in the generation of the 10,000 random variates for each gamma distribution depends upon the value of the shape parameter α.

2.1 Case $0 < \alpha < 1$. This algorithm is due to Ahrens and Dieter (3). Atkinson and Pearce (4) tested three algorithms for the generation of gamma variates and recommend Ahrens and Dieter algorithm for a "one-time" simulation which is the case in this thesis research. In addition, Law and Kelton (5) recommend the use of this algorithm to generate general gamma random variates with shape parameter α less than one.

Algorithm:

2.1.1 Generate U_1 as an independent and identical distributed uniform U (0, 1), and let $P = bU_1$ and $b = (e + \alpha) / e$

where

$$e = \text{constant } 2.718281828$$

If $P > 1$, go to step 2.1.3. Otherwise, proceed to step 2.1.2.

2.1.2 Let $Z = P^{\frac{1}{\alpha}}$, and generate $U_2 \sim U(0, 1)$. If $U_2 \leq e^{-Z}$, return $Y = Z$ and $X = \beta Y$ where

β is the scale parameter of the general gamma distribution to be generated.

Otherwise, go back to step 2.1.1.

2.1.3 Let $Z=-\ln[\frac{(b-P)}{\alpha}]$, and generate $U_2 \sim U\ (0,\ 1)$. If $U_2 \leq Z^{\alpha-1}$, return $Y = Z$ and $X = \beta Y$. Otherwise, go back to step 2.1.1.

2.2 Case $\alpha = 1$. A gamma distribution with shape parameter $\alpha = 1$ and scale parameter β is an exponential distribution with mean β. The algorithm to be used in order to generate gamma variates ($\alpha = 1$, β) is based on the inverse transform method.

Algorithm:

2.2.1 Generate $U \sim U\ (0,\ 1)$

2.2.2 Return $X = -\beta \ln (U)$

2.3 Case $\alpha > 1$. According to Law and Kelton (5, p. 489), "There are several good algorithms for the case $\alpha > 1$." However, they recommend a method due to Cheng (6), who called this the GB algorithm.

Algorithm:

2.3.1 Generate U_1 and U_2 as IID U (0, 1) and let $a = 1 / (2\alpha-1)^{1/2}$, $b = \alpha-\ln (4)$, $q = (\alpha+1) / a$, $\theta = 4.5$, and $d = 1+\ln (\theta)$.

2.3.2 Let $V = a \ln [U_1 / (1-U_1)]$, $Z = \alpha(e)^V$, $T = U_1^2 U_2$, and $W = b + qV - Z$

2.3.3 If $W + d - \theta T \geq 0$, return $Y = Z$ and $X = \beta Y$. Otherwise, proceed to the next step (2.3.4.).

2.3.4 If $W \geq \ln (T)$, return $Y = Z$ and $X = \beta Y$. Otherwise, go back to step 2.3.1.

In order to generate correct gamma variates, it is essential that a statistically reliable U (0, 1) random-number generator be available. In this thesis research the random-number generator used is the one included in Minitab for windows release 10. This random-number generator generates U_i's which resemble values of true independent and identically distributed uniform U (0, 1) random variables. This generator was tested statistically to see how closely the U_i's generated resemble IID U (0, 1) random variables. The test used is a special case of the chi-square test with all parameters known. This test is recommended by Law and Kelton (5, p. 437). The results are shown in Appendix B and they indicate that the generator is good enough to generate reliable gamma variates.

3. Calculate the average $\overline{X}$ of the 10,000 gamma variates for each of the forty gamma distributions using the equation $(\sum X_i) / 10{,}000$.

4. Group the 10,000 gamma variates $X_1, X_2, X_3, \ldots, X_{5000}, X_{5001}, \ldots, X_{9999}, X_{10000}$ for each gamma distribution generated in step 2 in subgroups of two consecutive measurements in the following manner:

$$(X_1, X_2), (X_2, X_3), \ldots, (X_{5000}, X_{5001}), \ldots, (X_{9999}, X_{10000}).$$

At the end there will be 9,999 (N-1) subgroups of n = 2 consecutive measurements for each of the forty gamma distributions generated in step 2.

Then, for each subgroup, calculate the moving range n = 2 MR using the equation:

$$\text{MR} = \text{Absolute value } (X_{i+1} - X_i)$$

In this way, the empirical moving range n = 2 MR distributions are obtained from the 9,999 moving ranges already calculated for each gamma distribution.

5. Evaluate the expected value of each of the forty empirical moving range n = 2 MR distributions. This evaluation is done using the equation:

$$\text{E (MR)} = \overline{MR} = (\sum \text{MR}_i) / 9{,}999$$

6. With the average moving range $\overline{MR}$ for each empirical moving range n = 2 MR

distribution and the value of the normal control chart constants d_2 and D_4, control limits are set for the individual measurement and moving range n = 2 MR control charts for each of the forty gamma distributions using the following equations:

$$UCL_X = \overline{X} + 3\ \overline{MR}\ /\ d_2 = \overline{X} + 2.6596\ \overline{MR}$$

$$LCL_X = \overline{X} - 3\ \overline{MR}\ /\ d_2 = \overline{X} - 2.6596\ \overline{MR}$$

$$UCL_{MR} = D_4\overline{MR} = 3.268\ \overline{MR}$$

where

d_2 is the bias correction factor which has a value of 1.128 for n = 2 under the assumption of normality.

D_4 is the control chart constant which has a value of 3.268 for n = 2 under the assumption of normality.

7. Evaluate the performance of the individual measurement and moving range n = 2 MR control charts for each of the forty gamma distributions defined in step 1 of this Procedure I.

For the individual measurement control charts, the performance will be measured through the average run length (ARL) for several shifts in the process average $k\sigma$ where k = 0 (0.2) 3 using the equation:

$$ARL = 1\ /\ P$$

where

P is the probability of detection evaluated by the equation:

$$P = \text{Probability}\ (X > UCL_X) + \text{Probability}\ (X < LCL_X)$$

These probabilities will be evaluated using the gamma cumulative distribution function routine contained in Minitab for windows release 10.

Then, empirical ARL curves will be drawn for each of the forty X charts in order to show the performance of the individual measurement X control charts, using the control chart constants d_2 and D_4 under the assumption of normality, when the underlying process distribution is Pearson type III with location parameter c = 0 (gamma distributions).

For the moving range n = 2 MR control charts, the performance will be measured through the probability of type I error since only shifts in the process average are considered in this research.

Since the moving range n = 2 MR distribution is theoretically unknown when the parent distribution is Pearson type III with c = 0, the probability of a type I error and empirical ARL in control must be evaluated empirically using the equations:

$$\text{Empirical probability (type I error)}_{MR} = P' = B / 9{,}999$$

$$\text{Empirical ARL in control} = ARL' = 1 / P'$$

where

B is the number of moving ranges greater than the UCL_{MR} for each of the forty moving range (n=2) control charts corresponding to the forty gamma distributions generated in step 2.

3.2 Objective two. The second objective is to determine the empirical formulas $f(\alpha, \beta)$ for the control chart constants d_2, d_3, and D_4 when the process distribution can be approximated by a Pearson type III distribution with location parameter c = 0, shape parameter α, and scale parameter β.

PROCEDURE II

The detailed procedure designed to accomplish objective two is the following:

1. Forty gamma distributions are selected using different combinations of shape parameter α and scale parameter β in order to have a representative set of gamma distributions which go from J-shaped curves to bell-shaped curves approximating the normal distribution as α increases.

Ten values of the shape parameter α are selected. They are:

$$\alpha = 0.5,\ 1,\ 1.5,\ 2,\ 3,\ 4,\ 5,\ 10,\ 50, \text{ and } 100$$

Four values of the scale parameter β are selected. They are:

$$\beta = 0.5,\ 1,\ 5, \text{ and } 10$$

2. Generate ten thousand (10,000) random variates for each gamma distribution indicated in step 1 of this Procedure II.

The algorithm used in the generation of the 10,000 random variates for each gamma distribution depends upon the value of the shape parameter α.

2.1 Case $0 < \alpha < 1$.

Algorithm:

2.1.1 Generate U_1 as an independent and identical distributed uniform U (0, 1), and let $P = bU_1$ and $b = (e + \alpha) / e$

where

$$e = \text{constant } 2.718281828$$

If $P > 1$, go to step 2.1.3. Otherwise, proceed to step 2.1.2.

2.1.2 Let $Z = P^{\frac{1}{\alpha}}$, and generate $U_2 \sim U\ (0, 1)$. If $U_2 \leq e^{-Z}$, return $Y = Z$ and

$X = \beta Y$ where

β is the scale parameter of the general gamma distribution to be generated.

Otherwise, go back to step 2.1.1.

2.1.3 Let $Z = -\ln[\frac{(b-P)}{\alpha}]$, and generate $U_2 \sim U(0, 1)$. If $U_2 \leq Z^{\alpha-1}$, return $Y = Z$ and $X = \beta Y$. Otherwise, go back to step 2.1.1.

2.2 Case $\alpha = 1$.

Algorithm:

2.2.1 Generate $U \sim U(0, 1)$

2.2.2 Return $X = -\beta \ln(U)$

2.3 Case $\alpha > 1$.

Algorithm:

2.3.1 Generate U_1 and U_2 as IID $U(0, 1)$ and let $a = 1 / (2\alpha-1)^{1/2}$, $b = \alpha - \ln(4)$, $q = (\alpha+1) / a$, $\theta = 4.5$, and $d = 1 + \ln(\theta)$.

2.3.2 Let $V = a \ln[U_1 / (1-U_1)]$, $Z = \alpha(e)^V$, $T = U_1^2 U_2$, and $W = b + qV - Z$

2.3.3 If $W + d - \theta T \geq 0$, return $Y = Z$ and $X = \beta Y$. Otherwise, proceed to the next step (2.3.4.).

2.3.4 If $W \geq \ln(T)$, return $Y = Z$ and $X = \beta Y$. Otherwise, go back to 2.3.1.

3. Calculate the average $\overline{X}$ of the 10,000 gamma variates for each of the forty gamma distributions using the equation $(\sum X_i) / 10{,}000$.

4. Group the 10,000 gamma variates $X_1, X_2, X_3, \ldots, X_{5000}, X_{5001}, \ldots, X_{9999}, X_{10000}$ for each gamma distribution generated in step 2 in subgroups of two consecutive measurements in the following manner:

$$(X_1, X_2), (X_2, X_3), \ldots, (X_{5000}, X_{5001}), \ldots, (X_{9999}, X_{10000}).$$

At the end there will be 9,999 (N-1) subgroups of n = 2 consecutive measurements for each of the forty gamma distributions generated in step 2 of this Procedure II.

Then, for each subgroup, calculate the moving range n = 2 MR using the equation:

$$MR = \text{Absolute value } (X_{i+1} - X_i)$$

In this way, the empirical moving range n = 2 MR distributions are obtained from the 9,999 moving ranges already calculated for each gamma distribution.

5. Evaluate the expected value of each of the forty empirical moving range n = 2 MR distribution. This evaluation can be done using the equation:

$$E\ (MR) = \overline{MR} = (\sum MR_i) / 9{,}999$$

6. Evaluate the standard deviation σ_{MR} of each of the forty empirical moving range n = 2 MR distributions obtained from the 9,999 moving ranges already calculated for each of the forty gamma distributions. The evaluation of σ_{MR} can be done using the equation:

$$\sigma_{MR} = [\ \sum (MR_i - \overline{MR})^2 / 9{,}998\ ]^{1/2}$$

7. With the average moving range $\overline{MR}$ and standard deviation σ_{MR} for each empirical moving range n = 2 MR distribution and the theoretical process standard deviation $\sigma\ (\alpha, \beta)$ of each gamma distribution, approximate control chart constants d_2, d_3, and D_4 can be calculated using the equations:

$$d_2 = \overline{MR}\ /\ \sigma\ (\alpha, \beta)$$

$$d_3 = \sigma_{MR} / \sigma(\alpha, \beta)$$

$$D_4 = 1 + 3d_3 / d_2$$

where

$$\sigma(\alpha, \beta) = (\beta^2 \alpha)^{1/2}$$

8. Find models in which the expected value of the control chart constants d_2, d_3, and D_4 can be written as functions of two independent variables α, β. It means

$$d_2 = f_1(\alpha, \beta)$$

$$d_3 = f_2(\alpha, \beta)$$

$$D_4 = f_3(\alpha, \beta)$$

The method to be used in order to build the models for d_2, d_3, and D_4 is the method of fitting multiple regression models using the least-squares approach.

A statistical program package (Minitab for windows release 10), which features regression software, will be used to test different multiple regression models. The model which maximizes the multiple coefficient of determination R^2 will be the one selected to predict the mean value of the control chart constants d_2 ,d_3, and D_4.

The multiple coefficient of determination R^2 is a sample statistic that tells us how well the model fits the data, and thereby represents a measure of adequacy of the model. R^2 is defined as:

$$R^2 = 1 - [\, \Sigma (y_i - \hat{y}_i)^2 / \Sigma (y_i - \bar{y})^2 \,] = 1 - SSE / SSyy$$

The global F test will be used in order to test the validity of the multiple regression model selected. In this F test the null hypothesis

$$Ho : \lambda_1 = \lambda_2 = \ldots\ldots. = \lambda_k = 0$$

is tested against the alternative hypothesis

Ha : at least one of the λ parameters does not equal zero

The test statistic is defined by

$$F = (R^2 / k) / \{ (1 - R^2) / [n - (k + 1)] \}$$

and the rejection region by

$$F > F\alpha' (k, n - (k + 1))$$

where

n is the number of data points

k is the number of λ parameters in the model excluding the constant term λ_o.

λ_i's are the parameters of the multiple regression model, and

α' is the significance level.

3.3 Objective three. The third objective is to compare the performance of the individual measurement X and moving range n = 2 MR control charts, using the normal control chart constants, with the performance of these control charts using the Pearson type III c = 0 (gamma) control chart constants calculated in objective two, when 10, 30, and 50 data values are available from an unknown process distribution. The performance of the control charts will be evaluated using the proportion of control charts which indicate at least one signal when the process is in control and for shifts in the process average of 1 and 2 process standard deviations.

The motivation of this objective is due to the fact that normally people in industry use the normal control chart constants to set individual measurement and moving range control charts only having 10, 30, or 50 pieces of data from an unknown process distribution.

The idea is to evaluate the performance of the X and MR control charts under the blind assumption of normality and then compare this performance with the performance of these control charts using the Pearson type III (gamma) constants which cover a bigger range of underlying process distribution than the normal constants.

PROCEDURE III

The detailed procedure designed to achieve objective three is the following:

1. Five different process distributions are selected to represent unknown parent distributions. Thus, the performance of the individual measurement X and moving range n = 2 MR control charts based on normal control chart constants can be compared with those control charts based on gamma control chart constants under different process distributions generally unknown by people in industry.

The five process distributions selected are:

- Lognormal $(0, 1^2)$
- Normal $(40, 10^2)$
- Exponential $(\theta = 1)$
- Gamma $(\alpha = 1.5, \beta = 1)$
- Chi-square $(df = 4)$

2. Generate one thousand (1,000) sets of $k = 10, 30$, and 50 observations for each of the five distributions selected in step 1 of Procedure III.

2.1 Lognormal $(0, 1^2)$ algorithm

Law and Kelton (5, p. 492) recommend the following algorithm to generate lognormal random variates LN (μ, σ^2).

2.1.1 Generate Y ~ Normal (μ, σ^2). See algorithm in 2.2 of this Procedure III.

2.1.2 Return $X = e^Y$

2.2 **Normal (40, 10^2) algorithm**

Given that Y ~ N (0, 1), X ~ N (μ, σ^2) can be obtained by using $X = \mu + \sigma Y$. Therefore, if one generates standard normal random variates, normal distributions N (μ, σ^2) can be easily generated.

The algorithm to be used in order to generate standard normal random variates is known as the polar method. This method is recommended by several authors including Law and Kelton (5, p. 491).

Algorithm:

2.2.1 Generate U_1 and U_2 as IID U (0, 1), let $V_i = 2U_{i-1}$ for i = 1, 2, ..., k and let $W = V_1^2 + V_2^2$.

2.2.2 If W > 1, go back to step 2.2.1. Otherwise, let $Z = [(-2 \ln W) / W]^{1/2}$, $Y_1 = V_1 Z$, and $Y_2 = V_2 Z$. Y_1 and Y_2 are IID N ~ (0, 1) random variates.

2.2.3 Return $X_1 = \mu + \sigma Y_1$ and $X_2 = \mu + \sigma Y_2$. X_1 and X_2 are IID N (μ, σ^2) random variates.

2.3 **Exponential (θ = 1) algorithm**

The algorithm to be used to generate exponential random variates with mean $\theta = 1$ is described in 2.2 (Case $\alpha = 1$), Procedure I (p. 42).

2.4 **Gamma ($\alpha = 1.5$, $\beta = 1$) algorithm**

The algorithm to be used to generate gamma random variates with shape parameter $\alpha = 1.5$ and scale parameter $\beta = 1$ is described in 2.3 (Case $\alpha > 1$), Procedure I (p. 42).

2.5 **Chi- square with 4 degrees of freedom algorithm**

Knowing that a chi-square distribution is a gamma distribution with shape parameter α = d.o.f. / 2 and scale parameter $\beta = 2$, the algorithm used to generate chi-square (d.o.f. = 4) random variates is the same algorithm as the one to generate gamma $\alpha = 2$ and $\beta = 2$ random variates. This algorithm is described in 2.3 (Case $\alpha > 1$), Procedure I (p. 42).

3. Calculate the average $\overline{X}$ for each run of k = 10, 30, and 50 observations generated from the five distributions selected in step 1 of Procedure III using the equation:

$$\overline{X} = (\sum X_j) / k$$

4. Group the runs generated in subgroups of two consecutive measurements and calculate the moving range for each subgroup using the equation:

$$MR_j = \text{Absolute value} (X_{i+1} - X_i)$$

The manner how to form the subgroups of two consecutive observations is explained in step 4, Procedure I (p. 43).

5. Evaluate the average moving range for each run using the equation:

$$\overline{MR} = (\sum MR_j) / (k - 1)$$

6. In order to get the Pearson type III with c = 0 (gamma) control chart constants d_2, d_3, and D_4 to be used in setting control limits for each run of k observations, Pearson type

III parameters α and β have to be estimated from the k observations generated.

Since the process distribution is supposedly unknown, the idea is to fit the data with a Pearson type III with c = 0 distribution by estimating the parameters α and β from the k data values (gamma distribution assumption as the underlying process distribution). According to Fisher (7, p. 332), the method of moments is inefficient to estimate parameters of a gamma distribution, except for a distribution closely resembling the normal distribution. Kendall and Stuart (8, p. 38) show that the efficiency of the estimated shape parameter α of a gamma distribution by the method of moments may be as low as 22 percent. Therefore, Fisher (7, p. 332) and Law and Kelton (5, p. 331) recommend the method of maximum likelihood estimation (MLE) in order to estimate the parameters α and β of type III from the data.

The difficulty in applying the method of maximum likelihood estimation to estimate the parameters α and β of a gamma distribution is that closed expressions for the maximum likelihood estimators $\hat{\alpha}$ and $\hat{\beta}$ cannot be obtained analytically. Therefore, numerical methods must be used to estimate the parameters α and β of a gamma distribution.

Choi and Wette (9, p. 683) developed a numerical technique of the maximum likelihood method to estimate the parameters of a gamma distribution. This method is recommended by Law and Kelton (5, p. 331) to estimate α and β. Therefore, this method is the one to be used in this Procedure III to estimate α and β from the data in order to fit a Pearson type III distribution with location parameter c = 0 (gamma distribution).

In this numerical technique of the maximum likelihood method, the statistic T is evaluated using the equation:

$$T = [\ \ln \bar{X} - \sum \ln X_i / k\ ]^{-1}$$

Then, using Table 6.19 in Law and Kelton (5, p. 411) the estimator $\hat{\alpha}$ is obtained as a function of the statistic T. This table is reproduced in Appendix J of this thesis research. With the estimator $\hat{\alpha}$ and using the equation:

$$\hat{\beta} = \bar{X} / \hat{\alpha}$$

the scale parameter β is estimated.

Using the estimators $\hat{\alpha}$ and $\hat{\beta}$ and the functions (models) generated in Procedure II by multiple regression analysis

$$d_2 = f_1(\alpha, \beta)$$

$$d_3 = f_2(\alpha, \beta)$$

$$D_4 = f_3(\alpha, \beta) = 1 + 3d_3 / d_2$$

one can obtain the approximate or empirical mean value of the Pearson type III with $c = 0$ (gamma) control chart constants d_2, d_3, and D_4 in order to set control limits for the individual measurement X and moving range $n = 2$ MR control charts.

7. Given the gamma control chart constants and using the control chart constants under the assumption of normality, two sets of control limits are obtained for each simulation run of $k = 10$, 30, and 50 observations. One set of control limits is obtained using the normal constants and the other one is obtained using the Pearson type III (gamma) constants.

The equations to be used to set control limits for X and MR control charts are:

$$UCL_X = \bar{X} + 3\ \overline{MR} / d_2$$

$$LCL_X = \overline{X} - 3\ \overline{MR} / d_2$$

$$UCL_{MR} = D_4\overline{MR}$$

8. Generate three sets of 1,000 new samples of k' = 30 observations for each of the five process distributions using the same algorithms described in step 2 of this Procedure III. The first set of 1,000 new samples is left as it is (no shift in the process average), the second set of 1,000 new samples is shifted up by one process standard deviation, and the third set of 1,000 new samples is shifted up by two process standard deviations. The shifts of 1 and 2 standard deviations in the process average are considered only up since the quality characteristic cannot take negative values (see delimitations of this research).

9. Determine if the first observation (k'=1), the first ten observations (k'=10), and the thirty observations (k'=30) of the first new sample of k' = 30 data values fall outside normal and gamma control limits for the first X control chart. This step is executed repeatedly for the five process distributions and for the three sets of 1,000 new samples (k'=30). Each time it is compared the nth new sample of k' = 30 with the normal and gamma control limits corresponding to the nth X control chart calculated from the nth old sample of k = 10, 30, and 50 observations.

10. Group the first set of 1,000 new samples of k' = 30 data values (no shift in the process average) in subgroups of two consecutive measurements and calculate the moving range for each subgroup using the equation:

$$MR_j' = \text{Absolute value } (X'_{i+1} - X'_i)$$

At the end, there are 30 moving ranges for each of the 1,000 new samples of k'=30. This is different to the logical 29 moving ranges (N-1) because an additional subgroup is formed using the last observation of the 1,000 old samples of $k = 10$, 30, and 50 observations with the first observation of the new 1,000 samples of $k' = 30$ observations (no shift).

11. Determine if the first moving range (MR_1'), the first ten moving ranges ($MR_{1...10}'$), and the thirty moving ranges ($MR_{1...30}'$) fall above the normal and gamma upper control limits corresponding to the first MR control chart. This step is done repeatedly for the five process distributions and for the first set (no shift) of 1,000 new samples of $k' = 30$. Each time it is compared the n^th^ new sample of $k' = 30$ with the normal and gamma limits corresponding to the n^{th} MR control chart calculated from the n^{th} old sample of $k = 10$, 30, and 50 observations.

12. Calculate for each of the five distributions and for $k = 10$, 30, and 50 the proportion of individual measurement X and moving range $n = 2$ MR control charts which show at least one out-of-control signal. This is done comparing the first observation ($k'=1$), the first ten observations ($k'=10$), and the thirty observations ($k'=30$) of the three sets of 1,000 new samples generated with the two sets of control limits calculated using the 1,000 old samples of $k = 10$, 30, and 50 data values.

This step is done separately for the X and the MR control charts, set with the normal control chart constants d_2, d_3, and D_4, and for those X and MR control charts set with the gamma control chart constants d_2, d_3, and D_4. The equation to be used to evaluate the proportion is:

$$P = N / 1000$$

where

- P is the proportion of X and MR control charts which show at least one out-of-control signal for both sets of control limits (normal and gamma limits).
- N is the number of control charts which show at least one out-of-control signal.

The proportion P is evaluated separately for each of the five distributions, for each k (10, 30, and 50), for each of the three sets (no shift, 1 sigma shift, and 2 sigma shift) of k' (1, 10, and 30) and for each set of control limits (normal and gamma).

CHAPTER IV

RESULTS AND ANALYSIS

The results of this thesis research are presented following the three objectives described in chapter I.

4.1 Objective one.

The first objective is to evaluate the performance of the individual measurement X and moving range n = 2 MR control charts, using the control chart constants d_2, d_3, and D_4 under the assumption of normality, when the underlying process distribution is the Pearson type III family of distributions with location parameter c = 0 (gamma distributions) so often encountered in industry.

Following Procedure I, described in detail in chapter III (p. 40), forty gamma distributions are generated using ten values of the shape parameter α (0.5, 1, 1.5, 2, 3, 4, 5, 10, 50, and 100) and four values of the scale parameter β (0.5, 1, 5, and 10).

For each gamma distribution, ten thousand (10,000) gamma random variates are generated in a spreadsheet designed in Quattro Pro for Windows using the random number generator included in Minitab for Windows release 10 and following the algorithm described in Procedure I. Portions of the gamma distributions generated can be observed in Appendix D. The algorithm used to generate gamma variates is tested statistically to see how closely the values generated resemble IID gamma distributions (α, β). The test is a goodness of fit test for 100 and 1,000 observations for the gamma distribution (1, 1). The results of the test are shown in Appendix C and they indicate that the algorithm is good enough to generate reliable gamma variates. Then, for each gamma distribution the following values are calculated:

- Average $\overline{X}$ of the 10,000 gamma variates.

- Average moving range $\overline{MR}$ of the 9,999 subgroups of two consecutive measurements.

- Control limits for the individual measurement X control charts (UCL_X and LCL_X) using the normal bias correction factor $d_2 = 1.128$.

- Upper control limits for the moving range n = 2 MR control charts (UCL_{MR}) using the normal control chart constant $D_4 = 3.268$.

These values are summarized in Table 4.1.

TABLE 4.1

SUMMARY TABLE - VALUES CALCULATED USING PROCEDURE I.

Alpha α	**Beta β**	**Avg. $\overline{X}$**	**Avg. $\overline{MR}$**	**UCL_X**	**LCL_X**	**UCL_{MR}**
0.5	0.5	0.2476	0.3149	1.0851	-0.5899	1.0291
	1.0	0.5045	0.6374	2.1997	-1.1908	2.0831
	5.0	2.4525	3.0912	10.6737	-5.7688	10.1020
	10.0	4.9689	6.3167	21.7687	-11.8308	20.6430
1.0	0.5	0.4966	0.5006	1.8280	-0.8348	1.6360
	1.0	1.0207	0.9976	3.6738	-1.6323	3.2600
	5.0	4.9572	4.9450	18.1089	-8.1945	16.1604
	10.0	9.9641	10.1105	36.8536	-16.9254	33.0410
1.5	0.5	0.7451	0.6300	2.4205	-0.9303	2.0587
	1.0	1.4920	1.2539	4.8267	-1.8427	4.0976
	5.0	7.5528	6.3645	24.4797	-9.3741	20.7992

Alpha α	Beta β	Avg. $\bar{X}$	Avg.$\overline{MR}$	UCL_X	LCL_X	UCL_{MR}
1.5	10.0	15.0286	12.7060	48.8212	-18.7641	41.5234
2.0	0.5	0.9971	0.7352	2.9524	-0.9582	2.4026
	1.0	1.9625	1.4976	5.9454	-2.0204	4.8940
	5.0	9.9023	7.3454	29.4380	-9.6335	24.0049
	10.0	20.0860	15.1945	60.4969	-20.3249	49.6556
3.0	0.5	1.5018	0.9459	4.0174	-1.0139	3.0911
	1.0	3.0280	1.8759	8.0171	-1.9611	6.1304
	5.0	15.1172	9.4211	40.1733	-9.9389	30.7881
	10.0	30.1224	18.7847	80.0816	-19.8368	61.3882
4.0	0.5	1.9969	1.0826	4.8761	-0.8823	3.5379
	1.0	4.0032	2.1963	9.8443	-1.8379	7.1774
	5.0	19.9459	11.0745	49.3993	-9.5074	36.1913
	10.0	40.2152	22.0412	98.8354	-18.4051	72.0307
5.0	0.5	2.5080	1.2346	5.7916	-0.7756	4.0347
	1.0	5.0065	2.4833	11.6111	-1.5982	8.1156
	5.0	24.9952	12.3467	57.8322	-7.8419	40.3492
	10.0	49.8423	24.3149	114.5095	-14.8250	79.4611
10.0	0.5	4.9852	1.7319	9.5913	0.3791	5.6598
	1.0	9.9423	3.5097	19.2765	0.6081	11.4696
	5.0	50.1309	17.4940	9606574	3.6044	57.1703
	10.0	100.6372	34.9837	193.6788	7.5955	114.3266
50.0	0.5	24.9684	3.9957	35.5952	14.3416	13.0579
	1.0	49.9587	7.9154	71.0104	28.9071	25.8676
	5.0	250.2511	39.4540	355.1820	145.3202	128.9358
	10.0	500.8203	80.2515	714.2551	287.3855	262.2619

Alpha α	Beta β	Avg. $\bar{X}$	Avg. $\overline{MR}$	UCL_X	LCL_X	UCL_{MR}
100.0	0.5	49.9843	5.6459	65.0001	34.9686	18.4509
	1.0	100.1233	11.2389	130.0140	70.2325	36.7288
	5.0	499.9215	55.5181	647.5760	352.2670	181.4331
	10.0	1001.3230	112.9637	1301.7580	700.8875	369.1654

More details about the forty gamma distributions and their values can be observed in the spreadsheets shown in Appendix D.

Then, using the values of the individual measurement X control limits (UCL_X and LCL_X) and the gamma cumulative distribution function routine contained in Minitab for Windows release 10, the average run lengths (ARLs) for several shifts in the process average ($k\sigma$, where $k = 0\ (0.2)\ 3$) are computed using the equation:

$$ARL = 1 / P$$

where

P is the probability of detection evaluated by the equation:

$$P = \text{Probability}\ (x > UCL_X) + \text{Probability}\ (x < LCL_X)$$

The probabilities of detection (P) calculated in Minitab and the average run lengths (ARLs) are summarized in Tables 4.2 and 4.3 respectively for the forty gamma distributions generated in Procedure I.

TABLE 4.2 a

PROBABILITIES OF DETECTION (P) FOR DIFFERENT SHIFTS IN THE PROCESS AVERAGE kσ WHERE k = 0 (0.2) 1.4

α	β	Shift in the process average kσ							
		0	0.2	0.4	0.6	0.8	1.0	1.2	1.4
0.5	0.5	0.0372	0.0440	0.0520	0.0617	0.0732	0.0872	0.1040	0.1244
	1.0	0.0360	0.0425	0.0502	0.0595	0.0706	0.0840	0.1002	0.1198
	5.0	0.0388	0.0459	0.0543	0.0644	0.0765	0.0911	0.1087	0.1302
	10	0.0369	0.0436	0.0516	0.0612	0.0726	0.0864	0.1031	0.1234
1.0	0.5	0.0258	0.0316	0.0385	0.0471	0.0575	0.0702	0.0858	0.1048
	1.0	0.0254	0.0310	0.0379	0.0462	0.0565	0.0690	0.0843	0.1029
	5.0	0.0267	0.0327	0.0399	0.0487	0.0595	0.0727	0.0888	0.1084
	10	0.0251	0.0306	0.0374	0.0457	0.0558	0.0682	0.0833	0.1017
1.5	0.5	0.0215	0.0268	0.0335	0.0418	0.0521	0.0648	0.0806	0.0999
	1.0	0.0218	0.0272	0.0340	0.0424	0.0528	0.0657	0.0816	0.1012
	5.0	0.0204	0.0255	0.0319	0.0398	0.0496	0.0617	0.0768	0.0952
	10	0.0207	0.0259	0.0323	0.0403	0.0502	0.0625	0.0777	0.0964
2.0	0.5	0.0188	0.0240	0.0304	0.0386	0.0488	0.0616	0.0775	0.0972
	1.0	0.0182	0.0231	0.0294	0.0373	0.0472	0.0596	0.0750	0.0941
	5.0	0.0191	0.0243	0.0309	0.0391	0.0495	0.0624	0.0786	0.0986
	10	0.0166	0.0212	0.0269	0.0342	0.0433	0.0547	0.0689	0.0866
3.0	0.5	0.0134	0.0175	0.0229	0.0297	0.0385	0.0497	0.0639	0.0818
	1.0	0.0136	0.0178	0.0232	0.0301	0.0390	0.0504	0.0648	0.0828
	5.0	0.0134	0.0175	0.0229	0.0297	0.0385	0.0498	0.0640	0.0818
	10	0.0137	0.0179	0.0233	0.0303	0.0393	0.0507	0.0652	0.0834
4.0	0.5	0.0124	0.0165	0.0220	0.0290	0.0382	0.0500	0.0652	0.0843

α	β	Shift in the process average kσ							
		0	0.2	0.4	0.6	0.8	1.0	1.2	1.4
4.0	1.0	0.0116	0.0155	0.0206	0.0272	0.0359	0.0471	0.0613	0.0795
	5.0	0.0113	0.0151	0.0201	0.0266	0.0350	0.0460	0.0599	0.0777
	10	0.0113	0.0150	0.0200	0.0265	0.0349	0.0458	0.0598	0.0775
5.0	0.5	0.0101	0.0138	0.0186	0.0250	0.0334	0.0443	0.0584	0.0765
	1.0	0.0099	0.0135	0.0183	0.0245	0.0328	0.0436	0.0574	0.0752
	5.0	0.0103	0.0139	0.0188	0.0253	0.0338	0.0448	0.0590	0.0772
	10	0.0111	0.0151	0.0203	0.0273	0.0363	0.0481	0.0633	0.0827
10	0.5	0.0079	0.0114	0.0161	0.0225	0.0312	0.0429	0.0582	0.0782
	1.0	0.0076	0.0108	0.0153	0.0214	0.0298	0.0409	0.0557	0.0749
	5.0	0.0073	0.0105	0.0148	0.0208	0.0289	0.0398	0.0542	0.0730
	10	0.0072	0.0103	0.0146	0.0204	0.0284	0.0391	0.0533	0.0718
50	0.5	0.0037	0.0056	0.0087	0.0134	0.0202	0.0299	0.0436	0.0622
	1.0	0.0039	0.0059	0.0092	0.0141	0.0212	0.0315	0.0457	0.0650
	5.0	0.0039	0.0059	0.0091	0.0140	0.0211	0.0313	0.0454	0.0646
	10	0.0034	0.0052	0.0081	0.0125	0.0189	0.0281	0.0411	0.0587
100	0.5	0.0032	0.0047	0.0075	0.0118	0.0183	0.0279	0.0414	0.0600
	1.0	0.0032	0.0047	0.0075	0.0118	0.0183	0.0278	0.0413	0.0599
	5.0	0.0037	0.0054	0.0084	0.0132	0.0203	0.0307	0.0454	0.0654
	10	0.0031	0.0045	0.0072	0.0114	0.0177	0.0269	0.0400	0.0581

TABLE 4.2 b

PROBABILITIES OF DETECTION (P) FOR DIFFERENT SHIFTS IN THE PROCESS AVERAGE kσ WHERE k = 1.6 (0.2) 3.0

α	β	Shift in the process average kσ							
		1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
0.5	0.5	0.1495	0.1803	0.2188	0.2676	0.3306	0.4153	0.5372	0.7544
	1.0	0.1438	0.1733	0.2101	0.2564	0.3160	0.3953	0.5073	0.6921
	5.0	0.1566	0.1892	0.2299	0.2818	0.3495	0.4414	0.5779	0.8698
	10	0.1482	0.1787	0.2168	0.2650	0.3273	0.4107	0.5302	0.7389
1.0	0.5	0.1280	0.1563	0.1909	0.2332	0.2848	0.3479	0.4249	0.5189
	1.0	0.1257	0.1535	0.1875	0.2290	0.2798	0.3417	0.4173	0.5097
	5.0	0.1324	0.1617	0.1975	0.2413	0.2947	0.3599	0.4397	0.5370
	10	0.1243	0.1518	0.1854	0.2264	0.2765	0.3378	0.4126	0.5039
1.5	0.5	0.1237	0.1529	0.1884	0.2315	0.2835	0.3458	0.4197	0.5061
	1.0	0.1253	0.1548	0.1907	0.2343	0.2868	0.3498	0.4243	0.5116
	5.0	0.1180	0.1458	0.1798	0.2211	0.2710	0.3309	0.4020	0.4856
	10	0.1194	0.1476	0.1819	0.2237	0.2741	0.3346	0.4064	0.4907
2.0	0.5	0.1216	0.1515	0.1880	0.2322	0.2851	0.3478	0.4211	0.5051
	1.0	0.1178	0.1469	0.1823	0.2253	0.2769	0.3382	0.4099	0.4924
	5.0	0.1233	0.1536	0.1905	0.2351	0.2886	0.3520	0.4259	0.5105
	10	0.1085	0.1355	0.1684	0.2085	0.2568	0.3144	0.3822	0.4607
3.0	0.5	0.1041	0.1318	0.1658	0.2070	0.2565	0.3151	0.3830	0.4603
	1.0	0.1054	0.1334	0.1677	0.2094	0.2593	0.3183	0.3868	0.4645
	5.0	0.1042	0.1318	0.1658	0.2071	0.2566	0.3151	0.3831	0.4603
	10	0.1061	0.1342	0.1686	0.2105	0.2607	0.3199	0.3887	0.4666
4.0	0.5	0.1083	0.1381	0.1747	0.2190	0.2718	0.3336	0.4043	0.4833

α	**β**	**Shift in the process average kσ**							
		1.6	**1.8**	**2.0**	**2.2**	**2.4**	**2.6**	**2.8**	**3.0**
4.0	1.0	0.1023	0.1307	0.1657	0.2081	0.2589	0.3185	0.3873	0.4645
	5.0	0.1001	0.1279	0.1623	0.2040	0.2540	0.3129	0.3808	0.4573
	10	0.0998	0.1276	0.1619	0.2036	0.2535	0.3123	0.3801	0.4566
5.0	0.5	0.0993	0.1279	0.1631	0.2059	0.2571	0.3171	0.3859	0.4627
	1.0	0.0977	0.1259	0.1607	0.2030	0.2537	0.3131	0.3813	0.4577
	5.0	0.1003	0.1291	0.1646	0.2077	0.2592	0.3195	0.3886	0.4657
	10	0.1071	0.1376	0.1749	0.2202	0.2739	0.3365	0.4078	0.4867
10	0.5	0.1037	0.1358	0.1754	0.2233	0.2798	0.3448	0.4176	0.4965
	1.0	0.0995	0.1306	0.1690	0.2156	0.2708	0.3346	0.4064	0.4845
	5.0	0.0971	0.1276	0.1654	0.2112	0.2657	0.3287	0.3998	0.4775
	10	0.0956	0.1257	0.1630	0.2083	0.2623	0.3249	0.3956	0.4729
50	0.5	0.0868	0.1187	0.1586	0.2074	0.2651	0.3312	0.4044	0.4825
	1.0	0.0905	0.1233	0.1644	0.2143	0.2731	0.3402	0.4141	0.4926
	5.0	0.0899	0.1226	0.1635	0.2133	0.2719	0.3389	0.4127	0.4912
	10	0.0823	0.1128	0.1514	0.1987	0.2549	0.3197	0.3918	0.4693
100	0.5	0.0850	0.1174	0.1583	0.2082	0.2671	0.3343	0.4083	0.4867
	1.0	0.0848	0.1171	0.1580	0.2078	0.2667	0.3338	0.4078	0.4862
	5.0	0.0921	0.1265	0.1695	0.2217	0.2827	0.3517	0.4270	0.5061
	10	0.0825	0.1142	0.1543	0.2034	0.2616	0.3281	0.4016	0.4797

TABLE 4.3 a

AVERAGE RUN LENGTHS (ARLs) FOR DIFFERENT SHIFTS IN THE PROCESS

AVERAGE kσ WHERE k = 0 (0.2) 1.4

α	β	Shift in the process average kσ							
		0	0.2	0.4	0.6	0.8	1.0	1.2	1.4
0.5	0.5	26.9	22.7	19.2	16.2	13.7	11.5	9.6	8.0
	1.0	27.8	23.5	19.9	16.8	14.2	11.9	9.9	8.3
	5.0	25.8	21.8	18.4	15.5	13.1	10.9	9.2	7.7
	10	27.1	22.9	19.4	16.3	13.8	11.6	9.7	8.1
1.0	0.5	38.7	31.7	25.9	21.2	17.4	14.2	11.7	9.5
	1.0	39.4	32.3	26.4	21.6	17.7	14.5	11.9	9.7
	5.0	37.4	30.6	25.1	20.5	16.8	13.8	11.3	9.2
	10	39.9	32.6	26.7	21.9	17.9	14.7	12.0	9.8
1.5	0.5	46.6	37.3	29.8	23.9	19.2	15.4	12.4	10.0
	1.0	45.9	36.8	29.4	23.6	18.9	15.2	12.3	9.9
	5.0	48.9	39.2	31.4	25.1	20.2	16.2	13.0	10.5
	10	48.4	38.7	30.9	24.8	19.9	15.9	12.9	10.4
2.0	0.5	53.1	41.7	32.9	25.9	20.5	16.2	12.9	10.3
	1.0	54.9	43.2	34.0	26.8	21.2	16.8	13.3	10.6
	5.0	52.3	41.1	32.4	25.6	20.2	16.0	12.7	10.1
	10	60.1	47.2	37.1	29.3	23.1	18.3	14.5	11.5
3.0	0.5	74.7	57.1	43.7	33.6	25.9	20.1	15.6	12.2
	1.0	73.7	56.3	43.2	33.2	25.6	19.8	15.4	12.1
	5.0	74.7	57.1	43.7	33.6	25.9	20.1	15.6	12.2
	10	73.2	55.9	42.9	32.9	25.4	19.7	15.3	11.9
4.0	0.5	80.8	60.5	45.5	34.4	26.2	19.9	15.3	11.9

α	β	Shift in the process average kσ							
		0	0.2	0.4	0.6	0.8	1.0	1.2	1.4
4.0	1.0	86.3	64.7	48.6	36.7	27.9	21.2	16.3	12.6
	5.0	88.6	66.3	49.8	37.6	28.5	21.8	16.7	12.9
	10	88.9	66.5	49.9	37.7	28.6	21.8	16.7	12.9
5.0	0.5	98.5	72.6	53.7	39.9	29.9	22.6	17.1	13.1
	1.0	100.4	73.9	54.7	40.7	30.5	22.9	17.4	13.3
	5.0	97.3	71.8	53.1	39.6	29.6	22.3	16.9	12.9
	10	90.0	66.4	49.2	36.7	27.5	20.8	15.8	12.1
10	0.5	125.2	87.9	62.2	44.4	32.0	23.3	17.2	12.8
	1.0	132.0	92.6	65.4	46.7	33.6	24.4	17.9	13.4
	5.0	136.2	95.4	67.4	48.0	34.6	25.1	18.4	13.7
	10	139.0	97.4	68.7	49.0	35.2	25.6	18.8	13.9
50	0.5	273.4	178.9	115.1	74.8	49.5	33.3	22.9	16.1
	1.0	255.7	168.5	108.8	70.9	47.0	31.8	21.9	15.4
	5.0	255.8	169.6	109.6	71.4	47.3	31.9	22.0	15.5
	10	293.9	192.8	123.8	80.3	52.9	35.6	24.4	17.0
100	0.5	315.1	211.4	133.7	84.6	54.5	35.9	24.2	16.7
	1.0	310.2	210.9	133.9	84.9	54.7	35.9	24.2	16.7
	5.0	274.1	186.7	119.1	75.9	49.1	32.5	22.0	15.3
	10	324.7	219.9	139.3	88.1	56.6	37.2	25.0	17.2

TABLE 4.3 b

AVERAGE RUN LENGTHS (ARLs) FOR DIFFERENT SHIFTS IN THE PROCESS

AVERAGE kσ WHERE k = 1.6 (0.2) 3.0

α	β	Shift in the process average kσ							
		1.6	**1.8**	**2.0**	**2.2**	**2.4**	**2.6**	**2.8**	**3.0**
0.5	0.5	6.7	5.5	4.6	3.7	3.0	2.4	1.9	1.3
	1.0	6.9	5.8	4.8	3.9	3.2	2.5	1.9	1.4
	5.0	6.4	5.3	4.3	3.5	2.9	2.3	1.7	1.2
	10	6.7	5.6	4.6	3.8	3.1	2.4	1.9	1.4
1.0	0.5	7.8	6.4	5.2	4.3	3.5	2.9	2.4	1.9
	1.0	7.9	6.5	5.3	4.4	3.6	2.9	2.4	1.9
	5.0	7.6	6.2	5.1	4.1	3.4	2.8	2.3	1.9
	10	8.0	6.6	5.4	4.4	3.6	2.9	2.4	1.9
1.5	0.5	8.1	6.5	5.3	4.3	3.5	2.9	2.4	1.9
	1.0	8.0	6.5	5.2	4.3	3.5	2.9	2.4	1.9
	5.0	8.5	6.9	5.6	4.5	3.7	3.0	2.5	2.0
	10	8.4	6.8	5.5	4.5	3.6	3.0	2.5	2.0
2.0	0.5	8.2	6.6	5.3	4.3	3.5	2.9	2.4	1.9
	1.0	8.5	6.8	5.5	4.4	3.6	3.0	2.4	2.0
	5.0	8.1	6.5	5.2	4.3	3.5	2.8	2.3	1.9
	10	9.2	7.4	5.9	4.8	3.9	3.2	2.6	2.1
3.0	0.5	9.6	7.6	6.0	4.8	3.9	3.2	2.6	2.1
	1.0	9.5	7.5	6.0	4.8	3.9	3.1	2.6	2.1
	5.0	9.6	7.6	6.0	4.8	3.9	3.2	2.6	2.1
	10	9.4	7.5	5.9	4.7	3.8	3.1	2.6	2.1
4.0	0.5	9.2	7.2	5.7	4.6	3.7	3.0	2.5	2.0

α	β	Shift in the process average kσ							
		1.6	**1.8**	**2.0**	**2.2**	**2.4**	**2.6**	**2.8**	**3.0**
4.0	1.0	9.8	7.7	6.0	4.8	3.9	3.1	2.6	2.1
	5.0	9.9	7.8	6.2	4.9	3.9	3.2	2.6	2.1
	10	10.0	7.8	6.2	4.9	3.9	3.2	2.6	2.2
5.0	0.5	10.1	7.8	6.1	4.9	3.9	3.2	2.6	2.1
	1.0	10.2	7.9	6.2	4.9	3.9	3.2	2.6	2.1
	5.0	10.0	7.7	6.1	4.8	3.9	3.1	2.6	2.1
	10	9.3	7.3	5.7	4.5	3.7	3.0	2.5	2.0
10	0.5	9.6	7.4	5.7	4.5	3.6	2.9	2.4	2.0
	1.0	10.0	7.7	5.9	4.6	3.7	3.0	2.5	2.0
	5.0	10.3	7.8	6.0	4.7	3.8	3.0	2.5	2.1
	10	10.5	7.9	6.1	4.8	3.8	3.1	2.5	2.1
50	0.5	11.5	8.4	6.3	4.8	3.8	3.0	2.5	2.0
	1.0	11.1	8.1	6.1	4.7	3.7	2.9	2.4	2.0
	5.0	11.1	8.2	6.1	4.7	3.7	2.9	2.4	2.0
	10	12.2	8.9	6.6	5.0	3.9	3.1	2.6	2.1
100	0.5	11.8	8.5	6.3	4.8	3.7	3.0	2.4	2.0
	1.0	11.8	8.5	6.3	4.8	3.7	3.0	2.5	2.0
	5.0	10.9	7.9	5.9	4.5	3.5	2.8	2.3	1.9
	10	12.1	8.8	6.5	4.9	3.8	3.0	2.5	2.0

More details about the calculations of the probabilities of detection (P) and average run lengths (ARLs) are shown in Appendix E.

From Table 4.3 (a and b), empirical average run length (ARL) curves are drawn for each of the forty X control charts corresponding to each of the forty gamma distributions generated. These ARL curves show the overall performance of the individual measurement X control charts, using the normal bias correction factor $d_2 = 1.128$, when the underlying process distribution is Pearson type III with location parameter $c = 0$ (gamma distribution).

The empirical average run length (ARL) curves for the different combinations between shape parameters α and scale parameters β can be observed from Figure 4.1 to Figure 4.10.

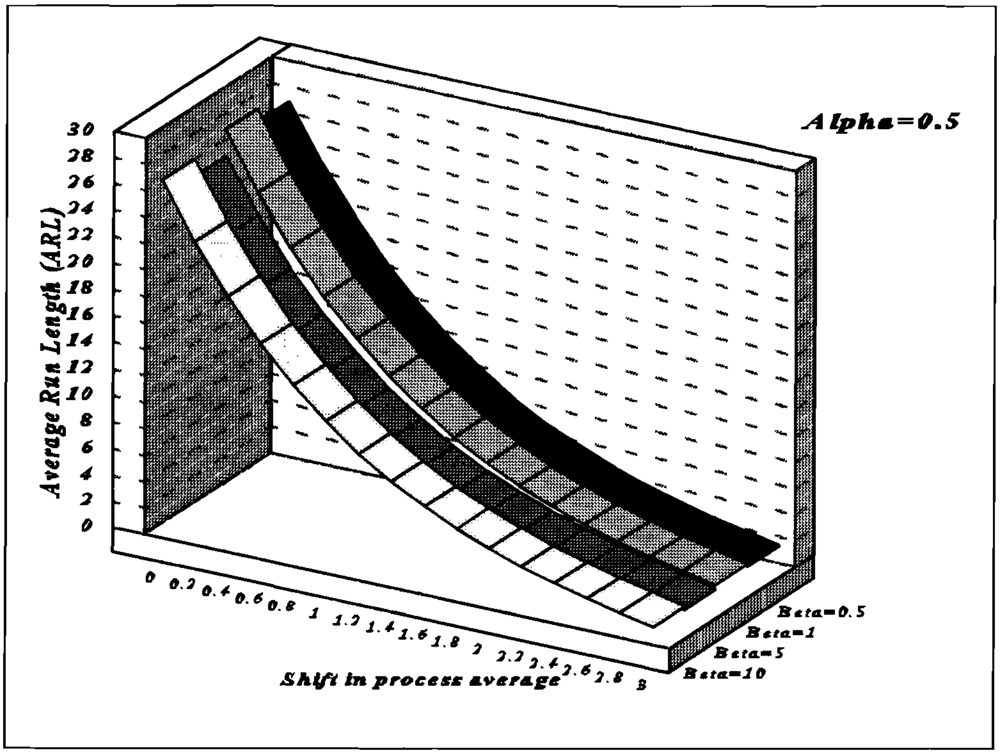
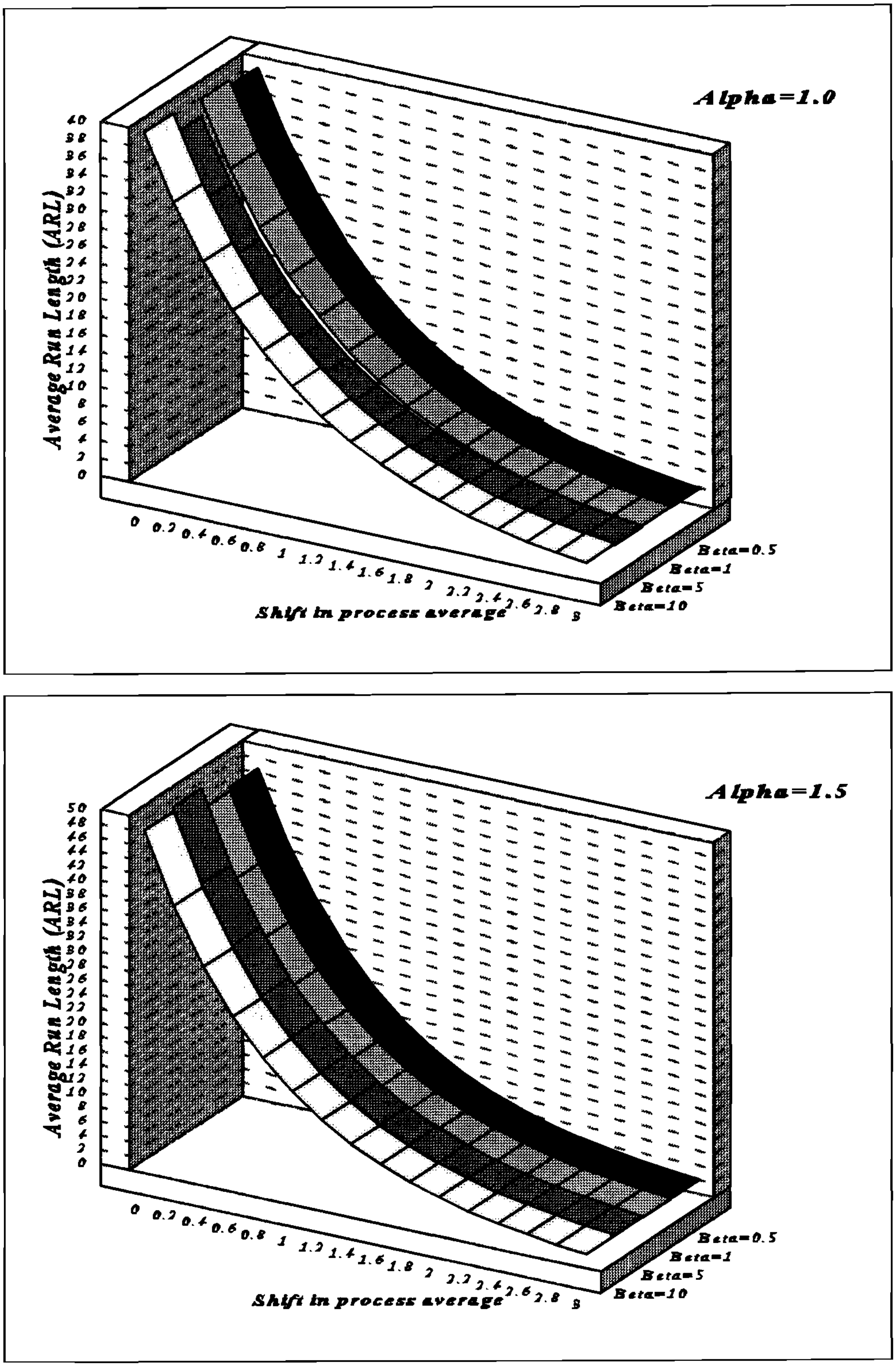
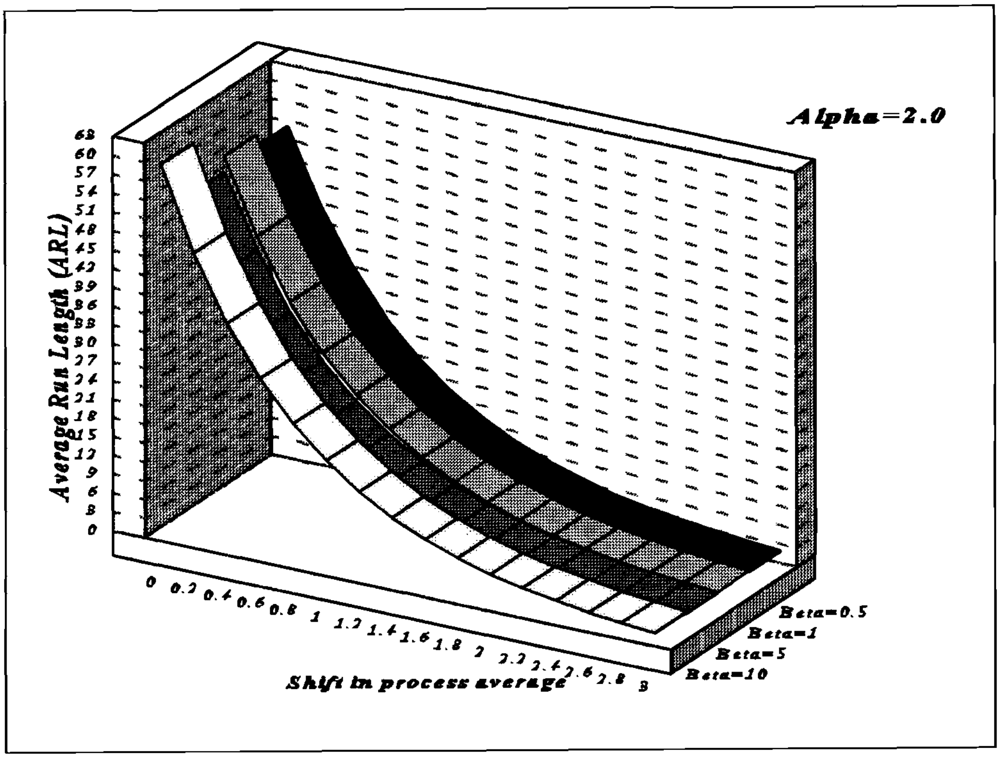
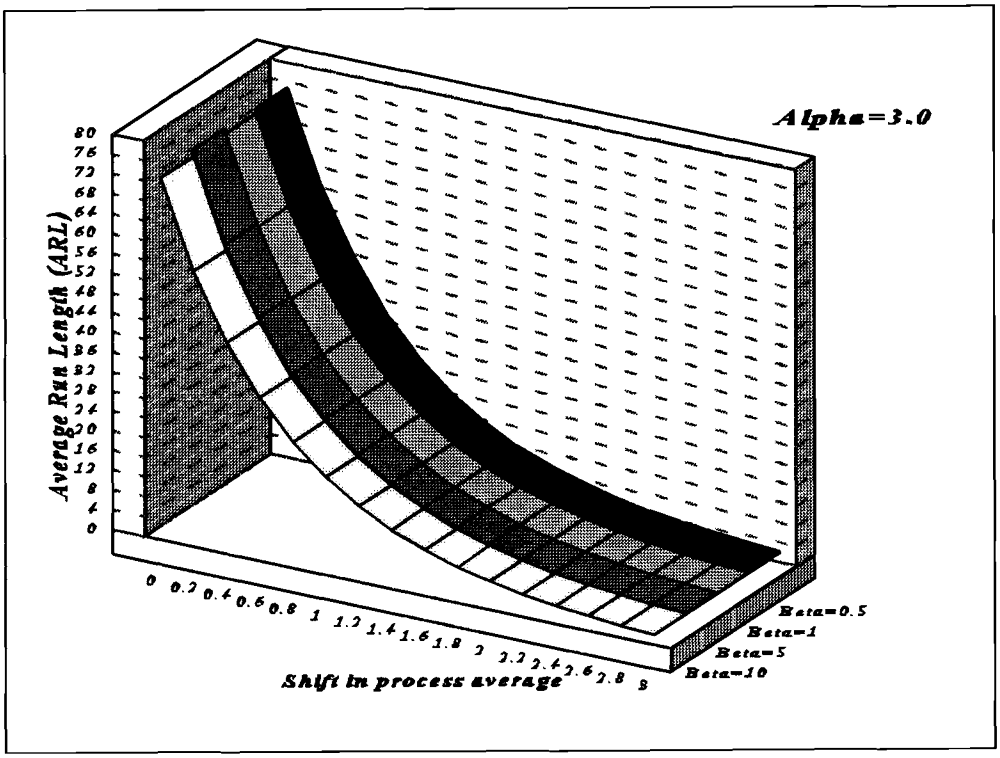


Figure 4.1 Empirical ARL curve for shape parameter $\alpha = 0.5$.

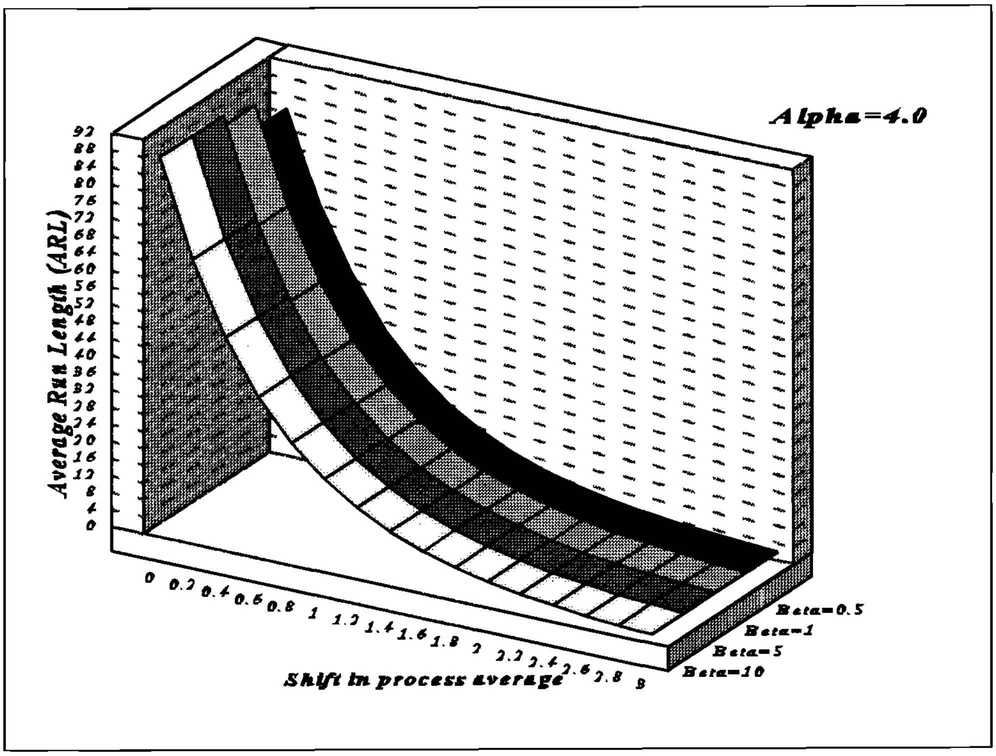


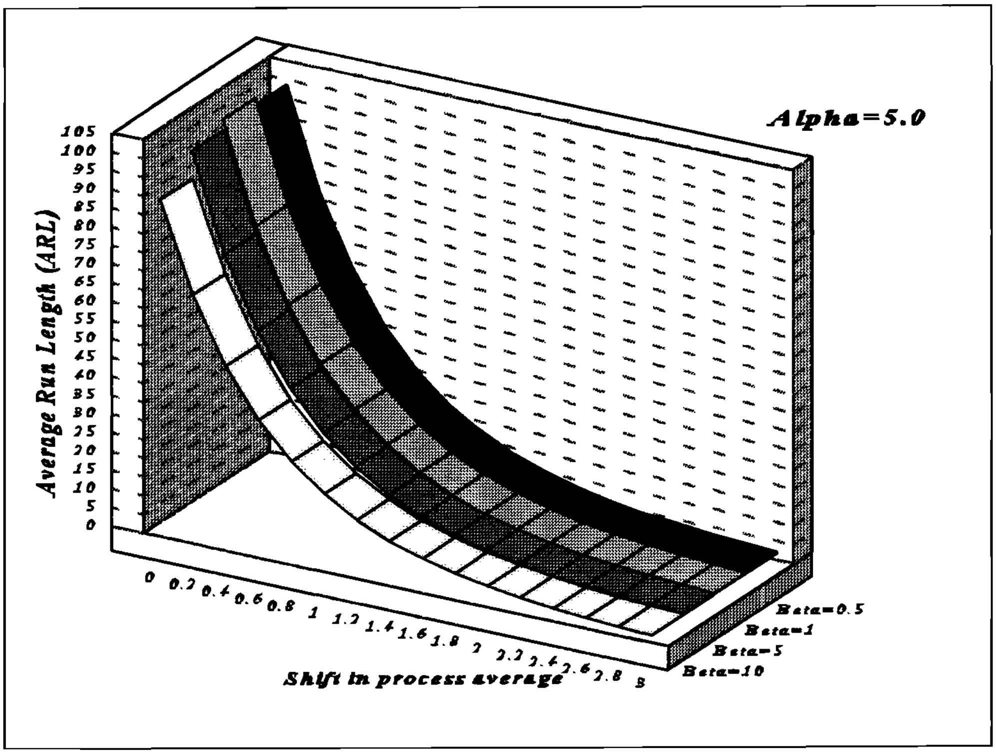
Figures 4.2 and 4.3. Empirical ARL curves for shape parameters $\alpha = 1.0$ and 1.5.



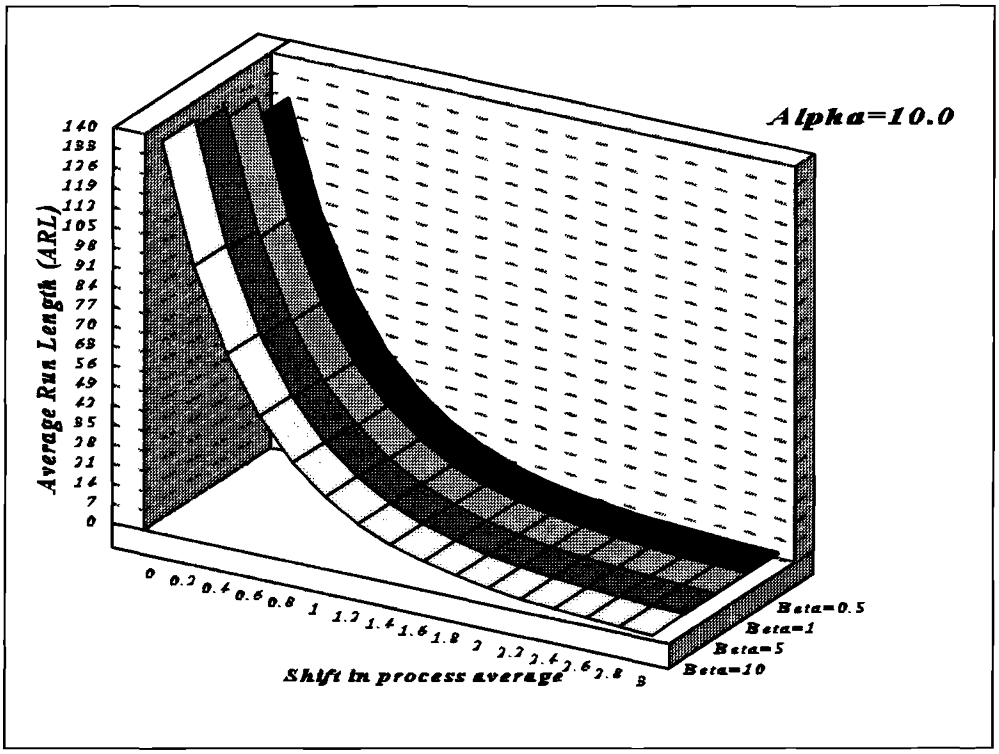


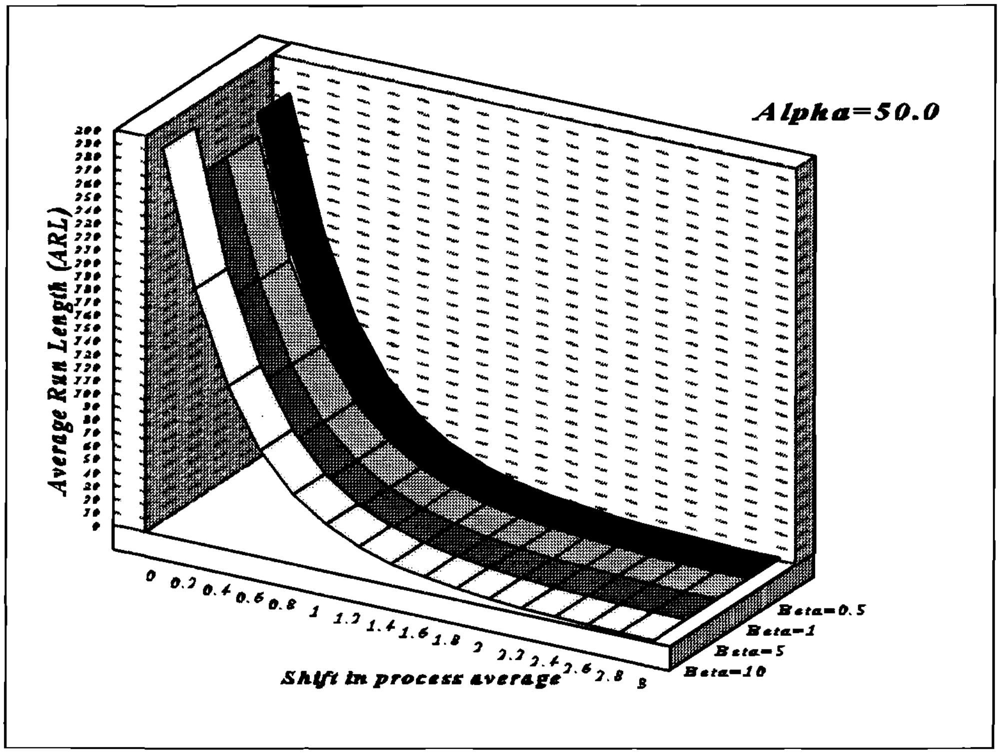
Figures 4.4 and 4.5. Empirical ARL curves for shape parameters $\alpha = 2.0$ and 3.0.





Figures 4.6 and 4.7. Empirical ARL curves for shape parameters α = 4.0 and 5.0





Figures 4.8 and 4.9. Empirical ARL curves for shape parameters $\alpha = 10$ and 50.

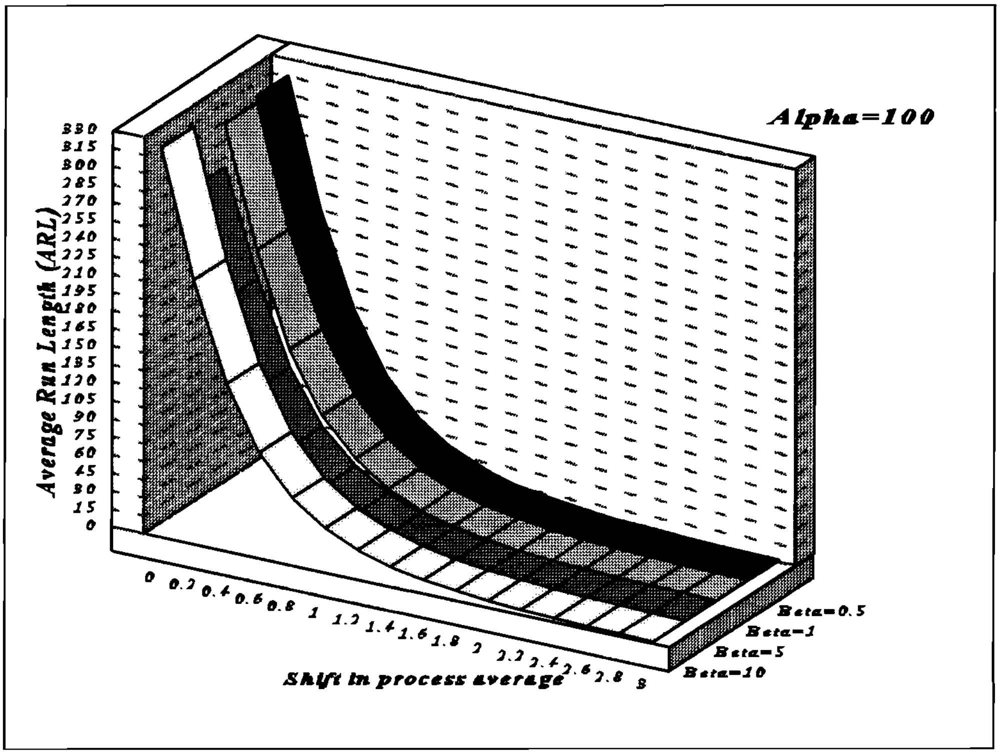


Figure 4.10. Empirical ARL curve for shape parameter α = 100

From the empirical average run length (ARL) curves, it is observed that for shape parameters α < 5 the ARLs in control (no shift) are substantially less (from 15% to 74%) than the 100 stated in the first hypothesis as the minimum accepted in industry for practical purposes. However, the average run lengths (ARLs) for shifts in the process average of kσ = 1, 2 and 3 process standard deviations are smaller, for most of the shape parameter α values, than the 43.9, 6.3, and 2 stated in the first hypothesis for shifts in the process average of k = 1, 2, and 3 sigma, respectively. Only for a few combinations of shape parameter α and scale parameter β (for example α = 50 and β = 10), the ARLs for shifts in the process average of k = 2 and 3 process standard deviations are a little bit higher (approximately 4.5%) than the theoretical ARL for normal distributions. It is the author's belief that these tiny differences (approximately 4.5%) in some cases are due to the presence of random error in the simulation process.

Additionally, it can be seen from the empirical ARL curves that the ARL values do not vary with the scale parameter β. This is due to the fact that the scale parameter β does not affect the shape of the gamma distribution.

For the moving range n = 2 MR control charts, using the values of the upper control limits (UCL_{MR}) and the moving range values (MR_i), the empirical probabilities of type I error and empirical ARLs in control are calculated for each of the forty gamma distributions generated. The equations used are:

Empirical probability (type I error) = P' = B / 9,999

Empirical ARL = ARL' = 1 / P'

where

B is the number of moving ranges (MR_i) above the UCL_{MR} for each of the forty gamma distributions.

The empirical probabilities of type I error (P') and the empirical ARL' in control are shown in Table 4.4.

TABLE 4.4

EMPIRICAL PROBABILITIES OF TYPE I ERROR (P') AND EMPIRICAL ARL' IN CONTROL FOR THE MR (n=2) CONTROL CHARTS

α	**β**	**Prob. P'**	**ARL'**	**α**	**β**	**Prob. P'**	**ARL'**
0.5	0.5	0.0536	18.7	4.0	0.5	0.0176	56.8
	1.0	0.0597	16.8		1.0	0.0177	56.5

α	β	Prob. P'	ARL'	α	β	Prob. P'	ARL'
0.5	5.0	0.0558	17.9	4.0	5.0	0.0151	66.2
	10	0.0571	17.5		10	0.0187	53.5
1.0	0.5	0.0396	25.3	5.0	0.5	0.0162	61.7
	1.0	0.0386	25.9		1.0	0.0163	61.3
	5.0	0.0415	24.1		5.0	0.0183	54.6
	10	0.0367	27.3		10	0.0155	64.5
1.5	0.5	0.0304	32.9	10	0.5	0.0129	77.5
	1.0	0.0301	33.2		1.0	0.0129	77.5
	5.0	0.0288	34.7		5.0	0.0143	69.9
	10	0.0301	33.2		10	0.0156	64.1
2.0	0.5	0.0220	45.5	50	0.5	0.0100	100.0
	1.0	0.0271	36.9		1.0	0.0112	89.3
	5.0	0.0252	39.7		5.0	0.0104	96.2
	10	0.0248	40.3		10	0.0089	112.3
3.0	0.5	0.0218	45.9	100	0.5	0.0107	93.5
	1.0	0.0220	45.5		1.0	0.0087	114.9
	5.0	0.0194	51.5		5.0	0.0099	101.0
	10	0.0204	49.0		10	0.0096	104.2

More details about the calculations of the empirical probabilities of type I error P' and the empirical ARL' in control for MR (n=2) control charts can be seen in the spreadsheets shown in Appendix D.

From table 4.4, it is observed that for shape parameters $\alpha \leq 10$ the empirical ARL' in control (no shift) are substantially less (from 30% to 83%) than the 100 value stated in the first hypothesis as a minimum accepted value in industry for practical matters. It is not only until the shape parameter α reaches a value of 50 when the empirical ARL' in control begin to approach the practical 100 value. In normal theory the ARL in control has a value of 107.14.

For all of the reasons mentioned above, the first hypothesis is rejected. It means that for practical purposes in industry the individual measurement X control chart, using the normal bias correction factor d_2, does not work well when the underlying process distribution is skewed (asymmetric) represented by gamma distributions with shape parameter $\alpha < 5$. In relation with the moving range n = 2 MR control chart, it means that for practical matters this control chart does not perform well either when the underlying process distribution is asymmetric represented by gamma distributions with shape parameters $\alpha \leq 10$.

As a consequence, individual measurement X and moving range n = 2 MR control charts must be very carefully interpreted if the underlying process distribution is skewed (asymmetric). According to Duncan (1, p. 400), "In such cases, the multiple of σ used to set control limits might be better derived from other distributions for which the percentage points have been computed." This is exactly what this thesis research is trying to accomplish with objective three using the Pearson type III family of distributions with c = 0 (gamma distributions) as the assumption to set control limits for X and MR (n=2) control charts.

4.2 Objective two.

The second objective is to determine empirical functions $f(\alpha, \beta)$ for the control chart constants d_2, d_3, and D_4 when the process distribution can be approximated by a

Pearson type III distribution with location parameter $c = 0$, shape parameter α, and scale parameter β.

Using the same forty gamma distributions generated in Procedure I and based on Procedure II described in page 45, the following values are computed for each distribution:

- Average $\overline{X}$ of the 10,000 gamma variates.

- Average moving range $\overline{MR}$ of the 9,999 subgroups of two consecutive measurements.

- Moving range standard deviation σ_{MR} obtained from the 9,999 MR_i.

- Approximate values for the bias correction factors d_2 and d_3 and the control chart constant D_4.

These values are summarized in Table 4.5.

TABLE 4.5

SUMMARY TABLE - VALUES CALCULATED USING PROCEDURE II

α	β	$\overline{X}$	$\overline{MR}$	$\sigma(\alpha,\beta)$	σ_{MR}	d_2	d_3	D_4
0.5	0.5	0.2476	0.3149	0.3536	0.3726	0.8907	1.0538	4.5493
	1.0	0.5045	0.6374	0.7071	0.7858	0.9014	1.1112	4.6982
	5.0	2.4525	3.0912	3.5355	3.7717	0.8743	1.0668	4.6604
	10	4.9689	6.3167	7.0711	7.6504	0.8933	1.0819	4.6334
1.0	0.5	0.4966	0.5006	0.5000	0.4979	1.0012	0.9958	3.9838
	1.0	1.0207	0.9976	1.0000	1.0008	0.9976	1.0008	4.0098
	5.0	4.9572	4.9450	5.0000	5.0334	0.9890	1.0067	4.0536
	10	9.9641	10.1105	10.0000	10.0519	1.0110	1.0052	3.9826

α	β	$\overline{X}$	$\overline{MR}$	$\sigma(\alpha,\beta)$	σ_{MR}	d_2	d_3	D_4
1.5	0.5	0.7451	0.6300	0.6124	0.5831	1.0287	0.9522	3.7768
	1.0	1.4920	1.2539	1.2247	1.1480	1.0238	0.9374	3.7468
	5.0	7.5528	6.3645	6.1237	5.8146	1.0393	0.9495	3.7408
	10	15.0286	12.7060	12.2475	11.8153	1.0374	0.9647	3.7897
2.0	0.5	0.9971	0.7352	0.7071	0.6406	1.0397	0.9060	3.6141
	1.0	1.9625	1.4976	1.4142	1.3258	1.0589	0.9375	3.6559
	5.0	9.9023	7.3454	7.0711	6.4374	1.0388	0.9104	3.6291
	10	20.0860	15.1945	14.1421	13.1893	1.0744	0.9326	3.6041
3.0	0.5	1.5018	0.9459	0.8660	0.8067	1.0922	0.9315	3.5587
	1.0	3.0280	1.8759	1.7321	1.5935	1.0830	0.9200	3.5485
	5.0	15.1172	9.4211	8.6603	7.8210	1.0879	0.9031	3.4905
	10	30.1224	18.7847	17.3205	15.7486	1.0845	0.9093	3.5151
4.0	0.5	1.9969	1.0826	1.0000	0.8836	1.0826	0.8836	3.4487
	1.0	4.0032	2.1963	2.0000	1.7963	1.0981	0.8982	3.4537
	5.0	19.9459	11.0745	10.0000	8.9646	1.1075	0.8965	3.4285
	10	40.2152	22.0412	20.0000	18.1502	1.1021	0.9075	3.4704
5.0	0.5	2.5080	1.2346	1.1180	0.9972	1.1043	0.8919	3.4230
	1.0	5.0065	2.4833	2.2361	2.0015	1.1106	0.8951	3.4179
	5.0	24.9952	12.3467	11.1803	10.0514	1.1043	0.8990	3.4423
	10	49.8423	24.3149	22.3607	19.5458	1.0874	0.8741	3.4116
10.0	0.5	4.9852	1.7319	1.5811	1.3572	1.0953	0.8583	3.3509
	1.0	9.9423	3.5097	3.1623	2.7479	1.1099	0.8690	3.3489
	5.0	50.1309	17.4940	15.8114	13.7233	1.1064	0.8679	3.3534
	10	100.637	34.9837	31.6228	27.5975	1.1063	0.8727	3.3666
50.0	0.5	24.9684	3.9957	3.5355	3.0206	1.1302	0.8544	3.2679

α	β	$\overline{X}$	$\overline{MR}$	$\sigma(\alpha,\beta)$	σ_{MR}	d_2	d_3	D_4
50.0	1.0	49.9587	7.9154	7.0711	6.0473	1.1194	0.8552	3.2920
	5.0	250.251	39.4540	35.3553	29.9551	1.1159	0.8473	3.2777
	10	500.820	80.2515	70.7107	60.6941	1.1349	0.8583	3.2689
100	0.5	49.9843	5.6459	5.0000	4.2898	1.1292	0.8580	3.2794
	1.0	100.123	11.2389	10.0000	8.4914	1.1239	0.8491	3.2666
	5.0	499.921	55.5181	50.0000	42.1747	1.1104	0.8435	3.2790
	10	1001.32	112.964	100.000	85.6926	1.1296	0.8569	3.2758

The details about the calculations performed to set Table 4.5 are shown in the spreadsheets contained in Appendix D.

In order to find models in which the expected values of the control chart constants d_2, d_3, and D_4 are written as functions of two independent variables α and β, the empirical values of d_2, d_3, and D_4 shown in Table 4.5 are plotted against α and β. These graphs can be observed in Figures 4.11, 4.12, and 4.13

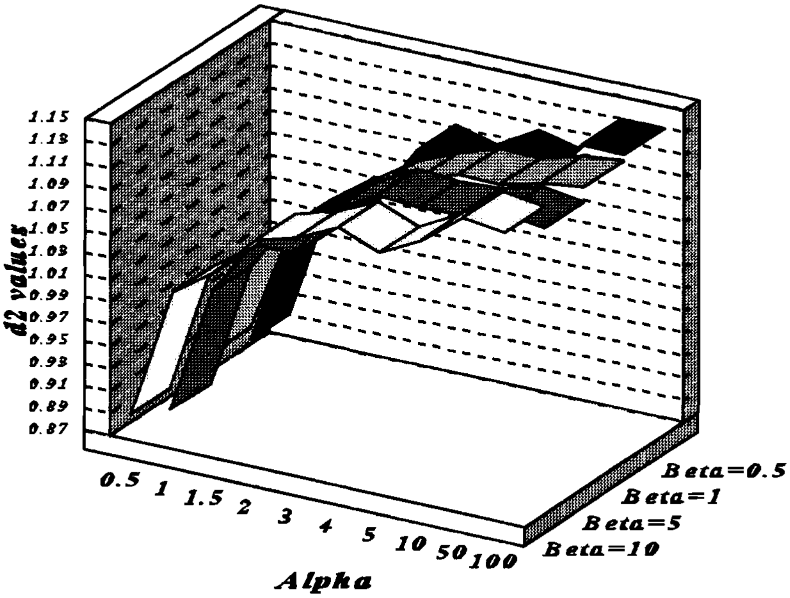
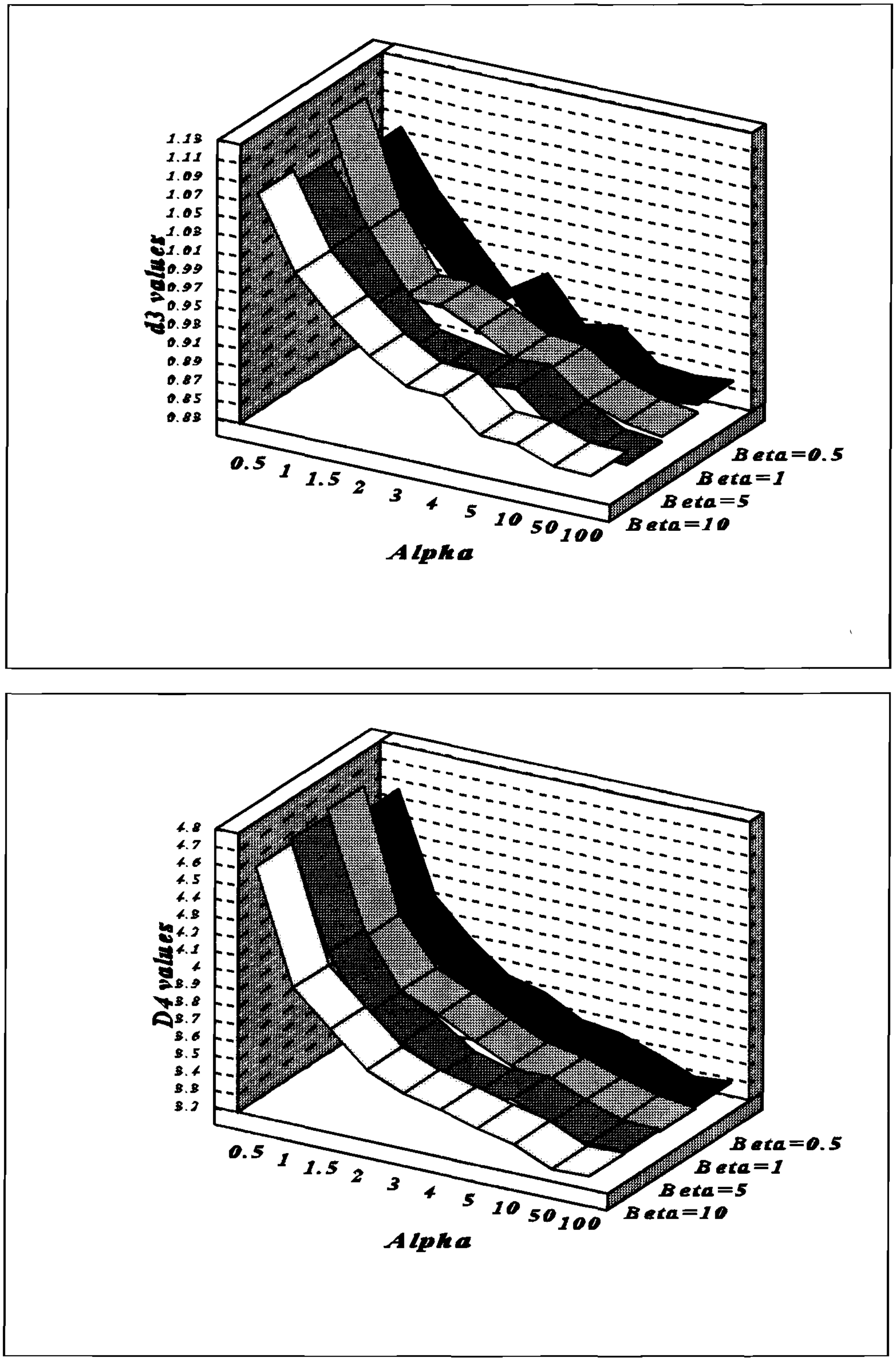


Figure 4.11. Bias correction factor d_2 as a function of α and β.



Figures 4.12 and 4.13. Empirical d_3 and D_4 values as functions of α and β.

It is obvious from the graphs (Figures 4.11, 4.12, and 4.13) that there are non-linear patterns in the three control chart constants d_2, d_3, and D_4 as functions of the shape parameter α. Also, it seems that the control chart constants d_2, d_3, and D_4 do not vary with the scale parameter β.

Based on this information, different quadratic, cubic, and exponential models are generated in Minitab for Windows release 10 using the method of fitting multiple regression models with the least-squares approach. The Minitab outputs for the different models tried can be seen in Appendix F.

Combinations of exponential functions for the shape parameter α are found to be the ones which better fit the data for the three control chart constants d_2, d_3, and D_4. The scale parameter β, as suspected, is found not significant for all the models generated.

4.2.1 Bias correction factor d_2.

For the bias correction factor d_2, the combination of exponential functions which best fits the data is:

$$d_2 = 0.64282 + 0.09775 (1 - e^{-0.5\alpha}) + 0.35736 (1 - e^{-2\alpha}) + 0.02483 (1 - e^{-0.1\alpha})$$

This model has a multiple coefficient of determination R^2 of 97.9%. This value of R^2 indicates that the model is useful for predicting the population of d_2.

The global F test is used as indicated in Procedure II to test the validity of the multiple regression model selected. From the Minitab output (Appendix G - Models selected), the value of the test statistic F is:

$$F = 566.07$$

Using a significance level $\alpha' = 0.01$, the rejection region for the test is defined by the value of Fc $_{\alpha'(k, n-(k+1))}$. From an F table, this critical value is:

$$Fc_{0.01(3, 36)} = 4.39$$

Clearly the null hypothesis Ho: $\lambda_1 = \lambda_2 = \lambda_3 = 0$ is rejected since the value of the F statistic is greater than the critical value Fc:

$$F > Fc_{\alpha'(k, n-(k+1))}$$

$$566.07 > 4.39$$

Therefore, it is concluded that one can be very confident that this model is useful for predicting d_2.

Graphs are built to compare the simulated values of d_2 (empirical) with the regressed values of d_2. These graphs are shown in Appendix H.

In addition, a residual model diagnostic is performed to validate the assumption of normality for the residuals. Figure 4.14 shows the residual model diagnostic generated by Minitab. From this Figure 4.14, it can be concluded that the residuals (ε_i) follow a normal distribution with mean zero and variance σ^2 ($\varepsilon_i \sim N(0, \sigma^2)$).

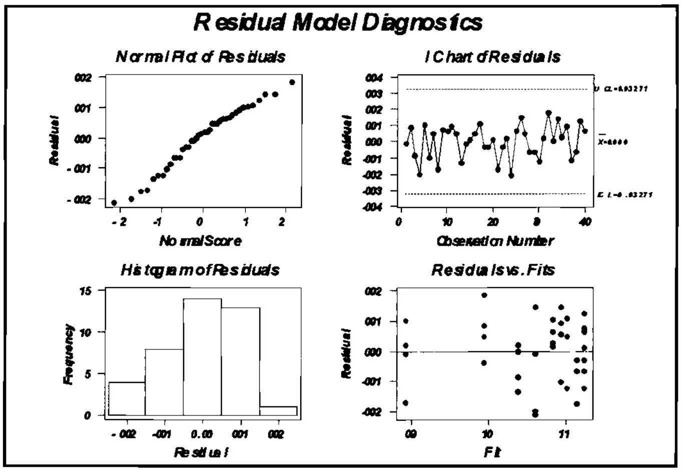


Figure 4.14. Residual model diagnostic for the bias correction factor d_2.

4.2.2 Bias correction factor d_3.

For the bias correction factor d_3, the combination of exponential functions which best fits the data is:

$$d_3 = 0.859457 - 0.2964\ e^{-\alpha} + 0.29099\ e^{-0.5\alpha} + 0.4758\ e^{-2\alpha}$$

This model has a multiple coefficient of determination R^2 of 96.5%. This value of R^2 indicates that the model is useful for predicting the population of d_3.

The global F test is used as indicated in Procedure II to test the validity of the multiple regression model selected. From the Minitab output (Appendix G - Models selected), the value of the test statistic F is:

$$F = 327.34$$

Using a significance level $\alpha' = 0.01$, the rejection region for the test is defined by the value of $Fc_{\alpha'(k,\ n-(k+1))}$. From an F table, this critical value is:

$$Fc_{0.01(3,\ 36)} = 4.39$$

Clearly the null hypothesis Ho: $\lambda_1 = \lambda_2 = \lambda_3 = 0$ is rejected since the value of the F statistic is greater than the critical value Fc:

$$F > Fc_{\alpha'(k,\ n-(k+1))}$$

$$327.34 > 4.39$$

Therefore, it is concluded that one can be very confident that this model is useful for predicting d_3.

Graphs are built to compare the simulated values of d_3 (empirical) with the regressed values of d_3. These graphs are shown in Appendix H.

In addition, a residual model diagnostic is performed to validate the assumption of normality for the residuals. Figure 4.15 shows the residual model diagnostic generated by Minitab. From this Figure 4.15, it can be concluded that the residuals (ε_i) follow a normal distribution with mean zero and variance σ^2 ($\varepsilon_i \sim N(0, \sigma^2)$).

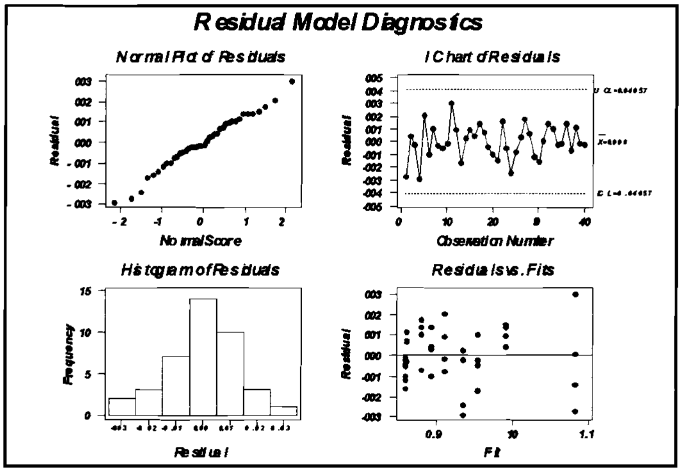


Figure 4.15. Residual model diagnostic for the bias correction factor d_3.

4.2.3 Control chart constant D_4.

For the control chart constant D_4, the combination of exponential functions which best fits the data is:

$$D_4 = 3.28976 + 1.87067\, e^{-\alpha} + 0.13663\, e^{-0.1\alpha}$$

This model has a multiple coefficient of determination R^2 of 98.0%. This value of R^2 indicates that the model is useful for predicting the population of D_4.

The global F test is used as indicated in Procedure II to test the validity of the multiple regression model selected. From the Minitab output (Appendix G - Models selected), the value of the test statistic F is:

$$F = 925.12$$

Using a significance level $\alpha' = 0.01$, the rejection region for the test is defined by the value of Fc $_{\alpha'(k,\, n-(k+1))}$. From an F table, this critical value is:

$$Fc_{0.01\,(2,\,37)} = 5.243$$

Clearly the null hypothesis Ho: $\lambda_1 = \lambda_2 = \lambda_3 = 0$ is rejected since the value of the F statistic is greater than the critical value Fc:

$$925.12 > 5.243$$

Therefore, it is concluded that one can be very confident that this model is useful for predicting D_4.

Graphs are built to compare the simulated values of D_4 (empirical) with the regressed values of D_4. These graphs are shown in Appendix H.

In addition, a residual model diagnostic is performed to validate the assumption of normality for the residuals. Figure 4.16 shows the residual model diagnostic generated by Minitab. From this Figure 4.16, it can be concluded that the residuals (ε_i) follow a normal distribution with mean zero and variance σ^2 ($\varepsilon_i \sim N(0, \sigma^2)$).

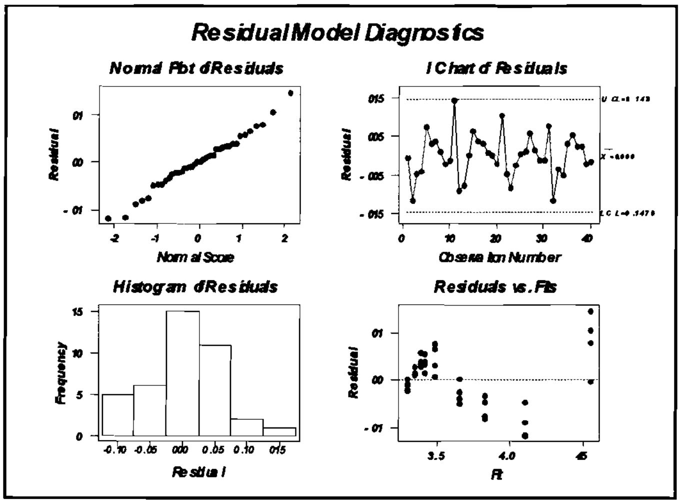


Figure 4.16. Residual model diagnostic for the control chart constant D_4.

4.3 Objective three.

The third objective of this thesis research is to compare the performance of the individual measurement X and moving range n = 2 MR control charts, using the normal control chart constants, with the performance of these control charts using the Pearson type III c = 0 (gamma) control chart constants computed in objective two, when 10, 30, and 50 data values are available from an unknown process distribution. The performance of the control charts will be evaluated using the proportion of control charts which indicate at least one signal when the process is in control and for shifts in the process average of 1 and 2 process standard deviations σ.

The results of Objective three are presented separately for each of the five unknown process distributions. Then, an overall analysis is performed over the results of the five distributions to test the second hypothesis stated in Chapter I (p. 5).

According to Procedure III, one thousand samples of k = 10, 30, and 50 observations are generated in Quattro Pro for Windows using the random number generator included in Minitab and following the algorithms described for each of the five process distributions. The algorithms used to generate gamma and normal variates are tested statistically to see how closely the values generated resemble IID gamma (α, β) and normal (μ, σ^2) distributions, respectively. The tests are goodness of fit tests for 100 and 1,000 observations for the gamma distribution (2, 1) and for the normal $(40, 10^2)$. The results of the tests are shown in Appendix C and they indicate that both algorithms are good enough to generate reliable gamma and normal variates respectively. The other algorithms are not tested statistically because they are particular cases of either the gamma algorithm or the normal algorithm.

Spreadsheets which place 250 samples of $k = 10$, 30, and 50 observations are designed to perform the whole analysis contained in objective three. Therefore, for each distribution and for $k = 10$, 30, and 50 observations, the spreadsheets are run four times to complete the 1,000 samples required in Procedure III. A portion of the spreadsheets and a subset of the results for each of the five process distributions and for $k = 10$, 30, and 50 observations can be seen in Appendix I.

Then, for each of the five distributions and for each sample generated of $k = 10$, 30, and 50 observations, the following values are calculated:

- Sample average $\overline{X}$.
- Sample average moving range $\overline{MR}$ from the 9, 29, and 49 subgroups of two consecutive measurements formed respectively for $k = 10$, 30, and 50.
- Sample shape parameter α and sample scale parameter β. In order to estimate these parameters α and β, the numerical technique developed by Choi and Wette (9, p. 683) and described in Procedure III is used. The statistic T is evaluated for each sample. Then, using the table reproduced in Appendix J and included in the spreadsheets designed (Appendix I), the values of α and β are estimated.
- Gamma bias correction factors d_2 and d_3 and gamma control chart constant D_4 using the exponential models selected in objective two

$$d_2 = f_1(\alpha)$$

$$d_3 = f_2(\alpha)$$

$$D_4 = f_3(\alpha)$$

- Two sets of control limits for the X and MR (n=2) control charts are calculated for each simulation run of k = 10, 30, and 50 observations. One set of control limits is obtained using the normal control chart constants and the other one is obtained using the gamma constants computed before.

A subset of the details of these calculations performed for each of the five distributions and for each simulation run of k = 10, 30, and 50 observations can be seen partially in the spreadsheets included in Appendix I.

Next, as indicated in Procedure III, three sets of 1,000 new samples of k' = 30 observations are generated for each of the five process distributions. The first set is left as it is (no shift), the second set is shifted up one process standard deviation, and the third set is shifted up two process standard deviations. Only for the first set of 1,000 new samples (no shift in the process average), the observations are grouped in subgroups of two consecutive measurements and the moving range values are calculated. The first subgroup is formed using the last observation of the old samples of k = 10, 30, and 50 observations with the first observation of the new 1000 samples of k' = 30. Therefore, there are thirty moving ranges for each new sample of k' = 30 data values.

Then, the first observation (k'=1) and first moving range, the first ten observations (k'=10) and first ten moving ranges, and the thirty observations (k'=30) and thirty moving ranges of the first new sample of k' = 30 data values, are compared with the two sets of control limits calculated before for the first sample of k = 10, 30, and 50 measurements and for each of the five process distributions. This step is executed repeatedly for each of the 1,000 samples contained in the three sets of new samples (k'=30) and for each of the five distributions. Each time the comparison is between the n^{th} new sample of k' = 30 with the normal and gamma control limits corresponding to the n^{th} old samples of k = 10, 30, and 50 observations, respectively. It is important to clarify that for the moving range the step is repeated only for the first set of 1,000 new samples because only shifts in the process average are considered in this research.

Thus, for each of the five process distributions and for k = 10, 30, and 50 data values, the proportion of individual measurement X and moving range n = 2 MR control charts which indicate at least one signal are recorded. This is done for the three comparisons described before (k'=1, 10, and 30 new observations) and for the two set of control limits (normal and gamma). For the moving range, the proportions are computed only for the first set of 1,000 new samples of k' = 30.

A subset of the details about the calculations of the number of X and MR control charts which indicate at least one signal for each of the five distributions, for k = 10, 30, and 50, for k' = 1, 10, and 30, and for both sets of control limits (normal and gamma), can be observed partially in the spreadsheets included in Appendix I.

4.3.1 **Lognormal (0, 1^2)**

The number of normal and gamma individual measurement X and moving range n = 2 MR control charts which indicate at least one signal are summarized in Table 4.6 for the lognormal distribution. This table indicates the number of normal and gamma control charts out of the 1,000 generated which show at least one false alarm (no shift in the process average) and signal at least one out-of-control condition (shift in the process average of 1 and 2 sigma) for values of k = 10, 30, and 50 and k' = 1, 10, and 30.

TABLE 4.6

NUMBER OF X AND MR (n=2) CONTROL CHARTS WHICH INDICATE AT LEAST ONE SIGNAL OUT OF THE 1,000 GENERATED FOR THE LOGNORMAL

Shift in sigma	**X control charts (k=10)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	62	453	714	55	413	667
1	216	673	834	197	628	799
2	558	844	927	512	815	904

Shift in sigma	**X control charts (k=30)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	45	367	678	39	323	622
1	129	622	858	106	566	814
2	449	874	964	367	814	934

Shift in sigma	**X control charts (k=50)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	33	328	664	28	283	605
1	116	621	864	94	537	796
2	395	866	974	303	806	944

Value of k (obsv.)	**MR control charts (no shift in the process average)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
10	83	469	718	56	381	623
30	60	379	669	45	283	559
50	60	343	656	40	242	545

From the values in Table 4.6, the reductions in false alarm rate and power of detection in percentage due to the use of gamma control limits rather than normal control limits are computed. These results are presented in Table 4.7.

TABLE 4.7

REDUCTION IN SIGNALS FROM NORMAL TO GAMMA CONTROL CHARTS FOR THE LOGNORMAL DISTRIBUTION (IN PERCENT)

<table>
<tr><th colspan="10">X control chart</th></tr>
<tr><th rowspan="2">Shift
in σ</th><th colspan="3">k = 10</th><th colspan="3">k = 30</th><th colspan="3">k = 50</th></tr>
<tr><th>k'=1</th><th>k'=10</th><th>k'=30</th><th>k'=1</th><th>k'=10</th><th>k'=30</th><th>k'=1</th><th>k'=10</th><th>k'=30</th></tr>
<tr><td>0</td><td>11.29</td><td>8.83</td><td>6.58</td><td>13.33</td><td>11.99</td><td>8.26</td><td>15.15</td><td>13.72</td><td>8.89</td></tr>
<tr><td>1</td><td>8.79</td><td>6.69</td><td>4.20</td><td>17.83</td><td>9.00</td><td>5.13</td><td>18.97</td><td>13.53</td><td>7.87</td></tr>
<tr><td>2</td><td>8.24</td><td>3.44</td><td>2.48</td><td>18.26</td><td>6.86</td><td>3.11</td><td>23.29</td><td>6.93</td><td>3.08</td></tr>
<tr><th colspan="10">MR control chart (no shift in the process average)</th></tr>
<tr><th>k</th><th colspan="3">k' = 1</th><th colspan="3">k' = 10</th><th colspan="3">k' = 30</th></tr>
<tr><td>10</td><td colspan="3">32.53</td><td colspan="3">18.76</td><td colspan="3">13.23</td></tr>
<tr><td>30</td><td colspan="3">25.00</td><td colspan="3">25.33</td><td colspan="3">16.44</td></tr>
<tr><td>50</td><td colspan="3">33.33</td><td colspan="3">29.45</td><td colspan="3">16.92</td></tr>
</table>

Note: Values marked are the biggest reduction (in percent) in the k' column.

In order to test the second part of the second hypothesis (power of detection at least equal to the theoretical power using the normal assumption for shifts of 1 and 2 process standard deviations), the performance of the gamma X control chart for k' = 1 is compared with the performance of the theoretical normal X control chart. This comparison is shown in Table 4.8. Table 4.8 indicates percentages of signals for shifts in the process average of 1 and 2 sigma for the lognormal distribution.

TABLE 4.8

PERCENTAGE OF SIGNALS (%) - GAMMA X CONTROL CHARTS vs. THEORETICAL NORMAL X CONTROL CHARTS FOR SHIFTS OF 1 AND 2 SIGMA AND k' = 1

Shift	k = 10		k = 30		k = 50	
in σ	Gamma	NT	Gamma	NT	Gamma	NT
1	19.7	2.28	10.6	2.28	9.4	2.28
2	51.2	15.87	36.7	15.87	30.3	15.87

NT: Normal theory.

In order to evaluate the effect of the number of observations used to set control limits (k = 10, 30, and 50), the performance of only the normal X control charts for k = 10 are compared with the performance of those normal X control charts for k = 30. In the same way, the performance of only the normal X control chart constants for k = 30 are compared with those normal X control charts for k = 50. The values used to do the comparison are taken from Table 4.6. The comparison is shown in Table 4.9. Table 4.9 indicates the differences in percentage of signals between k = 10 and 30 and between k = 30 and 50 for the normal X control chart.

TABLE 4.9

DIFFERENCES IN PERCENTAGE OF SIGNALS (%) DUE TO THE VALUE OF k FOR THE NORMAL X CONTROL CHART - LOGNORMAL DISTRIBUTION

Shift	k = 10 vs. k = 30			k = 30 vs. k = 50		
in σ	k' = 1	k' = 10	k' = 30	k' = 1	k' = 10	k' = 30
0	(27.42)	(18.98)	(5.04)	(26.67)	(10.63)	(2.06)
1	(40.28)	(7.58)	2.88	(10.08)	(0.16)	0.70
2	(19.53)	3.55	3.99	(12.03)	(0.92)	1.04

Note: Values in parenthesis are negative percentages (reduction in percentage of signals).

4.3.2 **Normal (40, 10^2)**

The number of normal and gamma individual measurement X and moving range n = 2 MR control charts which indicate at least one signal are summarized in Table 4.10 for the normal distribution. This table indicates the number of normal and gamma control charts out of the 1,000 generated which show at least one false alarm (no shift in the process average) and signal at least one out-of-control condition (shift in the process average of 1 and 2 sigma) for values of k = 10, 30, and 50 and k' = 1, 10, and 30.

TABLE 4.10

NUMBER OF X AND MR (n=2) CONTROL CHARTS WHICH INDICATE AT LEAST ONE SIGNAL OUT OF THE 1,000 GENERATED FOR THE NORMAL

Shift in sigma	**X control charts (k=10)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	30	150	301	27	144	290
1	67	337	536	67	327	523
2	235	711	843	229	696	833
Shift in sigma	**X control charts (k=30)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	10	72	165	10	66	154
1	35	276	532	33	260	509
2	167	742	912	164	734	906
Shift in sigma	**X control charts (k=50)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	4	54	143	4	53	136
1	31	263	535	26	252	514
2	169	786	948	161	774	942
Value of k (obsv.)	**MR control charts (no shift in the process average)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
10	31	194	350	28	188	336
30	15	119	276	13	108	253
50	11	115	256	9	99	238

From the values in Table 4.10, the reductions in false alarm rate and power of detection in percentage due to the use of gamma control limits rather than normal control limits are computed. These results are presented in Table 4.11.

TABLE 4.11

REDUCTION IN SIGNALS FROM NORMAL TO GAMMA CONTROL CHARTS FOR THE NORMAL DISTRIBUTION (IN PERCENT)

<table>
<tr><th colspan="10">X control chart</th></tr>
<tr><th>Shift</th><th colspan="3">k = 10</th><th colspan="3">k = 30</th><th colspan="3">k = 50</th></tr>
<tr><th>in σ</th><th>k'=1</th><th>k'=10</th><th>k'=30</th><th>k'=1</th><th>k'=10</th><th>k'=30</th><th>k'=1</th><th>k'=10</th><th>k'=30</th></tr>
<tr><td>0</td><td>10.00</td><td>4.00</td><td>3.65</td><td>0.00</td><td>8.33</td><td>6.67</td><td>0.00</td><td>1.85</td><td>4.90</td></tr>
<tr><td>1</td><td>0.00</td><td>2.97</td><td>2.43</td><td>5.71</td><td>5.80</td><td>4.32</td><td>16.13</td><td>4.18</td><td>3.93</td></tr>
<tr><td>2</td><td>2.55</td><td>2.11</td><td>1.19</td><td>2.19</td><td>1.08</td><td>0.66</td><td>4.73</td><td>1.53</td><td>0.63</td></tr>
<tr><th colspan="10">MR control chart (no shift in the process average)</th></tr>
<tr><th>k</th><th colspan="3">k' = 1</th><th colspan="3">k' = 10</th><th colspan="3">k' = 30</th></tr>
<tr><td>10</td><td colspan="3">9.68</td><td colspan="3">3.09</td><td colspan="3">4.0</td></tr>
<tr><td>30</td><td colspan="3">13.33</td><td colspan="3">9.24</td><td colspan="3">8.33</td></tr>
<tr><td>50</td><td colspan="3">18.18</td><td colspan="3">13.91</td><td colspan="3">7.03</td></tr>
</table>

Note: Values marked are the biggest reduction (in percent) in the k' column.

In order to test the second part of the second hypothesis (power of detection at least equal to the theoretical power using the normal assumption for shifts of 1 and 2 process standard deviations), the performance of the gamma X control chart for k' = 1 is compared with the performance of the theoretical normal X control chart. This comparison is shown in Table 4.12. Table 4.12 indicates percentages of signals for shifts in the process average of 1 and 2 sigma for the normal distribution.

TABLE 4.12

PERCENTAGE OF SIGNALS (%) - GAMMA X CONTROL CHARTS vs. THEORETICAL NORMAL X CONTROL CHARTS FOR SHIFTS OF 1 AND 2 SIGMA AND k' = 1

Shift	k = 10		k = 30		k = 50	
in σ	Gamma	NT	Gamma	NT	Gamma	NT
1	6.70	2.28	3.3	2.28	2.6	2.28
2	22.9	15.87	16.4	15.87	16.1	15.87

NT: Normal theory.

In order to evaluate the effect of the number of observations used to set control limits (k = 10, 30, and 50), the performance of only the normal X control charts for k = 10 are compared with the performance of those normal X control charts for k = 30. In the same way, the performance of only the normal X control chart constants for k = 30 are compared with those normal X control charts for k = 50. The values used to do the comparison are taken from Table 4.10. The comparison is shown in Table 4.13. Table 4.13 indicates the differences in percentage of signals between k = 10 and 30 and between k = 30 and 50 for the normal X control chart.

TABLE 4.13

DIFFERENCES IN PERCENTAGE OF SIGNALS (%) DUE TO THE VALUE OF k FOR THE NORMAL X CONTROL CHART - NORMAL DISTRIBUTION

Shift	k = 10 vs. k = 30			k = 30 vs. k = 50		
in σ	k' = 1	k' = 10	k' = 30	k' = 1	k' = 10	k' = 30
0	(66.67)	(52.00)	(45.18)	(60.00)	(25.00)	(13.33)
1	(47.76)	(18.10)	(0.75)	(11.43)	(4.71)	0.56
2	(28.94)	4.36	8.19	1.20	5.93	3.95

Note: Values in parenthesis are negative percentages (reduction in percentage of signals).

4.3.3 **Exponential (mean=1)**

The number of normal and gamma individual measurement X and moving range n = 2 MR control charts which indicate at least one signal are summarized in Table 4.14 for the exponential distribution. This table indicates the number of normal and gamma control charts out of the 1,000 generated which show at least one false alarm (no shift in the process average) and signal at least one out-of-control condition (shift in the process average of 1 and 2 sigma) for values of k = 10, 30, and 50 and k' = 1, 10, and 30.

TABLE 4.14

NUMBER OF X AND MR (n=2) CONTROL CHARTS WHICH INDICATE AT LEAST ONE SIGNAL OUT OF THE 1,000 GENERATED FOR THE EXPONENTIAL

Shift in sigma	**X control charts (k=10)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	47	342	608	38	300	533
1	138	596	817	115	526	742
2	347	792	912	288	729	859

Shift in sigma	**X control charts (k=30)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	34	280	548	21	208	451
1	89	548	825	65	444	737
2	231	820	950	172	728	902

Shift in sigma	**X control charts (k=50)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	28	246	555	22	181	448
1	86	537	863	57	443	776
2	221	858	983	159	757	956

Value of k (obsv.)	**MR control charts (no shift in the process average)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
10	58	353	614	32	254	468
30	55	278	552	20	153	360
50	44	248	552	23	133	330

From the values in Table 4.14, the reductions in false alarm rate and power of detection in percentage due to the use of gamma control limits rather than normal control limits are computed. These results are presented in Table 4.15.

TABLE 4.15

REDUCTION IN SIGNALS FROM NORMAL TO GAMMA CONTROL CHARTS FOR THE EXPONENTIAL DISTRIBUTION (IN PERCENT)

X control chart									
Shift in σ	**k = 10**			**k = 30**			**k = 50**		
	k'=1	**k'=10**	**k'=30**	**k'=1**	**k'=10**	**k'=30**	**k'=1**	**k'=10**	**k'=30**
0	19.15	12.28	12.34	38.24	25.71	17.70	21.43	26.42	19.28
1	16.67	11.74	9.18	26.97	18.98	10.67	33.72	17.50	10.08
2	17.00	7.95	5.81	25.54	11.22	5.05	28.05	11.77	2.75

MR control chart (no shift in the process average)			
k	**k' = 1**	**k' = 10**	**k' = 30**
10	44.83	28.05	23.78
30	63.64	44.96	34.78
50	47.73	46.37	40.22

Note: Values marked are the biggest reduction (in percent) in the k' column.

In order to test the second part of the second hypothesis (power of detection at least equal to the theoretical power using the normal assumption for shifts of 1 and 2 process standard deviations), the performance of the gamma X control chart for k' = 1 is compared with the performance of the theoretical normal X control chart. This comparison is shown in Table 4.16. Table 4.16 indicates percentages of signals for shifts in the process average of 1 and 2 sigma for the exponential distribution.

TABLE 4.16

PERCENTAGE OF SIGNALS (%) - GAMMA X CONTROL CHARTS vs. THEORETICAL NORMAL X CONTROL CHARTS FOR SHIFTS OF 1 AND 2 SIGMA AND k' = 1

Shift	k = 10		k = 30		k = 50	
in σ	Gamma	NT	Gamma	NT	Gamma	NT
1	11.5	2.28	6.5	2.28	5.7	2.28
2	28.8	15.87	17.2	15.87	15.90	15.87

NT: Normal theory.

In order to evaluate the effect of the number of observations used to set control limits (k = 10, 30, and 50), the performance of only the normal X control charts for k = 10 are compared with the performance of those normal X control charts for k = 30. In the same way, the performance of only the normal X control chart constants for k = 30 are compared with those normal X control charts for k = 50. The values used to do the comparison are taken from Table 4.14. The comparison is shown in Table 4.17. Table 4.17 indicates the differences in percentage of signals between k = 10 and 30 and between k = 30 and 50 for the normal X control chart.

TABLE 4.17

DIFFERENCES IN PERCENTAGE OF SIGNALS (%) DUE TO THE VALUE OF k FOR THE NORMAL X CONTROL CHART - EXPONENTIAL DISTRIBUTION

Shift	k = 10 vs. k = 30			k = 30 vs. k = 50		
in σ	k' = 1	k' = 10	k' = 30	k' = 1	k' = 10	k' = 30
0	(27.66)	(18.13)	(9.87)	(17.65)	(12.14)	1.28
1	(35.51)	(8.05)	0.98	(3.37)	(2.01)	4.61
2	(33.43)	3.54	4.17	(4.33)	4.63	3.47

Note: Values in parenthesis are negative percentages (reduction in percentage of signals).

4.3.4 **Gamma (α=1.5, β=1.0)**

The number of normal and gamma individual measurement X and moving range n = 2 MR control charts which indicate at least one signal are summarized in Table 4.18 for the gamma distribution. This table indicates the number of normal and gamma control charts out of the 1,000 generated which show at least one false alarm (no shift in the process average) and signal at least one out-of-control condition (shift in the process average of 1 and 2 sigma) for values of k = 10, 30, and 50 and k' = 1, 10, and 30.

TABLE 4.18

NUMBER OF X AND MR (n=2) CONTROL CHARTS WHICH INDICATE AT LEAST ONE SIGNAL OUT OF THE 1,000 GENERATED FOR THE GAMMA

Shift in sigma	**X control charts (k=10)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	36	287	539	33	252	474
1	111	506	755	99	456	692
2	304	743	896	257	691	856

Shift in sigma	**X control charts (k=30)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	28	238	524	20	195	433
1	66	489	809	58	416	742
2	232	807	958	190	733	925

Shift in sigma	**X control charts (k=50)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	19	216	497	14	170	418
1	57	483	811	48	412	752
2	207	827	977	162	744	948

Value of k (obsv.)	**MR control charts (no shift in the process average)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
10	55	297	534	36	230	433
30	32	247	528	20	164	370
50	26	227	511	11	139	354

From the values in Table 4.18, the reductions in false alarm rate and power of detection in percentage due to the use of gamma control limits rather than normal control limits are computed. These results are presented in Table 4.19.

TABLE 4.19

REDUCTION IN SIGNALS FROM NORMAL TO GAMMA CONTROL CHARTS FOR THE GAMMA DISTRIBUTION (IN PERCENT)

X control chart									
Shift in σ	**k = 10**			**k = 30**			**k = 50**		
	k'=1	**k'=10**	**k'=30**	**k'=1**	**k'=10**	**k'=30**	**k'=1**	**k'=10**	**k'=30**
0	8.33	12.20	12.06	28.57	18.07	17.37	26.32	21.30	15.90
1	10.81	9.88	8.34	12.12	14.93	8.28	15.79	14.70	7.27
2	15.46	7.00	4.46	18.10	9.17	3.44	21.74	10.04	2.97

MR control chart (no shift in the process average)			
k	**k' = 1**	**k' = 10**	**k' = 30**
10	34.55	22.56	18.91
30	37.50	33.60	29.92
50	57.69	38.77	30.72

Note: Values marked are the biggest reduction (in percent) in the k' column.

In order to test the second part of the second hypothesis (power of detection at least equal to the theoretical power using the normal assumption for shifts of 1 and 2 process standard deviations), the performance of the gamma X control chart for k' = 1 is compared with the performance of the theoretical normal X control chart. This comparison is shown in Table 4.20. Table 4.20 indicates percentages of signals for shifts in the process average of 1 and 2 sigma for the gamma distribution.

TABLE 4.20

PERCENTAGE OF SIGNALS (%) - GAMMA X CONTROL CHARTS vs. THEORETICAL NORMAL X CONTROL CHARTS FOR SHIFTS OF 1 AND 2 SIGMA AND k' = 1

Shift	k = 10		k = 30		k = 50	
in σ	Gamma	NT	Gamma	NT	Gamma	NT
1	9.90	2.28	5.80	2.28	4.80	2.28
2	25.70	15.87	19.00	15.87	16.20	15.87

NT: Normal theory.

In order to evaluate the effect of the number of observations used to set control limits (k = 10, 30, and 50), the performance of only the normal X control charts for k = 10 are compared with the performance of those normal X control charts for k = 30. In the same way, the performance of only the normal X control chart constants for k = 30 are compared with those normal X control charts for k = 50. The values used to do the comparison are taken from Table 4.18. The comparison is shown in Table 4.21. Table 4.21 indicates the differences in percentage of signals between k = 10 and 30 and between k = 30 and 50 for the normal X control chart.

TABLE 4.21

DIFFERENCES IN PERCENTAGE OF SIGNALS (%) DUE TO THE VALUE OF k FOR THE NORMAL X CONTROL CHART - GAMMA DISTRIBUTION

Shift	k = 10 vs. k = 30			k = 30 vs. k = 50		
in σ	k' = 1	k' = 10	k' = 30	k' = 1	k' = 10	k' = 30
0	(22.22)	(17.07)	(2.78)	(32.14)	(9.24)	(5.15)
1	(40.54)	(3.36)	7.15	(13.64)	(1.23)	0.25
2	(23.68)	8.61	6.92	(10.78)	2.48	1.98

Note: Values in parenthesis are negative percentages (reduction in percentage of signals).

4.3.5 **Chi-Square χ^2 (df=4)**

The number of normal and gamma individual measurement X and moving range n = 2 MR control charts which indicate at least one signal are summarized in Table 4.22 for the chi-square distribution. This table indicates the number of normal and gamma control charts out of the 1,000 generated which show at least one false alarm (no shift in the process average) and signal at least one out-of-control condition (shift in the process average of 1 and 2 sigma) for values of k = 10, 30, and 50 and k' = 1, 10, and 30.

TABLE 4.22

NUMBER OF X AND MR (n=2) CONTROL CHARTS WHICH INDICATE AT LEAST ONE SIGNAL OUT OF THE 1,000 GENERATED FOR THE CHI-SQUARE

Shift in sigma	**X control charts (k=10)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	48	266	490	43	246	454
1	108	509	702	93	475	662
2	291	729	881	263	691	846

Shift in sigma	**X control charts (k=30)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	29	194	449	23	161	397
1	80	504	773	70	437	718
2	219	790	955	195	736	931

Shift in sigma	**X control charts (k=50)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
0	23	165	422	19	134	364
1	72	496	799	23	156	363
2	201	804	975	175	737	944

Value of k (obsv.)	**MR control charts (no shift in the process average)**					
	Normal limits			**Gamma limits**		
	k' = 1	**k' = 10**	**k' = 30**	**k' = 1**	**k' = 10**	**k' = 30**
10	56	282	500	44	243	414
30	35	213	474	23	156	363
50	34	181	444	22	124	335

From the values in Table 4.22, the reductions in false alarm rate and power of detection in percentage due to the use of gamma control limits rather than normal control limits are computed. These results are presented in Table 4.23.

TABLE 4.23

REDUCTION IN SIGNALS FROM NORMAL TO GAMMA CONTROL CHARTS FOR THE CHI-SQUARE DISTRIBUTION (IN PERCENT)

X control chart									
Shift	**k = 10**			**k = 30**			**k = 50**		
in σ	**k'=1**	**k'=10**	**k'=30**	**k'=1**	**k'=10**	**k'=30**	**k'=1**	**k'=10**	**k'=30**
0	10.42	7.52	7.35	20.69	17.01	11.58	17.39	18.79	13.74
1	13.84	6.68	5.70	12.50	13.29	7.12	9.72	13.51	9.01
2	9.62	5.21	3.97	10.96	6.84	2.51	12.94	8.33	3.18

MR control chart (no shift in the process average)			
k	**k' = 1**	**k' = 10**	**k' = 30**
10	21.43	13.83	17.20
30	34.29	26.76	23.42
50	35.29	31.49	24.55

Note: Values marked are the biggest reduction (in percent) in the k' column.

In order to test the second part of the second hypothesis (power of detection at least equal to the theoretical power using the normal assumption for shifts of 1 and 2 process standard deviations), the performance of the gamma X control chart for k' = 1 is compared with the performance of the theoretical normal X control chart. This comparison is shown in Table 4.24. Table 4.24 indicates percentages of signals for shifts in the process average of 1 and 2 sigma for the chi-square distribution.

TABLE 4.24

PERCENTAGE OF SIGNALS (%) - GAMMA X CONTROL CHARTS vs. THEORETICAL NORMAL X CONTROL CHARTS FOR SHIFTS OF 1 AND 2 SIGMA AND k' = 1

Shift	k = 10		k = 30		k = 50	
in σ	Gamma	NT	Gamma	NT	Gamma	NT
1	9.30	2.28	7.00	2.28	6.50	2.28
2	26.30	15.87	19.50	15.87	17.50	15.87

NT: Normal theory.

In order to evaluate the effect of the number of observations used to set control limits (k = 10, 30, and 50), the performance of only the normal X control charts for k = 10 are compared with the performance of those normal X control charts for k = 30. In the same way, the performance of only the normal X control chart constants for k = 30 are compared with those normal X control charts for k = 50. The values used to do the comparison are taken from Table 4.22. The comparison is shown in Table 4.25. Table 4.25 indicates the differences in percentage of signals between k = 10 and 30 and between k = 30 and 50 for the normal X control chart.

TABLE 4.25

DIFFERENCES IN PERCENTAGE OF SIGNALS (%) DUE TO THE VALUE OF k FOR THE NORMAL X CONTROL CHART - CHI-SQUARE DISTRIBUTION

Shift	k = 10 vs. k = 30			k = 30 vs. k = 50		
in σ	k' = 1	k' = 10	k' = 30	k' = 1	k' = 10	k' = 30
0	(39.58)	(27.07)	(8.37)	(20.69)	(14.95)	(6.01)
1	(25.93)	(0.98)	10.11	(10.00)	(1.59)	3.36
2	(24.74)	8.37	8.40	(8.22)	1.77	2.09

Note: Values in parenthesis are negative percentages (reduction in percentage of signals).

4.3.6 **Overall Analysis of the Results**

The overall analysis of the results described from section 4.3.1 to section 4.3.5 is based on the second hypothesis stated in Chapter I.

The second hypothesis of this thesis research states that the individual measurement X and moving range n = 2 MR control charts, using gamma control chart constants, have better performance than the same control charts using the normal constants, when 10, 30, and 50 data values are available from an unknown process distribution. Better performance means less false alarm rate in control and power of detection (X chart), for shifts in the process average of 1 and 2 sigma, at least equal to the theoretical power using the normal assumption (0.0228 and 0.1587 respectively for shifts in the process average of 1 and 2 sigma).

From Tables 4.6, 4.10, 4.14, 4.18, and 4.22, it is clearly seen that the gamma control charts (X and MR) always yield less false alarm rate than the normal control charts (X and MR) because the gamma limits are always wider than the normal limits.

However, this reduction in false alarm rate leads to reductions in the power of detection too. This is the statistical price that the gamma control charts have to pay in order to reduce the number of false signals when the underlying process distribution is asymmetric (skewed distribution).

The higher power of detection in the normal X control charts is unquestionable. However, in general, when the power increases the probabilities of a type I error or alpha risk also increases. According to Walker, et al. (42, p. 248), "Occasions arise in practice when a signal from the chart is automatically interpreted as an indication of an out-of-control process. Operators may be instructed to stop the process in order to search out and remove assignable causes. Under such circumstances, spurious signals can lead to counterproductive changes."

In this regard, it is important to have a criterion that does not indicate trouble too often when such trouble is not present. This statement has been stressed by Shewhart and many other quality experts. This criterion is better accomplished by the Pearson type III with $c = 0$ (gamma) control charts (less false alarm rate at the expense of reductions in the power of detection when shifts are present).

In addition, from Tables 4.7, 4.11, 4.15, 4.19, and 4.23, it is observed that in almost all of the cases for the X chart, the reductions in false alarm rate (%) are greater than the reductions in power of detection (%) for shifts of 1 and 2 process standard deviations when gamma control limits are used instead of the normal control limits. For the MR charts, the reductions in false alarm rate are always substantially big (from 14% to 63%). Therefore, based on the empirical evidence, it seems that the gamma control charts have better performance than the normal control charts.

Now, even though the empirical power of detection for the gamma X control charts is always less than the empirical power of detection for the normal X control charts, the empirical power of detection for the gamma X control charts is always greater than the theoretical power of detection for the normal control charts (0.0228 and 0.1587 for shifts in the process average of 1 and 2 sigma respectively). It is clearly seen in Tables 4.8, 4.12, 4.16, 4.20, and 4.24.

In conclusion, based on the empirical results, it could be said that there is not evidence to reject the statement of the second hypothesis. It means that, based on the empirical evidence, the gamma control charts (X and MR) seem to have better performance than the same control charts set with the normal constants d_2, d_3, and D_4. However, even though the performance of the gamma control charts is better than the performance of the normal control charts when the process distribution is non-normal, the number of empirical false alarms (no shift) is still too big (greater than the 1% accepted for practical purposes and greater than the theoretical value 0.27%). For instance, it is observed in Table 4.14 (exponential distribution) that the false alarm rates for k' = 1 are 3.8%, 2.1%, and 2.2% for k = 10, 30, and 50 data values, respectively. These false alarm rate values are far away the theoretical normal curve false alarm rate (0.27%) and the practical false alarm rate used in industry (1.0%). It is the author's belief that these high false alarm rates using the gamma control charts are due to the following three factors:

- The empirical nature of the study (# of observations).
- The skewness of the process distribution which affects the number of data values above

the three sigma upper control limit (tail area).

- The use of symmetric control limits (X chart) for asymmetric process distributions.

In relation to the effects of the number of observations used to set control limits (k = 10, 30, and 50) in the performance of the individual measurement X and moving range n = 2 MR control charts there are not conclusive results. However, from Tables 4.9, 4.13, 4.17, 4.21, and 4.25, it seems that the differences in performance k = 10 versus k = 30 are more inconsistent than the differences in performance k = 30 versus k = 50. In addition, the number of false alarms (X and MR), when k = 10 is used to set control limits, is always much greater (from 28% to 65% for the asymmetric distributions and from 150% to 200% for the normal distribution) than the number of false alarms when k = 30 and 50 data values are used to set control limits.

Therefore, it is the author's belief that k = 10 observations is not a good sample size to set reliable control limits (X and MR) for future predictions. This goes against some authors who believe that control charts always perform well no matter what number of observations are available. Additionally, from the empirical evidence, it seems that there is not too much difference in performance between k = 30 and k = 50 data values used to set control limits. As a consequence, it seems to be safe to say that k = 30 measurements is a good sample size to set control limits (X and MR) for future predictions.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions and recommendations

- The empirical ARL curves (from Figure 4.1 to Figure 4.10) indicate that the individual measurement X control chart, using the normal curve bias correction factor $d_2 = 1.128$, does not work well when the underlying process distribution shows a marked departure from normality (highly skewed distributions). This departure from normality is represented in this thesis research by a Pearson type III with $c = 0$ family of distributions (gamma distributions). For gamma distributions with shape parameter $\alpha < 5$, the ARLs in control (no shift) are substantially less (from 15% to 74%) than the 100 accepted in industry as a minimum for practical purposes and much less than the 370 stated in the normal theory (1 / 0.0027). Therefore, if the process is suspected to have a skewed (asymmetric) distribution, the individual measurement X control chart, using the normal bias correction factor d_2, must be very carefully used and interpreted.

  In general, it is recommended not to use the X chart, under the assumption of normality, when it is suspected that the process distribution is markedly non-normal (represented in this research by asymmetric distributions). According to Duncan (1, p. 400), "In such cases, the multiple of σ used to set control limits might be better derived from other distributions for which the percentage points have been computed."

- The empirical ARL values in control (Table 4.4) indicate that the moving range $n = 2$ MR control chart, using the normal curve control chart constant $D_4 = 3.268$, does not work well when the underlying process distribution is skewed . From Table 4.4, it is observed that for gamma distributions with shape parameter $\alpha \leq 10$ the empirical ARLs in control are substantially less (from 30% to 83%) than the 100 accepted in industry as a minimum for practical purposes and much less than the 107.14 given by the normal theory (1 / 0.0093).

Therefore, if the process has a skewed (asymmetric) distribution, the moving range n = 2 MR control chart, using the normal D_4, must be very carefully used and interpreted.

In general, it is recommended not to use the MR (n=2) chart, under the assumption of normality, when it is suspected that the process distribution is markedly non-normal (represented in this research by skewed distributions). Instead, the control limits must be based on the percentiles of a probability distribution which better fits the moving range distribution. Another approach could be to transform the original data to a new variable that can be approximated by a normal distribution. In the latter case, the control charts under the assumption of normality can be used safely on the transformed data.

- The bias correction factors d_2 and d_3 and the control chart constant D_4 show an exponential behavior approaching the normal curve values as the shape parameter α increases when the underlying process distributions are represented by gamma distributions. This behavior can be observed from Figure 4.11 to Figure 4.13 for the three constants, respectively.

The apparent exponential behavior is corroborated by the regression model selected to fit the values of d_2, d_3, and D_4 (Appendix G) when the underlying process distribution is gamma with shape parameter α and scale parameter β. The regression models, using the least-squares approach, which best fit the data for the three constants are combinations of exponential functions for the shape parameter α. The scale parameter β, as suspected, is found not to be significant in all the models generated.

- For four out of the five distributions selected to represent unknown process distributions (lognormal, exponential, gamma, and chi-square), the individual measurement X and moving range n = 2 MR control charts, set with the gamma control chart constants d_2, d_3, and D_4, have better performance than the same control charts set with the normal curve constants d_2, d_3, and D_4. Better performance means less false alarm rate in control, for the X and MR control charts, and power of detection at least equal to the theoretical power using the normal assumption for the X chart. This can be observed in Tables 4.6 and 4.8, 4.14 and 4.16, 4.18 and 4.20, and 4.22 and 4.24 for the four process distributions, respectively.

For the fifth distribution (normal), the individual measurement X and moving range n = 2 MR control charts, set with the gamma constants, have approximately the same performance as those control charts set with the normal constants. This can be seen in Table 4.10 for the normal curve. The similar performance is due to the fact that the gamma constants d_2, d_3, and D_4 approach the normal values when the gamma distribution approaches the normal curve (α increases).

In addition, for all cases (five distributions), the reductions in false alarm rates are bigger than the reductions in power of detection for shifts of 1 and 2 sigma when the gamma control limits are used instead of the normal limits. This can be observed in

Tables 4.7, 4.11, 4.15, 4.19, and 4.23.

Therefore, based on the empirical evidence, it is recommended that the gamma control chart constants d_2, d_3, and D_4 be used to set control limits for X and MR (n=2) control charts when the underlying process distribution is suspected to be a skewed distribution (asymmetric distribution).

However, even though the performance of the gamma control charts is better than the performance of the normal curve control charts when the process distribution is skewed, the number of empirical false alarms (no shift) is still too big. These high false alarm rates are far away the theoretical normal curve false alarm rate (0.27%) and the practical false alarm rate used in industry (1.0%). It is the author's belief that these high false alarm rates, using the gamma control charts, are due to the following three factors:

1. The empirical nature of the study (# of observations).
2. The skewness of the process distribution which affects the number of data values above the three sigma upper control limit (tail area).
3. The use of symmetric control limits (X chart) for asymmetric process distributions.

As a consequence, more research is needed in this area to improve the performance of the X and MR (n=2) gamma control charts.

- The number of empirical false alarms, when k = 10 observations are used to set control limits, is always much greater (from 28% to 65% for the asymmetric distributions and from 150% to 200% for the normal distribution) than the number of false alarms when k = 30 and 50 data values are used to set control limits. In addition, it is observed from Tables 4.9, 4.13, 4.17, 4.21, and 4.25 that the differences in performance k=10 versus k=30 have more variation than the differences in performance k=30 versus k=50. It means that the performance of X and MR (n=2) control charts are more consistent when k=30 and 50 data values are used to set control limits.

Therefore, based on the empirical evidence, it is not recommended to use k = 10 observations to set reliable control limits (X and MR control charts) for future predictions. Instead, it seems safe to say that k = 30 measurements is a good sample size to set these control limits for future predictions.

5.2 Research contributions

- This thesis research supplies the empirical evidence required to avoid using the individual measurement X and moving range n = 2 MR control charts when the underlying process distribution is suspected to be a skewed (asymmetric) distribution. This is on behalf of people in industry who use this pair of control charts (X and MR), under the assumption of normality, indiscriminately without knowing the approximate shape of the underlying process distribution.
- This research provides empirical equations to calculate approximately the correct control chart constants d_2, d_3, and D_4 when the underlying process distribution is a gamma distribution with shape parameter α and scale parameter β.
- This thesis provides empirical evidence that supports the hypothesis that the gamma control charts (X and MR) perform better than the normal curve control charts (X and MR) when the process distribution has a marked departure from normality (represented in this research by skewed distributions). However, more research is needed in this area since the number of empirical false alarms in control for the gamma control

charts is still unacceptable.

In this regard, this research opens ways for future research providing a new methodology for setting control limits (X and MR) under skewed (asymmetric) circumstances.

- This thesis research sets the empirical foundations that support the fact that k = 10 observations is not a good sample size to calculate reliable control limits for future predictions (X and MR). This goes against some authors who believe that X and MR (n=2) control charts always perform well no matter what number of observations are available. In addition, this research shows that there is not too much difference in performance between k = 30 and k = 50 data values used to set control limits. As a consequence, it seems to suggest that k = 30 observations is a good sample size to set those control limits for future predictions.

5.3 For future research

The fact that the gamma control charts (X and MR) still signal a large number of false alarms when the process is in control suggests that more research is needed in this area. It is the author's belief that these higher false alarm rates, using the gamma control charts, are due to the following three factors:

1. The empirical nature of the study (# of observations).
2. The skewness of the process distribution which affects the number of data values above the three sigma upper control limit (tail area).
3. The use of symmetric control limits (X chart) for asymmetric process distributions.

In Figure 5.1, the effects of the skewness and symmetrical control limits can be observed.

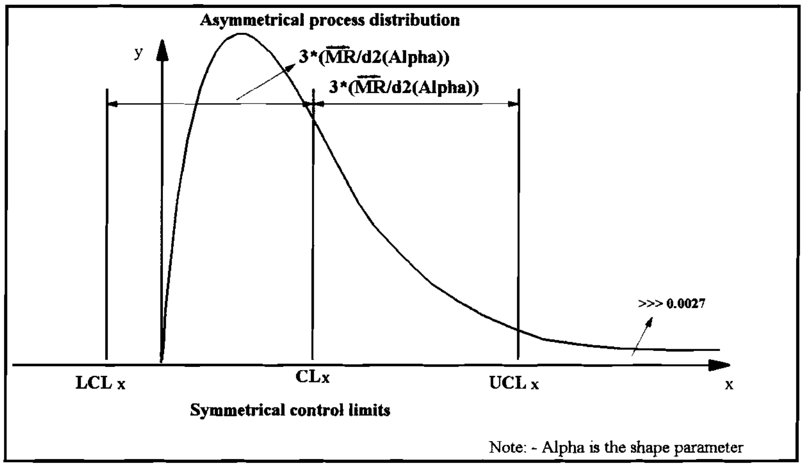


Figure 5.1. Effects of skewness and symmetrical control limits (X chart).

In order to get rid off these three factors, additional research is recommended in the field of setting asymmetric control limits (X and MR) based on the number of observations available, k, and the shape parameter, α. Following the methodology developed in this research, gamma control limits for the individual measurement X control chart are set at:

$$UCL_X = \bar{X} + J_u\,(\overline{MR} \,/\, d_2\,(\alpha)) = \bar{X} + E_{2u}\,(k,\ \alpha)\ \overline{MR}$$

$$LCL_X = \bar{X} - J_l\,(\overline{MR} \,/\, d_2\,(\alpha)) = \bar{X} - E_{2l}\,(k,\ \alpha)\ \overline{MR}$$

$$E_{2u}\,(k,\ \alpha) = J_u\,(k,\ \alpha) \,/\, d_2\,(\alpha)$$

$$E_{2l}\,(k,\ \alpha) = J_l\ (k,\ \alpha) \,/\, d_2\,(\alpha)$$

where:

- $d_2\,(\alpha)$ is the gamma bias correction factor evaluated in this research.

- $E_{2u}\,(k,\ \alpha)$ is the gamma control chart constant used to set the individual measurement upper control limit. It is a function of the number of observations available k and the shape parameter α.

- E_{2l} (k, α) is the gamma control chart constant used to set the individual measurement lower control limit. It is a function of the number of observations available k and the shape parameter α.

- J_u (k, α) is a value which yields an upper tail area similar to the normal theory in control (0.00135). This value depends upon the sample size k used to set control limits and the shape parameter α.

- J_l (k, α) is a value which yields a lower tail area similar to the normal theory in control (0.00135). This value depends upon the sample size k used to set control limits and the shape parameter α.

The proposed idea is seen in Figure 5.2.

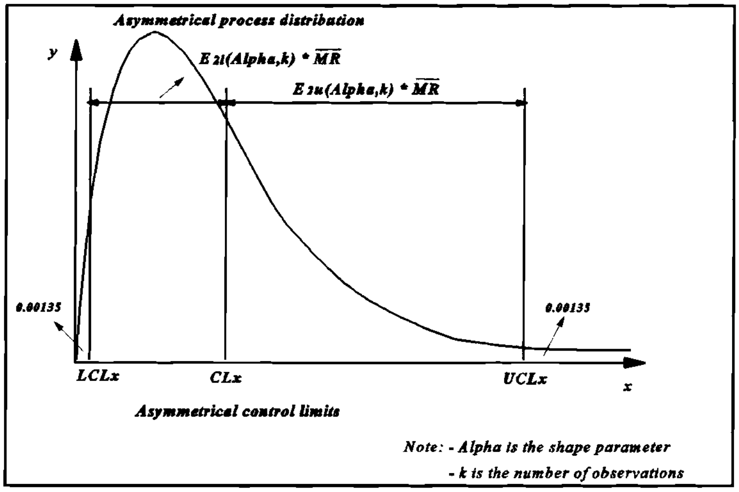


Figure 5.2. Asymmetric gamma control limits (X chart) for asymmetric process distributions.

For the MR (n=2) control charts, the same logic is used.

$$UCL_{MR} = \overline{MR} + L_u * \sigma_{MR} = \overline{MR} + L_u(k, \alpha)*(d_3(\alpha)/d_2(\alpha))*\overline{MR}$$

$$UCL_{MR} = (1+L_u(k, \alpha)*(d_3(\alpha)/d_2(\alpha)))*\overline{MR}$$

where:

- d_2 (α) is the gamma bias correction factor evaluated in this research.
- d_3 (α) is the gamma bias correction factor evaluated in this research.
- L_u(k, α) is a value which yields an upper tail area similar to the normal theory in control for the range distribution (0.0093). This value depends upon the sample size used to set control limits k and the shape parameter α.

The proposed idea for the moving range n = 2 MR control chart is seen in Figure 5.3.

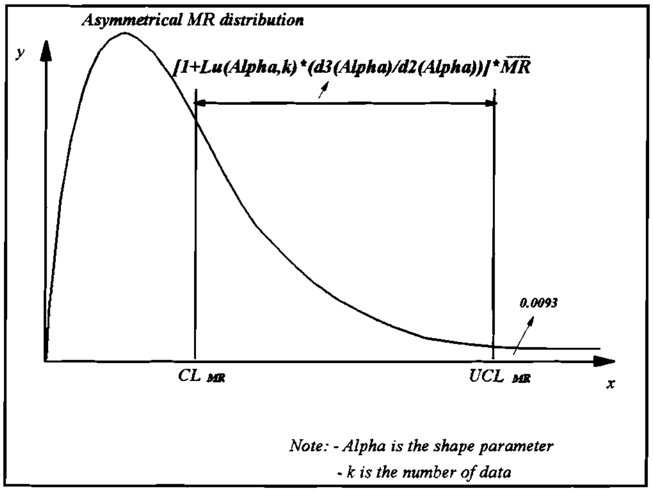


Figure 5.3. Gamma upper control limit (MR chart) for asymmetric distributions.

Future research can also be done in the following areas:

- Evaluate the performance of the gamma control charts (X and MR) under shifts in the process standard deviation (variability).
- Use a more generic family of distributions (for instance, the Burr family of distributions) to fit any set of data available to set control limits. Then, using the same methodology developed in this research, appropriate control chart constants and asymmetric control limits can be calculated.

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APPENDICES

APPENDIX A

VALUES OF THE BIAS CORRECTION FACTORS d_2 AND d_3 AND CONTROL CHART CONSTANTS A_2, D_3, D_4, AND E_2 - NORMAL ASSUMPTION

ANSI/ASQC Standard A1-1978

IV. FACTORS AND FORMULAS FOR CONTROL CHARTS FOR VARIABLES

Table 1

Factors for Computing Central Lines and 3-sigma Control Limits for $\bar{X}$, s, and R Charts

	Chart for Averages			Chart for Standard Deviations						Chart for Ranges						
Observations in Sample, n	Factors for Control Limits			Factors for Central Line		Factors for Control Limits				Factors for Central Line		Factors for Control Limits				
	A	A_2	A_3	c_4	$1/c_4$	B_3	B_4	B_5	B_6	d_2	$1/d_2$	d_3	D_1	D_2	D_3	D_4
2	2.121	1.880	2.659	0.7979	1.2533	0	3.267	0	2.606	1.128	0.8865	0.853	0	3.686	0	3.267
3	1.732	1.023	1.954	0.8862	1.1284	0	2.568	0	2.276	1.693	0.5907	0.888	0	4.358	0	2.574
4	1.500	0.729	1.628	0.9213	1.0854	0	2.266	0	2.088	2.059	0.4857	0.880	0	4.698	0	2.282
5	1.342	0.577	1.427	0.9400	1.0638	0	2.089	0	1.964	2.326	0.4299	0.864	0	4.918	0	2.114
6	1.225	0.483	1.287	0.9515	1.0510	0.030	1.970	0.029	1.874	2.534	0.3946	0.848	0	5.078	0	2.004
7	1.134	0.419	1.182	0.9594	1.0423	0.118	1.882	0.113	1.806	2.704	0.3698	0.833	0.204	5.204	0.076	1.924
8	1.061	0.373	1.099	0.9650	1.0363	0.185	1.815	0.179	1.751	2.847	0.3512	0.820	0.388	5.306	0.136	1.864
9	1.000	0.337	1.032	0.9693	1.0317	0.239	1.761	0.232	1.707	2.970	0.3367	0.808	0.547	5.393	0.184	1.816
10	0.949	0.308	0.975	0.9727	1.0281	0.284	1.716	0.276	1.669	3.078	0.3249	0.797	0.687	5.469	0.223	1.777
11	0.905	0.285	0.927	0.9754	1.0252	0.321	1.679	0.313	1.637	3.173	0.3152	0.787	0.811	5.535	0.256	1.744
12	0.866	0.266	0.886	0.9776	1.0229	0.354	1.646	0.346	1.610	3.258	0.3069	0.778	0.922	5.594	0.283	1.717
13	0.832	0.249	0.850	0.9794	1.0210	0.382	1.618	0.374	1.585	3.336	0.2998	0.770	1.025	5.647	0.307	1.693
14	0.802	0.235	0.817	0.9810	1.0194	0.406	1.594	0.399	1.563	3.407	0.2935	0.763	1.118	5.696	0.328	1.672
15	0.775	0.223	0.789	0.9823	1.0180	0.428	1.572	0.421	1.544	3.472	0.2880	0.756	1.203	5.741	0.347	1.653
16	0.750	0.212	0.763	0.9835	1.0168	0.448	1.552	0.440	1.526	3.532	0.2831	0.750	1.282	5.782	0.363	1.637
17	0.728	0.203	0.739	0.9845	1.0157	0.466	1.534	0.458	1.511	3.588	0.2787	0.744	1.356	5.820	0.378	1.622
18	0.707	0.194	0.718	0.9854	1.0148	0.482	1.518	0.475	1.496	3.640	0.2747	0.739	1.424	5.856	0.391	1.608
19	0.688	0.187	0.698	0.9862	1.0140	0.497	1.503	0.490	1.483	3.689	0.2711	0.734	1.487	5.891	0.403	1.597
20	0.671	0.180	0.680	0.9869	1.0133	0.510	1.490	0.504	1.470	3.735	0.2677	0.729	1.549	5.921	0.415	1.585
21	0.655	0.173	0.663	0.9876	1.0126	0.523	1.477	0.516	1.459	3.778	0.2647	0.724	1.605	5.951	0.425	1.575
22	0.640	0.167	0.647	0.9882	1.0119	0.534	1.466	0.528	1.448	3.819	0.2618	0.720	1.659	5.979	0.434	1.566
23	0.626	0.162	0.633	0.9887	1.0114	0.545	1.455	0.539	1.438	3.858	0.2592	0.716	1.710	6.006	0.443	1.557
24	0.612	0.157	0.619	0.9892	1.0109	0.555	1.445	0.549	1.429	3.895	0.2567	0.712	1.759	6.031	0.451	1.548
25	0.600	0.135	0.606	0.9896	1.0105	0.565	1.435	0.559	1.420	3.931	0.2544	0.708	1.806	6.056	0.459	1.541

APPENDIX B

CHI-SQUARE TEST - RANDOM NUMBER GENERATOR IN MINITAB

This particular case of the chi-square χ^2 test is designed to check whether the U_i's generated appear to be uniformly distributed between 0 and 1. The idea is to evaluate how well the generated U_i's resemble values of true IID U(0, 1) random variates.

Test procedure:

1. Divide the interval [0, 1] into k subintervals of equal length and generate U1, U2,..., Un.

Rules of thumb:

- k should be at least 100.
- n / k should be at least 5.

2. Calculate the statistic χ^2 using the equation:

$$\chi^2 = (k/n)\sum[fj-(n/k)]^2$$

Where

fj is the number of U_i's that are in the $j^{th.}$ subinterval.

3. The null hypothesis is:

Ho: U_i's are IID U(0, 1) random variables

4. The rejection region is defined by:

$$\chi^2_{k-1,\ 1-\alpha'}$$

Where

α' is the confidence level.

k-1 is the degrees of freedom.

5. Reject the null hypothesis if the χ^2 statistic is greater than $\chi^2_{k-1,\ 1-\alpha'}$.

Results of the test:

The test is performed three times with different samples generated and different values of k and n.

First test: n = 5000 observations.

k = 100 subintervals.

$\alpha' = 0.01$

1. $n/k = 5000/100 = 50$ which is greater than the value 5 recommended in the rules of thumb.

2. The value of the χ^2 statistic is:

$$\chi^2 = 118.88$$

3. The null hypothesis is:

Ho: U_i's are IID U(0, 1) random variables

4. The rejection region is defined by:

$$\chi^2_{99,\, 0.99} = 134.6392$$

5. There is not reason to reject the null hypothesis since $\chi^2 < \chi^2_{99,\, 0.99}$.

Second test: n = 1000 observations.

k = 100 subintervals.

$\alpha' = 0.01$

1. $n/k = 1000/100 = 10$ which is greater than the value 5 recommended in the rules of thumb.

2. The value of the χ^2 statistic is:

$$\chi^2 = 92.0$$

3. The null hypothesis is:

$$Ho: U_i\text{'s are IID } U(0, 1) \text{ random variables}$$

4. The rejection region is defined by:

$$\chi^2_{99,\,0.99} = 134.6392$$

5. There is not reason to reject the null hypothesis since $\chi^2 < \chi^2_{99,\,0.99}$.

Third test: n = 5000 observations.

k = 200 subintervals.

$\alpha' = 0.01$

1. n/k = 5000/200 = 25 which is greater than the value 5 recommended in the rules of thumb.

2. The value of the χ^2 statistic is:

$$\chi^2 = 168.16$$

3. The null hypothesis is:

$$Ho: U_i\text{'s are IID } U(0, 1) \text{ random variables}$$

4. The rejection region is defined by:

$$\chi^2_{199,\,0.99} = 248.3332$$

5. There is not reason to reject the null hypothesis since $\chi^2 < \chi^2_{199,\,0.99}$.

Therefore, based on the results of the three tests, it could be said that this random number generator does not behave in a way that is significantly different from that would be expected from truly IID U(0, 1) random variables.

n=5000	k	interval	fj	n/k	[fj-(n/k)]^2
k=100	1	0.01	53	50	9
	2	0.02	59	50	81
	3	0.03	46	50	16
	4	0.04	33	50	289
	5	0.05	53	50	9
	6	0.06	46	50	16
	7	0.07	56	50	36
	8	0.08	47	50	9
	9	0.09	54	50	16
	10	0.1	51	50	1
	11	0.11	50	50	0
	12	0.12	69	50	361
	13	0.13	49	50	1
	14	0.14	50	50	0
	15	0.15	59	50	81
	16	0.16	58	50	64
	17	0.17	51	50	1
	18	0.18	56	50	36
	19	0.19	50	50	0
	20	0.2	42	50	64
	21	0.21	60	50	100
	22	0.22	44	50	36
	23	0.23	50	50	0
	24	0.24	59	50	81
	25	0.25	58	50	64
	26	0.26	42	50	64
	27	0.27	48	50	4
	28	0.28	53	50	9
	29	0.29	33	50	289
	30	0.3	57	50	49
	31	0.31	63	50	169
	32	0.32	46	50	16
	33	0.33	45	50	25
	34	0.34	59	50	81
	35	0.35	48	50	4
	36	0.36	45	50	25
	37	0.37	60	50	100
	38	0.38	63	50	169
	39	0.39	43	50	49
	40	0.4	53	50	9
	41	0.41	33	50	289
	42	0.42	56	50	36
	43	0.43	43	50	49
	44	0.44	48	50	4
	45	0.45	50	50	0
	46	0.46	43	50	49
	47	0.47	45	50	25
	48	0.48	55	50	25
	49	0.49	46	50	16
	50	0.5	53	50	9
	51	0.51	52	50	4
	52	0.52	43	50	49
	53	0.53	51	50	1
	54	0.54	54	50	16
	55	0.55	54	50	16
	56	0.56	66	50	256
	57	0.57	42	50	64
	58	0.58	51	50	1
	59	0.59	50	50	0
	60	0.6	46	50	16
	61	0.61	39	50	121
	62	0.62	49	50	1
	63	0.63	51	50	1
	64	0.64	42	50	64
	65	0.65	49	50	1
	66	0.66	57	50	49
	67	0.67	63	50	169
	68	0.68	56	50	36
	69	0.69	59	50	81
	70	0.7	49	50	1
	71	0.71	43	50	49
	72	0.72	53	50	9
	73	0.73	48	50	4
	74	0.74	39	50	121
	75	0.75	51	50	1
	76	0.76	57	50	49
	77	0.77	57	50	49
	78	0.78	39	50	121
	79	0.79	44	50	36
	80	0.8	60	50	100
	81	0.81	59	50	81
	82	0.82	44	50	36
	83	0.83	54	50	16
	84	0.84	51	50	1
	85	0.85	52	50	4
	86	0.86	44	50	36
	87	0.87	45	50	25
	88	0.88	44	50	36
	89	0.89	66	50	256
	90	0.9	39	50	121
	91	0.91	40	50	100
	92	0.92	55	50	25
	93	0.93	44	50	36
	94	0.94	60	50	100
	95	0.95	36	50	196
	96	0.96	38	50	144
	97	0.97	58	50	64
	98	0.98	39	50	121
	99	0.99	45	50	25
	100	1	40	50	100
			=======	=======	=======
		Total:	5000	5000	5944

Chi-square value = (k/n) Sum [fj-(n/k)]^2
Chi-square value = 118.88

n=1000	k	Interval	fj	n/k	[fj-(n/k)]^2
k=100	1	0.01	14	10	16
	2	0.02	9	10	1
	3	0.03	11	10	1
	4	0.04	9	10	1
	5	0.05	9	10	1
	6	0.06	9	10	1
	7	0.07	8	10	4
	8	0.08	14	10	16
	9	0.09	10	10	0
	10	0.1	10	10	0
	11	0.11	10	10	0
	12	0.12	8	10	4
	13	0.13	4	10	36
	14	0.14	11	10	1
	15	0.15	11	10	1
	16	0.16	12	10	4
	17	0.17	10	10	0
	18	0.18	10	10	0
	19	0.19	9	10	1
	20	0.2	12	10	4
	21	0.21	7	10	9
	22	0.22	12	10	4
	23	0.23	14	10	16
	24	0.24	9	10	1
	25	0.25	10	10	0
	26	0.26	8	10	4
	27	0.27	8	10	4
	28	0.28	14	10	16
	29	0.29	10	10	0
	30	0.3	17	10	49
	31	0.31	4	10	36
	32	0.32	12	10	4
	33	0.33	10	10	0
	34	0.34	8	10	4
	35	0.35	9	10	1
	36	0.36	9	10	1
	37	0.37	10	10	0
	38	0.38	11	10	1
	39	0.39	10	10	0
	40	0.4	19	10	81
	41	0.41	9	10	1
	42	0.42	7	10	9
	43	0.43	7	10	9
	44	0.44	10	10	0
	45	0.45	18	10	64
	46	0.46	3	10	49
	47	0.47	12	10	4
	48	0.48	7	10	9
	49	0.49	5	10	25
	50	0.5	9	10	1
	51	0.51	13	10	9
	52	0.52	9	10	1
	53	0.53	11	10	1
	54	0.54	11	10	1
	55	0.55	8	10	4
	56	0.56	19	10	81
	57	0.57	11	10	1
	58	0.58	12	10	4
	59	0.59	8	10	4
	60	0.6	7	10	9
	61	0.61	9	10	1
	62	0.62	10	10	0
	63	0.63	9	10	1
	64	0.64	6	10	16
	65	0.65	8	10	4
	66	0.66	15	10	25
	67	0.67	12	10	4
	68	0.68	14	10	16
	69	0.69	14	10	16
	70	0.7	9	10	1
	71	0.71	6	10	16
	72	0.72	9	10	1
	73	0.73	12	10	4
	74	0.74	10	10	0
	75	0.75	10	10	0
	76	0.76	15	10	25
	77	0.77	12	10	4
	78	0.78	9	10	1
	79	0.79	13	10	9
	80	0.8	10	10	0
	81	0.81	9	10	1
	82	0.82	11	10	1
	83	0.83	6	10	16
	84	0.84	6	10	16
	85	0.85	17	10	49
	86	0.86	13	10	9
	87	0.87	9	10	1
	88	0.88	6	10	16
	89	0.89	10	10	0
	90	0.9	9	10	1
	91	0.91	9	10	1
	92	0.92	9	10	1
	93	0.93	4	10	36
	94	0.94	8	10	4
	95	0.95	11	10	1
	96	0.96	8	10	4
	97	0.97	9	10	1
	98	0.98	10	10	0
	99	0.99	7	10	9
	100	1	10	10	0
			=======	=======	=======
		Total:	1000	1000	920

Chi-square value = (k/n) Sum [fj-(n/k)]^2
Chi-square value = 92

	k	Interval	fj	n/k	[fj-(n/k)]^2
n=5000	1	0.005	34	25	81
k=200	2	0.01	30	25	25
	3	0.015	30	25	25
	4	0.02	24	25	1
	5	0.025	22	25	9
	6	0.03	22	25	9
	7	0.035	18	25	49
	8	0.04	24	25	1
	9	0.045	27	25	4
	10	0.05	21	25	16
	11	0.055	36	25	121
	12	0.06	33	25	64
	13	0.065	29	25	16
	14	0.07	24	25	1
	15	0.075	19	25	36
	16	0.08	29	25	16
	17	0.085	21	25	16
	18	0.09	21	25	16
	19	0.095	24	25	1
	20	0.1	28	25	9
	21	0.105	30	25	25
	22	0.11	29	25	16
	23	0.115	30	25	25
	24	0.12	18	25	49
	25	0.125	27	25	4
	26	0.13	35	25	100
	27	0.135	29	25	16
	28	0.14	24	25	1
	29	0.145	33	25	64
	30	0.15	22	25	9
	31	0.155	24	25	1
	32	0.16	23	25	4
	33	0.165	20	25	25
	34	0.17	21	25	16
	35	0.175	27	25	4
	36	0.18	28	25	9
	37	0.185	26	25	1
	38	0.19	25	25	0
	39	0.195	16	25	81
	40	0.2	29	25	16
	41	0.205	32	25	49
	42	0.21	28	25	9
	43	0.215	24	25	1
	44	0.22	28	25	9
	45	0.225	21	25	16
	46	0.23	17	25	64
	47	0.235	28	25	9
	48	0.24	24	25	1
	49	0.245	15	25	100
	50	0.25	17	25	64
	51	0.255	33	25	64
	52	0.26	28	25	9
	53	0.265	20	25	25
	54	0.27	32	25	49
	55	0.275	23	25	4
	56	0.28	27	25	4
	57	0.285	26	25	1
	58	0.29	30	25	25
	59	0.295	27	25	4
	60	0.3	25	25	0
	61	0.305	16	25	81
	62	0.31	30	25	25
	63	0.315	30	25	25
	64	0.32	28	25	9
	65	0.325	31	25	36
	66	0.33	21	25	16
	67	0.335	20	25	25
	68	0.34	27	25	4
	69	0.345	21	25	16
	70	0.35	26	25	1
	71	0.355	23	25	4
	72	0.36	21	25	16
	73	0.365	30	25	25
	74	0.37	25	25	0
	75	0.375	34	25	81
	76	0.38	33	25	64
	77	0.385	23	25	4
	78	0.39	23	25	4
	79	0.395	27	25	4
	80	0.4	27	25	4
	81	0.405	26	25	1
	82	0.41	17	25	64
	83	0.415	20	25	25
	84	0.42	26	25	1
	85	0.425	29	25	16
	86	0.43	29	25	16
	87	0.435	27	25	4
	88	0.44	32	25	49
	89	0.445	18	25	49
	90	0.45	33	25	64
	91	0.455	20	25	25
	92	0.46	24	25	1
	93	0.465	28	25	9
	94	0.47	27	25	4
	95	0.475	31	25	36
	96	0.48	20	25	25
	97	0.485	21	25	16
	98	0.49	24	25	1
	99	0.495	22	25	9
	100	0.5	27	25	4
	101	0.505	24	25	1
	102	0.51	19	25	36
	103	0.515	33	25	64
	104	0.52	21	25	16
	105	0.525	27	25	4
	106	0.53	21	25	16
	107	0.535	30	25	25
	108	0.54	25	25	0
	109	0.545	26	25	1
	110	0.55	25	25	0
	111	0.555	33	25	64
	112	0.56	22	25	9
	113	0.565	26	25	1
	114	0.57	28	25	9
	115	0.575	24	25	1
	116	0.58	21	25	16
	117	0.585	26	25	1
	118	0.59	23	25	4
	119	0.595	28	25	9
	120	0.6	19	25	36
	121	0.605	25	25	0
	122	0.61	24	25	1
	123	0.615	28	25	9
	124	0.62	21	25	16
	125	0.625	24	25	1
	126	0.63	25	25	0
	127	0.635	22	25	9
	128	0.64	29	25	16
	129	0.645	18	25	49
	130	0.65	27	25	4
	131	0.655	30	25	25
	132	0.66	24	25	1
	133	0.665	18	25	49
	134	0.67	22	25	9
	135	0.675	28	25	9
	136	0.68	34	25	81
	137	0.685	29	25	16
	138	0.69	21	25	16
	139	0.695	23	25	4
	140	0.7	15	25	100
	141	0.705	21	25	16
	142	0.71	22	25	9
	143	0.715	15	25	100
	144	0.72	28	25	9
	145	0.725	33	25	64
	146	0.73	26	25	1
	147	0.735	20	25	25
	148	0.74	27	25	4
	149	0.745	24	25	1
	150	0.75	18	25	49
	151	0.755	19	25	36
	152	0.76	27	25	4
	153	0.765	25	25	0
	154	0.77	19	25	36
	155	0.775	25	25	0
	156	0.78	25	25	0
	157	0.785	28	25	9
	158	0.79	23	25	4
	159	0.795	25	25	0
	160	0.8	26	25	1
	161	0.805	26	25	1
	162	0.81	22	25	9
	163	0.815	25	25	0
	164	0.82	17	25	64
	165	0.825	22	25	9
	166	0.83	32	25	49
	167	0.835	24	25	1
	168	0.84	29	25	16
	169	0.845	30	25	25
	170	0.85	21	25	16
	171	0.855	29	25	16
	172	0.86	16	25	81
	173	0.865	27	25	4
	174	0.87	27	25	4
	175	0.875	15	25	100
	176	0.88	24	25	1
	177	0.885	26	25	1
	178	0.89	25	25	0
	179	0.895	25	25	0
	180	0.9	21	25	16
	181	0.905	24	25	1
	182	0.91	23	25	4
	183	0.915	29	25	16
	184	0.92	17	25	64
	185	0.925	26	25	1
	186	0.93	18	25	49
	187	0.935	25	25	0
	188	0.94	29	25	16
	189	0.945	25	25	0
	190	0.95	29	25	16
	191	0.955	31	25	36
	192	0.96	16	25	81
	193	0.965	25	25	0
	194	0.97	26	25	1
	195	0.975	25	25	0
	196	0.98	30	25	25
	197	0.985	23	25	4
	198	0.99	25	25	0
	199	0.995	30	25	25
	200	1	23	25	4
			=======	=======	=======
		Total:	5000	5000	4204

Chi-square value = (k/n) Sum [fj-(n/k)]^2
Chi-square value = 168.16

APPENDIX C

GOODNESS OF FIT TESTS - GENERATION GAMMA AND NORMAL RANDOM VARIATES

The generation of gamma and normal random variables is tested statistically to check whether the values generated, in fact, agree with the underlying probabilistic model assumed for these data. The test used is the χ^2 goodness-of-fit test.

Only the generation of gamma and normal random variates is tested statistically because the other distributions generated in this research are either particular cases or derivations from these two distributions. The exponential and chi-square distributions are particular cases of the gamma distribution. The lognormal distribution is derived from the normal distribution.

For the gamma distribution, four tests are performed using different parameters and number of observations. For the normal distribution, two tests are run using different number of observations.

1. Gamma distribution

1.1 First test

Gamma distribution with shape parameter $\alpha = 1$ and scale parameter $\beta = 1$. This is equivalent to an exponential distribution with mean 1. The number of observations used to perform the test is 1000.

The null hypothesis Ho to be tested is:

Ho: The data generated can be regarded as a gamma (1, 1) distribution.

From the spreadsheet designed in Quattro Pro, the χ^2 chi-square statistic is:

$$\chi^2 = 7.20$$

Using a significance level of $\alpha' = 0.01$, the rejection region is defined by the following critical value:

$$\chi^2_{\alpha', k-1} = \chi^2_{0.99, 12} = 26.217$$

Since the χ^2 chi-square statistic is not greater than the critical value $\chi^2_{0.99, 12}$, there is not statistical reasons to reject the null hypothesis that the 1000 data values generated come from a gamma (1, 1) distribution.

1.2 Second test

Gamma distribution with shape parameter $\alpha = 1$ and scale parameter $\beta = 1$. This is equivalent to an exponential distribution with mean 1. The number of observations used to perform the test is 100.

The null hypothesis Ho to be tested is:

Ho: The data generated can be regarded as a gamma (1, 1) distribution.

From the spreadsheet designed in Quattro Pro, the χ^2 chi-square statistic is:

$$\chi^2 = 2.396$$

Using a significance level of $\alpha' = 0.01$, the rejection region is defined by the following critical value:

$$\chi^2_{\alpha', k-1} = \chi^2_{0.99, 6} = 16.8119$$

Since the χ^2 chi-square statistic is not greater than the critical value $\chi^2_{0.99, 6}$, there is not statistical reasons to reject the null hypothesis that the 100 data values generated come from a gamma (1, 1) distribution.

1.3 Third test

Gamma distribution with shape parameter $\alpha = 2$ and scale parameter $\beta = 1$. The number of observations used to perform the test is 1000.

The null hypothesis Ho to be tested is:

Ho: The data generated can be regarded as a gamma (2, 1) distribution.

From the spreadsheet designed in Quattro Pro, the χ^2 chi-square statistic is:

$$\chi^2 = 13.315$$

Using a significance level of $\alpha' = 0.01$, the rejection region is defined by the following critical value:

$$\chi^2_{\alpha', k-1} = \chi^2_{0.99, 14} = 29.1413$$

Since the χ^2 chi-square statistic is not greater than the critical value $\chi^2_{0.99, 14}$, there is not statistical reasons to reject the null hypothesis that the 1000 data values generated come from a gamma (2, 1) distribution.

1.4 Fourth test

Gamma distribution with shape parameter $\alpha = 2$ and scale parameter $\beta = 1$. The number of observations used to perform the test is 100.

The null hypothesis Ho to be tested is:

Ho: The data generated can be regarded as a gamma (2, 1) distribution.

From the spreadsheet designed in Quattro Pro, the χ^2 chi-square statistic is:

$$\chi^2 = 5.4973$$

Using a significance level of $\alpha' = 0.01$, the rejection region is defined by the following critical value:

$$\chi^2_{\alpha', k-1} = \chi^2_{0.99, 8} = 20.0902$$

Since the χ^2 chi-square statistic is not greater than the critical value $\chi^2_{0.99, 8}$, there is not statistical reasons to reject the null hypothesis that the 100 data values generated come from a gamma (2, 1) distribution.

2. Normal distribution

2.1 First test

Normal distribution with mean $\mu = 1$ and standard deviation $\sigma = 10$. The number of observations used to perform the test is 1000.

The null hypothesis Ho to be tested is:

Ho: The data generated can be regarded as a normal (40, 10^2) distribution.

From the spreadsheet designed in Quattro Pro, the χ^2 chi-square statistic is:

$$\chi^2 = 17.80$$

Using a significance level of $\alpha' = 0.01$, the rejection region is defined by the following critical value:

$$\chi^2_{\alpha', k-1} = \chi^2_{0.99, 15} = 30.5779$$

Since the χ^2 chi-square statistic is not greater than the critical value $\chi^2_{0.99, 15}$, there is not statistical reasons to reject the null hypothesis that the 1000 data values generated come from a normal (40, 10^2) distribution.

2.2 Second test

Normal distribution with mean $\mu = 1$ and standard deviation $\sigma = 10$. The number of observations used to perform the test is 100.

The null hypothesis Ho to be tested is:

Ho: The data generated can be regarded as a normal (40, 10^2) distribution.

From the spreadsheet designed in Quattro Pro, the χ^2 chi-square statistic is:

$$\chi^2 = 2.624$$

Using a significance level of $\alpha' = 0.01$, the rejection region is defined by the following critical value:

$$\chi^2_{\alpha', k-1} = \chi^2_{0.99, 8} = 20.0902$$

Since the χ^2 chi-square statistic is not greater than the critical value $\chi^2_{0.99, 8}$, there is not statistical reasons to reject the null hypothesis that the 100 data values generated come from a normal $(40, 10^2)$ distribution.

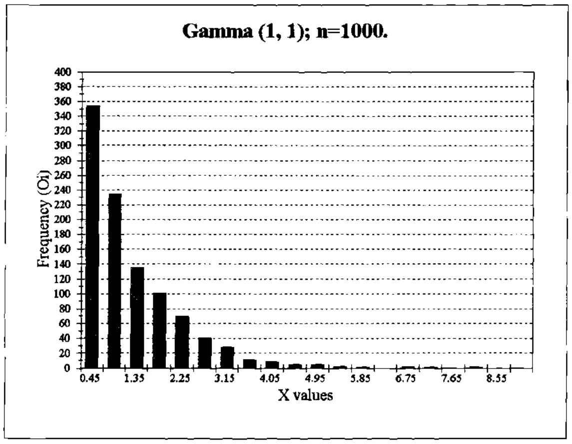
Appendix C - Goodness of fit tests

Gamma (1, 1) ; n=1000 ; k=20.

k	Interval	Colapsed Interval	Frequency	Colapsed Frequency Oi	Cumulative Probability	Probability	Expected Frequency Ei	(Oi-Ei)^2 / Ei
1	0.45		354	354	0.362372	0.362372	362.372	0.19342108
2	0.9		235	235	0.59343	0.231058	231.058	0.06725309
3	1.35		135	135	0.74076	0.14733	147.33	1.03189371
4	1.8		101	101	0.834701	0.093941	93.941	0.53043379
5	2.25		70	70	0.894601	0.0599	59.9	1.70300501
6	2.7		41	41	0.932795	0.038194	38.194	0.20614851
7	3.15		28	28	0.957148	0.024353	24.353	0.54615895
8	3.6		11	11	0.972676	0.015528	15.528	1.32037506
9	4.05		8	8	0.982578	0.009902	9.902	0.36534074
10	4.5		5	5	0.988891	0.006313	6.313	0.27308237
11	4.95		5	5	0.992917	0.004026	4.026	0.23563736
12	5.4	*	2	5	0.995483	0.002566	5.912	0.14068742
13	5.85	*	1		0.99712	0.001637		
14	6.3	*	0		0.998164	0.001044		
15	6.75	*	2		0.998829	0.000665		
16	7.2	-	1	2	0.999253	0.000424	1.171	0.58688386
17	7.65	-	0		0.999524	0.000271		
18	8.1	-	1		0.999696	0.000172		
19	8.55	-	0		0.999806	0.00011		
20	9	-	0		0.999877	7.1E-05		
			========	========		=========	========	==========
			1000	1000		0.999877	1000	7.20032094

Chi-square statistic = Sum [(Oi - Ei)^2 / Ei]

Chi-square statistic 7.200321



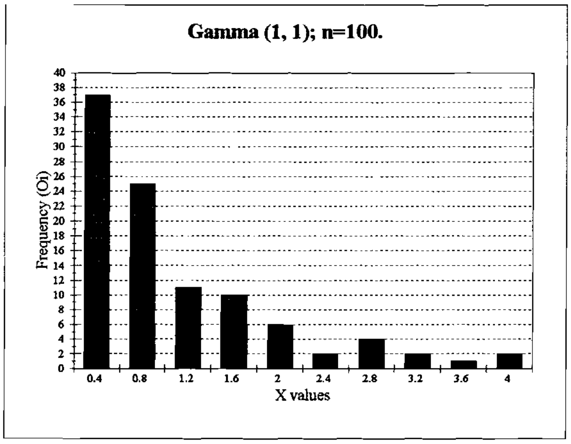
Appendix C - Goodness of fit tests

Gamma (1, 1) ; n=100 ; k=10.

k	Interval	Colapsed Interval	Frequency	Colapsed Frequency Oi	Cumulative Probability	Probability	Expected Frequency Ei	(Oi-Ei)^2 / Ei
1	0.4		37	37	0.32968	0.32968	32.968	0.49311526
2	0.8		25	25	0.550671	0.220991	22.0991	0.38079473
3	1.2		11	11	0.698806	0.148135	14.8135	0.98172493
4	1.6		10	10	0.798103	0.099297	9.9297	0.00049771
5	2		6	6	0.864665	0.066562	6.6562	0.06469133
6	2.4	*	2	6	0.909282	0.044617	7.4525	0.28309376
7	2.8	*	4		0.93919	0.029908		
8	3.2	-	2	5	0.959238	0.020048	6.081	0.19216593
9	3.6	-	1		0.972676	0.013438		
10	4	-	2		0.981684	0.009008		
			========	========		=========	========	==========
			100	100		0.981684	100	2.39608365

Chi-square statistic = Sum [(Oi - Ei)^2 / Ei]

Chi-square statistic 2.396084



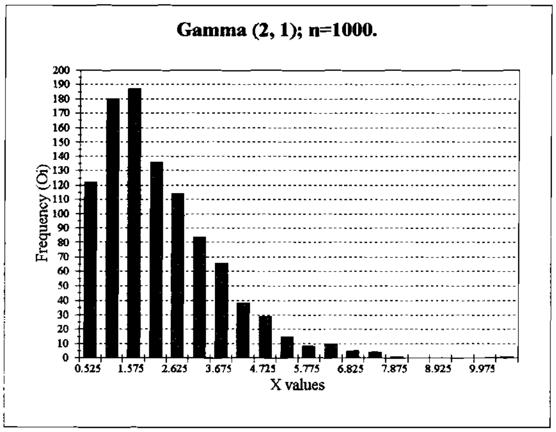
Appendix C - Goodness of fit tests

Gamma (2, 1) ; n=1000 ; k=20.

k	Interval	Colapsed Interval	Frequency	Colapsed Frequency Oi	Cumulative Probability	Probability	Expected Frequency Ei	(Oi-Ei)^2 / Ei
1	0.525		122	122	0.097878	0.097878	97.878	5.94485874
2	1.05		180	180	0.282628	0.18475	184.75	0.12212449
3	1.575		187	187	0.466956	0.184328	184.328	0.03873304
4	2.1		136	136	0.620385	0.153429	153.429	1.97987369
5	2.625		114	114	0.737406	0.117021	117.021	0.07798977
6	3.15		84	84	0.822164	0.084758	84.758	0.00677888
7	3.675		66	66	0.881492	0.059328	59.328	0.7503301
8	4.2		38	38	0.922023	0.040531	40.531	0.1580509
9	4.725		29	29	0.949215	0.027192	27.192	0.12021418
10	5.25		15	15	0.967203	0.017988	17.988	0.49633889
11	5.775		8	8	0.978969	0.011766	11.766	1.20540167
12	6.3		10	10	0.986595	0.007626	7.626	0.73903436
13	6.825		5	5	0.9915	0.004905	4.905	0.00183996
14	7.35	*	4		0.994634	0.003134		
15	7.875	*	1	5	0.996626	0.001992	5.126	0.00309715
16	8.4	-	0		0.997886	0.00126		
17	8.925	-	0		0.99868	0.000794		
18	9.45	-	0		0.999178	0.000498		
19	9.975	-	0		0.999489	0.000311		
20	10.5	-	1	1	0.999683	0.000194	3.374	1.67038411
			=========	=========		=========	=========	=========
			1000	1000		0.999683	1000	13.3150499

Chi-square statistic = Sum [(Oi - Ei)^2 / Ei]

Chi-square statistic = 13.31505



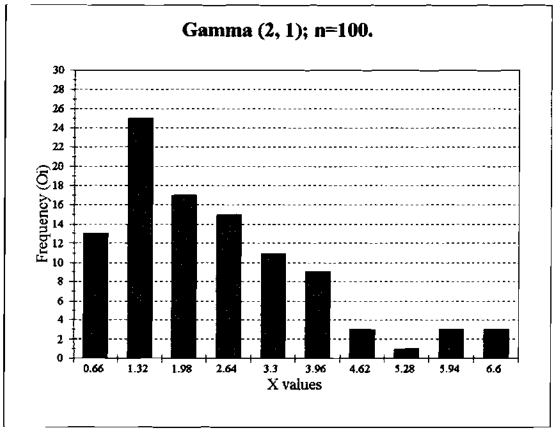
Appendix C - Goodness of fit tests

Gamma (2, 1) ; n=100 ; k=10.

k	Interval	Colapsed Interval	Frequency	Colapsed Frequency Oi	Cumulative Probability	Probability	Expected Frequency Ei	(Oi-Ei)^2 / Ei
1	0.66		13	13	0.142027	0.142027	14.2027	0.10184594
2	1.32		25	25	0.380246	0.238219	23.8219	0.05826234
3	1.98		17	17	0.588554	0.208308	20.8308	0.70448704
4	2.64		15	15	0.740245	0.151691	15.1691	0.00188507
5	3.3		11	11	0.841402	0.101157	10.1157	0.07730424
6	3.96		9	9	0.905447	0.064045	6.4045	1.05185733
7	4.62	*	3		0.944627	0.03918		
8	5.28	*	1	4	0.968019	0.023392	6.2572	0.81425427
9	5.94		3	3	0.981734	0.013715	1.3715	1.93365822
10	6.6		3	3	0.989661	0.007927	1.8266	0.75378712
			=========	=========		=========	=========	=========
			100	100		0.989661	100	5.49734157

Chi-square statistic = Sum [(Oi - Ei)^2 / Ei]

Chi-square statistic = 5.497342



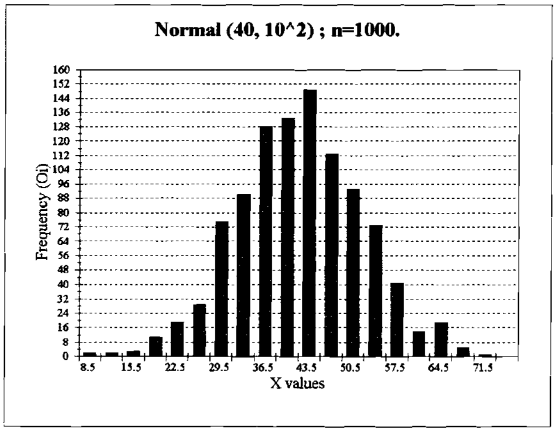
Appendix C - Goodness of fit tests

Normal (40, 10^2) ; n=1000 ; k=20.

k	Interval	Colapsed Interval	Frequency	Colapsed Frequency Oi	Cumulative Probability	Probability	Expected Frequency Ei	(Oi-Ei)^2 / Ei
1	8.5	*	2		0.000816	0.000816		
2	12	*	2		0.002555	0.001739		
3	15.5	*	3	7	0.007143	0.004588	7.143	0.0028628
4	19		11	11	0.017864	0.010721	10.721	0.00726061
5	22.5		19	19	0.040059	0.022195	22.195	0.45992453
6	26		29	29	0.080757	0.040698	40.698	3.36240611
7	29.5		75	75	0.146859	0.066102	66.102	1.1977611
8	33		90	90	0.241964	0.095105	95.105	0.27402371
9	36.5		128	128	0.363169	0.121205	121.205	0.38094159
10	40		133	133	0.5	0.136831	136.831	0.1072605
11	43.5		149	149	0.636831	0.136831	136.831	1.08224424
12	47		113	113	0.758036	0.121205	121.205	0.55543934
13	50.5		93	93	0.853141	0.095105	95.105	0.04659087
14	54		73	73	0.919243	0.066102	66.102	0.71983305
15	57.5		41	41	0.959941	0.040698	40.698	0.00224099
16	61		14	14	0.982136	0.022195	22.195	3.02581775
17	64.5		19	19	0.992857	0.010721	10.721	6.39323207
18	68	-	5		0.997445	0.004588		
19	71.5	-	1		0.999184	0.001739		
20	75	-	0	6	0.999767	0.000583	7.143	0.1828992
			=========	=========		=========	=========	=========
			1000	1000		0.999767	1000	17.8007385

Chi-square statistic = Sum [(Oi - Ei)^2 / Ei]

Chi-square statistic = 17.80074



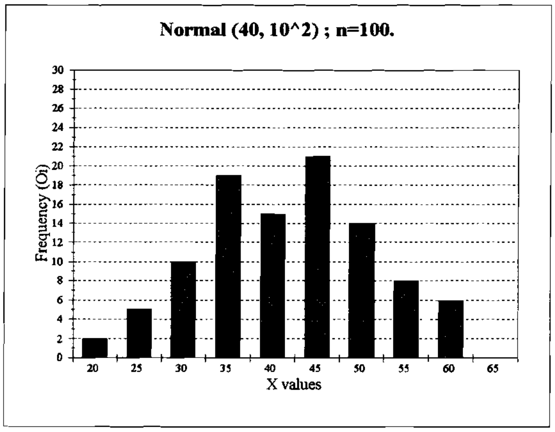
Appendix C - Goodness of fit tests

Normal (40, 10^2) ; n=100 ; k=10.

k	Interval	Colapsed Interval	Frequency	Colapsed Frequency Oi	Cumulative Probability	Probability	Expected Frequency Ei	(Oi-Ei)^2 / Ei
1	20		2	2	0.02275	0.02275	2.275	0.03324176
2	25		5	5	0.066807	0.044057	4.4057	0.08016717
3	30		10	10	0.158655	0.091848	9.1848	0.07235335
4	35		19	19	0.308538	0.149883	14.9883	1.07375332
5	40		15	15	0.5	0.191462	19.1462	0.89787918
6	45		21	21	0.691462	0.191462	19.1462	0.1794912
7	50		14	14	0.841345	0.149883	14.9883	0.06516662
8	55		8	8	0.933193	0.091848	9.1848	0.15283414
9	60	*	6		0.97725	0.044057		
10	65	*	0	6	0.99379	0.01654	6.6807	0.06935688
			=========	=========		=========	=========	=========
			100	100		0.99379	100	2.62424362

Chi-square statistic = Sum [(Oi - Ei)^2 / Ei]

Chi-square statistic = 2.624244



APPENDIX D

FORTY GAMMA DISTRIBUTION SPREADSHEETS

0 5	Alpha=0 5						
0 5	Beta=0 5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
	0 07106			0 0118	0 03981	0 075675	
	0 37686	0 3058	8 3E-05	0 05033	0 03853	0 07638	0
	0 12434	0 25252	0 003891	0 38478	0 33445	0 000382	0
	0 02839	0 09595	0 047939	0 06282	0 32196	5E-05	0
	0 10807	0 07968	0 055328	0 0159	0 04692	0 071813	0
	0 05252	0 05555	0 067262	0 01426	0 00164	0 098132	0
	0 46956	0 41704	0 010433	0 24561	0 23135	0 006981	0
	0 03791	0 43165	0 013631	0 50023	0 25462	0 003634	0
	0 00065	0 03726	0 077084	0 01124	0 48899	0 030307	0
	0 67519	0 67454	0 129341	0 0013	0 00994	0 093001	0
	0 59999	0 0752	0 057456	0 00142	0 00012	0 099086	0
	0 30009	0 2999	0 000225	0 44383	0 44241	0 016259	0
	0 12582	0 17427	0 019777	0 21645	0 22738	0 00766	0
	0 41056	0 28474	0.00091	0 23606	0 01961	0 087196	0
	0 45514	0 04458	0 073073	0 39737	0 16131	0 02359	0
	0 07886	0 37628	0 003768	0 06872	0 32865	0 000189	0
	0 27915	0 20029	0 013135	0 0796	0 01088	0 092428	0
	0 37238	0 09323	0 049138	0 00336	0 07624	0 056959	0
	0 03226	0 34012	0 000636	0 04684	0 04348	0 073669	0
	0 03073	0 00153	0 098201	0 9369	0 89006	0 330809	0
	0 18287	0 15214	0 026491	1 29106	0 35416	0 001541	0
	0 05217	0 1307	0 03393	0 26592	1 02514	0 504441	0
	0 05349	0 00132	0 098332	0 19736	0 06856	0 060683	0
	0 00816	0 04533	0 072668	0 29003	0 09267	0 049386	0
	0 06164	0 05348	0 06834	0 14152	0 14851	0 027686	0
	0 2511	0 18946	0 015735	0 42176	0 28024	0 001201	0
	0 05211	0 19899	0 013435	0 35563	0 06613	0 061887	0
	0 0188	0 03331	0.079293	0 19985	0 15578	0 025319	0
	0 00733	0 01147	0 09207	0 1761	0 02375	0 064768	0
	0 00018	0 00715	0 09471	0 78221	0 60611	0 084803	0
	0 40017	0 39999	0 00724	0 04607	0 73614	0 177443	0
	0 01609	0 38408	0 004786	0	0 04607	0 07227	0
	0 00366	0 01243	0 091488	0 30505	0 30505	9 7E-05	0
	0 00675	0 00309	0 097225	0 00557	0 29948	0 000238	0
	0 05287	0 04612	0 072243	0 04234	0 03677	0.077356	0
	2 97792	2.92505	6 812883	0 00137	0 04097	0 075038	1
	1 19821	1 77971	2 145688	0 02591	0.02454	0 084309	1
	0 05519	1 14302	0 685783	0 16678	0 14087	0 030286	1
	0 042	0 01319	0 091029	1 09694	0 93016	0 378545	0
	2.01538	1 97338	2 750556	0.2066	0.89034	0 331131	1
	0 26307	1 75231	2 066147	0.24003	0 03343	0 079225	1
	0 15992	0 10315	0 044838	0 99052	0 75049	0 189739	0
	0 04044	0 11948	0 038189	0 10176	0.88876	0 329315	0
	0 01114	0 0293	0 081567	0 08518	0.0166	0 088983	0
	0 67781	0 66667	0 123742	1 20712	1 12196	0 651346	0
	0 26085	0 41696	0.010416	1 09249	0 11463	0.040108	0
	0 2164	0.04445	0 073143	0 00919	1.0833	0 590439	0
	0 6486	0 4322	0 013759	0 05297	0 04378	0 073506	0
	0 74857	0 09997	0 046195	0 08178	0 02881	0 081847	0
	0 00959	0 73898	0 179844	0 0842	0.00242	0 097644	0
	0 23855	0 22896	0 007386	0 6299	0 5457	0.053269	0
	0 13573	0 10282	0 044978	0 1856	0 4443	0 016744	0
	0 38473	0.249	0.004343	0.05542	0 13018	0.034121	0
	0 07809	0 30664	6 8E-05	0.13316	0 07774	0 056245	0
	0.09503	0 01694	0.08878	0.0988	0 03436	0 078703	0
	0 05429	0.04074	0 075164	0.04377	0 05503	0.067532	0
	0 04913	0 00516	0 095939	0 7808	0 73703	0 178194	0
	0.2686	0 21947	0 009107	0.96889	0 18609	0 016592	0
	0 12041	0 14819	0 027792	0 00508	0 96181	0 418493	0
	1 39815	1 27774	0 927061	0.23135	0 22627	0 007855	1
	0 05211	1 34804	1 06325	0 00024	0 23111	0 007021	1
	0 82486	0 77275	0.209627	0 19965	0 19941	0 013338	0
	0 01064	0 81422	0.24932	0 52793	0 32828	0 000179	0
	0.25089	0 24025	0.005573	0.3638	0 16413	0.022732	0
	0	0.25089	0.004097	0.00424	0 35958	0 001995	0
	0.0221	0.0221	0 085732	0.00318	0 00108	0.098496	0
	0.01461	0 00749	0 094501	0.03889	0 03571	0 077947	0
	0 07533	0 06072	0 064607	0 03284	0 00605	0 095388	0
	0.00168	0.07365	0 058202	0.06742	0.03458	0 078579	0
	0 64507	0 64339	0 107908	0 07753	0.01011	0 092897	0
	0 4475	0 19757	0.013766	0 00231	0.07522	0 057447	0
	0 23988	0 20764	0 011505	0.01226	0 00995	0 092995	0
	0 44228	0 20242	0.012652	0 1306	0 11834	0 038636	0
	0 71065	0.26837	0 002165	0.92335	0 79275	0.228341	0

0 5	Alpha=0 5						
1	Beta=1	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	0 64404			0 85397	0 83403	0 038659	
0	0 17165	0 47239	0 027232	0 14969	0 70428	0 004471	0
0	0 09577	0 07588	0 315317	1 42024	1 27055	0 400865	0
0	0 01554	0 08023	0 310451	1 42015	9E-05	0 406178	0
0	0 43338	0 41784	0 048211	6E-05	1 42009	0 612586	0
0	0 00054	0 43284	0 041849	1 28552	1 28546	0 419967	0
0	2 44839	2 44785	3 277689	0 69644	0 58908	0 002336	1
0	3E-05	2 44836	3 279536	0 00141	0 69503	0.00332	1
0	4 73677	4 73674	16 8045	0 06445	0 06304	0 329902	1
0	0 00717	4 7296	16 74601	0 04734	0 01711	0 384773	1
0	0 06001	0 05284	0 341723	0 11325	0 06591	0 326614	0
0	0 78412	0 72411	0 007517	0 43344	0 32019	0 100629	0
0	0 71089	0 07323	0 3183	0 08637	0.34707	0 084298	0
0	0 44537	0 26552	0 138303	0 00056	0 08581	0 304264	0
0	0 18146	0 26391	0 139503	0 38974	0 38918	0 061619	0
0	0 18331	0 00185	0 403938	0 23456	0 15518	0 232547	0
0	0 17438	0 00893	0 394989	0 08226	0 1523	0 235333	0
0	0 05365	0 12073	0 266959	0 2723	0 19004	0 200141	0
0	0 18382	0 13017	0 257294	0 03944	0 23286	0 163662	0
0	0 56905	0 38523	0 063595	0 63182	0 59238	0.002028	0
0	1 92787	1 35882	0 520431	0 05815	0 57367	0 004063	0
0	0 43758	1 49029	0 727402	0 98229	0 92414	0 082213	0
0	0 15689	0 28069	0 12725	0 03606	0 94623	0.095369	0
0	0 00753	0 14936	0 238194	0 15193	0 11587	0 272005	0
0	0 03414	0 02661	0 373078	0.00691	0 14502	0 242449	0
0	0 83206	0 79792	0 025763	0 18844	0 18153	0 207828	0
0	0 02119	0 81087	0 030088	0 28035	0 09191	0 297571	0
0	0 01697	0 00422	0 400931	0 09426	0 18609	0.203891	0
0	0.05833	0 04136	0.355277	0 78125	0 68699	0.002458	0
0	0 16699	0 10868	0 279578	0 48437	0.29688	0 115961	0
0	0 26459	0 0976	0 291398	0.8683	0.38393	0.064253	0
0	0.1745	0.09009	0.29958	0 01737	0 85093	0.04559	0
0	0 05647	0 11803	0.269757	0 16073	0 14336	0 244087	0
0	0 17149	0 11502	0 272892	0.21287	0.05214	0 342542	0
0	1 34268	1 17119	0 28492	0 04398	0 16889	0.219512	0
0	0 11378	1 2289	0 349859	0 07639	0.03241	0.366026	0
0	0 32877	0 21499	0 17844	0 41654	0 34015	0 088364	0
0	0 00225	0 32652	0 096653	0 30591	0 11063	0 277498	0
0	2 15922	2 15697	2 309059	1 38405	1.07814	0 194242	1
0	1 48828	0.67094	0 001124	0 12437	1.25968	0.387219	0
0	0 56596	0 92232	0 081173	0 78116	0.65678	0 000375	0
0	0 0002	0.56576	0 005134	0 01322	0 76793	0 017035	0
0	0 9376	0.9374	0.089993	0 39115	0.37793	0.06733	0
0	0.65861	0.27899	0 128466	0.86441	0 47326	0.026946	0
1	0 79821	0 1396	0.247816	0.7598	0 10461	0 283877	0
0	0.88225	0 08404	0.30622	0.82263	0 06283	0.330143	0
1	0 0543	0 82795	0 036305	0.58721	0 23542	0 161597	0
0	0 25556	0 20126	0 190228	0.00014	0 58707	0.002534	0
0	0 05789	0 19767	0 193372	1 30518	1 30504	0 445728	0
0	3 42445	3 36656	7 448254	0.21101	1 09417	0 208629	1
0	0 26231	3 16214	6 374256	0 11545	0 09556	0 293603	1
0	0.02442	0 23789	0 159817	0.95304	0.83759	0 040072	0
0	0 20253	0 17811	0 210958	0 00489	0 94815	0 096559	0
0	3 86304	3 86051	9 139127	1 43805	1 43316	0.633218	1
0	0 16392	3 69912	9 374061	0 15739	1.28066	0 413769	1
0	0 83261	0 66869	0.000978	0.6064	0 44901	0.035495	0
0	0 88634	0 05373	0 340684	1.57256	0 96616	0 108076	0
0	0 00405	0.88229	0 059966	0.04488	1 52768	0 792579	0
0	0.03484	0.03079	0 367989	0.00265	0 04223	0.354241	0
0	0 10281	0.06797	0.324263	0 59273	0.59008	0 00224	0
0	0 00194	0 10087	0 287876	0 00959	0.58314	0 002945	0
0	0 03419	0 03225	0.36622	0 00722	0 00237	0 403277	0
0	1.67563	1 64144	1 008074	0.37769	0.37047	0.071258	0
0	0.0061	1 66953	1 065269	0.4209	0 04321	0 353075	0
0	0.02729	0 02119	0 379728	0 02315	0 39775	0.057437	0
0	0 03795	0.01068	0 392817	0.02829	0.00514	0.399767	0
0	0 44104	0 40309	0.054906	0.25673	0.22844	0 167257	0
0	0 00053	0 44051	0.03877	0.0997	0 15703	0.230768	0
0	0 57632	0 57579	0 003797	0 10726	0.00756	0 396712	0
0	0 03338	0 54294	0 008925	1 11384	1 00658	0 136286	0
0	0 44231	0 40893	0 052204	0 26846	0.84538	0 043251	0
0	0 40361	0 0387	0 358455	0 14253	0 12593	0 261613	0
0	0 15823	0.24538	0 153688	0 00113	0 1414	0 246027	0
0	0 00135	0 15688	0 23091	0.08853	0.0874	0.302512	0

0 5	Alpha=0 5						
5	Beta=5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	7 8209			0 3154	4 609	2 303749	
0	0 7334	7 0875	15 9705	2 5781	2 2627	0 686395	0
0	2 2503	1 5169	2 478387	0.046	2 5321	0 312581	0
0	3 606	1 3557	3 011923	0 6446	0 5986	6 213002	0
0	0 0075	3 5985	0 257364	0 1207	0 5239	6 590975	0
0	0 5255	0 518	6 621303	0 0282	0 0925	8 992138	0
0	4 5031	3 9776	0 785724	5 6922	5.664	6 619355	0
0	3 7675	0 7356	5 548801	0 0725	5 6197	6 393366	0
0	0 0028	3 7647	0 453617	12 1055	12 033	79 95598	0
0	2 75	2 7472	0 118329	3 8512	8 2543	26 65771	0
0	0 0416	2 7084	0 146528	4 3331	0 4819	6 808391	0
0	0 2912	0 2496	8 07463	3 2153	1 1178	3 894266	0
0	0 8899	0 5987	6 212503	1 4067	1 8086	1.645035	0
0	26 5596	25 6697	509 7891	0 8425	0 5642	6 385675	1
0	6 4229	20 1367	290 5494	0 0222	0 8203	5 156938	1
0	0 4996	5 9233	8 020851	0 038	0 0158	9 45802	0
0	0 3172	0 1824	8 461056	4 1945	4 1565	1 134887	0
0	1 1984	0 8812	4 884053	1 1172	3 0773	0 000193	0
0	13 3732	12 1748	82.51198	0.5914	0 5258	6.581223	1
0	1 1888	12 1844	82.68648	2 2294	1 638	2 111759	1
0	0 4457	0 7431	5 513524	4.5912	2 3818	0.532009	0
0	0 4551	0 0094	9 497426	2.234	2.3572	0.53874	0
0	6 1762	5 7211	6.91643	7 6388	5 4048	5 352794	0
0	8 0041	1 8279	1 5959	1 115	8 5238	11.78282	0
0	0 6497	7 3544	18 17496	0.995	0 12	8 827968	0
0	2 3734	1 7237	1 870027	1 6551	0.6601	5 910195	0
0	0 5592	1.8142	1 630702	8 3539	6 8988	13 01485	0
0	0 1116	0 4476	6 988565	0 5202	7 8337	22 49141	0
0	0 0231	0 0885	9 016143	3 9784	3 4582	0 134697	0
0	3 1772	3 1541	0 003958	0.6284	3.35	0 066983	0
0	1.3193	1 8579	1 521003	0 7268	0 0984	8 956788	0
0	2 1567	0 8374	5 079566	2.948	2 2212	0 756881	0
0	0.0329	2 1238	0 935842	1 9535	0 9945	4 396106	0
0	0 0276	0 0053	9 522713	1 7584	0 1951	8 387334	0
0	1 7031	1 6755	2 004176	1.2	0 5584	6 415022	0
0	3 7146	2 0115	1 165729	6.6719	5 4719	5 667783	0
0	7 5568	3 8422	0 564017	0 0007	6 6712	12.81648	0
0	9 9329	2.3761	0.511353	1 2023	1.2016	3 570548	0
0	0.0259	9.907	46 45527	3 9832	2 7809	0.096279	0
0	0.001	0 0249	9 40213	5 1903	1.2071	3 549793	0
0	0 7617	0 7607	5 431181	6 9792	1 7889	1.695958	0
0	0 1693	0 5924	6.243948	0.0385	6.9407	14.81873	0
0	13.7152	13 5459	109 301	0 7006	0.6623	5.899504	1
0	2.253	11 4822	70 07382	10 9464	10.2456	51 18559	1
0	12 3665	10 1135	49 31285	0.2156	10.7308	58.36365	1
0	0 2148	12 1517	82.09285	0 1062	0 1094	8 891068	1
0	2 6304	2 4156	0 456421	2.36	2 2538	0 701221	0
0	3 6625	1 0321	4 239849	0.0148	2.3452	0.5565	0
0	8 0738	4 4111	1 742164	3 3005	3 2857	0 037834	0
0	3.5788	4 4948	1 970123	0 5162	2 7843	0 094181	0
0	1 4962	2 0828	1.017252	1 1184	0 6022	6 195068	0
0	4 2108	2 7148	0.14182	0.1095	1 0089	4 335929	0
0	0 0011	4 2097	1 251068	1 0078	0 8983	4 808784	0
0	3 2469	3 2458	0 023904	0.452	0 5558	6 428199	0
0	1.157	2 0899	1.00258	2 1559	1 7039	1 924572	0
0	2.2014	1 0444	4 189347	1 7158	0 4401	7 028275	0
0	0 7664	1 435	2 742963	8 057	6 3412	10 56257	0
0	1 0752	0 3088	7 741691	0	8 057	24 65928	0
0	2 1802	1 105	3 944948	0 573	0.573	6 341278	0
0	0 3908	1 7894	1 694656	2.8027	2.2297	0 742164	0
0	5 1033	4 7125	2 628648	4 708	1 9053	1 406334	0
0	0 1174	4.9859	3 589928	3.9582	0 7498	5 482104	0
0	0 5644	0 447	6 991737	0 1264	3.8318	0 548504	0
0	0 6979	0 1335	8 747928	0 3022	0 1758	8 499495	0
0	2.6399	1.942	1 320638	2.5263	2 2241	0 751844	0
0	0 198	2 4439	0 418984	10 1548	7 6285	20 58719	0
0	0.3739	0 1779	8 487255	0 2832	9 8716	45 97397	0
0	0 4155	0 0416	9 299995	0 425	0 1418	8 698898	0
0	0 0981	0 3174	7 693907	0 278	0 147	8 668251	0
0	3 099	3 0009	0 008152	1 905	1 627	2 14385	0
0	3 7798	0 6806	5 810941	0 6909	1 2141	3 523464	0
0	7 5395	3 7599	0 447174	1 1635	0 4726	6 85701	0
0	0 0042	7 5353	19 75012	0 0722	1 0913	3 999557	0
0	10 5704	10 5662	55 67578	1 2315	1 1593	3 732196	1

0 5	Alpha=0 5							
10	Beta=10	MR	(MRi-MR)^2		MR	(MRi-MR)^2		
0	9 4367			0 2194	1 4006	24 16812		0
0	0 4527	8 984	7 114448	0 1371	0 0823	38 86784	0	0
0	10 8181	10 3654	16 39191	3 8693	3 7322	6.67968	0	0
0	0 0216	10 7965	20 06854	0 0235	3 8458	6 105385	0	0
0	54 7791	54 7575	2346 51	9 0451	9 0216	7 316442	1	0
0	8 0505	46 7286	1633 121	1 6821	7 363	1 094727	1	0
0	0 0298	8 0207	2 90359	2 1629	0 4808	34 05782	0	0
0	4 6913	4 6615	2 739713	0 9142	1 2487	25 6847	0	0
1	0 2369	4 4544	3 46819	7 0342	6 12	0 038694	0	0
0	4 2714	4 0345	5 208472	1 4223	5 6119	0 496754	0	0
0	12 6021	8 3307	4 056165	0 8696	0 5527	33 22379	0	0
0	0 2008	12 4013	37 02226	9 2022	8 3326	4.063822	0	0
0	0	0 2008	37 40433	1 5045	7 6977	1.90714	0	0
0	13 6689	13 6689	54 05473	5 4693	3 9648	5 53147	0	0
0	0 1533	13 5156	51.82405	3.9118	1 5575	22.65006	0	0
0	7 6674	7 5141	1 433748	0 614	3 2978	9 113804	0	0
0	1 1367	6 5307	0 045793	32 2062	31 5922	638 8505	0	1
0	37 6038	36 4671	909 0462	10 3827	21 8235	240 4606	1	1
0	5 1566	32 4472	682 8026	2 1951	8 1876	3.500238	1	0
0	2 7771	2 3795	15 5016	14 8889	12 6938	40 66731	0	0
0	2 6103	0 1668	37 82137	5.2144	9 6745	11 27477	0	0
0	0 2401	2 3702	15 57492	10.306	5 0916	1 500889	0	0
0	0 8426	0 6025	32 65217	4.0535	6 2525	0 004123	0	0
0	0 6504	0 1922	37 5096	5 4145	1.361	24.55904	0	0
0	2 6091	1 9587	18 99223	1 3692	4 0453	5 159293	0	0
0	0 8357	1 7734	20 64165	1 3598	0.0094	39 78213	0	0
0	0 0677	0 768	30 78816	0.5258	0 834	30 06008	0	0
0	5 2464	5 1787	1 295062	17.1259	16.6001	105 7482	0	0
0	1 5031	3 7433	6 622428	14 1866	2.9393	11 40688	0	0
0	0 4324	1 0707	27 5206	0 0032	14 1834	61.88485	0	0
0	7 2209	6 7885	0 222588	5.5247	5 5215	0.632355	0	0
0	3 2962	3 9247	5 721701	17 3368	11 8121	30 19934	0	0
0	6 4543	3 1581	9 976803	1 4316	15 9052	91 93918	0	0
0	7 9187	1 4624	23 5643	2 0811	0.6495	32 11724	0	0
0	9 8399	1 9232	19 30291	3 8921	1.811	20 3014	0	0
0	4 5693	5 2706	1 094341	0 0007	3 8914	5 882118	0	0
0	7 6962	3 1269	10 17487	1 2562	1 2555	25 61582	0	0
0	4 3693	3 3269	8 93895	0 4363	0.8199	30.2149	0	0
0	2 1284	2 2409	16 61221	6 6005	6 1642	0.023259	0	0
0	0 7065	1 4219	23 95914	5 6565	0.944	28 86599	0	0
0	0 0351	0.6714	31.8695	2 0358	3 6207	7 268458	0	0
0	14.2253	14 1902	61 99188	0 0138	2.022	18 44451	0	0
0	0 4071	13 8182	56.27239	0 7315	0 7177	31.34889	0	0
1	7 5538	7 1467	0 688887	11 0262	10 2947	15 82442	0	0
1	1 8561	5 6977	0 383171	0 0473	10 9789	21 73604	0	0
0	0 9831	0 873	29 63395	2 2285	2 1812	17 10242	0	0
0	0 4756	0.5075	33 74889	17 5442	15 3157	80 98186	0	0
0	0 7043	0 2287	37 06384	1 7914	15 7528	89.03984	0	0
0	2.353	1 6487	21 7903	5 6452	3 8538	8 065915	0	0
0	4 1274	1 7744	20 63256	2 86	2 7852	12 47155	0	0
0	1 7104	2 417	15 20772	0 071	2 789	12 44472	0	0
0	0 0047	1 7057	21 26139	5 1848	5 1138	1 446987	0	0
0	0 49	0 4853	34 00532	0 0246	5 1602	1 33751	0	0
0	6 1378	5 6478	0 447438	1 5506	1 526	22.95088	0	0
0	3 7243	2 4135	15 23503	12 0371	10 4865	17 38717	0	0
0	4 838	1 1137	27 07129	3 001	9 0361	7 395094	0	0
0	7 2864	2 4484	14 9638	1 2546	1 7464	20 88771	0	0
0	3 5963	3 6901	6 899068	2 3409	1 0863	27 35717	0	0
0	0 9136	2 6827	13 20601	0 5305	1 8104	20 30681	0	0
0	0 0222	0 8914	29 43396	14 9868	14 4561	66 24971	0	0
0	28 7999	28 7777	504 4962	1 0531	13 9335	58 01552	1	0
0	0 7669	28 033	471 5973	10 2611	9 208	8 359571	1	0
0	10 8926	10 1256	14 50766	2.338	7 9251	2 586926	0	0
0	15 673	4 7805	2 359934	0 8509	1 4851	23 34443	0	0
0	6 6418	9 0312	7 368468	20 4043	19 5534	175.21	0	0
0	4 4996	2 1422	17 42652	1 938	18 4663	147 6126	0	0
0	3 2812	1 2184	25 99274	6 1509	4 2129	4 426007	0	0
0	0 0086	3 2726	9 266592	0 6557	5 4952	0 674875	0	0
0	5 4602	5 4516	0 748411	0 8019	0 1462	38 07517	0	0
0	11 5502	6 09	0 051396	4 4627	3 6608	7 053846	0	0
0	14 5494	2 9992	11 00586	0 0526	4 4101	3 635153	0	0
0	1 163	13 3864	49 98055	11 6576	11 605	27 96603	0	0
0	4 9712	3 8082	6 292611	0 4497	11 2079	23 92376	0	0
0	6 6046	1 6334	21 93337	11 0326	10 5829	18 2004	0	0

0.26728	0.09497	0.048369
0.00796	0.25932	0.003089
0.0569	0.05094	0.069675
0.00103	0.05787	0.066064
0.00061	0.00042	0.098896
1.22503	1.22442	0.827227
0.00046	1.22457	0.827499
0.01763	0.01717	0.068643
0.0643	0.04667	0.071947
0.47652	0.41222	0.009471
0.00573	0.47079	0.024302
0.39782	0.39209	0.005958
0.32754	0.07028	0.059839
0.24568	0.08186	0.054308
0.02827	0.21741	0.009504
0.10633	0.07806	0.056093
1.11619	1.00986	0.482969
0.09859	1.0176	0.493787
0.24064	0.14205	0.029877
0.29272	0.05208	0.069074
0.0157	0.27702	0.001435
0.1856	0.1699	0.021025
0.0782	0.1074	0.043056
0.38733	0.30913	3.3E-05
0.42803	0.0407	0.075186
0.22583	0.2022	0.012701
0.05322	0.17261	0.020246
0.04536	0.00786	0.094274
0.01678	0.02858	0.081979
0.00991	0.00687	0.094882
0.31889	0.30898	3.5E-05
0.02277	0.29612	0.000353
0.04624	0.02347	0.084931
0.16812	0.12188	0.037257
0.08929	0.07883	0.055729
0.08795	0.00134	0.09832
0.11766	0.02971	0.081333
0.06629	0.05137	0.069448
0.62098	0.55469	0.057499
0.00316	0.61782	0.091761
0.14033	0.13717	0.031588
0.00154	0.13879	0.031015
0.01528	0.01374	0.090697
0.75898	0.7437	0.183869
0.20481	0.55417	0.05725
0.04261	0.1622	0.023317
0.15502	0.11241	0.041002
0.77809	0.62307	0.094969
0.20794	0.57015	0.065153
0.0774	0.13054	0.033989
0.02702	0.05038	0.069971
0.0312	0.00418	0.096547
0.38828	0.35708	0.001779
0.26333	0.12495	0.036081
0.26864	0.00531	0.095846
0.05181	0.21703	0.009579

Sum MR > UCLmr		
Sum X	1984.884	491.3042
X Average	0.247619	
MR Average	0.3149	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	1.085119	
Lower control limit for X (LCLx	-0.58988	
Upper control limit MR (UCLmr	1.029093	
MR Standard deviation	0.372561	
Process standard deviation	0.353553	
Gamma d2	0.890672	
Gamma d3	1.05376	
Gamma D4	4.549322	
0.5 Alpha=0.5		
0.5 Beta=0.5		
Proportion MR > UCLmr	0.053605	
Percentage	5.360536	
ARL for MR	18.65485	

0	0.14695	0.14644	0.241053
0	0.11606	0.03087	0.367892
0	0.04565	0.07043	0.321468
0	0.00074	0.04491	0.351058
0	0.00652	0.00578	0.398958
1	0.01614	0.00962	0.394122
1	0.04122	0.02508	0.374949
0	0.52534	0.48412	0.023498
0	0.06054	0.4648	0.029795
0	0.01093	0.04961	0.34551
0	0.02392	0.01299	0.389902
0	1.07898	1.05506	0.174431
0	0.00013	1.07885	0.194868
0	0.23651	0.23638	0.160826
0	1.03823	0.80172	0.026997
0	1.46562	0.42739	0.044109
0	0.20535	1.26027	0.387953
0	0.02864	0.17671	0.212246
0	0.401	0.37236	0.070252
0	0.97032	0.56932	0.004636
0	0.8412	0.12912	0.25836
0	0.62992	0.21128	0.181588
0	0.03841	0.59151	0.002107
0	1.64153	1.60312	0.932594
0	1.5505	0.09103	0.298532
0	0.04652	1.50398	0.750942
0	0.40498	0.35846	0.077814
0	0.14349	0.26149	0.141317
0	3.69936	3.55587	8.517402
0	0.01376	3.6856	9.291455
0	0.08565	0.07189	0.319814
0	0.52762	0.44187	0.038236
0	0.04531	0.48221	0.024067
0	0.55023	0.50492	0.017554
0	0.08747	0.46276	0.030503
0	1.08046	0.99299	0.128436
0	1.11886	0.0384	0.358814
0	0.0005	1.11836	0.231312
0	0.12362	0.12312	0.264495
0	0.36675	0.24313	0.155458
0	0.11702	0.24973	0.160297
0	0.74135	0.62433	0.000171
0	2.01392	1.27257	0.403427
0	0.89367	1.12025	0.233133
0	1.36372	0.47005	0.02801
0	0.0048	1.35892	0.520676
0	2.42209	2.41729	3.167969
0	0.86514	1.55695	0.845552
0	0.05202	0.81312	0.030874
0	0.03038	0.02164	0.379174
0	0.16832	0.13794	0.249471
0	0.35743	0.18911	0.200974
0	0.02357	0.33386	0.092143
0	0.28544	0.26187	0.141031
0	0.04517	0.24027	0.157721
0	0.01894	0.02523	0.374766

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Sum X	4124.014	920.9366
X Average	0.504495	
MR Average	0.637411	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	2.199737	
Lower control limit for X (LCLx	-1.19075	
Upper control limit MR (UCLmr	2.08306	
MR Standard deviation	0.785767	
Process standard deviation	0.707107	
Gamma d2	0.901435	
Gamma d3	1.111243	
Gamma D4	4.698245	
0.5 Alpha=0.5		
1 Beta=1		
Proportion MR > UCLmr	0.059706	
Percentage	5.970597	
ARL for MR	16.74874	

0	5.3528	5.3233	4.982318
0	0.4334	4.9194	3.342354
0	0.3315	0.1019	8.935851
0	5.6596	5.3281	5.003769
0	5.9071	0.2475	8.066569
0	4.4398	1.4673	2.637017
0	3.3947	1.0451	4.186482
0	3.2128	0.1819	8.463965
0	0.5642	2.6486	0.195865
0	0.0706	0.4936	6.74747
0	0	0.0706	9.12396
0	0.0024	0.0024	9.54062
0	10.3917	10.3893	53.26242
0	9.014	1.3777	2.936046
0	8.0367	0.9773	4.468528
0	1.3675	6.6692	12.80216
0	0.09	1.2775	3.289469
0	0.8234	0.7334	5.559171
0	3.8397	3.0163	0.005606
0	1.6323	2.2074	0.781084
0	0.386	1.2463	3.403617
0	0.335	0.051	9.242751
0	2.7619	2.4469	0.415109
0	0.6554	2.1265	0.930626
0	3.8751	3.2197	0.016515
0	0.5449	3.3302	0.057126
0	1.3156	0.7707	5.384671
0	1.5277	0.2121	8.269156
1	0.0781	1.4496	2.694816
1	0.6165	0.6384	6.516734
0	3.0121	2.3956	0.483845
0	4.4526	1.4405	2.724775
0	0.4683	3.9643	0.762322
0	4.0103	3.522	0.185598
0	0.3583	3.652	0.314509
0	0.5156	0.1573	8.607707
0	0.6219	0.1063	8.909564
0	0.887	0.2651	7.986781
0	0.6971	0.1899	8.41746
0	5.1893	4.4922	1.962831
0	0.3554	4.8339	3.03704
0	3.7837	3.4283	0.113644
0	0.3789	3.4048	0.098352
0	0.849	0.4701	6.870109
0	1.5418	0.6928	5.762272
0	0.2445	1.2973	3.218039
1	0.017	0.2275	8.200717
0	0.9991	0.9821	4.448258
0	1.179	0.1799	8.475606
0	0.4023	0.7767	5.356861
0	0.0423	0.36	7.459395
0	0.1983	0.156	8.615337
0	0.0001	0.1982	8.369387
0	1.6767	1.6766	2.001063
0	0.2205	1.4562	2.67319
0	4.9244	4.7039	2.600836

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Sum X	19753.38	4771.391
X Average	2.452478	
MR Average	3.091189	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	10.67373	
Lower control limit for X (LCLx	-5.76877	
Upper control limit MR (UCLmr	10.10201	
MR Standard deviation	3.771674	
Process standard deviation	3.535534	
Gamma d2	0.87432	
Gamma d3	1.066791	
Gamma D4	4.660411	
0.5 Alpha=0.5		
5 Beta=5		
Proportion MR > UCLmr	0.055806	
Percentage	5.580558	
ARL for MR	17.91935	

0	4.2571	2.7699	12.57985
0	6.4328	2.1757	17.14795
0	0	6.4328	0.013477
0	5.0368	5.0368	1.638164
0	3.8022	1.2346	25.82782
0	3.4909	0.3113	36.06492
0	8.9614	5.4705	0.716068
0	4.7674	4.194	4.505688
0	1.0375	3.7299	6.691574
0	0.0159	1.0216	28.03817
0	0.0446	0.0287	39.53904
0	7.4549	7.4103	1.195944
1	0.6217	6.8332	0.266764
0	0.848	0.2263	37.09307
0	4.888	4.04	5.183398
0	2.5627	2.3253	15.93134
0	0.0195	2.5432	14.23936
0	0.1291	0.1096	38.52819
0	0.3276	0.1985	37.43247
0	0.3861	0.0585	39.16516
0	1.0902	0.7041	31.50137
0	8.3562	7.266	0.901156
0	0.6036	7.7526	2.061787
0	3.6391	3.0355	10.76632
0	1.8806	1.7585	20.77726
0	2.5543	0.6737	31.84354
0	0.2135	2.3408	15.80784
0	0.5718	0.3583	35.50262
0	0.0712	0.5006	33.82711
0	3.1765	3.1053	10.31314
0	2.0218	1.1547	26.64632
0	15.5271	13.5053	61.67586
0	1.1407	14.3864	65.11993
0	1.1417	0.001	39.88816
0	5.8442	4.7025	2.605667
0	0.0561	5.7881	0.279426
0	3.9399	3.8838	5.91904
0	4.0953	0.1554	37.96171
0	0.0299	4.0654	5.068387
0	5.5317	5.5018	0.664075
0	0.1304	5.4013	0.837971
0	9.2713	9.1409	7.976062
0	0.3394	8.9319	6.83923
0	1.8648	1.5254	22.95663
0	8.622	6.7572	0.194033
0	5.3383	3.2837	9.199136
0	0.0184	5.3199	0.993626
0	0.0558	0.0374	39.42971
0	0.0331	0.0227	39.61453
0	7.5899	7.5568	1.537829
0	4.7188	2.8711	11.67221
0	29.0967	24.3779	326.2067
0	0.0159	29.0808	518.2039
0	0.0646	0.0487	39.28792
0	4.6089	4.5443	3.141429
0	1.62	2.9889	11.0743

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Sum X	39647.91	10041.17
X Average	4.968906	
MR Average	6.316706	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	21.76866	
Lower control limit for X (LCLx	-11.8306	
Upper control limit MR (UCLmr	20.643	
MR Standard deviation	7.650387	
Process standard deviation	7.071068	
Gamma d2	0.893317	
Gamma d3	1.081926	
Gamma D4	4.633406	
0.5 Alpha=0.5		
10 Beta=10		
Proportion MR > UCLmr	0.057106	
Percentage	5.710571	
ARL for MR	17.51138	

1	Alpha=1						
0.5	Beta=0.5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
	1.2252			0.07146	2.52468	4.096877	
	0.52487	0.70033	0.03989	0.10065	0.02919	0.222233	0
	0.7399	0.21503	0.081554	0.27807	0.17742	0.104449	0
	1.08785	0.34795	0.023304	0.75904	0.48097	0.000386	0
	1.03371	0.05414	0.199332	0.2838	0.47524	0.000643	0
	0.15638	0.87733	0.141921	1.09984	0.81604	0.099499	0
	0.133	0.02338	0.227744	1.47197	0.37213	0.016506	0
	0.13764	0.00464	0.245982	0.11802	1.35395	0.728196	0
	0.77724	0.6396	0.019319	0.28184	0.16382	0.113425	0
	0.13154	0.6457	0.021052	1.07395	0.79211	0.084975	0
	0.00253	0.12901	0.138083	0.31858	0.75537	0.064905	0
	0.09462	0.09209	0.166885	0.1897	0.12888	0.13818	0
	0.381	0.28638	0.045893	0.09168	0.09802	0.162075	0
	0.09507	0.28593	0.046086	1.14085	1.04917	0.300923	0
	0.42174	0.32667	0.030254	1.25567	0.11482	0.148831	0
	0.18719	0.23455	0.070788	0.06614	1.18953	0.474617	0
	0.14584	0.04135	0.210918	0.14701	0.08087	0.176178	0
	0.65584	0.51	8.8E-05	0.22715	0.08014	0.176791	0
	0.46399	0.19185	0.09533	0.01609	0.21106	0.083837	0
	0.49849	0.0345	0.217255	0.31234	0.29625	0.041761	0
	0.94378	0.44529	0.00306	0.07499	0.23735	0.069304	0
	0.3926	0.55118	0.002558	0.42687	0.35188	0.022119	0
	0.01359	0.37901	0.014786	0.2986	0.12827	0.138634	0
	0.2751	0.26151	0.057167	0.22347	0.07513	0.18103	0
	0.1871	0.088	0.170244	0.63759	0.41412	0.00748	0
	1.2465	1.0594	0.312251	2.21577	1.57818	1.161166	0
	1.20098	0.04552	0.207103	0.08611	2.12968	2.653818	0
	0.52774	0.67324	0.029803	0.16301	0.0769	0.179527	0
	0.42635	0.10139	0.159373	1.92421	1.7812	1.589098	0
	0.5522	0.12585	0.140442	0.14354	1.78067	1.638564	0
	0.09484	0.45736	0.00187	0.11815	0.02539	0.22583	0
	0.26699	0.19215	0.095145	0.01134	0.10681	0.165075	0
	0.00673	0.28026	0.048552	0.72898	0.71764	0.047104	0
	0.11138	0.10465	0.156781	1.1907	0.48172	0.001512	0
	0.30503	0.19365	0.094222	0.07031	1.12039	0.384133	0
	1.66225	1.35722	0.733788	0.40233	0.33202	0.028421	0
	0.17537	1.48688	0.972737	0.2811	0.12123	0.143926	0
	0.19216	0.01679	0.234078	0.25231	0.02879	0.22261	0
	0.04241	0.14975	0.1231	1.19657	0.94426	0.196829	0
	0.46335	0.42094	0.006347	0.35331	0.84326	0.117412	0
	0.57553	0.11218	0.150875	0.251	0.10231	0.15884	0
	0.93983	0.3643	0.018579	0.17587	0.07513	0.18103	0
	0.34845	0.59138	0.00824	1.97083	1.79496	1.675353	0
	0.36048	0.01203	0.238706	0.61625	1.35458	0.729272	0
	0.33208	0.02842	0.222959	0.25729	0.35898	0.020064	0
	0.38522	0.05316	0.200208	0.26593	0.00864	0.24203	0
	0.08931	0.29591	0.0419	0.06418	0.20175	0.089315	0
	0.3525	0.26319	0.056366	0.29476	0.23058	0.072914	0
	0.78853	0.43603	0.00417	0.37451	0.07975	0.17712	0
	0.20712	0.58141	0.006529	0.59101	0.2165	0.080716	0
	0.06928	0.11784	0.14651	0.49789	0.09312	0.166045	0
	0.31695	0.22787	0.074494	0.7888	0.29091	0.043972	0
	0.09421	0.22274	0.077209	0.5174	0.2714	0.052535	0
	0.39309	0.29888	0.040693	0.38011	0.13729	0.131998	0
	0.49077	0.09768	0.162349	0.68887	0.30876	0.036805	0
	0.06281	0.42796	0.005277	0.74065	0.05178	0.201445	0
	0.29372	0.23091	0.072736	0.34841	0.39224	0.011743	0
	0.90279	0.60907	0.011764	0.32158	0.02683	0.224463	0
	0.10696	0.79583	0.087157	0.55277	0.23119	0.072585	0
	0.21572	0.10876	0.153543	0.47503	0.07774	0.178815	0
	0.14042	0.0753	0.180885	0.02459	0.45044	0.002517	0
	0.75089	0.61047	0.01207	0.9887	0.96411	0.214836	0
	0.39779	0.3531	0.021758	0.05305	0.93565	0.189264	0
	0.00187	0.39592	0.010959	1.2374	1.18435	0.467506	0
	0.32956	0.32769	0.0299	0.1003	1.1371	0.405125	0
	0.74972	0.42016	0.006472	0.30044	0.20014	0.09028	0
	0.22861	0.52111	0.00042	0.67715	0.37671	0.01535	0
	0.16444	0.06417	0.190476	2.06095	1.3838	0.780032	0
	0.23903	0.07459	0.181489	0.42172	1.63923	1.296465	0
	0.02426	0.21477	0.081702	0.38469	0.03703	0.214902	0
	0.4578	0.43354	0.004498	0.46268	0.07799	0.178604	0
	0.49644	0.03864	0.213412	0.05937	0.40331	0.009466	0
	0.13608	0.36036	0.019669	0.59258	0.53321	0.001063	0
	0.46389	0.32781	0.029858	0.45268	0.1399	0.130109	0

1	Alpha=1						
1	Beta=1	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
1	1.37187			0.88361	0.78731	0.044206	
0	0.48332	0.88855	0.011884	0.35293	0.53068	0.217978	0
0	0.25879	0.22453	0.597578	0.18885	0.16408	0.694692	0
0	1.38907	1.13028	0.017614	0.45198	0.26313	0.53939	0
0	0.49134	0.89773	0.009968	0.32673	0.12525	0.760928	0
0	0.33639	0.15495	0.709994	0.77299	0.44626	0.303933	0
0	0.89571	0.55932	0.192056	2.28554	1.51255	0.265213	0
0	1.12067	0.22496	0.596913	0.08287	2.20267	1.452288	0
0	0.59543	0.52524	0.223088	2.28157	2.1987	1.442733	0
0	0.5066	0.08883	0.825793	0.24786	2.03371	1.073604	0
0	0.41145	0.09515	0.814347	0.22778	0.02008	0.95547	0
0	0.62585	0.2144	0.613342	1.47922	1.25144	0.064454	0
0	1.01218	0.38633	0.373604	0.08107	1.39815	0.160471	0
0	0.73483	0.27735	0.518705	0.4192	0.33813	0.43485	0
0	1.88056	1.14573	0.021954	0.65179	0.23259	0.585182	0
0	0.67209	1.20847	0.044482	2.01491	1.36312	0.133633	0
0	0.07441	0.59768	0.159905	0.33866	1.67625	0.460618	0
0	0.33206	0.25765	0.547469	0.05889	0.27977	0.515225	0
0	0.13122	0.20084	0.634765	0.66254	0.60365	0.155166	0
0	0.93737	0.60615	0.036838	0.46675	0.19579	0.642838	0
0	0.68229	0.25508	0.551279	1.71687	1.25012	0.063788	0
0	1.80551	1.12322	0.01579	0.72597	0.9909	4.4E-05	0
0	0.12579	1.67972	0.46534	1.26573	0.53978	0.209582	0
0	0.18923	0.06344	0.872583	0.33344	0.93229	0.00428	0
0	3.08508	2.89585	3.603499	1.45477	1.12133	0.015319	0
0	0.40885	2.67623	2.817928	0.01074	1.44403	0.199334	0
1	0.8464	0.43755	0.313613	1.49088	1.48012	0.232863	0
0	0.6888	0.1576	0.705535	3.15328	1.66242	0.442037	0
1	0.99901	0.31021	0.472452	0.95289	2.20039	1.446796	0
1	1.33871	0.3397	0.432782	2.55785	1.60498	0.368933	0
0	0.26515	1.07356	0.005778	0.94078	1.61707	0.383791	0
0	0.94706	0.68191	0.099636	0.31603	0.62475	0.138988	0
0	3.065	2.11794	1.255248	1.04068	0.72465	0.074481	0
0	2.77574	0.28926	0.501691	0.7355	0.30518	0.479392	0
0	2.35885	0.41689	0.337179	0.11027	0.62523	0.138631	0
0	0.79437	1.56448	0.321396	1.71224	1.60197	0.36531	0
0	1.05581	0.26144	0.541878	1.53001	0.18223	0.664768	0
0	1.55307	0.49726	0.250302	0.14578	1.38423	0.149512	0
0	0.2111	1.34197	0.118617	1.8904	1.74462	0.558098	0
0	3.44737	3.23627	5.011815	2.92992	1.03952	0.001781	0
0	2.69388	0.75351	0.059561	0.02718	2.90278	3.629781	0
0	0.02715	2.68671	2.788058	1.35118	1.324	0.108562	0
1	0.44265	0.4155	0.338798	0.77987	0.57129	0.181707	0
0	0.50995	0.0673	0.865387	2.17198	1.39211	0.155668	0
0	0.50154	0.00841	0.978421	0.18331	1.98887	0.982298	0
0	1.01809	0.51655	0.231372	0.64588	0.48257	0.286218	0
0	0.27529	0.7428	0.064903	2.44994	1.80408	0.65044	0
0	1.98248	1.70717	0.503544	1.5917	0.85824	0.019411	0
0	2.07609	0.09363	0.817092	2.36839	0.77869	0.048784	0
0	1.18799	0.8881	0.011982	0.14624	2.22218	1.499617	0
0	0.82327	0.38472	0.400488	0.88612	0.73988	0.0664	0
0	0.18833	0.83494	0.131494	3.47424	2.58812	2.529878	0
0	1.95412	1.76579	0.590175	0.04949	3.42475	5.891244	0
0	0.21098	1.74314	0.555887	0.18588	0.13639	0.741617	0
0	0.89851	0.68753	0.09612	1.47615	1.29027	0.085678	0
0	1.18602	0.28751	0.504173	4.72043	3.24428	5.047744	0
0	0.9707	0.21532	0.611902	2.58507	2.13536	1.294585	0
0	2.43315	1.46245	0.216121	0.22742	2.35765	1.84984	0
0	0.84486	1.58829	0.34898	0.21984	0.00758	0.980064	0
0	1.85169	1.00683	8.6E-05	0.15713	0.06271	0.873947	0
0	1.40645	0.44524	0.305059	1.20565	1.04852	0.002597	0
0	2.11722	0.71077	0.082249	1.00874	0.19891	0.641043	0
0	1.37184	0.74538	0.063596	0.23814	0.7706	0.051512	0
0	0.0889	1.28294	0.081441	1.75653	1.51839	0.271262	0
0	0.26754	0.17864	0.670633	1.28432	0.47221	0.275994	0
0	0.46542	0.19788	0.639491	0.3884	0.89592	0.010331	0
0	0.70668	0.24126	0.571992	0.54808	0.15968	0.702048	0
0	1.40382	0.69714	0.090253	0.30229	0.24579	0.565161	0
1	1.14865	0.25517	0.551145	0.83787	0.53558	0.213427	0
0	0.09339	1.05528	0.003329	2.23263	1.39476	0.157767	0
0	0.59508	0.50167	0.245908	1.62697	0.60568	0.153587	0
0	0.57982	0.01524	0.964956	0.34883	1.27814	0.078724	0
0	4.37295	3.79313	7.815203	2.72604	2.37721	1.90343	1
0	0.62802	3.74493	7.548033	1.28631	1.43973	0.195513	1

1	Alpha=1						
5	Beta=5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	0.1577			3.3619	17.7865	164.9033	
0	5.6364	5.4787	0.284801	5.5999	2.238	7.328026	0
0	1.2583	4.3781	0.321413	1.7992	3.8007	1.309497	0
0	0.7456	0.5127	19.64557	3.3207	1.5215	11.72058	0
0	0.7267	0.0189	24.26678	13.5884	10.2677	28.33079	0
0	1.4954	0.7687	17.44175	1.1073	12.4811	56.79231	0
0	5.1774	3.682	1.595251	3.9747	2.8674	4.316557	0
0	2.7701	2.4073	6.440087	5.2683	1.2936	13.33296	0
0	9.9802	7.2101	5.13053	4.0929	1.1754	14.21013	0
0	9.7294	0.2508	22.03582	12.2909	8.198	10.5818	0
0	0.4879	9.2415	18.45963	0.2726	12.0183	50.03111	0
0	6.866	6.3781	2.053682	10.4843	10.2117	27.73779	0
0	7.3708	0.5048	19.71567	0.5298	9.9545	25.09476	0
0	0.6961	6.6747	2.991749	1.645	1.1152	14.66762	0
0	0.6627	0.0334	24.12414	3.0078	1.3628	12.83239	0
0	9.3037	8.641	13.66017	0.6898	2.318	6.901301	0
0	0.6156	8.6881	14.01055	3.9949	3.3051	2.689379	0
0	2.6998	2.0842	8.184363	2.4336	1.5613	11.44965	0
0	6.8266	4.1268	0.669505	6.1344	3.7008	1.548115	0
0	2.5164	4.3102	0.403012	0.1034	6.031	1.179325	0
0	1.7907	0.7257	17.80277	2.3268	2.2232	7.408373	0
0	5.0267	3.236	2.920793	28.7197	26.3931	460.0196	0
0	3.8208	1.2059	13.98111	1.5076	27.2121	495.8223	0
0	3.5749	0.2459	22.08185	6.3522	4.8446	0.010087	0
0	2.6496	0.9253	16.15825	1.9567	4.3955	0.301986	0
0	0.3714	2.2782	7.111996	0.089	1.8677	9.469976	0
0	11.0167	10.6453	32.49305	8.3612	8.2722	11.07004	0
0	9.3573	1.6594	10.79538	16.4371	8.0759	9.80233	0
0	3.6007	5.7566	0.658642	3.8565	12.5806	58.30189	0
0	5.0668	1.4661	12.10297	10.7327	6.8762	3.729407	0
0	1.7377	3.3291	2.611238	4.8241	5.9086	0.928462	0
0	0.5531	1.1846	14.14085	17.0841	12.26	53.50875	0
0	10.2238	9.6707	22.33193	0.0825	17.0016	145.3608	0
0	4.1607	6.0631	1.250075	13.1538	13.0713	66.03622	0
0	0.0827	4.078	0.751746	6.4773	6.6765	2.997979	0
0	1.2074	1.1247	14.59494	3.587	2.8903	4.221926	0
0	6.5792	5.3718	0.18213	1.1357	2.4513	6.218702	0
0	0.6966	5.8826	0.879033	1.4772	0.3415	21.19251	0
0	0.8357	0.1391	23.09699	0.1968	1.2804	13.42953	0
0	16.0893	15.2536	106.2666	18.8155	18.6187	186.9692	0
0	9.3707	6.7186	3.145541	7.5383	11.2772	40.09634	0
0	2.5032	6.8675	3.695881	0.7624	6.7759	3.352075	0
0	2.6432	0.14	23.08834	5.0219	4.2595	0.469955	0
0	2.1554	0.4878	19.86692	4.7925	0.2294	22.23719	0
0	2.2842	0.1288	23.1961	2.0982	2.6943	5.065797	0
0	3.6161	1.3319	13.05473	3.4447	1.3465	12.94944	0
0	3.8047	0.1886	22.62365	1.2862	2.1585	7.764764	0
0	3.5171	0.2876	21.69168	9.6022	8.316	11.36342	0
0	1.7011	1.816	9.790845	0.7474	8.8548	15.28628	0
0	5.3209	3.6198	1.756242	2.6905	2.1431	7.850827	0
0	8.0102	2.6893	5.06833	1.0643	1.8262	9.727117	0
0	2.0771	5.9331	0.976277	10.1264	9.0621	16.95024	0
1	0.4767	1.6004	11.18657	3.2088	6.9178	3.891022	0
0	0.067	0.4097	20.56924	3.1659	0.0429	24.0309	0
0	3.1776	3.1106	3.365143	0.2304	2.9355	4.038221	0
0	8.8604	5.6828	0.544301	1.5739	1.3435	12.97104	0
0	6.548	2.3124	6.930755	23.7723	22.1984	297.6787	0
0	0.0863	6.4617	2.30028	2.0059	21.7664	282.9584	0
0	4.8005	4.7142	0.053284	8.0254	6.0195	1.15448	0
0	0.7384	4.0641	0.776042	0.7011	7.3243	5.660913	0
0	5.1117	4.3753	0.324595	3.06	2.3589	6.688082	0
0	1.1354	3.9763	0.938443	0.2092	2.8508	4.38581	0
0	1.1861	0.0527	23.93492	0.4758	0.2664	21.8896	0
0	2.3678	1.1795	14.17924	0.8618	0.3862	20.78298	0
0	11.6813	9.3137	19.06525	1.1758	0.314	21.44646	0
0	8.5507	3.1306	3.292166	0.8227	0.3531	21.08585	0
0	11.96	3.4093	2.358475	3.378	2.5553	5.710822	0
0	1.8892	10.0708	26.27349	1.7529	1.6251	11.02195	0
0	1.3679	0.5213	19.56941	13.0846	11.3317	40.78952	0
0	5.6609	4.293	0.425147	7.075	6.0096	1.133304	0
0	2.6627	2.9982	3.790157	11.7324	4.6574	0.082733	0
0	7.0985	4.4358	0.259318	3.7261	8.0063	9.371358	0
0	18.6487	11.5502	43.62824	10.7741	7.048	4.422472	0
0	1.7315	16.9172	143.3328	1.6963	9.0778	17.07977	1

1	Alpha=1							
10	Beta=10	MR	(MRi-MR)^2		MR	(MRi-MR)^2		
1	10.6679			9.479	12.9752	8.20675		0
0	10.5765	0.0914	100.3815	1.77	7.709	5.766997	0	0
0	0.5787	9.9978	0.012692	16.751	14.981	23.72219	0	0
0	21.7563	21.1776	122.4816	3.165	13.586	12.0794	0	0
0	6.8029	14.9534	23.45409	15.394	12.229	4.488223	0	0
0	31.3354	24.5325	207.9953	46.972	31.578	460.8554	0	0
0	0.327	31.0084	436.724	4.413	42.559	1052.908	0	1
0	9.7001	9.3731	0.543696	33.738	29.325	369.1986	0	0
0	2.9593	6.7408	11.35459	14.61	19.128	81.31608	0	0
0	18.6446	15.6853	31.07887	1.974	12.636	6.378366	0	0
0	1.7828	16.8618	45.58063	19.371	17.397	53.0937	0	0
0	8.3313	6.5485	12.68754	12.661	8.71	11.56311	0	0
0	37.5449	29.2136	364.9301	7.621	5.04	25.70954	0	0
0	10.4167	27.1282	289.6036	31.825	24.204	198.6279	0	0
0	0.8608	9.5559	0.307534	8.95	22.875	162.9335	0	0
0	9.316	8.4552	2.739877	3.611	5.339	22.76681	0	0
0	18.6902	9.3742	0.542075	21.78	18.169	84.94011	0	0
0	3.0231	15.6671	30.87628	12.122	9.658	0.204718	0	0
0	1.1448	1.8783	67.76841	7.6	4.522	31.23086	0	0
0	3.3394	2.1946	62.6608	6.688	0.912	84.61162	0	0
0	4.7054	1.366	76.46553	5.268	1.42	75.52405	0	0
1	13.5439	8.8385	1.617876	11.093	5.825	18.36514	0	0
1	10.7295	2.8144	53.23245	15.14	4.047	36.76552	0	0
0	3.5763	7.1532	8.745371	28.834	13.694	12.84178	0	0
0	3.4143	0.162	98.9718	9.975	18.859	78.537	0	0
0	25.8272	22.4129	151.3501	3.35	6.625	12.14841	0	0
0	5.2204	20.6068	110.1732	2.974	0.378	94.75988	0	0
0	14.3867	9.1663	0.891433	5.097	2.123	63.79948	0	0
0	16.0634	1.6767	71.12828	0.911	4.188	35.09919	0	0
0	9.3434	6.72	11.4952	6.422	5.511	21.15501	0	0
0	0.9895	8.3539	3.085494	7.94	1.518	73.83032	0	0
0	28.4538	27.4643	301.1559	16.222	8.282	3.343256	0	0
1	5.4943	22.9595	165.0979	5.388	10.838	0.528412	0	0
0	4.0714	1.4229	75.47365	1.155	4.231	34.56802	0	0
0	4.9548	0.8834	85.13859	3.47	2.315	80.76916	0	0
0	18.0079	13.0531	8.659146	15.643	12.173	4.254082	0	0
0	54.394	36.3861	690.4094	1.718	13.925	14.55074	1	0
0	3.6351	50.7589	1652.296	0.715	1.003	82.94578	1	0
0	12.8831	9.248	0.743833	0.512	0.203	98.15771	0	0
1	3.6122	9.2709	0.704857	2.679	2.167	83.09851	0	0
0	0.4263	3.1859	47.94949	5.083	2.404	59.38948	0	0
0	5.7474	5.3211	22.93794	32.902	27.819	313.5925	0	0
0	6.4952	0.7478	87.65935	0.197	32.705	510.5134	0	0
0	0.7732	5.722	19.25856	1.598	1.399	75.88949	0	0
0	1.616	0.8428	85.88947	26.993	25.397	233.6784	0	0
0	1.3604	0.2556	97.11821	0.429	26.564	270.7191	0	0
0	6.1806	4.8202	27.98682	8.011	7.582	6.393097	0	0
0	4.8714	1.3092	77.46213	13.159	5.148	24.62598	0	0
0	7.2304	2.359	60.08509	0.913	12.246	4.560542	0	0
0	12.8653	5.6349	20.03061	4.065	3.152	48.42013	0	0
0	0.674	12.1913	4.329906	17.541	13.476	11.32688	0	0
0	8.0074	7.3334	7.712048	19.405	1.864	88.00406	0	0
0	3.6962	4.3112	33.63139	20.245	0.84	85.94138	0	0
0	2.9791	0.7171	88.23518	7.473	12.772	7.083809	0	0
0	0.0406	2.9385	51.43697	10.081	2.608	56.28687	0	0
0	2.6711	2.6305	55.94976	13.227	3.146	48.50367	0	0
1	0.2155	2.4556	58.59684	8.804	4.423	32.34717	0	0
1	6.0379	5.8224	18.38744	10.082	1.278	78.0123	0	0
0	0.5162	5.5217	21.05669	10.134	0.052	101.1726	0	0
0	12.32	11.8038	2.867409	0.885	9.249	0.742109	0	0
0	5.7735	6.5465	12.70179	9.558	8.673	2.066284	0	0
0	8.101	2.3275	60.57443	43.819	34.261	583.2487	0	1
0	11.1407	3.0397	49.99561	0.358	43.461	1112.259	0	1
0	21.2175	10.0768	0.001133	8.506	8.147	3.855165	0	0
0	5.3714	15.8461	32.8976	5.994	2.511	57.75175	0	0
0	96.4203	91.0489	6551.031	7.984	1.99	65.94183	1	0
0	36.6717	59.7486	2463.945	0.479	7.505	6.788408	1	0
0	4.5885	32.0832	482.8014	15.332	14.853	22.49171	0	0
0	0.9665	3.622	42.10008	12.018	3.316	46.18465	0	0
0	6.2553	5.2888	23.24838	1.431	10.585	0.225191	0	0
0	19.5452	13.2899	10.10886	0.963	0.468	92.97698	0	0
0	5.1995	14.3457	17.93728	7.765	6.802	10.94589	0	0
0	12.527	7.3275	7.744852	2.057	5.708	19.38183	0	0
0	3.9466	8.5804	2.341076	7.064	5.007	26.04528	0	0

0 15307	0 07049	0 185
0 31638	0 16531	0 112423
0 07225	0 24613	0 064758
1 16362	1 09137	0 349002
1 43514	0 27152	0 05248
2 17714	0 742	0 058271
0 17035	2 00679	2 268591
0 40487	0 23452	0 070802
0 17197	0 2329	0 071666
0 00863	0 16334	0 113748
3 1931	3 18447	7 203127
0 7649	2 4282	3 71562
0 0069	0 758	0 066252
1 23522	1 22832	0 529568
0 00705	1 22817	0 52935
0 19802	0 19097	0 095874
0 18418	0 01384	0.236941
0 49765	0 31347	0 03502
0 04083	0 45682	0 001917
0 11651	0 07768	0 178866
0 04292	0 07559	0 180638
0 27974	0 23682	0 069583
2 41937	2 13963	2 686401
0 05768	2 36169	3 463635
0 92459	0 86691	0 134179
0 91679	0 0078	0 242858
0 98749	0 0707	0 184819
0 06894	0 91855	0 174677
1 17137	1 10243	0 362192
0 22076	0 95061	0.202504
0 28395	0 06319	0 191333
0 8159	0 53195	0 000982
0 04011	0 77579	0 076726
1 21639	1 17828	0 456536
1 30579	0 0894	0 16909
0 4257	0.88009	0 144006
0 3388	0 0869	0 171152
0 56368	0 22488	0 076025
0 15089	0 41279	0 007712
0 36824	0 21735	0 080234
0 62282	0 25458	0 060529
0 10934	0.51348	0 000166
0 04834	0 061	0 193253
0.5657	0 51736	0.000281
0 79135	0.22565	0 076601
0.26904	0 52231	0 000471
0 4175	0 14846	0 124007
0.50768	0.09018	0 168449
0.30375	0 20393	0.088016
0 45744	0 15369	0 120351
0 10113	0.35631	0 020821
0 80587	0 70474	0 041671
2 53912	1 73325	1 519412
0 59713	1 94199	2 077589
0.59241	0 00472	0 245903
2 59614	2 00373	2.259383

Sum MR > UCLmr		
Sum X	4003.54	962 3167
X Average	0 496586	
MR Average	0 500606	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	1.827984	
Lower control limit for X (LCLx	-0 83481	
Upper control limit MR (UCLmr	1 63598	
MR Standard deviation	0 497898	
Process standard deviation	0.5	
Gamma d2	1 001211	
Gamma d3	0 995795	
Gamma D4	3 983771	
1 Alpha=1		
0.5 Beta=0.5		
Proportion MR > UCLmr	0 039604	
Percentage	3.960396	
ARL for MR	25.25	

0	0 53945	1 25469	0 066218
0	0 29328	0 24617	0 564589
0	0 79815	0 50487	0 242745
0	0 00093	0 79722	0 040137
0	1 60457	1 60364	0 367331
0	0 42744	1 17713	0 032245
1	0 76066	0 33322	0 44135
0	0 49469	0 26597	0 535226
0	0 15408	0 34061	0 431585
0	1 18945	1 03537	0 001429
1	0 46504	0 72441	0 074612
1	0 33544	0 1296	0 753357
0	0 41341	0 07797	0 845649
0	1 0007	0 58729	0 168323
0	2 98163	1 98093	0 967013
0	1 20059	1 78104	0.613838
0	0 66169	0 5389	0 21037
0	2 61626	1 95457	0 915865
0	0 3091	2 30716	1 715048
0	1 30672	0 99762	3 4E-09
0	0 08517	1 22155	0 050171
0	0 60159	0.51642	0 231497
1	0 04838	0 55321	0 197448
1	0 19405	0 14567	0 725719
0	0 75089	0 55684	0 194238
0	0.22359	0.5273	0.221148
0	0 16845	0.05514	0.868158
0	1 24905	1.0606	0 006895
0	0 79841	0 45064	0.299123
0	0 1946	0.60381	0.15504
0	1 24427	1 04967	0 002715
0	0 48524	0 75903	0 056897
0	1 3619	0 87666	0.014617
0	0 22302	1 13888	0.019971
0	0 42297	0 19995	0.636184
0	1 26164	0 83867	0 025247
0	2.08247	0.82083	0 031234
0	0 15274	1.92973	0 868938
0	0.60722	0 45448	0.294938
0	0 25134	0 35588	0 411765
0	0 09982	0 15152	0.715786
0	1.0168	0 91898	0 006175
0	2.50254	1 48374	0.236369
0	0.855	1.64754	0.422472
0	1.2926	0.4378	0.313333
0	1.64271	0.34991	0.419453
0	0 1309	1 51181	0 264451
0	0 2774	0 1465	0 724306
0	1 5064	1.229	0.053564
0	4.0778	2.5714	2 476967
0	1 40163	2.67617	2.817726
0	1.93187	0 53024	0 218389
1	1.92728	0.00459	0.985993
1	0.04276	1.88452	0 786695
0	0 25588	0 21312	0 615349
1	0.0963	0 15958	0 702213
331	65		

Sum X	8114 779	2092.696
X Average	1.020747	
MR Average	0 997562	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	3.673837	
Lower control limit for X (LCLx	-1 63234	
Upper control limit MR (UCLmr	3.260031	
MR Standard deviation	1 000811	
Process standard deviation	1	
Gamma d2	0.997562	
Gamma d3	1 000811	
Gamma D4	4 009771	
1 Alpha=1		
1 Beta=1		
Proportion MR > UCLmr	0.038604	
Percentage	3.860386	
ARL for MR	25.90415	

0	11 7813	10 9496	36 05483
0	9 4845	2.2968	7 013136
0	2 8367	6 6478	2 899417
0	0 1275	2.7092	4 998948
0	0 1984	0.0709	23.75717
0	1 7445	1 5461	11 55274
0	0 1567	1 5878	11.27101
0	8 9385	8 7818	14 72078
0	6 3904	2 5481	5 745286
0	16 1293	9 7389	22.98116
0	5 8588	10.2705	28.3606
0	2 4937	3 3651	2 496187
0	9 4494	6 9557	4.042783
0	2.6742	6 7752	3 349513
0	0 0579	2.6163	5 422996
0	5 9979	5 94	0.98996
0	2 5392	3 4587	2.209185
0	3 7645	1.2253	13.83641
0	1 4284	2 3361	6.80653
0	11 809	10 3806	29 54539
0	0.5343	11.2747	40 06469
0	4.5574	4 0231	0 84996
0	15.187	10 6296	32 31431
0	6 1713	9 0157	16.57033
0	0 1831	5 9882	1 088198
0	12 7485	12 5654	58.07
0	0.2355	12.513	57 27413
0	2.5131	2.2776	7 115197
0	7 7565	5 2434	0 089023
0	2.5203	5 2362	0.084778
0	1.379	1 1413	14 48838
0	2 1505	0 7715	17 41837
0	2 1011	0 0494	23 96722
0	0 7066	1.3945	12 60628
0	1 0677	0.3611	21 01244
0	1.7827	0 715	17 89318
0	2.2495	0 4668	20.05457
0	6 1499	2 9004	4 180523
0	1 8388	3 3111	2.669736
0	0 3976	1.4412	12.27684
0	36 8582	36.4606	993.231
0	4.9208	31.9374	728 5879
0	4 7450	0.175	22.75321
0	0.9437	3.8021	1 306295
0	12.3185	11.3748	41.34191
0	10 1961	2 1224	7 967255
0	4 3252	6.8709	0.85723
0	10.6762	6 351	1.978744
0	5 1656	5 5106	0 319866
0	1.93	3.2356	2.92216
0	1.922	0.006	24 37429
0	1 8147	0 1073	23 40366
0	18.353	16 5383	134.4038
0	9.0938	9.2592	16 61204
0	0.3169	8 7769	14 68321
0	21.1484	20.8315	252.3798
307	79		

Sum X	39492.28	10079 35
X Average	4 957163	
MR Average	4.945033	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	18 10885	
Lower control limit for X (LCLx	-8 19452	
Upper control limit MR (UCLmr	16 16037	
MR Standard deviation	5 0334	
Process standard deviation	5	
Gamma d2	0.989007	
Gamma d3	1.00668	
Gamma D4	4.05361	
1 Alpha=1		
5 Beta=5		
Proportion MR > UCLmr	0 041504	
Percentage	4 150415	
ARL for MR	24 09398	

0	15 7716	9 6943	0 173187
0	6 1942	9 5774	0 28415
0	3 1325	3 0617	49 68498
0	2 7743	0 3582	95 10652
0	0 478	2 2963	61 06106
0	28 3578	27 8798	315 7495
0	8 2077	20 1501	100 7944
0	3 9984	4 2093	34 82366
0	4 0203	0 0219	101 779
0	23 6567	19 6364	90.74358
0	2 0488	21 6079	132 1912
0	1 2431	0.8057	86 57851
0	54 482	53 2389	1860 063
0	7 5993	46 6827	1352 198
0	11 3126	3 7133	40.92362
0	5 2288	6 0838	16.21397
0	6 9378	1 709	70 58449
0	2 2875	4 6503	29 81332
0	1 7632	0 5243	91 89441
0	7 4464	5.6832	19 60061
0	0 6837	6 7627	11 20748
0	8 5865	7 9028	4.873751
0	7 7584	0 8281	86 18216
0	30 5315	22 7731	160 3425
0	20 2282	10 3033	0.037188
0	2 5713	17 6569	56 9488
0	13 0632	10 4919	0 145498
0	14 4679	1 4047	75 79021
0	5 4947	8 9732	1.293354
0	5 8641	0 3694	94.8882
0	20 1518	14.2877	17 44936
0	10 2768	9.875	0.05544
0	4 0692	6 2076	15.2323
0	1 8054	2 2638	61 57003
0	21 1639	19 3585	85.52629
0	13 8534	7 3105	7.853761
0	0 4468	13 4066	10.86456
0	9 431	8 9842	1.268456
0	4.0499	5 3811	22.36682
0	2.927	1 1229	80 77619
1	13 8225	10 6955	0.616292
1	10 0011	3 6214	39.55224
0	32 0517	22 0506	142.567
0	14 4696	17 5821	55 82544
0	1 5764	12 8932	7 743657
0	3 8386	2.2622	61 59514
0	14 9137	11 0751	0.930535
0	6 6374	8 2763	3.364133
0	1 5884	5.049	25 61835
0	21 431	19 8426	94 7146
0	2 1112	19 3198	84 81199
0	4 2015	2 0903	64 32292
1	2 6887	1 5128	73 91971
0	4 4778	1 7891	69 24499
0	0 2283	4 2495	34 35082
1	22 4542	22 2259	146 784
327	68		

Sum X	79849.85	19790 97
X Average	9 964083	
MR Average	10 11046	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	36 8536	
Lower control limit for X (LCLx	-16 9254	
Upper control limit MR (UCLmr	33 04097	
MR Standard deviation	10 0519	
Process standard deviation	10	
Gamma d2	1 011046	
Gamma d3	1 00519	
Gamma D4	3 982624	
1 Alpha=1		
10 Beta=10		
Proportion MR > UCLmr	0 036704	
Percentage	3 670367	
ARL for MR	27 24523	

1.5 Alpha=1.5							
0.5 Beta=0.5	MR	(MRI-MR)^2		MR	(MRI-MR)^2		
1.27555			0.31571	0.13868	0.241346		0
1.14682	0.12873	0.251222	2.37111	2.0554	2.031907	0	0
1.31959	0.17277	0.209014	0.44908	1.92203	1.66947	0	0
0.58622	0.73337	0.010696	1.6221	1.17302	0.294925	0	0
0.85396	0.26774	0.131196	0.43669	1.18541	0.308536	0	0
0.07728	0.77668	0.02153	0.2702	0.16649	0.214795	0	0
0.66472	0.58744	0.001807	0.11468	0.15552	0.225084	0	0
0.22639	0.43833	0.036718	0.18879	0.07411	0.308958	0	0
0.2617	0.03531	0.353597	0.69634	0.50755	0.014982	0	0
0.45093	0.18923	0.194234	0.38212	0.31422	0.099686	0	0
0.9134	0.46247	0.02805	0.59169	0.20957	0.176719	0	0
0.25192	0.66148	0.000994	1.23602	0.64433	0.000207	0	0
0.19727	0.05465	0.33097	0.19526	1.04076	0.168765	0	0
0.71153	0.51426	0.013384	0.47419	0.27893	0.123215	0	0
1.24352	0.53199	0.009596	0.74156	0.26737	0.131464	0	0
1.99225	0.74873	0.014109	0.42358	0.31798	0.097325	0	0
0.59073	1.40152	0.59532	2.03557	1.61199	0.964402	0	0
0.16057	0.43016	0.039916	0.78249	1.25308	0.388291	0	0
1.68	1.51943	0.791174	0.17525	0.60724	0.000516	0	0
0.42629	1.25371	0.389076	0.26951	0.09426	0.286964	0	0
1.38486	0.95857	0.107991	0.99494	0.72543	0.009116	0	0
0.11288	1.27198	0.412202	0.41267	0.58227	0.002273	0	0
1.66565	1.55277	0.851597	0.54761	0.13494	0.245035	0	0
0.05072	1.61493	0.970185	0.57827	0.03066	0.359149	0	0
0.33073	0.28001	0.122458	0.9962	0.41793	0.044953	0	0
1.477	1.14627	0.266586	1.02169	0.02549	0.365372	0	0
0.15762	1.31938	0.475314	1.70498	0.68329	0.002845	0	0
0.24691	0.08929	0.292313	2.30004	0.59506	0.001217	0	0
1.61527	1.36836	0.545249	0.81384	1.4862	0.733164	0	0
0.29236	1.32291	0.480193	0.37276	0.44108	0.035672	0	0
0.08964	0.20272	0.182526	1.27536	0.9026	0.074338	0	0
0.32463	0.23499	0.155994	0.29823	0.97713	0.120534	0	0
1.00888	0.68425	0.002948	0.51476	0.21653	0.170916	0	0
1.38696	0.37608	0.063439	0.38796	0.1268	0.25316	0	0
2.47541	1.08845	0.210222	0.47251	0.08455	0.297461	0	0
0.29171	2.1837	2.414139	0.6692	0.19669	0.187714	1	0
0.27961	0.0121	0.381739	0.4619	0.2073	0.178633	0	0
0.49305	0.21344	0.173481	0.68903	0.22713	0.162264	0	0
0.12219	0.37086	0.067128	1.44293	0.7539	0.015364	0	0
1.26395	1.14176	0.261949	0.8104	0.83253	0.041039	0	0
0.72737	0.53658	0.008718	0.25439	0.35601	0.075043	0	0
0.47865	0.24872	0.145336	0.38669	0.1323	0.247656	0	0
0.87457	0.39592	0.05477	0.57262	0.18593	0.197154	0	0
1.45868	0.58411	0.002101	0.21595	0.35667	0.074682	0	0
0.36547	1.09321	0.21461	0.72233	0.50838	0.01527	0	0
0.64184	0.27637	0.125019	0.5059	0.21643	0.170999	0	0
0.4149	0.22694	0.162417	0.09195	0.41395	0.046656	0	0
0.0993	0.3156	0.098816	0.65186	0.55991	0.004906	0	0
1.15037	1.05107	0.177342	0.226	0.42586	0.041653	0	0
0.10912	1.04125	0.169168	0.49352	0.26752	0.131356	0	0
0.22725	0.11813	0.26196	0.46862	0.0249	0.368066	0	0
0.32782	0.10057	0.280243	0.4302	0.03842	0.349908	0	0
0.95947	0.63165	2.9E-06	0.19033	0.23987	0.152163	0	0
0.42066	0.53881	0.006307	0.03498	0.15535	0.225245	0	0
0.84857	0.42791	0.04082	0.44525	0.41027	0.048259	0	0
0.1811	0.66747	0.001408	0.82549	0.38024	0.062355	0	0
0.23022	0.04912	0.337364	0.0413	0.78419	0.02379	0	0
0.96817	0.73795	0.011664	0.40338	0.36208	0.071754	0	0
0.59974	0.36843	0.068393	0.87155	0.46817	0.026173	0	0
0.23682	0.36292	0.071305	0.33249	0.53906	0.008261	0	0
1.55982	1.323	0.480318	0.42918	0.09669	0.284366	0	0
0.70151	0.85831	0.052148	0.58362	0.13444	0.24553	0	0
0.74096	0.03945	0.34869	0.19536	0.36826	0.068482	0	0
0.9616	0.22064	0.167535	2.72102	2.52566	3.593716	0	1
0.80084	0.16076	0.220139	0.74754	1.97348	1.805073	0	0
2.42126	1.62042	0.981031	0.66799	0.07955	0.30294	0	0
0.11667	2.30459	2.804419	1.55686	0.88887	0.067039	1	0
0.13278	0.01611	0.3768	0.30319	1.25367	0.389026	0	0
0.66576	0.53298	0.009403	0.19428	0.10891	0.271483	0	0
0.71999	0.05423	0.331454	0.25941	0.06513	0.319022	0	0
0.37128	0.34871	0.079096	0.15428	0.10513	0.275436	0	0
0.57378	0.2025	0.182714	0.56224	0.40796	0.04928	0	0
0.175	0.39878	0.05344	0.30823	0.25401	0.141331	0	0
0.52592	0.35092	0.077858	0.23456	0.07367	0.309448	0	0

1.5 Alpha=1.5							
1 Beta=1	MR	(MRI-MR)^2		MR	(MRI-MR)^2		
0.3433			2.6485	1.6388	0.14818		0
0.1862	0.1571	1.202878	0.5822	2.0663	0.660062	0	0
0.1115	0.0747	1.390414	1.7435	1.1613	0.008567	0	0
1.4532	1.3417	0.007716	1.5305	0.213	1.083385	0	0
2.2055	0.7523	0.25156	5.5085	3.978	7.42095	0	0
0.909	1.2965	0.001818	2.3662	3.1423	3.566213	0	0
1.0206	0.1116	1.304753	0.1474	2.2188	0.931113	0	0
0.656	0.3646	0.79078	1.0568	0.9094	0.118651	0	0
1.6271	0.9711	0.079952	1.1913	0.1345	1.252962	0	0
2.9671	1.34	0.00742	0.9491	0.2422	1.023452	0	0
2.1384	0.8287	0.180759	2.5688	1.6197	0.13384	0	0
0.6873	1.4511	0.038904	1.3087	1.2601	3.9E-05	0	0
0.6844	0.0029	1.564896	0.4357	0.873	0.145053	0	0
0.1332	0.5512	0.493728	1.2639	0.8282	0.181165	0	0
1.2041	1.0709	0.033474	1.5228	0.2589	0.989941	0	0
1.3332	0.1291	1.26508	1.9487	0.4259	0.685514	0	0
1.7453	0.4121	0.708556	0.5877	1.361	0.011479	0	0
3.5331	1.7878	0.285094	1.416	0.8283	0.1811	0	0
1.4757	2.0574	0.64568	1.0003	0.4157	0.702509	0	0
1.2701	0.2058	1.098845	1.1206	0.1203	1.284954	0	0
0.408	0.8621	0.153474	0.8338	0.2868	0.935201	0	0
1.7754	1.3874	0.012892	1.3814	0.5476	0.4988	0	0
0.6218	1.1536	0.010052	3.0478	1.6664	0.170191	0	0
0.3114	0.3104	0.890113	1.5217	1.5261	0.074116	0	0
2.1474	1.836	0.338889	0.5612	0.9605	0.086059	0	0
1.0013	1.1461	0.011612	0.0174	0.5438	0.504182	0	0
1.1813	0.18	1.153171	1.1536	1.1362	0.013843	0	0
1.5448	0.3635	0.792737	0.4006	0.753	0.250859	0	0
1.7422	0.1974	1.116103	0.5879	0.1873	1.137546	0	0
0.5343	1.2079	0.002112	0.8825	0.2946	0.920176	0	0
1.6599	1.1256	0.01645	0.811	0.0715	1.39797	0	0
0.6561	1.0038	0.062529	3.8073	2.9983	3.036104	0	0
0.4555	0.2006	1.109352	3.1526	0.6547	0.35699	0	0
3.3054	2.8499	2.54735	0.8805	2.2721	1.036817	0	0
0.5966	2.7068	2.116856	3.542	2.8615	1.961456	0	0
0.1738	0.4228	0.690657	0.9899	2.5521	1.685432	0	0
1.7297	1.5559	0.091229	0.5755	0.4144	0.70469	0	0
5.0632	3.3235	4.283418	0.3829	0.1926	1.126268	0	0
1.9047	3.1485	3.589668	3.1731	2.7902	2.360347	0	0
1.6415	0.2632	0.981403	2.3621	0.811	0.196123	0	0
1.236	0.4055	0.719711	0.8371	1.525	0.073518	0	0
0.1649	1.0711	0.0334	0.5337	0.3034	0.90337	0	0
0.4709	0.306	0.898435	0.7653	0.2318	1.045011	0	0
2.1786	1.7077	0.205973	0.6817	0.0836	1.369504	0	0
0.6501	1.5285	0.075428	0.5191	0.1626	1.190844	0	0
0.9239	0.2738	0.960514	3.5784	3.0593	3.259621	0	0
0.2707	0.6532	0.36079	2.5325	1.0459	0.043247	0	0
1.4675	1.1968	0.003256	3.9782	1.4457	0.036803	0	0
1.3348	0.1327	1.256995	0.9951	2.9831	2.990276	0	0
1.2626	0.0722	1.396316	2.3322	1.3371	0.006929	0	0
3.3283	2.0657	0.659087	0.7272	1.605	0.123301	0	0
4.7625	1.4342	0.032523	0.5112	0.216	1.077149	0	0
3.4762	1.2863	0.001052	0.2786	0.2326	1.042968	0	0
0.0128	3.4634	4.882076	1.1088	0.8302	0.179486	0	0
1.6136	1.6008	0.120369	1.9298	0.821	0.187366	0	0
4.3748	2.7612	2.27208	0.4954	1.4344	0.032595	0	0
0.5109	3.8639	6.812319	0.6699	0.1745	1.165014	0	0
0.2937	0.2172	1.07466	0.3843	0.2856	0.937523	0	0
0.9959	0.7022	0.304327	1.9604	1.5761	0.10384	0	0
1.4158	0.4199	0.695486	1.0632	0.8972	0.127205	0	0
1.0576	0.3582	0.802203	0.7951	0.2681	0.971719	0	0
1.2556	0.198	1.114836	1.2674	0.4723	0.610833	0	0
1.0048	0.2508	1.006125	1.3321	0.0647	1.414097	0	0
2.0249	1.0201	0.054643	3.2702	1.9381	0.468187	0	0
2.5977	0.5728	0.46384	1.7595	1.5107	0.065968	0	0
0.6985	1.8992	0.416466	1.1353	0.6242	0.396469	0	0
5.799	5.1005	14.79665	3.3218	2.1865	0.869821	1	0
1.5119	4.2871	9.200557	2.448	0.8738	0.144444	1	0
2.3454	0.8335	0.176701	2.5346	0.0866	1.362491	0	0
1.6129	0.7325	0.271814	2.5587	0.0241	1.512305	0	0
0.9717	0.6412	0.37535	1.3896	1.1691	0.007164	0	0
1.209	0.2373	1.03339	1.0836	0.306	0.898435	0	0
2.8653	1.4563	0.040983	0.1664	0.9172	0.113339	0	0
1.6064	1.0589	0.038009	1.221	1.0548	0.039704	0	0

1.5 Alpha=1.5							
5 Beta=5	MR	(MRI-MR)^2		MR	(MRI-MR)^2		
3.0725			4.1278	10.9265	20.81162		0
5.017	1.9445	19.53662	8.9714	4.8436	2.313212	0	0
2.7653	2.2517	16.91533	3.6876	5.2838	1.167966	0	0
12.8696	10.1043	13.98592	14.7448	11.0572	22.0212	0	0
18.5913	5.7217	0.413224	18.05	3.3052	9.359468	0	0
11.048	7.5433	1.389511	2.7892	15.2608	79.14371	0	0
1.0505	9.9975	13.19851	10.6627	7.8735	2.277006	0	0
5.4074	4.3569	4.030557	5.8873	4.9754	1.929667	0	0
5.4047	0.0027	40.47281	3.6174	2.0699	18.4438	0	0
7.07	1.6653	22.08271	11.8126	8.1952	3.351372	0	0
5.3147	1.7553	21.24495	12.5233	0.7107	31.96573	0	0
1.4036	3.9111	6.019293	6.0934	6.4299	0.004274	0	0
8.4861	7.0825	0.515489	9.3954	3.302	9.379058	0	0
4.1246	4.3615	4.012108	3.5214	5.874	0.240614	0	0
23.9146	19.79	180.2434	6.5101	2.9887	11.39619	0	0
1.7562	22.1584	249.4465	5.5072	1.0029	28.74702	1	0
2.5073	0.7511	31.51054	0.4734	5.0338	1.770828	0	0
14.1256	11.6183	27.60215	15.3391	14.8657	72.26998	0	0
18.0718	3.9462	5.848294	0.4866	14.8525	72.04572	0	0
8.6654	9.4064	9.253005	8.0615	7.5749	1.465008	0	0
17.5062	8.8408	6.131939	12.2434	4.1619	4.763851	0	0
0.905	16.6012	104.7895	4.1282	8.1152	3.064864	0	0
2.0509	1.1459	27.23404	12.504	8.3758	4.045228	0	0
2.4601	0.4092	35.46589	14.7476	2.2436	16.98202	0	0
5.5682	3.1081	10.6043	1.6463	13.1013	45.38414	0	0
6.8054	1.2372	26.28946	11.8209	10.1746	14.51667	0	0
7.6844	0.879	30.09098	7.5616	4.2593	4.431971	0	0
8.6034	0.919	29.65374	9.3444	1.7828	20.9922	0	0
11.5208	2.9174	11.88267	9.2353	0.1091	39.13034	0	0
7.4307	4.0901	5.173008	4.6222	4.6131	3.067488	0	0
6.2459	1.1848	26.82955	7.4725	2.8503	12.34978	0	0
6.8557	0.6098	33.11686	1.763	5.7095	0.429057	0	0
2.8193	4.0364	5.420165	5.9457	4.1827	4.780359	0	0
2.3024	0.5169	34.19471	6.7127	0.767	31.33228	0	0
4.0863	1.7839	20.98212	5.5478	1.1649	27.0361	0	0
15.2386	11.1503	22.90365	15.8991	10.3513	15.89438	0	0
18.0768	2.8402	12.42086	4.5209	11.3782	25.13694	0	0
9.1245	8.9523	6.696581	11.9391	7.4182	1.110232	0	0
11.7824	2.6579	13.73907	2.8708	9.2683	8.431911	0	0
13.6824	1.88	20.11096	3.8138	1.143	27.26432	0	0
15.7571	2.0947	18.2314	4.0413	0.2275	37.66307	0	0
1.0813	14.6758	69.0773	7.3372	3.2959	9.416458	0	0
3.5814	2.4801	15.08876	1.8486	5.4886	0.767244	0	0
2.5695	0.9919	28.8651	19.2709	17.4223	122.2744	0	0
9.5561	6.9866	0.386978	3.9852	15.2857	79.58737	0	0
8.1683	1.3878	24.76779	18.3559	14.3707	64.09884	0	0
3.2418	4.9267	2.06734	6.3674	11.9885	31.8291	0	0
2.1042	1.1374	27.32283	6.5629	0.1955	38.05687	0	0
7.9887	5.8645	0.250025	2.8711	3.6918	7.143457	0	0
1.0027	6.966	0.381773	1.5085	1.3626	25.01925	0	0
7.1163	6.1136	0.062963	6.9411	5.4326	0.868484	0	0
6.1063	1.01	28.67093	2.0794	4.8617	2.258482	0	0
0.6135	5.4928	0.759904	1.8339	0.2455	37.44246	0	0
9.1357	8.5222	4.655563	11.1787	9.3448	8.882041	0	0
2.8535	6.2822	0.006777	3.9589	7.2198	0.731496	0	0
4.0414	1.1879	26.79744	9.4285	5.4696	0.80089	0	0
0.793	3.2484	9.710233	10.4523	1.0238	28.52334	0	0
0.7104	0.0826	39.46258	0.79	9.6623	10.87532	0	0
4.248	3.5376	7.991503	4.616	3.826	6.444108	0	0
6.127	1.879	20.11993	1.7436	2.8724	12.19493	0	0
4.7037	1.4233	24.4157	1.8736	0.13	38.8693	0	0
3.2816	1.4221	24.42758	3.2306	1.357	25.0753	0	0
20.0738	16.7922	108.7364	3.3338	0.1032	39.20419	0	0
6.3745	13.6993	53.79893	1.0707	2.2631	16.82168	0	0
8.0134	0.3611	36.04111	16.3429	15.2722	79.34668	0	0
4.8952	1.1182	27.52392	6.8717	9.4712	9.651431	0	0
35.786	30.8908	601.5382	14.1949	7.3232	0.919058	1	0
0.0203	35.7657	864.4291	4.4165	9.7784	11.65454	1	0
20.2619	20.2416	192.5732	5.7443	1.3278	25.3686	0	0
13.4183	6.8436	0.229513	14.8201	9.0758	7.351014	0	0
4.0551	9.3632	8.992054	12.7226	2.0975	18.2075	0	0
5.992	1.9369	19.60386	11.1368	1.5838	22.85533	0	0
8.9942	3.0022	11.30523	10.3301	0.8087	30.86719	0	0
11.5317	2.5375	14.64612	11.0538	0.7237	31.8189	0	0

1.5 Alpha=1.5							
10 Beta=10	MR	(MRI-MR)^2		MR	(MRI-MR)^2		
20.515			12.971	3.947	76.72082		0
6.824	13.691	0.970141	8.846	4.125	73.63429	0	0
32.822	25.998	176.6761	21.941	13.095	0.151288	0	0
44.674	11.852	0.729388	6.118	15.823	9.715425	0	0
3.596	41.078	804.968	14.533	8.415	18.41304	0	0
61.966	58.37	2085.197	9.372	5.161	56.92766	1	0
45.976	15.99	10.78438	25.31	15.938	10.44555	0	0
48.18	2.204	110.2929	53.487	28.177	239.3505	0	0
8.2	39.98	743.8688	7.264	46.223	1123.386	0	1
10.234	2.034	113.8925	7.493	0.229	155.6766	0	0
5.422	4.812	62.31591	5.651	1.842	118.0274	0	0
0.886	4.536	66.74959	6.082	0.431	150.6767	0	0
5.206	4.32	70.32571	23.477	17.395	21.98632	0	0
7.649	2.443	105.33	6.8	16.677	15.7685	0	0
31.152	23.503	116.5743	6.28	1.48	128.024	0	0
2.312	28.84	260.3046	8.127	0.153	157.5789	0	0
1.891	0.421	150.9223	4.588	3.539	84.03467	0	0
15.025	13.134	0.183148	45.755	41.167	810.0261	0	0
10.81	4.215	72.0978	46.665	0.91	139.1466	0	0
33.827	23.017	106.3158	13.702	32.963	410.3443	0	0
2.003	31.824	365.4963	32.225	18.523	33.837	0	0
2.182	0.179	156.9268	13.383	18.842	37.64998	0	0
3.434	1.252	131.1951	28.091	14.708	4.007834	0	0
14.451	11.017	2.852864	18.387	9.704	9.012259	0	0
5.445	9.006	13.69031	8.12	12.267	0.192758	0	0
1.004	4.441	68.31093	10.763	4.643	65.01265	0	0
4.324	3.32	88.09779	33.573	22.81	102.09	0	0
8.054	3.73	80.56934	10.387	23.186	109.8295	0	0
7.24	0.814	141.4207	70.109	69.722	2210.5	0	1
8.096	0.856	140.4235	41.799	28.31	243.4835	0	0
12.083	3.987	76.0217	13.403	28.396	246.1748	0	0
34.854	22.771	101.3034	10.151	3.252	89.37892	0	0
9.849	25.005	151.2644	11.965	1.814	118.6366	0	0
5.421	4.428	68.52599	14.059	2.094	112.6154	0	0
25.786	20.365	58.65963	21.996	7.937	22.74377	0	0
2.518	23.268	111.5549	1.107	20.889	66.9608	0	0
22.98	20.462	60.15488	3.828	2.721	99.70107	0	0
12.091	10.889	3.301643	7.758	3.93	77.01892	0	0
20.872	8.781	15.40596	24.431	16.673	15.73675	0	0
12.011	8.861	14.78435	10.967	13.464	0.5745	0	0
18.35	6.339	40.63923	11.354	0.387	151.7588	0	0
3.139	15.211	6.274813	15.406	4.051	74.90976	0	0
10.37	7.231	29.97609	27.618	12.213	0.243091	0	0
11.602	1.232	131.6536	11.886	15.732	9.156419	0	0
9.15	2.452	105.1454	3.442	8.444	18.16501	0	0
13.554	4.404	68.92391	5.067	1.625	122.7895	0	0
10.833	2.721	99.70107	18.35	13.283	0.33288	0	0
4.158	6.675	36.37347	12.516	5.834	47.22497	0	0
12.383	8.225	20.07974	13.686	1.17	133.0803	0	0
25.403	13.02	0.098569	4.808	9.078	13.16269	0	0
23.354	2.049	113.5728	9.637	5.029	58.93698	0	0
29.33	5.976	45.29347	18.267	8.63	16.61412	0	0
3.351	25.979	176.1714	11.455	6.812	34.73974	0	0
12.497	9.146	12.6739	4.744	6.711	35.94053	0	0
14.455	1.958	115.5204	7.235	2.491	104.3471	0	0
4.278	10.177	6.396055	10.803	3.568	83.50382	0	0
29.03	24.752	145.1051	7.691	3.112	92.04565	0	0
50.723	21.693	80.76541	23.552	15.861	9.953757	0	0
12.028	38.695	675.4259	55.832	32.28	383.1398	0	0
35.962	23.934	126.067	21.252	34.58	478.47	0	0
16.149	19.813	50.50885	15.556	5.696	49.14069	0	0
11.355	4.794	62.60042	17.05	1.494	125.7099	0	0
11.731	0.376	152.0299	22.965	5.915	46.11826	0	0
7.915	3.816	79.03285	36.882	13.917	1.466418	0	0
5.04	2.875	96.64939	27.244	9.638	9.412884	0	0
11.02	5.98	45.23965	7.249	19.995	53.1289	0	0
5.429	5.591	50.62383	25.559	18.31	31.40434	0	0
19.197	13.768	1.127754	10.751	14.808	4.418226	0	0
8.889	10.308	5.750607	11.891	1.14	133.7733	0	0
28.908	20.017	53.4501	31.406	19.515	46.3619	0	0
32.91	4.004	75.72554	6.427	24.979	150.6255	0	0
22.789	10.121	6.682444	29.26	22.833	102.5553	0	0
20.766	2.023	114.1274	11.44	17.82	26.15256	0	0
3.129	17.637	24.31434	5.135	6.305	40.97334	0	0

0.0016	0.91177	0.079422
0.75854	0.75694	0.016126
0.57006	0.18848	0.194896
1.4802	0.91014	0.078506
0.3857	1.0945	0.215807
0.24831	0.13739	0.242615
0.85496	0.60665	0.000543
0.21792	0.63704	5E-05
0.24021	0.02229	0.369251
0.53323	0.29302	0.113522
0.66347	0.13024	0.24971
0.54477	0.1187	0.261377
1.49204	0.94727	0.100692
0.33967	1.15237	0.272823
1.53458	1.19491	0.31918
0.12688	1.4077	0.604895
0.3837	0.25682	0.139226
0.17369	0.21001	0.17635
1.09075	0.91706	0.082432
0.8579	0.23285	0.157689
0.84547	0.01243	0.381331
2.65433	1.80886	1.389828
0.17073	2.4836	3.436018
1.04069	0.86996	0.057605
0.6907	0.34999	0.078378
3.7697	3.079	5.997845
0.37849	3.39121	7.624556
0.15436	0.22413	0.16469
0.10117	0.05319	0.332652
0.86985	0.76868	0.019246
0.27494	0.59491	0.001228
0.45232	0.17738	0.20482
0.89287	0.44055	0.035872
1.33565	0.44278	0.035033
0.43916	0.89649	0.071044
0.42429	0.01487	0.378324
0.58126	0.15697	0.22371
0.80901	0.22776	0.161765
3.85159	3.04258	5.820783
1.71492	2.13667	2.270205
1.20854	0.50638	0.01527
0.47934	0.7292	0.009851
0.05394	0.4254	0.041841
0.59857	0.54463	0.00728
0.57512	0.02345	0.367842
0.48892	0.0862	0.295664
0.26946	0.21946	0.168502
2.17922	1.90976	1.637913
0.19206	1.98716	1.842019
1.18614	0.99408	0.132591
0.64037	0.54577	0.007066
0.925	0.28463	0.119246
0.77458	0.15042	0.229949
1.15322	0.37864	0.063167
0.50354	0.64968	0.000389
0.17703	0.32651	0.092076

Sum X	5957.437	1493.681
X Average	0.745112	
MR Average	0.62995	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	2.420511	
Lower control limit for X (LCLx	-0.93029	
Upper control limit MR (UCLmr	2.058677	
MR Standard deviation	0.583067	
Process standard deviation	0.612372	
Gamma d2	1.028704	
Gamma d3	0.952177	
Gamma D4	3.776825	
1.5 Alpha=1.5		
0.5 Beta=0.5		
Proportion MR > UCLmr	0.030403	
Percentage	3.040304	
ARL for MR	32.89145	

0	1.0614	0.8187	0.189362
0	1.5135	0.4521	0.642816
0	0.4411	1.0724	0.032927
0	0.2911	0.15	1.218502
0	1.5841	1.293	0.001532
0	2.8301	1.246	6.2E-05
0	0.0119	2.8182	2.447166
0	2.1485	2.1366	0.779233
0	0.1828	1.9657	0.506719
0	0.5541	0.3713	0.778909
0	1.6375	1.0834	0.029056
0	2.299	0.6615	0.350888
0	1.999	0.3	0.909845
0	5.1584	3.1594	3.63109
0	0.4385	4.7199	12.01345
0	1.1477	0.7092	0.296652
0	0.8522	0.2955	0.91845
0	2.1599	1.3077	0.002899
0	1.243	0.9169	0.113541
0	0.1446	1.0984	0.024167
0	0.335	0.1904	1.130943
0	0.166	0.169	1.176917
1	0.8913	0.7253	0.279374
0	1.457	0.5657	0.473561
0	3.0771	1.6201	0.134133
1	2.8835	0.1936	1.124147
1	1.1726	1.7109	0.208887
0	1.6527	0.4801	0.598701
0	0.9997	0.653	0.36103
0	2.2391	1.2394	0.000209
0	1.5114	0.7277	0.276842
0	3.2384	1.727	0.223863
0	0.703	2.5354	1.64235
0	1.3488	0.6458	0.369734
0	1.1794	0.1694	1.176049
0	1.6635	0.4841	0.592527
0	0.8759	0.7876	0.217396
0	1.4134	0.5375	0.513169
1	1.4224	0.009	1.549671
1	0.9118	0.5106	0.552432
0	1.6581	0.7463	0.257615
0	0.838	0.8201	0.188146
0	1.457	0.619	0.403045
0	3.1495	1.6925	0.192407
0	0.6002	2.6493	1.947258
0	0.122	0.3782	0.766777
0	1.1251	1.0031	0.06288
0	0.7587	0.3684	0.784036
0	0.4598	0.2969	0.915769
0	2.2507	1.7909	0.288414
0	1.8965	0.3542	0.809384
0	0.2841	1.6124	0.128552
0	0.3047	0.0206	1.520925
0	0.3348	0.0301	1.497584
0	1.6301	1.2953	0.001717
0	1.0097	0.6204	0.401269
251	53		

Sum X	11894.7	3025.326
X Average	1.492002	
MR Average	1.253858	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	4.826731	
Lower control limit for X (LCLx	-1.84273	
Upper control limit MR (UCLmr	4.097608	
MR Standard deviation	1.148045	
Process standard deviation	1.224745	
Gamma d2	1.023771	
Gamma d3	0.937375	
Gamma D4	3.746831	
1.5 Alpha=1.5		
1 Beta=1		
Proportion MR > UCLmr	0.030103	
Percentage	3.010301	
ARL for MR	33.21927	

0	5.8529	1.3814	24.83153
0	2.0574	3.7955	6.599688
0	2.3579	0.3005	36.7724
0	15.1303	12.7724	41.06087
0	3.5529	11.5774	27.17407
0	9.7305	6.1776	0.034941
0	19.6814	9.9509	12.86209
0	5.0246	14.6568	68.76183
0	3.9202	1.1044	27.66891
0	19.0629	15.1427	77.05636
0	7.234	11.8289	29.8594
0	13.3741	6.1401	0.050366
0	12.0196	1.3545	25.10035
0	13.1518	1.1322	27.37722
1	3.9464	9.2064	8.070572
0	8.9793	5.0329	1.773224
0	9.7967	0.8174	30.77059
0	2.0922	7.7045	1.795534
0	3.1824	1.0902	27.8165
0	11.1565	7.9741	2.590733
0	19.7827	8.6262	5.115175
0	2.8746	16.9081	111.167
0	11.3847	8.5101	4.603493
0	8.7935	2.5912	14.23798
0	0.6146	8.1789	3.291958
0	11.0271	10.4125	16.3861
0	4.7896	6.2375	0.016135
0	2.9476	1.842	20.45323
0	15.5309	12.5833	38.67317
0	0.3406	15.1903	77.89431
0	1.641	1.3004	25.64536
0	13.3353	11.6943	28.4065
0	9.7819	3.5534	7.902422
0	7.8035	1.9784	19.23809
0	3.8585	3.945	5.8541
0	5.8192	1.9607	19.39367
0	3.5588	2.2604	16.84384
0	5.1847	1.6259	22.45456
0	9.6041	4.4194	3.78351
0	3.2515	6.3526	0.000142
0	13.1083	9.8568	12.19599
0	12.2112	0.8971	29.89273
0	1.4936	10.7176	18.94926
0	3.5336	2.04	18.70151
0	5.1041	1.5705	22.98267
0	10.3252	5.2211	1.30742
0	8.1404	2.1848	17.4701
0	1.7829	6.3576	4.9E-05
0	32.4394	30.6565	690.1001
0	1.3555	31.0839	611.0475
0	10.7671	9.4116	9.284668
0	10.2371	0.53	34.04166
0	5.274	4.9631	1.963991
0	8.485	3.211	9.944718
0	9.3693	0.8843	30.03286
0	15.0543	5.685	0.461754
238	63		

Sum X	60714.63	14813.31
X Average	7.552795	
MR Average	6.364525	
Normal constant d2 (n=2)	1.128	
Normal con*ant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	24.47972	
Lower control limit for X (LCLx	-9.37413	
Upper control limit MR (UCLmr	20.79927	
MR Standard deviation	5.814637	
Process standard deviation	6.123724	
Gamma d2	1.039323	
Gamma d3	0.949526	
Gamma D4	3.740803	
1.5 Alpha=1.5		
5 Beta=5		
Proportion MR > UCLmr	0.028803	
Percentage	2.880288	
ARL for MR	34.71875	

0	2.149	0.748	142.9946
0	5.674	3.525	84.29154
0	5.886	0.212	156.1011
0	63.996	58.11	2061.519
0	27.63	36.366	559.7936
0	12.004	15.626	8.526152
0	5.273	6.731	35.70113
0	23.137	17.864	26.60453
0	31.635	8.498	17.70762
0	8.413	23.222	110.5854
0	5.033	3.38	86.97507
0	0.589	4.444	68.26134
0	1.428	0.839	140.8267
0	2.504	1.076	135.2579
0	9.685	7.181	30.52609
0	18.082	8.397	18.56785
0	4.134	13.948	1.542459
0	4.806	0.674	144.77
0	27.68	22.872	103.3467
0	10.534	17.146	19.71322
0	3.847	6.687	36.22887
0	2.818	1.029	136.3533
0	4.456	1.638	122.5016
0	13.194	8.738	15.74536
0	19.216	6.022	44.67642
0	26.184	6.968	32.92513
0	11.545	14.639	3.736325
0	5.443	6.102	43.61338
0	6.688	1.245	131.3555
0	9.517	2.829	97.55597
0	1	8.517	17.54808
0	11.869	10.869	3.374725
0	39.98	28.111	237.3127
0	28.154	11.826	0.774475
0	49.722	21.568	78.53429
0	19.656	30.066	301.3681
0	15.224	4.432	68.45978
0	8.963	8.261	19.7584
0	15.718	8.753	15.62654
0	48.849	33.133	417.2606
0	11.271	37.578	618.6143
0	4.054	7.217	30.12959
0	5.04	0.986	137.3594
0	21.566	16.526	14.59208
0	41.609	20.043	53.83095
0	2.317	39.292	706.8131
0	15.494	13.177	0.221801
0	37.879	22.385	93.68222
1	3.531	34.348	468.3743
1	5.103	1.572	123.9669
0	13.769	8.666	16.32194
0	19.281	5.512	51.75425
0	7.007	12.274	0.186661
0	16.795	9.788	8.514971
0	39.344	22.549	96.88361
0	9.024	30.32	310.2515
229	59		

Sum X	119645.3	30640.45
X Average	15.02858	
MR Average	12.70604	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	48.82124	
Lower control limit for X (LCLx	-18.7641	
Upper control limit MR (UCLmr	41.52335	
MR Standard deviation	11.81534	
Process standard deviation	12.24745	
Gamma d2	1.037444	
Gamma d3	0.964719	
Gamma D4	3.789698	
1.5 Alpha=1.5		
10 Beta=10		
Proportion MR > UCLmr	0.030103	
Percentage	3.010301	
ARL for MR	33.21927	

2	Alpha=2						
0.5	Beta=0.5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
	1.14592			0.53665	0.70971	0.00065	
	0.507	0.63892	0.00927	1.42928	0.89263	0.024785	0
	1.96461	1.45761	0.521878	1.28121	0.14807	0.34472	0
	1.51783	0.44678	0.083185	2.20389	0.92268	0.035149	0
	0.77552	0.74231	5.1E-05	0.51113	1.69276	0.916924	0
	0.33629	0.43923	0.087597	0.52713	0.016	0.517247	0
	0.29226	0.04403	0.477714	1.94762	1.42049	0.469624	0
	0.67991	0.38765	0.12079	0.77296	1.17466	0.193126	0
	0.59086	0.08905	0.417508	0.39667	0.37629	0.128815	0
	0.03161	0.55925	0.030958	0.092	0.30467	0.185355	0
	0.70344	0.67183	0.004016	0.73533	0.64333	0.00844	0
	0.6277	0.07574	0.434886	2.11478	1.37945	0.41506	0
	2.13236	1.50466	0.592071	0.40691	1.70787	0.946089	0
	1.36036	0.772	0.001354	0.16493	0.22198	0.263393	0
	0.45386	0.9065	0.029344	0.26685	0.08192	0.426773	0
	0.45176	0.0021	0.537434	0.24741	0.01944	0.512311	0
	0.55373	0.10197	0.400979	0.32642	0.07901	0.430584	0
	0.65759	0.10386	0.398589	0.60426	0.27784	0.209177	0
	0.82748	0.16989	0.319574	0.32289	0.28137	0.20596	0
	1.89111	1.06363	0.107887	0.30961	0.01328	0.521167	0
	0.55711	1.334	0.358563	1.10381	0.7942	0.003481	0
	1.0626	0.52549	0.043978	0.36139	0.74242	5.2E-05	0
	1.24332	0.16072	0.330026	1.37568	1.01429	0.077892	0
	0.10024	1.14306	0.166367	1.60878	0.2331	0.252103	0
	1.27144	1.1712	0.190097	3.9339	2.32512	2.52785	0
	0.69941	0.37203	0.131892	0.20074	3.73316	8.987772	0
	0.24844	0.65097	0.007094	0.79551	0.59477	0.01972	0
	0.36229	0.11385	0.386074	1.70679	0.91128	0.031005	0
	0.31208	0.05021	0.46921	0.37969	1.3271	0.350347	0
	1.19	0.87792	0.020369	0.9073	0.52761	0.043093	0
	1.48402	0.29402	0.194639	0.56437	0.34293	0.153875	0
	0.78971	0.69431	0.001672	0.69117	0.1268	0.370149	0
	1.16667	0.37696	0.128335	0.54107	0.1501	0.34234	0
	1.79678	0.63011	0.011044	1.65817	1.1171	0.145849	0
	0.49117	1.30561	0.325369	1.40307	0.2551	0.230495	0
	1.22667	0.7355	9.1E-08	1.09228	0.31079	0.180123	0
	0.60346	0.42321	0.097337	0.73969	0.35259	0.146389	0
	0.65942	0.05596	0.461365	1.09104	0.35135	0.14734	0
	0.42042	0.439	0.087734	0.26311	0.82793	0.008599	0
	2.2199	1.79948	1.132695	0.18371	0.0794	0.430072	0
	0.96019	1.25971	0.275112	0.21645	0.03274	0.493448	0
	0.93979	0.0204	0.510937	1.01016	0.79371	0.003424	0
	1.98921	1.04942	0.098735	1.57462	0.56446	0.029152	0
	1.94906	0.04015	0.483093	0.20136	1.37326	0.407122	0
	0.63006	1.119	0.147303	0.4737	0.27234	0.214238	0
	0.13089	0.69917	0.001298	0.8696	0.3961	0.114988	0
	0.36347	0.23258	0.252626	1.5579	0.6881	0.002218	0
	0.54269	0.17922	0.309112	0.33625	1.22165	0.236635	0
	0.99887	0.45618	0.077851	1.08401	0.74776	0.000158	0
	0.67395	0.32492	0.168329	0.59584	0.48817	0.061023	0
	0.55961	0.11434	0.385466	0.17414	0.4217	0.098281	0
	0.29544	0.26417	0.221868	0.58456	0.41042	0.105481	0
	1.48479	1.18935	0.206253	1.84034	1.25578	0.271005	0
	2.17713	0.69234	0.001837	0.83284	1.0075	0.074148	0
	2.07416	0.10297	0.399713	2.31766	1.48482	0.561932	0
	0.74309	1.33107	0.355063	0.42319	1.89447	1.34391	0
	0.11982	0.62327	0.012528	1.42725	1.00406	0.072286	0
	1.04636	0.92654	0.036611	0.8237	0.60355	0.017331	0
	0.267	0.77936	0.00195	0.90831	0.08461	0.423266	0
	0.61687	0.34987	0.148478	0.52452	0.38379	0.123488	0
	0.37582	0.24105	0.244163	0.5653	0.04078	0.482217	0
	1.612	1.23618	0.250982	1.98087	1.41557	0.462905	0
	1.16662	0.44538	0.083995	0.64681	1.33426	0.358874	0
	0.68473	0.48189	0.064165	0.78561	0.139	0.355453	0
	0.95824	0.27351	0.213156	0.63396	0.15165	0.340529	0
	1.6932	0.73496	5.7E-08	1.06299	0.42903	0.093739	0
	1.18949	0.50371	0.053587	0.39389	0.6691	0.004369	0
	0.26123	0.92826	0.037273	1.10697	0.71306	0.000489	0
	0.70442	0.44319	0.085269	0.63189	0.47508	0.067662	0
	0.39066	0.31376	0.177611	0.21448	0.41741	0.10099	0
	0.57023	0.17957	0.308723	0.31516	0.10068	0.402614	0
	1.6794	1.10917	0.139855	0.55137	0.23621	0.24899	0
	0.89018	0.78922	0.002918	0.63762	0.08625	0.421134	0
	0.43255	0.45763	0.077044	0.85741	0.21979	0.265646	0

2	Alpha=2						
1	Beta=1	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	4.2317			0.8358	0.8245	0.453017	
0	4.1794	0.0523	2.088791	0.2339	0.6019	0.802216	0
0	0.5677	3.6117	4.469566	1.3093	1.0754	0.178223	0
0	5.7625	5.1948	13.66955	0.503	0.8063	0.477847	1
0	2.185	3.5775	4.326129	2.3796	1.8766	0.143667	0
0	3.9743	1.7893	0.085109	4.5914	2.2118	0.510131	0
0	6.3683	2.394	0.803596	1.7329	2.8585	1.852144	0
0	3.2771	3.0912	2.539672	4.4188	2.6859	1.41214	0
0	2.5168	0.7603	0.54356	0.7732	3.6456	4.614054	0
0	3.198	0.6812	0.666452	0.5889	0.1843	1.724665	0
0	1.4661	1.7319	0.054913	0.268	0.3209	1.384541	0
0	2.0956	0.6295	0.753537	1.5082	1.2402	0.066237	0
0	1.9507	0.1449	1.829703	0.68	0.8282	0.44805	0
0	0.5543	1.3964	0.010234	0.5582	0.1218	1.89273	0
0	3.3531	2.7988	1.693212	1.1226	0.5644	0.870797	0
0	0.1378	3.2153	2.950613	3.9492	2.8268	1.766334	0
0	2.9486	2.8108	1.724586	0.4304	3.5188	4.085391	0
0	4.724	1.7754	0.077192	2.4314	2.001	0.253447	0
0	1.1446	3.5794	4.334037	2.8441	0.4127	1.176932	0
0	1.9522	0.8076	0.476052	0.839	2.0051	0.257592	0
0	1.05	0.9022	0.35446	1.0777	0.2387	1.584741	0
0	1.5366	0.4866	1.02205	1.4385	0.3608	1.292235	0
0	4.569	3.0324	2.355718	3.2787	1.8402	0.117399	0
0	3.543	1.026	0.222374	1.075	2.2037	0.498627	0
0	2.8751	0.6679	0.688344	0.2431	0.8319	0.44311	0
1	0.5773	2.2978	0.640376	2.4937	2.2506	0.567062	0
0	1.0341	0.4568	1.083192	1.383	1.1107	0.149665	0
0	1.4777	0.4436	1.110842	1.5847	0.2017	1.679266	0
0	0.3738	1.1039	0.154972	2.4564	0.8717	0.391707	0
0	1.7304	1.3566	0.019871	1.4357	1.0207	0.2274	0
0	0.4011	1.3293	0.028313	1.8291	0.3934	1.219181	0
0	2.1747	1.7736	0.076195	0.4538	1.3753	0.014949	0
0	3.5984	1.4237	0.005456	1.4083	0.9545	0.29492	0
0	3.575	0.0234	2.173163	3.5162	2.1079	0.372509	0
0	1.811	1.764	0.070988	0.8213	2.6949	1.433611	0
0	2.5827	0.7717	0.52688	0.714	0.1073	1.932837	0
0	0.4852	2.0975	0.359922	1.851	1.137	0.130007	0
0	1.1336	0.6484	0.721081	3.4411	1.5901	0.008563	0
0	2.1336	1	0.247571	1.6794	1.7617	0.069767	0
0	1.1177	1.0159	0.232001	1.7907	0.1113	1.921731	0
0	2.2486	1.1309	0.134443	0.6461	1.1446	0.124584	0
0	1.6795	0.5691	0.862047	0.4246	0.2215	1.628342	0
0	0.8995	0.98	0.267674	2.506	2.0814	0.340863	0
0	3.8056	3.1061	2.587385	1.4143	1.0917	0.164726	0
0	3.0026	0.8028	0.482699	0.5185	0.8958	0.362121	0
0	1.9368	1.064	0.187979	0.9555	0.437	1.124798	0
0	0.9233	1.0155	0.232387	1.517	0.5615	0.876218	0
0	0.894	0.0293	2.155802	1.0996	0.4174	1.166757	0
0	1.3861	0.4921	1.01096	2.0306	0.931	0.320996	0
0	2.1668	0.7807	0.513896	2.2136	0.183	1.728081	0
0	5.2003	3.0335	2.359096	2.1562	0.0574	2.074076	0
0	2.2658	2.9345	2.064782	4.7162	2.56	1.128768	0
0	1.4493	0.8165	0.46385	3.0947	1.6216	0.01536	0
0	1.1014	0.3479	1.32173	0.6718	2.4229	0.856245	0
0	1.328	0.2266	1.615352	2.9112	2.2394	0.550319	0
0	3.1272	1.7992	0.090984	1.0955	1.8157	0.10121	0
0	1.776	1.3512	0.021423	1.1496	0.0541	2.083591	0
0	2.8344	1.0584	0.192866	0.338	0.8116	0.470548	0
0	2.4036	0.4308	1.137988	0.4653	0.1273	1.877626	0
0	0.2424	2.1612	0.440411	1.3187	0.8534	0.414949	0
0	0.5921	0.3497	1.317594	3.6266	2.3079	0.656643	0
0	3.4299	2.8378	1.79623	1.0673	2.5593	1.127281	0
0	0.2748	3.1551	2.747422	3.441	2.3737	0.767612	0
0	2.3934	2.1186	0.385684	1.5149	1.9261	0.183642	0
0	4.7736	2.3802	0.779044	1.3833	0.1316	1.865861	0
0	1.7471	3.0265	2.337842	0.314	1.0693	0.183411	0
0	6.3969	4.6498	9.936585	2.478	2.164	0.444135	0
0	1.2441	5.1528	13.36074	0.8304	1.6476	0.02251	1
0	1.8458	0.6017	0.802574	2.2975	1.4671	0.000928	0
0	4.4659	2.6201	1.260085	1.3667	0.9308	0.321223	0
0	1.8701	2.5958	1.20612	1.9377	0.571	0.858523	0
0	0.7832	1.0869	0.168646	4.2608	2.3431	0.714929	0
0	1.6565	0.8733	0.389707	1.8292	2.4516	0.910183	0
0	1.6502	0.0063	2.223872	0.5474	1.2818	0.046555	0

2	Alpha=2						
5	Beta=5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	15.9316			3.8634	2.7235	21.36238	
0	4.518	11.4136	16.54988	10.3055	6.4421	0.816033	0
0	5.8513	1.3333	36.14589	5.5256	4.7799	6.582024	0
0	8.9755	3.1242	17.81891	18.6868	13.1612	33.823	0
0	10.1529	1.1774	38.04479	20.2654	1.5786	33.25651	0
0	9.6289	0.524	46.53212	12.7472	7.5182	0.029844	0
0	19.9713	10.3424	8.981736	26.8141	14.0669	45.17795	0
0	8.8675	11.1038	14.12523	5.2641	21.55	201.7694	0
0	8.245	0.6225	45.198	8.7798	3.5157	14.66695	0
0	10.7149	2.4699	23.77094	5.6848	3.095	18.06629	0
0	7.7562	2.9587	19.24354	4.4934	1.1914	37.87228	0
0	2.5191	5.2371	4.445121	3.6799	0.8135	42.66631	0
0	9.2961	6.777	0.32313	2.0722	1.6077	32.92172	0
0	8.7118	0.5843	45.71309	1.2306	0.8416	42.30001	0
0	10.2196	1.5078	34.07811	5.5898	4.3592	8.917663	0
0	23.9577	13.7381	40.86603	5.9429	0.3531	48.8929	0
0	6.0101	17.9476	112.4057	7.3949	1.452	34.7327	0
0	2.6049	3.4052	15.52554	9.5567	2.1618	26.87018	0
0	9.1572	6.5523	0.62908	20.5743	11.0176	13.48472	0
0	1.8832	7.274	0.005104	4.4009	16.1734	77.93278	0
0	4.5207	2.6375	22.16475	15.2415	10.8406	12.2161	0
0	16.4326	11.9119	20.85251	10.2442	4.9973	5.513788	0
0	12.2349	4.1977	9.908302	0.5096	9.7346	5.708059	0
0	8.9495	3.2854	16.48397	6.4486	5.939	1.978089	0
0	9.0505	0.101	52.48199	7.8479	1.3993	35.35665	0
0	4.6033	4.4472	8.399828	17.8343	9.9864	6.97464	0
0	2.3117	2.2916	25.54136	21.6355	3.8012	12.56168	0
0	18.8763	16.5646	84.99281	9.142	12.4935	26.50246	0
0	4.8056	14.0707	45.22905	10.2818	1.1398	38.51004	0
0	8.1334	3.3278	16.14148	10.7252	0.4434	47.63823	0
0	10.1163	1.9629	28.7569	14.1018	3.3788	15.75174	0
0	8.4563	1.66	32.32429	3.2729	10.8289	12.13445	0
0	11.8484	3.3921	15.62894	22.9335	19.6606	151.663	0
0	1.5475	10.3009	6.734711	7.1561	15.7774	71.09786	0
0	13.681	12.1335	22.92546	29.2668	22.1105	218.0068	0
0	12.0801	1.6009	32.9998	12.4177	16.8489	90.31565	0
0	9.0571	3.023	18.68354	5.5859	6.8318	0.263832	0
0	10.5222	1.4651	34.57846	14.1624	6.5985	1.565137	0
0	13.4731	2.9509	19.31203	5.2615	8.9209	2.482057	0
0	10.6587	2.8144	20.53037	23.2257	17.9642	112.7579	0
0	12.6501	1.9914	28.6658	18.9386	4.2871	9.353478	0
0	14.1132	1.4631	34.60199	15.1517	3.7869	12.86325	0
0	13.9723	0.1409	51.90548	11.0193	4.1324	10.32366	0
0	3.0895	10.8828	12.51288	4.2362	6.7831	0.316233	0
0	10.3127	7.2232	0.014944	8.5207	4.2845	9.369388	0
0	21.7821	11.4694	17.007	7.4471	1.0736	39.33605	0
0	5.6666	16.1155	76.91385	30.6215	23.1744	250.5558	0
0	12.5047	6.8381	0.2574	5.0061	25.6164	333.6276	0
0	3.5056	8.9991	2.734573	12.2186	7.2135	0.01741	0
0	8.8406	5.335	4.041891	7.4056	4.813	6.413281	0
0	7.4437	1.3969	35.38519	6.2394	1.1662	38.18308	0
0	12.7164	5.2727	4.296274	29.6202	23.3808	257.1326	0
0	17.1811	4.4647	8.298695	4.137	25.4832	328.9781	0
0	13.1846	3.9965	11.21544	4.2776	0.1406	51.9098	0
0	9.8279	3.3567	15.91009	17.6433	13.3657	36.24346	0
0	10.4568	0.6289	45.11198	15.8905	1.7528	31.27768	0
0	24.5105	14.0537	45.00068	8.2427	7.6478	0.091416	0
0	6.3665	18.144	116.6088	10.8088	2.5661	22.84214	0
0	5.29	1.0765	39.29968	22.2817	11.4729	17.03588	0
0	6.9332	1.6432	32.5156	10.2618	12.0199	21.85052	0
0	4.4951	2.4381	24.08204	2.0133	8.2485	0.815507	0
0	6.5047	2.0096	28.47125	1.9487	0.0646	53.01071	0
0	20.011	13.5063	37.95613	9.5188	7.5701	0.05047	0
0	4.5385	15.4725	66.04901	6.0385	3.4803	14.93935	0
0	5.0287	0.4902	46.99439	3.9858	2.0527	28.01316	0
0	17.8355	12.8068	29.82639	2.0178	1.968	28.91692	0
0	15.4918	2.3437	25.01748	12.2822	10.2644	8.520295	0
0	20.0829	4.5911	7.58842	24.1637	11.8815	20.57579	0
0	6.0459	14.037	44.7769	8.5921	15.5716	67.66962	0
0	12.3567	6.3108	1.070492	1.9089	6.6832	0.438569	0
0	13.1426	0.7859	43.02764	2.3259	0.417	48.00336	0
0	9.687	3.4556	15.1309	9.7429	7.417	0.00512	0
0	5.8677	3.8193	12.4337	14.5962	4.8533	6.21079	0
0	15.3944	9.5267	4.757871	4.6069	9.9893	6.989966	0

2	Alpha=2							
10	Beta=10	MR	(MRi-MR)^2		MR	(MRi-MR)^2		
0	41.069			13.8359	60.6241	2063.85		1
0	13.849	27.22	144.613	10.3971	3.4388	138.1961	0	0
0	4.417	9.432	33.20622	4.7	5.6971	90.20031	0	0
0	19.127	14.71	0.234725	14.6802	9.9802	27.18876	0	0
0	41.036	21.909	45.08472	26.3501	11.6699	12.42269	0	0
0	11.663	29.373	201.0303	3.1812	23.1689	63.59131	0	0
0	11.125	0.538	214.8125	11.5037	8.3225	47.22417	0	0
0	8.012	3.113	145.9623	34.4246	22.9209	59.6975	0	0
0	12.762	4.75	109.0872	10.3638	24.0608	78.61156	0	0
0	13.797	1.035	200.491	21.277	10.9132	18.32939	0	0
0	5.615	8.182	49.17493	16.7963	4.4807	114.7852	0	0
0	31.525	25.91	114.8223	6.5761	10.2202	24.7435	0	0
0	18.87	12.655	6.44898	12.5733	5.9972	84.59004	0	0
0	19.261	0.391	219.1431	96.575	84.0017	4734.433	0	1
0	9.985	9.276	35.02845	31.6899	64.8851	2469.157	0	1
0	29.479	19.494	18.48584	52.2248	20.5349	28.52004	0	0
0	20.012	9.467	32.80407	28.3804	23.8444	74.82104	0	0
0	16.862	3.15	145.0696	38.9503	8.5699	43.88512	0	0
0	1.569	15.293	0.009705	25.7368	11.2135	15.84823	0	0
0	13.555	11.986	10.29437	19.5467	6.1901	81.07893	0	0
0	15.444	1.889	177.0359	9.8771	9.6696	30.52435	0	0
0	17.81	2.366	164.57	28.8578	18.9807	14.33543	0	0
0	18.813	1.003	201.3982	4.5704	24.2874	82.68112	0	0
0	1.978	16.835	2.691292	24.7388	20.1684	24.73984	0	0
0	12.091	10.113	25.82148	52.7282	27.9694	163.7099	0	0
0	23.05	10.959	17.93933	19.6506	33.0776	319.8058	0	0
0	41.707	18.657	11.98902	6.7612	12.8894	5.313413	0	0
0	52.223	10.516	21.88821	23.2351	16.4739	1.636905	0	0
0	8.695	43.528	802.7881	16.0731	7.162	64.5208	0	0
0	33.149	24.454	85.73863	27.3349	11.2618	15.466	0	0
0	45.221	12.072	9.749907	14.0693	13.2456	3.79815	0	0
0	11.537	33.684	341.8622	8.2125	5.8768	88.81924	0	0
0	7.238	4.299	118.7116	7.3022	0.9103	204.0379	0	0
0	4.263	2.975	149.3158	30.7399	23.4377	67.95061	0	0
0	30.978	26.715	132.7223	10.9493	19.7906	21.12428	0	0
0	29.646	1.332	192.1685	9.9249	1.0244	200.7913	0	0
0	8.216	21.43	38.88166	18.9084	8.9635	38.57632	0	0
0	30.404	22.188	48.90926	8.4034	10.505	21.99126	0	0
0	59.666	29.262	197.895	35.5554	27.152	142.9822	0	0
0	30.491	29.175	195.4548	11.5082	24.0472	78.37058	0	0
0	7.127	23.364	66.74099	7.9173	3.5909	134.6432	0	0
0	12.17	5.043	103.0526	8.9707	1.0534	199.9703	0	0
0	13.167	0.997	201.5686	5.204	3.7667	130.5943	0	0
0	9.736	3.431	138.3796	8.5964	3.3924	139.2892	0	0
0	35.188	25.452	105.2166	13.7161	5.1197	101.5013	0	0
0	16.812	18.376	10.12204	15.8412	2.1251	170.8088	0	0
0	17.779	0.967	202.4213	23.6986	7.8574	53.8328	0	0
1	14.795	2.984	149.0959	7.0615	16.6371	2.08114	0	0
0	2.954	11.841	11.24586	9.6476	2.5861	158.9714	0	0
0	16.575	13.621	2.475852	4.3374	5.3102	97.69907	0	0
0	20.691	4.116	122.7328	19.7571	15.4197	0.050722	0	0
0	2.532	18.159	6.788354	17.1186	2.6385	157.6527	0	0
1	6.889	4.357	117.4511	5.3704	11.7482	11.87687	0	0
0	2.181	4.708	109.9664	38.215	32.8446	311.5266	0	0
0	23.097	20.916	32.73574	14.6026	23.6124	70.86131	0	0
0	11.573	11.524	13.47245	26.9711	12.3685	7.986187	0	0
0	8.787	2.786	153.9705	21.4979	5.4732	94.50337	0	0
0	21.226	12.439	7.592693	13.4622	8.0357	51.24819	0	0
0	15.657	5.569	92.64995	19.1795	5.7173	89.81702	0	0
0	11.404	4.253	119.7161	13.9285	5.251	98.87288	0	0
0	31.06	19.646	19.81599	37.5313	23.6028	70.69978	0	0
0	5.068	25.982	116.3705	31.2368	6.2945	79.20972	0	0
0	28.231	23.163	63.49724	22.7526	8.4843	45.02657	0	0
0	4.289	23.942	76.51903	16.4636	6.2889	79.30943	0	0
0	20.592	16.303	1.226807	2.4104	14.0532	1.30253	0	0
0	24.819	4.227	120.2857	8.7773	6.3669	77.92624	0	0
0	10.494	14.325	0.756003	29.1945	20.4172	27.27676	0	0
0	17.372	6.878	69.16391	20.1367	9.0578	37.65889	0	0
0	7.271	10.101	25.94358	18.443	1.6937	182.2712	0	0
0	5.956	1.315	192.6401	16.5779	1.8651	177.6725	0	0
0	8.949	2.993	148.8762	14.2711	2.3068	166.0924	0	0
0	44.787	35.838	426.1547	6.5349	7.7362	55.626	0	0
0	15.094	29.693	210.207	15.5989	9.064	37.58284	0	0
0	30.095	15.001	0.037436	15.4557	0.1432	226.5412	0	0

1.76092	0.21436	0.271273
1.31633	0.44459	0.084453
1.85563	0.5393	0.038376
0.79604	1.05959	0.10523
1.43775	0.64171	0.00874
0.7017	0.73605	7.2E-07
1.24505	0.54335	0.036806
1.31938	0.07433	0.436747
0.67127	0.64811	0.007564
0.57505	0.09622	0.408294
1.63525	1.0602	0.105626
0.96908	0.66617	0.004765
0.56465	0.40443	0.109408
0.8341	0.26945	0.216922
1.04715	0.21305	0.272639
1.44734	0.40019	0.112231
0.31845	1.12889	0.154993
0.23343	0.08502	0.422732
0.56544	0.33201	0.162561
1.78874	1.2233	0.238243
0.58918	1.19956	0.215631
1.22973	0.64055	0.008958
0.61256	0.61717	0.013931
1.18347	0.57091	0.026991
0.59059	0.59288	0.020255
1.01635	0.42576	0.095752
0.87289	0.14346	0.350155
0.10712	0.76577	0.000935
0.66898	0.56186	0.030046
0.7797	0.11072	0.389974
0.44147	0.33823	0.157584
1.83396	1.39249	0.432032
0.22124	1.61272	0.770044
0.72997	0.50873	0.051288
0.67822	0.05175	0.467102
0.55818	0.12004	0.37842
0.78741	0.22923	0.256004
0.14048	0.64693	0.007791
1.46323	1.32275	0.345217
0.90192	0.56131	0.030237
1.23725	0.33533	0.159895
0.86376	0.37349	0.130833
1.59055	0.72679	7.1E-05
0.11455	1.476	0.548787
0.99247	0.87792	0.020369
1.48641	0.49394	0.058208
0.63539	0.85102	0.013415
0.46756	0.16783	0.321907
0.08155	0.38601	0.121933
0.03398	0.04757	0.472833
1.36929	1.33531	0.360134
0.31496	1.05433	0.101845
1.16704	0.85208	0.013861
2.57829	1.41125	0.457045
3.03371	0.45542	0.078276
1.24636	1.78735	1.107022

Sum X	7972.997	1998.12
X Average	0.997112	
MR Average	0.735199	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	2.952427	
Lower control limit for X (LCLx	-0.9582	
Upper control limit MR (UCLmr	2.402629	
MR Standard deviation	0.640616	
Process standard deviation	0.707107	
Gamma d2	1.039728	
Gamma d3	0.905968	
Gamma D4	3.614053	
2 Alpha=2		
0.5 Beta=0.5		
Proportion MR > UCLmr	0.022002	
Percentage	2.20022	
ARL for MR	45.45	

0	3.1981	0.159	1.791757
0	1.2343	1.9638	0.217375
0	1.8901	0.6558	0.708568
0	0.0268	1.8633	0.133762
0	1.8897	1.8629	0.13347
0	3.0216	1.1319	0.133711
0	0.2724	2.7492	1.56659
0	0.8646	0.5922	0.819686
0	3.6849	2.8203	1.749628
0	1.3329	2.352	0.730059
0	1.2939	0.039	2.127412
0	0.2606	1.0333	0.215542
0	3.4661	3.2055	2.917042
0	1.2857	2.1804	0.466264
0	2.1711	0.8854	0.374746
0	2.4922	0.3211	1.38407
0	2.0153	0.4769	1.041757
0	2.5261	0.5108	0.973705
0	3.4093	0.8832	0.377444
0	5.2056	1.7963	0.089243
0	2.807	2.3986	0.811864
0	0.4505	2.3565	0.737769
0	2.8689	2.4184	0.847937
0	6.641	3.7721	6.173509
0	1.833	4.808	10.95898
0	3.3611	1.5281	0.000932
0	4.2909	0.9298	0.322357
0	0.3397	3.9512	6.020324
0	2.2097	1.87	0.138708
0	3.7266	1.5169	0.000374
0	0.4663	3.2603	3.107234
0	1.5604	1.0941	0.162784
0	1.6799	0.1195	1.899063
0	1.8047	0.1248	1.884484
0	4.0544	2.2497	0.565707
0	5.2976	1.2432	0.064702
0	0.1466	5.151	13.34759
0	0.7806	0.634	0.745745
0	2.8384	2.0578	0.313863
0	0.6645	2.1739	0.457429
0	0.4844	0.1801	1.735714
0	3.5383	3.0539	2.422178
0	0.3131	3.2252	2.984722
0	2.9593	2.6462	1.319362
0	2.1775	0.7818	0.51232
0	3.9934	1.8159	0.101337
0	2.2887	1.7047	0.042905
0	4.8982	2.6095	1.236399
0	0.884	4.0142	6.333451
0	1.008	0.124	1.886681
0	4.6298	3.6218	4.512374
0	0.8728	3.757	5.105046
0	2.3595	1.4867	0.000118
0	4.6514	2.2919	0.630968
0	1.0574	3.594	4.395039
0	1.6603	0.6029	0.800426
177	43		

Sum X	15756.53	3868.599
X Average	1.962513	
MR Average	1.497565	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	5.945399	
Lower control limit for X (LCLx	-2.02037	
Upper control limit MR (UCLmr	4.894043	
MR Standard deviation	1.325774	
Process standard deviation	1.414214	
Gamma d2	1.058938	
Gamma d3	0.937464	
Gamma D4	3.65586	
2 Alpha=2		
1 Beta=1		
Proportion MR > UCLmr	0.027103	
Percentage	2.710271	
ARL for MR	36.89658	

0	16.3204	9.3427	3.989025
0	6.7884	9.532	4.78102
0	10.6708	3.8824	11.99268
0	22.1041	11.4333	16.71055
0	18.4468	3.6573	13.60242
0	16.8171	1.6297	32.66975
0	4.7697	12.0474	22.10838
0	12.4005	7.6308	0.081427
0	0.8046	11.5959	18.06636
0	20.5349	19.7303	153.3846
0	11.9881	8.5468	1.443252
0	23.6869	11.6988	18.95169
0	5.9632	17.7237	107.7082
0	8.2003	2.2371	26.09519
0	14.0266	5.8263	2.307803
0	15.9795	1.9529	29.07955
0	12.3757	3.6038	13.99991
0	0.6054	11.7703	19.57934
0	7.836	7.2306	0.01319
0	20.5912	12.7552	29.26544
0	5.7443	14.8469	56.27182
0	23.8637	18.1194	116.0781
0	13.1698	10.6939	11.21215
0	13.365	0.1952	51.12601
0	7.9035	5.4615	3.549251
0	3.8041	4.0994	10.53681
0	7.8234	4.0193	11.08324
0	24.5469	16.7235	87.9479
0	9.0947	15.4522	65.71947
0	7.837	1.2577	37.06065
0	23.127	15.29	63.11594
0	1.3369	21.7901	208.648
0	8.734	7.3971	0.002668
0	12.595	3.861	12.14136
0	10.5363	2.0587	27.94968
0	1.4578	9.0785	3.003478
1	3.6532	2.1954	26.52297
0	8.7934	5.1402	4.863108
0	21.588	12.7946	29.69328
0	22.9703	1.3823	35.55911
0	4.338	18.6323	127.3931
0	19.2767	14.9387	57.65751
0	7.828	11.4487	16.8367
0	4.0531	3.7749	12.7488
0	9.5669	5.5138	3.354926
0	15.5115	5.9446	1.962368
0	13.337	2.1745	26.73868
0	15.0864	1.7494	31.31573
0	15.4657	0.3793	48.52718
0	5.7328	9.7329	5.699939
0	7.2678	1.535	33.76128
0	7.4703	0.2025	51.02167
0	1.3445	6.1258	1.487535
0	2.0177	0.6732	44.51886
0	8.1477	6.13	1.477308
0	6.5869	1.5608	33.46212
207	64		

Sum X	79444.32	19578.22
X Average	9.902254	
MR Average	7.345446	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	29.43801	
Lower control limit for X (LCLx	-9.63351	
Upper control limit MR (UCLmr	24.00492	
MR Standard deviation	6.437374	
Process standard deviation	7.071068	
Gamma d2	1.038803	
Gamma d3	0.910382	
Gamma D4	3.629129	
2 Alpha=2		
5 Beta=5		
Proportion MR > UCLmr	0.025203	
Percentage	2.520252	
ARL for MR	39.67857	

0	6.78	9.159	36.42707
0	12.888	6.108	82.56419
0	8.542	4.346	117.6896
0	4.198	4.344	117.733
0	18.252	14.054	1.300704
0	18.766	0.514	215.5168
0	10.773	7.993	51.86137
0	52.707	41.934	715.0017
0	14.675	38.032	521.5521
0	42.513	27.838	159.8585
0	17.887	24.626	88.95349
0	12.317	5.57	92.6307
0	15.263	2.946	150.0254
0	33.68	18.417	10.38461
0	13.789	19.891	22.05726
0	13.5	0.289	222.1735
0	8.833	4.667	110.8279
0	46.129	37.296	488.477
0	22.763	23.366	66.77367
0	22.455	0.308	221.6074
0	44.986	22.531	53.82446
0	30.907	14.079	1.244305
0	8.392	22.515	53.58995
0	27.985	19.593	19.34694
0	17.277	10.708	20.12854
0	5.898	11.379	14.55792
0	7.248	1.35	191.6697
0	21.352	14.104	1.189156
0	4.298	17.054	3.457799
0	23.848	19.55	18.97052
0	28.53	4.682	110.5123
0	20.612	7.918	52.94722
0	56.571	35.959	431.1651
0	13.606	42.965	771.2015
0	19.576	5.97	85.09111
0	11.107	8.469	45.23214
0	35.099	23.992	77.39628
0	23.824	11.275	15.36236
0	17.028	6.796	70.53454
0	12.776	4.252	119.738
0	59.333	46.557	983.6074
0	17.975	41.358	684.5296
0	33.632	15.657	0.213921
0	11.939	21.693	42.23071
0	20.494	8.555	44.08275
0	26.858	6.364	77.97745
0	34.553	7.695	56.24226
0	18.285	16.268	1.152436
0	19.377	1.092	198.8801
0	35.313	15.936	0.549846
0	25.513	9.8	29.10046
0	11.044	14.469	0.526327
0	20.788	9.744	29.70778
0	13.649	7.139	64.89083
0	31.208	17.559	5.590935
0	74.46	43.252	787.2242
203	49		

Sum X	161613.4	39046.71
X Average	20.08601	
MR Average	15.19448	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	60.49687	
Lower control limit for X (LCLx	-20.3249	
Upper control limit MR (UCLmr	49.65557	
MR Standard deviation	13.18933	
Process standard deviation	14.14214	
Gamma d2	1.074412	
Gamma d3	0.932626	
Gamma D4	3.604102	
2 Alpha=2		
10 Beta=10		
Proportion MR > UCLmr	0.024802	
Percentage	2.480248	
ARL for MR	40.31855	

3 Alpha=3

0.5	Beta=0.5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
	1.13356			1.09658	0.28038	0.44289	
	0.96998	0.16358	0.611993	1.94679	0.85021	0.009153	0
	0.79264	0.17734	0.590654	1.14922	0.79757	0.021996	0
	0.86384	0.0712	0.765065	3.0667	1.91748	0.944006	0
	2.49578	1.63194	0.470678	0.553	2.5137	2.458059	0
	1.19956	1.29622	0.122738	1.80332	1.25032	0.092684	0
	1.98204	0.78248	0.0267	2.01696	0.21364	0.536176	0
	0.85691	1.12513	0.032131	0.71546	1.3015	0.126466	0
	1.96639	1.10948	0.026765	1.99998	1.28452	0.114677	0
	1.5281	0.43829	0.257648	1.6397	0.36028	0.342927	0
	0.45312	1.07498	0.016687	2.74853	1.10883	0.026553	0
	0.9751	0.52198	0.179691	1.67423	1.0743	0.016492	0
	1.90565	0.93055	0.000235	3.29693	1.6227	0.458085	0
	1.13806	0.76759	0.031787	0.80944	2.48749	2.376561	0
	2.19589	1.05783	0.012533	1.90053	1.09109	0.021086	0
	0.82639	1.3695	0.179454	0.52879	1.37174	0.181357	0
	1.35417	0.52778	0.174808	1.86026	1.33147	0.14868	0
	1.60076	0.24659	0.489007	1.24244	0.61782	0.107623	0
	0.48815	1.11261	0.027799	1.17627	0.06617	0.77389	0
	2.55708	2.06893	1.261241	1.4547	0.27843	0.44549	0
	0.95808	1.599	0.426566	2.10122	0.64652	0.089616	0
	1.20081	0.24273	0.49442	0.61374	1.48748	0.29333	0
	2.60557	1.40476	0.210571	2.51736	1.90362	0.917266	0
	2.78974	0.18417	0.580202	1.17963	1.33753	0.15339	0
	0.64741	2.14233	1.431492	1.57144	0.39161	0.307215	0
	2.24591	1.5985	0.425913	1.84583	0.27439	0.450899	0
	1.41046	0.83545	0.012195	0.49848	1.34735	0.161178	0
	1.33665	0.07381	0.760506	2.23998	1.7415	0.633011	0
	1.24496	0.09169	0.729641	0.43386	1.80612	0.740013	0
	0.96757	0.27739	0.446879	0.49717	0.06331	0.77893	0
	1.66166	0.69409	0.063398	0.77081	0.27364	0.451907	0
	0.48705	1.17461	0.052317	0.60783	0.16298	0.612933	0
	1.63858	1.15153	0.042292	1.70442	1.09659	0.022713	0
	1.33927	0.29931	0.418053	1.72523	0.02081	0.855755	0
	2.22081	0.88154	0.00414	1.07933	0.6459	0.089988	0
	0.53827	1.68254	0.542668	0.75352	0.32581	0.384487	0
	0.67871	0.14044	0.648734	0.63018	0.12334	0.676572	0
	1.68768	1.00897	0.00398	1.23671	0.60653	0.115158	0
	1.61483	0.07285	0.762182	0.46109	0.77562	0.028988	0
	1.79942	0.18459	0.579563	2.48638	2.02529	1.165126	0
	1.1228	0.67662	0.072501	0.55879	1.92759	0.963754	0
	0.27541	0.84739	0.0097	1.75097	1.19218	0.060664	0
	0.64291	0.3675	0.334524	3.1816	1.43063	0.234982	0
	1.76019	1.11728	0.029378	1.07592	2.10568	1.345136	0
	1.46323	0.29696	0.421097	2.37249	1.29657	0.122983	0
	2.91375	1.45052	0.254661	2.16	0.21249	0.537861	0
	2.61202	0.30173	0.414929	0.77687	1.38313	0.191187	0
	1.03386	1.57816	0.399778	2.22838	1.45151	0.255662	0
	1.27961	0.24575	0.490182	1.54356	0.68482	0.068152	0
	0.94163	0.33798	0.369543	2.16897	0.62541	0.102701	0
	2.53912	1.59749	0.424595	2.60612	0.43715	0.258806	0
	1.1917	1.34742	0.161234	1.78263	0.82349	0.014979	0
	1.4392	0.2475	0.487735	0.86857	0.91406	0.001013	0
	0.76981	0.66939	0.076447	1.6212	0.75263	0.037346	0
	3.19775	2.42794	2.196502	1.38299	0.23821	0.500797	0
	0.79168	2.40607	2.132155	0.25867	1.12432	0.031841	0
	1.87318	1.0815	0.018393	2.31379	2.05512	1.230413	0
	3.62232	1.74914	0.645226	0.90547	1.40832	0.213851	0
	1.08166	2.54066	2.543323	0.85312	0.05235	0.798396	0
	0.49089	0.59077	0.126103	0.79062	0.0625	0.78036	0
	0.42068	0.07021	0.766798	1.498	0.70738	0.056882	0
	2.40364	1.98296	1.075535	0.86702	0.63098	0.099162	0
	2.17771	0.22593	0.518328	0.79268	0.07434	0.759582	0
	1.97377	0.20394	0.550475	0.8306	0.03792	0.824392	0
	1.14768	0.82609	0.01435	1.47444	0.64384	0.091228	0
	1.53538	0.3877	0.311565	0.81515	0.65929	0.082134	0
	1.95598	0.4206	0.275919	1.98389	1.16874	0.049667	0
	0.87223	1.08375	0.019008	1.53943	0.44446	0.251422	0
	1.70926	0.83703	0.011848	1.42553	0.1139	0.692191	0
	1.3893	0.31996	0.391776	0.66392	0.76161	0.033955	0
	2.26271	0.87341	0.005252	1.827	1.16308	0.047176	0
	0.57613	1.68658	0.548636	2.34587	0.51887	0.182338	0
	0.21655	0.35958	0.343748	3.02039	0.67452	0.073636	0
	1.8863	1.66975	0.523988	2.43521	0.58518	0.130106	0

3 Alpha=3

1	Beta=1	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	1.9923			5.1019	3.2043	1.764682	
0	2.2	0.2077	2.782846	2.9237	2.1782	0.091393	0
0	3.529	1.329	0.299085	1.7464	1.1773	0.488023	0
0	1.2752	2.2538	0.142819	1.9917	0.2453	2.658812	0
0	5.9257	4.6505	7.69848	3.2131	1.2214	0.428353	0
0	5.994	0.0683	3.267369	2.4762	0.7369	1.29729	0
0	3.3137	2.6803	0.647081	0.662	1.8142	0.003805	0
0	4.3006	0.9869	0.790297	2.8747	2.2127	0.113443	0
0	0.6637	3.6369	3.101168	0.8675	2.0072	0.017243	0
0	3.6644	3.0007	1.265205	5.1936	4.3261	6.003546	0
0	3.4238	0.2406	2.674162	5.5229	0.3293	2.39193	0
0	1.0602	2.3636	0.237864	1.9576	3.5653	2.854118	0
0	3.3549	2.2947	0.175405	2.4418	0.4842	1.936791	0
0	2.0739	1.281	0.35389	3.9541	1.5123	0.132195	0
0	3.6432	1.5693	0.093995	7.4573	3.5032	2.648149	0
0	2.706	0.9372	0.881132	2.5104	4.9469	9.431124	0
0	2.0028	0.7032	1.375194	2.6553	0.1449	2.996314	0
0	4.7416	2.7388	0.74462	3.2378	0.5825	1.672849	0
0	3.6668	1.0748	0.64174	5.2809	2.0431	0.02796	0
0	2.006	1.6608	0.046262	1.3675	3.9134	4.151461	0
0	3.6444	1.6384	0.0564	2.3111	0.9436	0.869158	0
0	2.3292	1.3152	0.314369	1.7732	0.5379	1.790208	0
0	3.2592	0.93	0.894701	5.6911	3.9179	4.169819	0
0	2.2731	0.9861	0.79172	3.2037	2.4874	0.373949	0
0	1.8347	0.4384	2.066368	2.4062	0.7975	1.162918	0
0	2.4145	0.5798	1.67984	0.9998	1.4064	0.220418	0
0	2.661	0.2465	2.6549	1.0909	0.0911	3.185463	0
0	2.4766	0.1844	2.861127	2.3627	1.2718	0.364921	0
0	5.7368	3.2602	1.916324	3.1487	0.788	1.187853	0
0	5.8589	0.1221	3.075767	8.6128	5.4841	12.87528	0
0	2.8866	2.9723	1.202123	1.3542	7.2586	28.9736	0
0	1.9985	0.8861	0.975722	2.1179	0.7637	1.236959	0
0	3.2387	1.2402	0.404097	1.0101	1.1078	0.589957	0
0	0.6217	2.617	0.549249	1.7785	0.7684	1.226526	0
0	3.6447	3.023	1.315869	1.0593	0.7192	1.337924	0
0	0.7378	2.9069	1.062989	2.7971	1.7378	0.019068	0
0	5.744	5.0062	9.798862	2.6204	0.1767	2.887235	0
0	3.0079	2.7361	0.739967	2.6836	0.0632	3.285832	0
0	5.2291	2.2212	0.119241	1.151	1.5326	0.117846	0
0	4.3921	0.837	1.079285	6.16	5.009	9.8164	0
0	1.3713	3.0208	1.310827	1.4628	4.6972	7.95981	0
0	4.3732	3.0019	1.267906	1.5572	0.0944	3.173694	0
0	5.1801	0.8069	1.142732	2.5294	0.9722	0.816649	0
0	3.4423	1.7378	0.019068	1.2809	1.2485	0.393614	0
0	1.609	1.8333	0.001814	2.6017	1.3208	0.308121	0
0	1.9029	0.2939	2.502681	2.1572	0.4445	2.048867	0
0	6.0579	4.155	5.194358	1.2407	0.9165	0.920423	0
0	3.8022	2.2557	0.144258	4.939	3.6983	3.321191	0
0	1.9355	1.8667	8.4E-05	5.1703	0.2313	2.704665	0
0	4.3626	2.4271	0.303836	2.0457	3.1246	1.559285	0
0	0.6714	3.6912	3.295363	4.8514	2.6057	0.532628	0
0	7.1392	6.4678	21.08567	6.131	1.4796	0.157043	1
0	3.3997	3.7395	3.473055	1.8019	4.3291	6.018256	0
0	4.9232	1.5235	0.124176	4.3345	2.5326	0.431273	0
0	2.8385	2.0847	0.043603	2.9257	1.4088	0.21817	0
0	2.1908	0.6477	1.508442	2.7548	0.1709	2.906979	0
0	1.6364	0.5544	1.746327	3.3892	0.6344	1.541289	0
0	1.7715	0.1351	3.030338	5.858	2.4688	0.351546	0
0	3.4157	1.6442	0.053679	1.2084	4.6496	7.693486	0
0	1.7014	1.7143	0.02611	3.592	2.3836	0.257773	0
0	3.5319	1.8305	0.00206	6.736	3.144	1.608112	0
0	3.8687	0.3368	2.368787	0.8856	5.8504	15.79676	0
0	3.8034	0.0653	3.278224	1.979	1.0934	0.612285	0
0	6.5714	2.768	0.795868	5.6874	3.7084	3.358106	0
0	1.808	4.7634	8.337734	2.3225	3.3649	2.217161	0
0	5.5846	3.7766	3.812712	1.7198	0.6029	1.620495	0
0	3.8759	1.7087	0.027951	3.6708	1.951	0.005642	0
0	2.0823	1.7936	0.006771	2.9002	0.7704	1.2221	0
0	4.667	2.5847	0.502417	2.1282	0.772	1.218565	0
0	2.1241	2.5429	0.444907	3.4009	1.2727	0.363834	0
0	0.9559	1.1682	0.50082	2.8063	0.5946	1.641695	0
0	3.2509	2.295	0.175658	1.5444	1.2619	0.376979	0
0	4.1959	0.945	0.86655	3.3094	1.765	0.012296	0
0	2.7151	1.4808	0.156093	3.8081	0.4987	1.896843	0

3 Alpha=3

5	Beta=5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	13.3879			12.0306	11.7059	5.220333	
0	26.2834	12.8955	12.07149	10.2652	1.7654	58.60967	0
0	11.4273	14.8561	29.53928	16.1705	5.9053	12.36082	0
0	8.0904	3.3369	37.01743	19.3983	3.2278	38.3569	0
0	8.7105	0.6201	77.45751	21.0185	1.6202	60.85396	0
0	22.1972	13.4867	16.52914	24.8735	3.855	30.98141	0
0	8.1446	14.0526	21.45084	16.2492	8.6243	0.634882	0
0	16.0518	7.9072	2.291878	14.9267	1.3225	65.58724	0
0	31.0784	15.0266	31.42169	16.0799	1.1532	68.35809	0
0	17.2836	13.7948	19.12929	24.4535	8.3736	1.097246	0
0	11.7275	5.5561	14.93819	10.9484	13.5051	16.6791	0
0	11.6932	0.0343	88.11192	11.3363	0.3879	81.59861	0
0	18.2176	6.5244	8.390842	39.3986	28.0623	347.4945	0
0	11.8523	6.3653	9.337884	30.5034	8.8952	0.276566	0
0	14.9541	3.1018	39.93349	9.673	20.8304	130.1722	0
0	10.922	4.0321	29.04127	23.7432	14.0702	21.61418	0
0	25.0095	14.0875	21.77533	16.1339	7.6093	3.282601	0
0	14.755	10.2545	0.694564	10.1793	5.9548	12.01659	0
0	16.6197	1.8647	57.09911	3.7562	6.4231	8.987975	0
0	48.5595	31.9398	507.0921	17.4509	13.6947	18.2637	1
0	7.8081	40.7514	981.588	14.1312	3.3197	37.22702	1
0	15.3422	7.5341	3.56075	23.6802	9.549	0.01636	0
0	15.5076	0.1654	85.66789	7.9445	15.7357	39.87424	0
0	7.7169	7.7907	2.658188	6.392	1.5525	61.91479	0
0	16.5903	8.8734	0.29997	15.9766	9.5846	0.026734	0
0	20.9161	4.3258	25.96203	7.9179	8.0587	1.85612	0
0	15.0895	5.8266	12.92039	29.4085	21.4906	145.6729	0
0	19.2933	4.2038	27.22017	30.8688	1.4603	63.37426	0
0	46.4022	27.1089	312.8584	10.6348	20.234	116.9189	0
0	6.6355	39.7667	920.8557	8.0183	2.6165	46.30251	1
1	16.3907	9.7552	0.111626	5.3983	2.62	46.25489	0
0	17.4182	1.0275	70.45244	16.2013	10.803	1.909661	0
0	35.0557	17.6375	67.50931	12.6008	3.6005	33.87933	0
0	11.2395	23.8162	207.219	13.5844	0.9836	71.19132	0
0	26.2962	15.0567	31.76004	5.9307	7.6537	3.123685	0
0	7.6424	18.6538	85.24284	7.4869	1.5562	61.85657	0
0	15.7546	8.1122	1.713206	33.7067	26.2198	282.1965	0
0	8.5901	7.1645	5.092221	9.1818	24.5449	228.7295	0
0	21.1297	12.5396	9.725073	30.9755	21.8137	153.5767	0
0	18.6169	2.5128	47.72454	8.9134	22.0621	159.795	0
0	9.2786	9.3383	0.006855	12.1609	3.2475	38.11328	0
0	10.3894	1.1108	69.061	9.1266	3.0343	40.79115	0
0	7.1916	3.1978	38.7294	17.7846	8.658	0.582314	0
0	15.3915	8.1999	1.491317	34.6878	16.9032	55.98189	0
0	13.9015	1.49	62.90227	23.7656	10.9222	2.253316	0
0	17.8495	3.948	29.95477	21.8776	1.888	56.74752	0
0	16.8097	1.0398	70.24611	7.4609	14.4167	24.95607	0
0	26.0513	9.2416	0.032218	13.3247	5.8638	12.65435	0
0	18.5214	7.5299	3.576619	9.1435	4.1812	27.4565	0
0	8.9652	9.5562	0.018253	20.174	11.0305	2.590184	0
0	4.8473	4.1179	28.12388	5.7178	14.4562	25.35228	0
0	18.6067	13.7594	18.82089	10.9689	5.2511	17.38886	0
0	13.9492	4.6575	22.69184	23.8336	12.8647	11.85841	0
0	14.5266	0.5774	78.21094	18.5621	5.2715	17.21914	0
0	3.1051	11.4215	4.00162	4.4062	14.1559	22.41838	0
0	15.0873	11.9822	6.559258	2.7683	1.6379	60.57813	0
0	13.2877	1.7998	58.08719	9.9566	7.1883	4.985374	0
0	12.1725	1.1152	68.98789	16.1798	6.2232	10.22653	0
0	29.9539	17.7814	69.8947	12.7878	3.392	36.34999	0
0	25.8489	4.105	28.26087	11.485	1.3028	65.90672	0
0	14.8912	10.9577	2.361155	10.9373	0.5477	78.73714	0
0	18.2384	3.3472	36.8922	25.1338	14.1985	22.80449	0
0	13.2884	4.95	19.99069	15.4753	9.6585	0.056361	0
0	24.705	11.4166	3.98204	16.5169	1.0416	70.21594	0
0	5.5855	19.1195	94.05906	26.7374	10.2205	0.639048	0
0	6.5141	0.9286	72.12247	9.9196	16.8178	54.71124	0
0	20.9018	14.3877	24.86716	25.5263	15.6067	38.26171	0
0	9.822	11.0798	2.751302	10.1256	15.4007	35.75567	0
0	14.3155	4.4935	24.28119	25.2221	15.0965	32.21022	0
0	5.0417	9.2738	0.021698	12.583	12.6391	10.35556	0
0	10.8358	5.7941	13.15509	11.8811	0.7019	76.02436	0
0	15.7543	4.9185	20.27336	36.512	24.6309	231.3382	0
0	9.9024	5.8519	12.73915	30.0627	6.4493	8.831566	0
0	12.9069	3.0045	41.17269	24.3296	5.7331	13.60131	0

3 Alpha=3

10	Beta=10	MR	(MRi-MR)^2		MR	(MRi-MR)^2		
0	19.527			7.246	7.3	131.8972		0
0	35.178	15.651	9.819763	21.087	13.841	24.43968	0	0
0	15.173	20.005	1.489254	18.691	2.396	268.5879	0	0
0	16.056	0.883	320.4691	53.605	34.914	260.1559	0	0
0	39.108	23.052	18.21028	31.627	21.978	10.19748	0	0
0	15.042	24.066	27.89266	13.493	18.134	0.423346	0	0
0	2.874	12.168	43.78006	56.298	42.803	576.8811	0	0
0	38.951	36.077	299.0254	27.715	28.581	95.96847	0	0
0	16.286	22.665	15.05712	35.616	7.901	118.4538	0	0
0	36.133	19.847	1.128587	23.909	11.707	50.09313	0	0
0	19.649	16.484	5.292991	33.094	9.185	92.15328	0	0
0	15.122	4.527	203.2806	16.095	16.999	3.188546	0	0
0	6.805	8.317	109.5717	40.281	24.186	29.17458	0	0
0	65.549	58.744	1596.75	3.228	37.055	333.8057	0	0
0	33.456	32.094	177.1388	17.728	14.502	18.34109	0	0
0	78.433	44.978	686.0916	14.321	3.407	236.4721	0	0
0	29.365	49.068	917.0813	22.694	8.373	108.4025	0	0
0	25.142	4.223	212.0417	18.298	4.396	207.0333	0	0
0	14.494	10.648	66.20507	23.596	5.298	181.8897	0	0
0	56.238	41.744	527.1317	47.26	23.664	23.80806	0	0
0	31.082	25.156	40.5941	14.86	32.4	185.3778	0	0
0	36.442	5.36	180.2212	38.875	24.015	27.35656	0	0
0	33.791	2.651	260.2947	9.951	28.924	102.8064	0	0
0	31.692	2.099	278.4109	14.447	4.496	204.1655	0	0
0	2.354	29.338	111.3732	9.431	5.016	189.5757	0	0
0	11.747	9.393	88.20309	13.945	4.514	203.6515	0	0
0	40.073	28.326	91.03736	38.008	24.063	27.66098	0	0
0	13.732	26.341	57.09842	7.333	30.675	141.3804	0	0
0	45.936	32.204	180.079	12.779	5.446	177.9196	0	0
0	65.076	19.14	0.126274	19.42	6.641	147.4682	0	0
0	84.888	19.812	1.055448	55.381	35.961	295.027	0	0
0	28.163	56.725	1439.47	24.351	31.03	149.9486	0	0
0	45.466	17.303	2.195287	75.551	51.2	1050.755	0	0
0	63.379	17.913	0.759774	45.239	30.312	132.8798	0	0
0	33.463	29.916	123.907	18.674	26.565	60.53385	0	0
0	23.445	10.018	76.85415	68.161	49.487	942.6343	0	0
0	33.245	9.8	80.72394	36.172	31.989	174.3549	0	0
0	19.629	13.416	28.8224	27.866	8.306	109.8021	0	0
0	31.643	11.814	48.58996	2.37	25.498	45.04222	0	0
0	29.451	2.192	275.316	27.218	24.848	36.76421	0	0
0	93.644	64.393	2080.122	78.412	51.194	1050.386	1	0
0	48.86	44.984	686.4059	15.183	63.229	1975.3	0	1
0	6.604	42.256	550.9043	89.854	74.671	3123.284	0	1
0	24.221	17.617	1.363407	29.137	60.717	1758.322	0	0
0	23.684	0.537	332.9787	26.622	2.515	264.7015	0	0
0	51.468	27.784	80.9863	25.92	0.702	326.9822	0	0
0	43.598	7.87	119.1296	15.38	10.54	67.97425	0	0
0	41.63	1.968	282.7997	20.765	5.385	179.5506	0	0
0	8.37	33.26	209.5358	32.599	11.834	48.31154	0	0
0	28.235	19.865	1.167156	17.621	14.978	14.49058	0	0
0	46.962	18.727	0.003324	22.339	4.718	197.8706	0	0
0	22.643	24.319	30.62903	19.709	2.63	260.9727	0	0
0	22.955	0.312	341.2388	19.47	0.239	343.9411	0	0
0	46.624	23.669	23.85687	58.134	38.664	395.1886	0	0
0	56.364	9.74	81.80569	38.939	19.195	0.168387	0	0
0	9.079	47.285	812.2699	11.42	27.519	76.28887	0	0
0	9.903	0.824	322.585	50.257	38.837	402.0967	0	0
0	3.346	6.557	149.5154	12.509	37.748	359.6086	0	0
0	40.322	36.976	330.9252	40.842	28.333	91.17099	0	0
0	29.188	11.134	58.53245	6.813	34.029	232.3902	0	0
0	27.708	1.48	299.4509	21.206	14.393	19.28659	0	0
0	29.633	1.925	284.2478	46.865	25.459	44.54695	0	0
0	27.452	2.181	275.6812	35.857	10.808	63.62695	0	0
0	74.456	47.004	796.3317	48.869	12.812	35.67255	0	0
0	18.625	55.831	1372.432	28.083	20.586	3.244862	0	0
0	12.662	5.963	164.3947	21.532	6.551	149.6822	0	0
0	16.228	3.566	231.6073	29.237	7.705	122.7586	0	0
0	54.948	38.72	397.4162	37.279	8.042	115.4045	0	0
0	30.918	24.03	27.5137	83.849	46.57	772.0257	0	0
0	17.18	13.738	25.46868	37.034	46.815	785.7005	0	0
0	5.774	11.406	54.44448	13.359	23.675	23.91552	0	0
0	29.939	24.165	28.94817	9.218	4.141	214.4365	0	0
0	30.208	0.269	342.8293	22.308	13.09	32.42904	0	0
0	42.119	11.911	47.24707	64.968	42.66	570.0323	0	0

0.71458	1.67617	0.533323
0.56205	0.15253	0.629404
1.62221	1.06016	0.01306
1.29478	0.32743	0.382481
2.90884	1.61406	0.446464
1.87492	1.03392	0.007751
1.34955	0.52537	0.176829
2.56729	1.21774	0.073908
2.38204	0.18525	0.578558
1.33123	1.05081	0.01101
1.78229	0.45106	0.244847
1.13752	0.64477	0.090667
1.28171	0.14419	0.642707
1.55817	0.27646	0.448123
0.25367	1.3045	0.128608
0.81059	0.35692	0.346874
1.24466	0.63407	0.097226
1.28567	0.04101	0.81879
1.62065	0.33498	0.373199
2.94951	1.32886	0.146674
1.64934	1.30017	0.125521
1.01459	0.63475	0.096802
0.91895	0.09564	0.722908
0.69208	0.22687	0.516976
1.5341	0.84202	0.010787
0.83915	0.69495	0.062966
2.00544	1.16629	0.048581
2.51472	0.50928	0.19062
1.82021	0.69451	0.063187
1.32668	0.49353	0.204621
2.27802	0.95134	3E-05
1.02396	1.25406	0.094975
0.51988	0.50408	0.195187
1.47757	0.95769	0.000139
1.29796	0.17961	0.58717
0.84257	0.65539	0.084384
1.23191	0.58934	0.127121
0.65648	0.57543	0.137233
1.79636	1.13988	0.037636
1.13264	0.66372	0.079614
0.69707	0.43557	0.260416
0.57729	0.11978	0.882441
2.45953	1.88224	0.87677
0.79264	1.66689	0.519855
1.3965	0.60388	0.116978
0.44463	0.95187	3.6E-05
0.43707	0.00756	0.880445
3.19362	2.75655	3.278526
0.78692	2.4067	2.133995
1.46713	0.70021	0.060354
0.88063	0.6065	0.115179
0.94447	0.06384	0.777995
0.50322	0.44125	0.254652
1.29948	0.79626	0.022386
1.26842	0.03106	0.836896
1.37696	0.10854	0.701138

Sum X	12068.98	2948.656
X Average	1.501763	
MR Average	0.94588	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	4.017402	
Lower control limit for X (LCLx	-1.01388	
Upper control limit MR (UCLmr	3.091136	
MR Standard deviation	0.806728	
Process standard deviation	0.866025	
Gamma d2	1.092208	
Gamma d3	0.931529	
Gamma D4	3.558658	
3 Alpha=3		
0.5 Beta=0.5		
Proportion MR > UCLmr	0.021802	
Percentage	2.180218	
ARL for MR	45.86697	

0	3.9144	2.4929	0.380706
0	2.3808	1.5336	0.11716
0	2.7689	0.3881	2.213509
0	3.6861	0.9172	0.91908
0	3.9023	0.2162	2.754559
0	2.7319	1.1704	0.497711
0	3.6534	0.9215	0.910854
0	1.0221	2.6313	0.57065
0	3.3363	2.3142	0.192119
0	3.0294	0.3069	2.461719
0	1.8301	1.1993	0.457769
0	8.9613	7.1312	27.61832
0	5.1912	3.7701	3.588045
0	2.7365	2.4547	0.335025
0	1.4718	1.2647	0.373549
0	3.1089	1.6371	0.057019
0	3.8685	0.7596	1.246096
0	7.9485	4.08	4.858116
0	3.0764	4.8721	8.977295
0	4.0881	1.0117	0.746818
0	7.4049	3.3168	2.076232
0	0.7026	6.7023	23.29427
0	1.2723	0.5697	1.706123
0	6.3811	5.1088	10.45173
0	5.0999	1.2812	0.353652
0	4.1517	0.9482	0.860602
0	2.298	1.8537	0.000492
0	4.7064	2.4084	0.283571
0	1.2243	3.4821	2.579922
0	1.9303	0.706	1.368634
0	4.9383	3.008	1.281681
0	5.049	0.1107	3.115883
0	0.9541	4.0949	4.924021
0	2.5135	1.5594	0.100184
0	0.545	1.9685	0.008577
0	0.9962	0.4512	2.029732
0	1.459	0.4628	1.996814
0	4.7589	3.2999	2.027814
0	3.5093	1.2496	0.392235
0	1.2156	2.2937	0.174568
0	2.5581	1.3425	0.284501
0	3.8284	1.2703	0.366735
0	1.8055	2.0229	0.021613
0	2.6853	0.8798	0.992168
0	5.1674	2.4821	0.367495
0	5.0457	0.1217	3.07717
0	3.2189	1.8268	0.002409
0	3.085	0.1339	3.034517
0	3.6758	0.5908	1.651447
0	3.7417	0.0659	3.276051
0	2.5459	1.1958	0.462518
0	7.309	4.7631	8.336002
0	5.3673	1.9417	0.004331
0	4.9064	0.4609	2.002187
0	5.4371	0.5307	1.809527
0	1.8976	3.5395	2.76761
176	42		

Sum X	24155.91	6124.122
X Average	3.028003	
MR Average	1.875887	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	8.017083	
Lower control limit for X (LCLx	-1.96106	
Upper control limit MR (UCLmr	6.130397	
MR Standard deviation	1.593547	
Process standard deviation	1.732051	
Gamma d2	1.083044	
Gamma d3	0.920035	
Gamma D4	3.548471	
3 Alpha=3		
1 Beta=1		
Proportion MR > UCLmr	0.022002	
Percentage	2.20022	
ARL for MR	45.45	

0	6.6104	9.4676	0.002163
0	17.1597	10.5493	1.272846
0	24.5984	7.4387	3.92989
0	14.7002	9.8982	0.227629
0	10.4245	4.2757	26.47509
0	23.5732	13.1487	13.89504
0	7.5233	16.0499	43.94105
0	30.7557	23.2324	190.7521
0	7.9161	22.8396	180.0563
0	20.2379	12.3218	8.414089
0	17.0617	3.1762	38.99871
1	11.2694	5.7923	13.16815
0	17.3318	6.0624	11.28083
0	8.2014	9.1304	0.084504
0	8.8224	0.621	77.44167
0	22.8244	14.002	20.98469
0	61.0014	38.177	826.9021
0	22.2537	38.7477	860.0498
0	42.3601	20.1064	114.1757
0	69.1748	26.8147	302.5375
0	18.9089	50.2659	1668.298
1	10.464	8.4449	0.952957
0	36.2258	25.7618	267.0186
0	16.3902	19.8356	108.4619
0	9.0705	7.3197	4.415861
0	14.154	5.0835	18.81473
0	38.1643	24.0103	212.8449
0	7.4259	30.7384	454.4275
0	14.4262	7.0003	5.860249
0	9.0297	5.3965	16.19737
0	14.8269	5.7972	13.13262
0	11.0225	3.8044	31.54726
0	5.8393	5.1832	17.95975
0	30.0947	24.2554	220.0566
0	11.24	18.8547	88.9929
0	23.4336	12.1936	7.686783
0	3.3823	20.0513	113.0013
0	9.4407	6.0584	11.30772
0	33.9585	24.5178	227.9105
0	14.7544	19.2041	95.70719
0	2.1325	12.6219	10.24515
0	9.5583	7.4258	3.981202
0	10.2454	0.6871	76.28267
0	8.8925	1.3529	65.09577
0	4.545	4.3475	25.74137
0	22.2217	17.6767	68.15501
0	5.9323	16.2894	47.17361
0	32.0271	26.0948	278.0124
0	8.4406	23.5865	200.6587
0	8.6977	0.2571	83.97881
0	10.378	1.6803	59.91991
0	19.3601	8.9821	0.192717
0	12.062	7.2961	4.507108
0	7.2341	4.8279	21.09744
0	9.3573	2.1232	53.25927
0	23.7365	14.3792	24.5828
174	46		

Sum X	121403.4	29768.68
X Average	15.11721	
MR Average	9.421095	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	40.17331	
Lower control limit for X (LCLx	-9.9389	
Upper control limit MR (UCLmr	30.78814	
MR Standard deviation	7.820973	
Process standard deviation	8.660254	
Gamma d2	1.087854	
Gamma d3	0.903088	
Gamma D4	3.490466	
3 Alpha=3		
5 Beta=5		
Proportion MR > UCLmr	0.019402	
Percentage	1.940194	
ARL for MR	51.54124	

0	26.748	27.672	78.98499
0	16.757	9.991	77.32828
0	23.3	6.543	149.858
0	13.241	10.059	76.13697
0	59.886	46.645	776.1991
0	33.332	26.554	60.3628
0	13.403	19.929	1.309537
0	50.127	36.724	321.8203
0	36.556	13.571	27.18215
0	15.025	21.531	7.542438
0	14.797	0.228	344.3493
0	10.743	4.054	216.9921
0	9.635	1.108	312.464
0	27.12	17.485	1.68909
0	24.084	3.036	248.02
0	27.346	3.262	240.9527
1	15.99	11.356	55.18484
1	36.186	20.196	1.991909
0	40.708	4.522	203.4232
0	59.95	19.242	0.209169
1	46.027	13.923	23.63564
0	23.659	22.368	12.8404
0	37.938	14.279	20.30088
0	40.918	2.98	249.787
0	35.771	5.147	185.9855
0	44.171	8.4	107.841
0	25.843	18.328	0.208529
0	55.247	29.404	112.7706
0	42.543	12.704	36.97431
0	32.205	10.338	71.3459
0	31.574	0.631	329.555
0	39.133	7.559	126.0152
0	19.132	20.001	1.479507
0	12.307	6.825	143.0332
0	15.179	2.872	253.2124
0	10.039	5.14	166.1765
0	22.874	12.835	35.39834
0	35.772	12.898	34.65265
0	20.96	14.812	15.78195
0	82.085	61.126	1792.705
0	15.379	66.706	2296.456
0	29.951	14.572	17.74642
0	21.894	8.067	115.0825
0	28.675	6.781	144.0878
0	26.153	2.522	264.4738
0	33.624	7.471	127.9987
0	44.662	11.038	60.01059
0	31.595	13.067	32.69152
0	45.146	13.551	27.39109
0	27.714	17.432	1.829662
0	18.513	9.201	91.84635
0	19.85	1.337	304.4205
0	30.618	10.768	64.26868
0	17.836	12.782	36.03181
0	24.952	7.116	136.1574
0	14.546	10.408	70.20178
161	33		

Sum X	239886.1	61337.99
X Average	30.12241	
MR Average	18.78465	
Normal constant d2 (n=2)	1.128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	80.08158	
Lower control limit for X (LCLx	-19.8368	
Upper control limit MR (UCLmr	61.38824	
MR Standard deviation	15.74864	
Process standard deviation	17.32051	
Gamma d2	1.084532	
Gamma d3	0.909248	
Gamma D4	3.515134	
3 Alpha=3		
10 Beta=10		
Proportion MR > UCLmr	0.020402	
Percentage	2.040204	
ARL for MR	49.01471	

4	Alpha=4						
0.5	Beta=0.5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
	1.08946			1.34045	0.66319	0.175901	
	1.13115	0.04169	1.083483	1.55346	0.21301	0.756178	0
	1.47313	0.34198	0.548511	2.66596	1.1125	0.000894	0
	0.82683	0.6463	0.190353	0.95071	1.71525	0.400252	0
	1.16462	0.33779	0.554735	3.04077	2.09006	1.014985	0
	2.94196	1.77734	0.48267	0.83027	2.2105	1.272169	0
	5.23558	2.29362	1.466581	2.70156	1.87129	0.62204	0
	2.33646	2.89912	3.299763	2.88876	0.1872	0.801732	0
	3.59373	1.25727	0.030511	2.33833	0.55043	0.2832	0
	1.21683	2.3769	1.675225	1.44737	0.89096	0.036724	0
	1.15922	0.05761	1.050594	1.86626	0.41889	0.440504	0
	1.46999	0.31077	0.595714	2.33357	0.46731	0.378576	0
	2.49841	1.02842	0.002935	0.76878	1.56479	0.232512	0
	0.70547	1.79294	0.50459	0.89671	0.12793	0.911385	0
	1.77908	1.07361	8.1E-05	1.16798	0.27127	0.658248	0
	1.00674	0.77234	0.096258	2.0297	0.86172	0.048786	0
	1.48416	0.47742	0.366237	1.32002	0.70968	0.139066	0
	1.19302	0.29114	0.626401	2.72489	1.40487	0.103861	0
	2.80826	1.61524	0.283711	1.60333	1.12156	0.001518	0
	2.53636	0.2719	0.657227	0.1834	1.41993	0.113795	0
	3.33891	0.80255	0.078425	2.49703	2.31363	1.515447	0
	2.68104	0.65787	0.180391	1.70884	0.78819	0.086674	0
	1.07385	1.60719	0.2752	1.44575	0.26309	0.671589	0
	2.08329	1.00944	0.005352	2.15072	0.70497	0.142601	0
	2.18497	0.10168	0.962194	1.97749	0.17323	0.826945	0
	2.77367	0.5887	0.243932	2.80167	0.82418	0.066778	0
	2.39259	0.38108	0.492123	1.23461	1.56706	0.234706	0
	1.2379	1.15469	0.005198	0.6733	0.56131	0.271738	0
	2.10923	0.87133	0.044633	1.57618	0.90288	0.032298	0
	1.72733	0.3819	0.490974	4.96337	3.38719	5.311158	0
	1.46819	0.25914	0.678078	2.07246	2.89091	3.270003	0
	2.93792	1.46973	0.149873	2.32038	0.24792	0.696683	0
	2.08138	0.85654	0.051101	3.21117	0.89079	0.036789	0
	1.70211	0.37927	0.494666	1.06442	2.14675	1.132426	0
	4.87567	3.17356	4.372134	1.88858	0.82416	0.066789	0
	2.54224	2.33343	1.564588	3.01971	1.13113	0.002356	0
	2.21068	0.33156	0.564054	3.35138	0.33167	0.563689	0
	2.2303	0.01962	1.129916	1.04376	2.30762	1.500686	0
	2.59721	0.36691	0.512205	2.53077	1.48701	0.163551	0
	3.54445	0.94724	0.018321	2.49459	0.03618	1.094985	0
	3.97745	0.433	0.421974	1.78034	0.71425	0.135678	0
	1.36549	2.61196	2.338957	3.0738	1.29346	0.044464	0
	1.317	0.04849	1.069373	2.90567	0.16813	0.836246	0
	0.66613	0.65087	0.186387	0.78488	2.14079	1.119776	0
	1.49879	0.83266	0.062468	0.63805	0.12683	0.913487	0
	2.99458	1.49579	0.17073	2.35297	1.71492	0.399835	0
	2.25696	0.73762	0.119008	1.47305	0.87992	0.041077	0
	1.5285	0.72846	0.125412	0.71916	0.75389	0.108047	0
	0.61919	0.90931	0.030028	0.52272	0.19644	0.785271	0
	0.77358	0.15439	0.861565	2.61603	2.09331	1.021545	0
	2.84908	2.0755	0.98586	2.56664	0.04939	1.067513	0
	3.67856	0.82948	0.084067	2.33107	0.23557	0.717452	0
	1.48657	2.19199	1.230757	2.4291	0.09803	0.969368	0
	1.30469	0.18188	0.811288	1.30265	1.12645	0.001923	0
	2.30223	0.99754	0.007234	1.44051	0.13786	0.892524	0
	2.24514	0.05709	1.051661	1.73743	0.29692	0.617285	0
	1.35183	0.89331	0.035829	1.612	0.12543	0.916165	0
	1.24376	0.10807	0.949699	1.63923	0.02723	1.113796	0
	1.94909	0.70533	0.142329	1.42026	0.21897	0.745848	0
	2.98619	1.0371	0.00207	1.73805	0.31779	0.584927	0
	1.26216	1.72403	0.411439	1.60328	0.13477	0.898372	0
	1.9826	0.72044	0.131156	0.40558	1.1977	0.013249	0
	1.53041	0.45219	0.397411	2.16458	1.759	0.457524	0
	1.54924	0.01883	1.131596	1.56645	0.59813	0.234706	0
	1.93452	0.38528	0.486248	3.28174	1.71529	0.400303	0
	1.27457	0.65995	0.178629	3.07724	0.2045	0.771051	0
	0.94892	0.32565	0.572968	0.87456	2.20268	1.25459	0
	0.67764	0.27128	0.658232	1.96619	1.09163	8.2E-05	0
	1.02662	0.34898	0.538191	1.81526	0.15093	0.868	0
	1.66785	0.64123	0.194803	0.73358	1.08168	8.4E-07	0
	0.94926	0.71859	0.1325	1.46934	0.73576	0.120295	0
	2.00635	1.05709	0.000651	2.71227	1.24293	0.025707	0
	1.74905	0.2573	0.681112	1.52909	1.18318	0.010117	0
	2.79042	1.04137	0.0017	1.44646	0.08263	0.99993	0

4	Alpha=4						
1	Beta=1	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	5.9191			2.8703	4.9493	7.579269	
0	8.5601	2.641	0.1978	2.3969	0.4734	2.968222	0
0	3.3627	5.1974	9.006885	2.7076	0.3107	3.555309	0
0	4.7341	1.3714	0.680382	2.0471	0.6605	2.358537	0
0	2.755	1.9791	0.047155	1.8831	0.164	4.130051	0
0	3.7563	1.0013	1.427912	3.5382	1.6551	0.292846	0
0	1.7014	2.0549	0.019981	1.8335	1.7047	0.241624	0
0	5.2751	3.5737	1.897361	9.3948	7.5613	28.78373	0
0	1.6219	3.6532	2.122695	2.3466	7.0482	23.54139	0
0	3.0275	1.4056	0.625132	5.0867	2.7401	0.29577	0
0	4.4321	1.4046	0.626714	6.7334	1.6467	0.302008	0
0	4.4183	0.0138	4.7631	4.8722	1.8612	0.11226	0
0	3.3123	1.106	1.188651	2.1746	2.6976	0.251349	0
0	8.3494	5.0371	8.070413	2.7239	0.5493	2.712453	0
0	0.5242	7.8252	31.68505	2.0904	0.6335	2.442196	1
0	2.9484	2.4242	0.05196	7.3297	5.2393	9.260136	0
0	4.1457	1.1973	0.997907	8.276	0.9463	1.562382	0
0	2.0514	2.0943	0.010394	2.26	5.996	14.43808	0
0	4.0247	1.9733	0.049706	9.6012	7.3212	26.26508	0
0	2.1546	1.8701	0.106376	5.4373	4.1639	3.871636	0
0	4.864	2.7094	0.26332	2.1985	3.2388	1.066905	0
0	2.8031	2.0609	0.01832	2.5079	0.3094	3.560213	0
0	2.2338	0.5693	2.646975	11.1522	8.8443	41.57731	0
0	2.4126	0.1788	4.070116	11.4546	0.3024	3.586678	0
0	2.3653	0.0473	4.617998	5.9074	5.5472	11.22885	0
0	8.0794	5.7141	12.37525	2.5267	3.3807	1.402915	0
0	3.07	5.0094	7.913797	1.6125	0.9142	1.643659	0
0	8.012	2.942	0.556139	1.7466	0.1341	4.252474	0
0	5.7684	0.2436	3.812853	4.0559	2.3093	0.01278	0
0	5.8406	0.0722	4.5116	3.3139	0.742	2.114851	0
0	7.656	1.8154	0.145049	4.0187	0.7048	2.224431	0
0	6.2762	1.3798	0.666595	2.026	1.9927	0.041434	0
0	3.5246	2.7516	0.308411	6.9374	4.9114	7.372025	0
0	3.7272	0.2026	3.974651	2.1477	4.7897	6.725969	0
0	2.3724	1.3548	0.708043	4.2397	2.092	0.010869	0
0	3.1357	0.7633	2.053354	1.4998	2.7399	0.295552	0
0	6.7537	2.618	0.177871	1.378	0.1218	4.303354	0
0	5.4638	0.2899	3.634181	0.5563	0.8217	1.889395	0
0	1.2845	4.1793	3.932476	5.4828	4.9265	7.45425	0
0	4.158	2.8735	0.458664	3.7712	1.7116	0.234888	0
0	3.2135	0.9445	1.566885	2.0302	1.741	0.207255	0
0	3.6424	0.4289	3.123536	3.1689	1.1387	1.118418	0
0	8.3801	2.7377	0.293165	2.4687	0.7002	2.238174	0
0	4.1444	2.2357	0.001556	2.8445	0.3758	3.314048	0
0	4.6682	0.5238	2.797098	5.4296	2.5851	0.151202	0
0	0.9849	3.6833	2.211309	7.2902	1.8606	0.112663	0
0	1.3969	0.412	3.183558	2.8343	4.4559	5.106006	0
0	4.943	3.5461	1.822088	1.0473	1.787	0.167488	0
0	4.4831	0.4599	3.014921	4.0385	2.9912	0.631941	0
0	5.5282	1.0451	1.325153	2.502	1.5365	0.435274	0
0	2.7923	2.7359	0.291219	3.5442	1.0422	1.331838	0
0	4.1001	1.3078	0.789348	1.8077	1.7365	0.211373	0
0	5.6635	1.5634	0.400503	2.5012	0.6935	2.258266	0
0	3.0908	2.5727	0.141713	4.8553	2.3541	0.024916	0
0	8.1772	5.0864	8.352951	5.1857	0.3104	3.556441	0
0	6.0877	2.0895	0.011396	2.9862	2.1795	0.000281	0
0	11.2369	5.1492	8.719897	5.4539	2.4677	0.073684	0
0	1.6073	9.6296	55.25465	3.5999	1.854	0.117137	1
0	4.8916	3.2843	1.183847	4.843	1.2431	0.9085	0
0	1.7328	3.1588	0.926497	6.6429	1.7999	0.157096	0
0	1.4416	0.2912	3.629226	5.4316	1.2113	0.970132	0
0	2.6074	1.1658	1.061833	3.2652	2.1664	0.000891	0
0	6.862	4.2546	4.236793	5.7014	2.4362	0.057575	0
0	5.0478	1.8142	0.145964	5.5836	0.1178	4.319966	0
0	5.2494	0.2016	3.97864	2.4696	3.114	0.84226	0
0	2.2201	3.0293	0.693968	6.2303	3.7607	2.447495	0
0	5.637	3.4169	1.48998	2.7115	3.5188	1.749131	0
0	3.7578	1.8792	0.100522	4.9011	2.1896	4.4E-05	0
0	1.7927	1.9651	0.053432	3.1191	1.782	0.171605	0
0	3.6611	1.8684	0.107487	1.1054	2.0137	0.033326	0
0	4.1289	0.4678	2.987549	5.2472	4.1418	3.785154	0
0	9.9781	5.8492	13.34402	1.6367	3.6105	2.000095	0
0	4.8949	5.0832	8.334464	3.5473	1.9106	0.061598	0
0	3.072	1.8229	0.139392	5.3759	1.8286	0.135169	0

4	Alpha=4						
5	Beta=5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	31.8246			13.2859	1.7718	86.53939	
0	13.4349	18.3897	53.51281	29.7612	16.4953	29.38556	0
0	20.912	7.4771	12.94096	20.6818	9.0994	3.900841	0
0	11.0811	9.8309	1.546429	19.8392	0.8426	104.6909	0
0	8.7744	2.3067	76.87352	16.4344	3.4048	58.8236	0
0	19.4734	10.699	0.140966	16.3737	0.0607	121.3028	0
0	16.8179	2.6555	70.8788	19.9367	3.563	56.42195	0
1	42.8382	26.0203	223.3783	21.4637	1.527	91.15389	0
0	22.7498	20.0884	81.25121	18.5256	2.9381	66.20027	0
0	8.5633	14.1865	9.684825	25.1769	6.6513	19.5643	0
0	29.0205	20.4572	88.03591	16.9174	8.2595	7.923971	0
0	17.8397	11.1808	0.011309	16.4946	0.4228	113.4577	0
0	14.7516	3.0881	63.78188	18.6537	2.1591	79.48355	0
0	6.6745	8.0771	8.984136	14.9024	3.7513	53.6286	0
0	10.0826	3.4081	58.773	5.5235	9.3789	2.874906	0
0	10.0395	0.0431	121.6908	7.2329	1.7094	87.70425	0
0	25.0738	15.0341	15.67879	28.9462	21.7133	113.185	0
0	19.968	5.1056	35.62723	9.9477	18.9985	62.79049	0
1	23.4823	3.5143	57.15594	17.701	7.7533	11.03007	0
0	18.413	5.0693	36.06188	24.5246	6.8236	18.06977	0
0	20.9994	2.5864	72.04707	31.8795	7.3549	13.83509	0
0	10.3019	10.6975	0.142095	15.8229	16.0566	24.82177	0
1	35.616	25.3141	202.7675	14.1548	1.6681	88.47951	0
0	9.3391	26.2769	231.1143	24.9122	10.7574	0.100524	0
0	17.9138	8.5747	6.248774	39.9358	15.0238	15.59575	0
0	8.0398	9.874	1.441092	19.9607	19.9751	79.22149	0
0	11.1277	3.0879	63.76506	13.108	6.8527	17.82321	0
0	29.089	17.9613	47.42864	19.2936	6.1856	23.9009	0
0	4.4855	24.6035	183.0351	9.3678	9.9258	1.319408	0
0	14.9487	10.4632	0.373632	7.0822	2.2756	77.41985	0
0	8.3578	6.5909	20.10226	14.2217	7.1295	15.56267	0
0	27.963	19.6052	72.77361	23.5553	9.3336	3.030575	0
0	12.2016	15.7614	21.96746	31.911	8.3557	7.391628	0
0	17.1267	4.9251	37.81458	7.1705	24.7405	186.7608	0
0	7.3367	9.79	1.649824	22.3429	15.1724	16.79315	0
0	20.6859	13.3492	5.174466	7.1518	15.1911	16.94677	0
0	35.1936	14.5077	11.78717	15.1251	7.9733	9.617161	0
0	9.1941	25.9995	222.767	10.6143	4.5108	43.08156	0
0	16.8565	7.6624	11.64212	15.9684	5.3541	32.72246	0
0	10.5338	6.3227	22.57917	11.8931	4.0753	48.98817	0
0	25.8295	15.2957	17.81891	21.8695	9.9764	1.205724	0
0	20.8556	4.9739	37.21677	9.0851	12.7844	2.923913	0
0	18.0121	2.8435	67.74862	36.6902	27.6051	273.2622	0
0	7.1999	10.8122	0.068778	20.8644	15.8258	22.57528	0
0	13.1438	5.9439	26.32259	20.5818	0.2826	116.4641	0
0	17.0054	3.8616	52.02527	37.225	16.6432	31.01092	0
0	18.0759	1.0705	100.0791	24.0638	13.1612	4.354506	0
0	31.5157	13.4398	5.594858	7.3441	16.7197	31.86879	0
0	5.7317	25.784	216.3707	19.3309	11.9868	0.832374	0
0	18.6429	12.9112	3.373633	18.8582	0.4727	112.3972	0
0	9.1052	9.5377	2.381615	32.4808	13.8226	6.493044	0
0	22.644	13.5388	6.072997	20.3307	12.1501	1.157013	0
0	19.7796	2.8644	67.405	23.0186	2.6879	70.3343	0
0	6.5011	11.2785	0.041634	18.3871	4.6315	41.51167	0
0	8.3555	0.1456	119.4399	21.0992	2.7121	69.92898	0
0	15.4507	7.0952	15.83447	26.1871	5.0879	35.83884	0
0	19.9442	4.4935	43.30897	15.2028	10.9843	0.008128	0
0	38.5544	18.6102	56.78746	29.8872	14.6844	13.0317	0
0	11.1458	27.4086	266.8043	14.1052	15.782	22.16098	0
0	20.7709	9.6251	2.100629	21.5419	7.4367	13.23326	0
0	14.4916	6.2793	22.99351	10.7817	10.7602	0.098756	0
0	13.472	1.0196	101.1001	22.0743	11.2926	0.047587	0
0	22.5522	9.0802	3.977052	14.6269	7.4474	13.15553	0
0	35.9719	13.4197	5.500175	11.2576	3.3693	59.36941	0
0	26.123	9.8489	1.501985	10.7434	0.5142	111.519	0
0	37.3383	11.2153	0.019837	28.8249	18.0815	49.09868	0
0	50.5011	13.1628	4.361186	23.4835	5.3414	32.86792	0
0	21.1264	29.3747	334.899	14.4285	9.055	4.078198	0
0	41.7957	20.6693	92.06105	9.8749	4.5536	42.52155	0
0	22.6213	19.1744	65.60911	37.9056	28.0307	287.5143	0
0	22.0502	0.5711	110.3205	5.5591	32.3465	452.4999	0
0	22.266	0.2158	117.9104	15.3366	9.7775	1.682092	0
0	28.2636	5.9976	25.77445	17.3304	1.9938	82.45829	0
0	11.3412	16.9224	34.19846	11.8821	5.4683	31.42897	0

4	Alpha=4							
10	Beta=10	MR	(MRi-MR)^2		MR	(MRi-MR)^2		
0	38.562			29.241	24.927	8.327664		0
0	74.921	36.359	204.9985	32.353	3.112	358.3158	0	0
0	49.915	25.006	8.789857	26.431	5.922	259.8296	0	0
0	35.859	14.056	63.76391	58.676	32.245	104.1169	0	0
0	62.044	26.185	17.17082	18.075	40.601	344.465	0	0
0	32.723	29.321	52.99504	27.535	9.46	158.2874	0	0
0	21.049	11.674	107.4795	52.341	24.806	7.643949	0	0
0	20.963	0.086	482.0322	60.034	7.693	205.8717	0	0
0	34.277	13.314	76.16456	74.92	14.886	51.19733	0	0
0	48.178	13.901	66.26336	19.906	55.014	1087.204	0	0
0	41.266	6.912	228.8936	29.395	9.489	157.5585	0	0
0	21.864	19.402	6.965539	26.68	2.715	373.5032	0	0
0	34.92	13.056	80.73437	33.752	7.072	224.0779	0	0
0	23.789	11.131	119.0331	28.373	5.379	277.6299	0	0
0	22.381	1.408	425.7302	32.001	3.628	339.0471	0	0
0	64.375	41.994	398.113	5.849	26.152	16.89842	0	0
0	55.498	8.877	173.297	18.854	11.005	121.7984	0	0
0	14.761	40.737	349.5318	35.415	18.561	12.11201	0	0
0	34.981	20.22	3.316881	29.361	6.054	255.5915	0	0
0	18.776	16.205	34.06159	12.615	16.746	28.03947	0	0
0	21.35	2.574	378.9731	18.687	6.072	255.0163	0	0
0	53.321	31.971	98.60032	27.918	9.231	164.102	0	0
0	40.626	12.695	87.35203	54.909	26.991	24.50022	0	0
0	20.665	19.961	4.32736	26.568	28.341	39.68709	0	0
0	40.698	20.033	4.032991	62.177	35.609	184.0644	0	0
0	48.081	7.383	214.8637	19.681	42.496	418.3976	0	0
0	52.136	4.055	323.5045	32.193	12.512	90.80624	0	0
0	20.427	31.709	93.46576	40.848	8.655	179.1912	0	0
0	56.233	35.806	189.4689	42.509	1.661	415.3538	0	0
0	47.646	8.587	181.0163	17.714	24.795	7.583245	0	0
0	27.811	19.835	4.867454	21.108	3.394	347.7192	0	0
0	57.146	29.335	63.19907	54.159	33.051	121.215	0	0
0	24.291	32.855	116.9376	55.062	0.903	446.8248	0	0
0	58.599	34.308	150.4736	28.895	26.367	18.71228	0	0
0	23.534	35.065	169.6186	26.576	2.119	396.8953	0	0
0	34.818	11.284	115.718	45.939	19.363	7.17292	0	0
0	23.84	10.978	122.3951	19.406	26.533	20.17599	0	0
0	46.151	22.311	0.072775	73.078	63.672	1000.506	0	0
0	24.015	22.136	0.008981	64.564	8.514	182.988	0	0
0	26.744	2.729	372.9623	31.953	32.611	111.72	0	0
0	48.708	21.964	0.005965	23.454	8.499	183.392	0	0
0	57.326	8.618	180.1831	77.784	54.33	1042.565	0	0
0	39.478	17.848	17.58318	16.618	61.166	1530.748	0	0
0	20.751	18.727	10.98413	38.524	21.906	0.018287	0	0
0	27.493	6.742	234.0665	90.2	51.676	878.2198	0	0
0	17.531	9.962	145.9078	13.565	76.635	2980.48	0	1
0	9.288	8.243	190.3912	45.399	31.834	95.89633	0	0
0	29.879	20.591	2.103169	40.828	4.571	305.209	0	0
0	32.723	2.844	368.5337	56.213	15.385	44.30541	0	0
0	22.443	10.28	138.3265	15.737	40.476	339.8407	0	0
0	13.795	8.648	179.3786	23.173	7.436	213.3128	0	0
0	36.196	22.401	0.129434	30.819	7.646	207.2227	0	0
0	34.389	1.807	409.4241	59.993	29.174	50.8764	0	0
0	41.642	7.253	218.6918	25.291	34.702	160.2951	0	0
0	95.651	54.009	1021.938	63.779	38.488	270.4962	0	0
0	84.302	11.349	114.3238	18.38	45.399	545.5854	0	0
0	29.033	55.269	1104.085	21.78	3.38	348.2415	0	0
0	52.431	23.398	1.840823	84.763	63.003	1677.867	0	0
0	11.59	40.841	353.4313	90.259	5.496	273.7447	0	0
0	21.028	9.438	158.8414	60.467	29.792	60.07442	0	0
0	24.138	3.11	358.3915	10.203	50.264	796.5247	0	0
0	53.555	29.417	54.40197	20.935	10.732	127.8987	0	0
0	72.8	19.245	7.818906	34.756	13.821	67.57219	0	0
0	12.057	60.743	1497.827	23.609	11.147	118.6843	0	0
0	21.164	9.107	167.2943	49.701	26.092	16.40873	0	0
0	68.08	46.916	618.7541	6.855	40.846	353.6193	0	0
0	49.64	18.44	12.96886	27.959	19.104	8.627324	0	0
0	82.993	33.353	127.9561	31.992	4.033	324.2964	0	0
0	51.363	31.63	91.9445	59.256	27.264	27.27732	0	0
0	45.588	5.775	264.5903	37.415	21.841	0.040092	0	0
0	43.454	2.134	396.2978	28.668	8.747	176.7366	0	0
0	36.421	7.033	225.247	39.42	10.752	127.4467	0	0
0	49.666	13.245	77.37367	78.192	38.772	279.9186	0	0
0	29.637	20.029	4.049072	62.75	15.442	43.54985	0	0

1 09858	1 88549	0 64464
1 49782	0 39924	0 466974
1 88378	0 38596	0 4853
3 03508	1 1513	0 00472
1 75961	1 27547	0 037201
1 5944	0 16521	0 841595
1 21829	0 37811	0 499121
1 15226	0 06603	1 033405
2 23471	1 08245	2 1E-08
1 79203	0 44268	0 409491
2 75685	0 96482	0 013871
0 80837	1 94848	0 749757
1 08262	0 27425	0 653422
2 46288	1 38026	0 088604
2 51487	0 05199	1 062147
1 99865	0 51622	0 320781
1 14976	0 84889	0 054618
1 84378	0 694	0 151006
1 38625	0 45751	0 390731
0 99044	0 39581	0 471674
0 66207	0 32837	0 568856
2 50843	1 84636	0 583337
1 20405	1 30438	0 049189
0 74158	0 46247	0 384555
1 67927	0 93769	0 020997
2 31728	0 63801	0 197656
1 09186	1 22542	0 020399
2 00821	0 91635	0 027637
0 97124	1 03697	0 002082
0 79938	0 17186	0.829438
0 69055	0 10683	0 948219
3 06813	2 37558	1 67181
1 79335	1 27278	0 03617
2 44329	0 64994	0 18719
2 95335	0 51006	0 327796
1 68227	1 27108	0 035527
1 85034	0 16807	0.836356
0 56348	1 28686	0 041724
1 35134	0 78786	0 086869
1 80622	0 45488	0 394026
2 58392	0 7777	0 092961
0 95846	1 62546	0 294702
0 64936	0.3091	0 598295
3 02393	2 37457	1 669199
1 97657	1 04736	0 001242
0 51252	1.46405	0 145508
4 10942	3 5969	6 321729
1 24324	2 86618	3 181175
2 4238	1 18056	0 009597
1 50753	0 91627	0 027684
1 15617	0 35136	0.534705
1.81836	0 66219	0 17674
2 13654	0 31818	0.58433
1 86201	0 27453	0.652969
2 87165	1 00964	0.005322
0.67726	2 19439	1.236088

Sum MR > UCLmr		
Sum X	15905	4063.998
X Average	1 9969	
MR Average	1 082595	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3 268	
Upper contro limit for X (UCLx	4.876142	
Lower control limit for X (LCLx	-0 88234	
Upper control limit MR (UCLmr	3 537921	
MR Standard deviation	0 883636	
Process standard deviation	1	
Gamma d2	1 082595	
Gamma d3	0 883636	
Gamma D4	3 448661	
4 Alpha=4		
0 5 Beta=0 5		
Proportion MR > UCLmr	0 017602	
Percentage	1 760176	
ARL for MR	56 8125	

0	3 2761	0 5312	2 772401
0	3 1285	0 1478	4 196978
0	1 4922	1 6363	0 313547
0	6 0798	4 5876	5 718542
0	4 696	1 3838	0 660079
0	4 3288	0 3672	3 345434
0	3 8791	0 4497	3 050447
0	2 0694	1 8097	0 149423
0	2 0337	0 0357	4 667988
0	5 7436	3 7099	2 291128
0	5 0857	0 6579	2 366529
0	0 9591	4 1266	3 72624
0	4 2454	3 2863	1 188203
0	3 9627	0 2827	3 661684
0	2 3526	1 6101	0 343575
0	2 0817	0 2709	3 706983
0	4 3722	2 2905	0 008883
0	7 0573	2.6851	0.238972
0	2 3299	4 7274	6 406706
0	2 2579	0 072	4.51245
0	1 9361	0 3218	3 513573
0	1 73	0.2061	3.960708
0	6 5166	4 7866	6 709899
0	1 2897	5.2269	9 184823
0	6 4064	5 1167	8 529012
0	6 0654	0.341	3 441963
0	1 0819	4.9835	7 768747
0	1 2922	0 2103	3 944006
0	1 7081	0 4159	3 169656
0	7 6412	5.9331	13.96403
0	1 7503	6 8909	13.65042
0	4 5603	2.81	0 376686
0	6 3403	1 78	0 173266
0	3 0168	3.3235	1.270686
0	8 5428	5.526	11.08722
0	4.5103	4 0325	3.371804
0	4 2376	0.2728	3.699671
0	2 2727	1 9648	0.05357
0	2.5465	0.2738	3.695825
0	3.8363	1 2898	0.821657
0	3.5781	0 2582	3 756049
0	0 9972	2.5809	0 147953
0	2.6834	1 6862	0 260154
0	4.552	1 8686	0 107356
0	1.2117	3 3403	1 308844
0	4 1822	2.9705	0.599459
1	1.5155	2.6667	0.221321
0	5.5349	4.0194	3 323866
0	2 201	3 3339	1.294241
0	2 6806	0.4796	2.946897
0	4.8864	2.2058	9 1E-05
0	3.5321	1.3543	0 708884
0	6 8331	3.301	1.220466
0	7 32	0 4869	2 921887
0	7 0927	0 2273	3.876775
0	7 8196	0.7269	2 158998
126	50		

Sum X	32086.97	7944 791
X Average	4 003177	
MR Average	2 196253	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3 268	
Upper contro limit for X (UCLx	9.644274	
Lower control limit for X (LCLx	-1 83792	
Upper control limit MR (UCLmr	7 177354	
MR Standard deviation	1 796333	
Process standard deviation	2	
Gamma d2	1 098126	
Gamma d3	0.898167	
Gamma D4	3 453725	
4 Alpha=4		
1 Beta=1		
Proportion MR > UCLmr	0.017702	
Percentage	1 770177	
ARL for MR	56 49153	

0	16 7155	7 295	14.28428
0	30 7051	13 9896	6 498072
0	15 1981	15.507	19 64748
0	8 8179	6.3802	22 03603
0	26 4612	17 6433	43 14973
0	33.7005	7 2393	14 70841
0	19.6952	14 0053	8.589854
0	10 614	9.0812	3.973065
0	13.3765	2.7625	69 08859
0	45 5969	32 2204	447 151
0	4 1762	41 4207	920 8946
0	10.0273	5 8511	27 28344
0	13 046	3.0187	64 89519
0	16 9719	3 9259	51 10184
0	11 651	5 3209	33 10339
0	26 8786	15 2276	17 24862
0	20.2237	6 6549	19 53246
0	15 435	4 7867	39 51071
0	21 8837	6 4487	21 39761
0	7 918	13 9657	8.359299
0	18 3961	10 4781	0 355639
0	14 1157	4.2804	46 15918
0	18.4282	4.3125	45 72403
0	14 2888	4 1394	48 09499
0	28 5099	14 2211	9 901376
0	10 2418	18 2681	61 74853
0	31 4489	21 2071	102.6705
0	17 6751	13 7738	7.286465
0	12.5696	5 1055	35 62842
0	14 7748	2.2052	78.66368
0	22.8217	8.0469	9 166088
0	12.0963	10 7254	0.121839
0	27 551	15 4547	19 18655
0	20 1547	7 3963	13 52882
0	30 5462	10.3915	0.466427
0	14 8512	15.695	21.34944
0	9 5003	5 3509	32 75908
0	20 3669	10 8666	0.043204
0	10 4831	9 8838	1 417659
0	33 3854	22.9023	139.8979
0	22 8804	10 505	0.324279
0	26.0935	3.2131	81.8009
0	17 1617	8.9318	4 59097
0	13 9575	3 2042	61 94091
0	11 6798	2.2777	77 38289
0	27 9659	16.2861	27 18125
0	19 5537	8 4122	7 087601
0	13 6063	5 9474	26.28669
0	26 4122	12 8059	2.997902
0	17 0756	9 3366	3.020139
0	17 5518	0 4782	112 323
0	37 7903	20 2385	83 97972
0	19 7048	18 0855	49 15475
0	17 0197	2.6851	70 38127
0	9 7643	7 2554	14 58518
0	11 5141	1 7498	86.94919
146	31		

Sum X	159671	39788 14
X Average	19 94592	
MR Average	11 07445	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3 268	
Upper contro limit for X (UCLx	49 39925	
Lower control limit for X (LCLx	-9 50742	
Upper control limit MR (UCLmr	36 19132	
MR Standard deviation	8.964618	
Process standard deviation	10	
Gamma d2	1 107445	
Gamma d3	0 896462	
Gamma D4	3 428458	
4 Alpha=4		
5 Beta=5		
Proportion MR > UCLmr	0 015102	
Percentage	1.510151	
ARL for MR	66 21854	

0	36 421	3 452	345 5595
0	21 957	14 464	57 41443
0	25 704	3 747	334 6789
0	44 879	18 975	9 401771
0	36 613	8 066	195.3071
0	53 11	16 497	30 73849
0	21 115	31 995	99 07752
0	19 005	2 11	397 254
0	57 185	38 18	260 4599
0	66 876	9 691	152 5282
1	23 113	43 763	471 8353
0	34 662	11 549	110 0869
0	46 395	11 733	106.2596
0	64 622	18 227	14.54836
0	30 459	34 163	146 9373
0	21 38	9 079	168 0194
0	103 012	81 632	3551 06
0	24 124	78 888	3231 555
0	93 344	69 22	2225.836
0	65 973	27 371	28 40644
0	44 852	21 121	0 846825
0	39 076	5 776	264 5577
0	9 053	30 023	63 70864
0	14 39	5 337	279 0313
0	18 361	3 971	326 5332
0	75 307	56 946	1218.343
0	42 113	33 194	124.3843
0	69 118	27 005	24 63901
0	57 831	11 287	115.6535
0	31 742	26 089	16.38444
0	15 108	16 636	29 21652
0	44 537	29 431	54 60869
0	79 945	35 408	178 6705
0	20 713	69 232	1383 153
0	33 663	12 95	82 65048
0	27 055	6 608	238 1846
0	12 18	14 875	51 35486
0	36 104	23 924	3 54482
0	58 701	22 597	0.308879
0	14 104	44 597	508 7627
0	16 189	2 085	398.2511
0	63.841	47 652	655.9115
0	41 203	22 638	0.356134
0	57 402	18 199	34 13166
0	21 949	35 453	179 8756
0	19 993	1 956	403 4165
0	50 875	30 882	78 1592
0	25 827	25 048	9.040661
0	31 175	5 348	278 664
0	13 014	18 161	15 05619
0	49 548	36 534	210 0404
0	24 474	25 074	9 197689
0	67 481	43 007	439 5635
0	45 469	22 012	0.000854
0	90 28	44 811	518 4624
0	54 168	36 112	197 9865
124	27		

Sum X	321466 8	80684 96
X Average	40 21518	
MR Average	22 04123	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3 268	
Upper contro limit for X (UCLx	98 83547	
Lower control limit for X (LCLx	-18 4051	
Upper control limit MR (UCLmr	72 03074	
MR Standard deviation	18 15019	
Process standard deviation	20	
Gamma d2	1 102062	
Gamma d3	0 907509	
Gamma D4	3 470396	
4 Alpha=4		
10 Beta=10		
Proportion MR > UCLmr	0 018702	
Percentage	1 870187	
ARL for MR	53 47059	

5	Alpha=5						
0.5	Beta=0.5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
	1.07974			3.54696	2.0358	0.641893	
	1.56595	0.48621	0.560114	1.4186	2.12836	0.798776	0
	3.26401	1.69806	0.214779	2.60927	1.19067	0.001931	0
	1.14765	2.11636	0.77747	1.41834	1.19093	0.001909	0
	3.33162	2.18397	0.90127	2.24829	0.82995	0.163756	0
	3.38343	0.05181	1.399034	2.25193	0.00364	1.515306	0
	1.66348	1.71995	0.235548	1.27574	0.97619	0.066785	0
	1.55128	0.1122	1.259821	0.66318	0.61256	0.386956	0
	3.46223	1.91095	0.457426	2.60084	1.93766	0.494269	0
	4.91497	1.45274	0.047577	2.32513	0.27571	0.919504	0
	1.28157	3.6334	5.754157	2.13483	0.1903	1.090599	0
	2.00249	0.72092	0.263885	1.57571	0.55912	0.456297	0
	4.21315	2.21066	0.952659	1.73857	0.16286	1.148664	0
	2.30045	1.9127	0.459796	3.08136	1.34281	0.011706	0
	2.80184	0.50139	0.537623	1.39824	1.68314	0.201172	0
	1.73867	1.06317	0.029394	1.66489	0.26665	0.936961	0
	2.05937	0.3207	0.835245	3.63814	1.97325	0.545578	0
	2.5696	0.51023	0.524737	1.40689	2.23125	0.993276	0
	3.37311	0.80351	0.165854	1.77205	0.36516	0.755956	0
	2.90406	0.46905	0.586094	2.38566	0.61361	0.38565	0
	1.38113	1.52293	0.083124	2.89921	0.51355	0.519938	0
	1.96881	0.58768	0.418528	4.01506	1.11585	0.014106	0
	2.50294	0.53413	0.490683	1.31052	2.70454	2.160672	0
	1.52343	0.97951	0.06508	3.22294	1.91242	0.459416	0
	1.19808	0.32535	0.826767	1.07073	2.16221	0.841976	0
	5.73276	4.53468	10.89041	2.32842	1.25769	0.000532	1
	2.6298	3.10296	3.490704	2.60592	0.2775	0.916074	0
	0.81147	1.81833	0.34072	3.35291	0.74699	0.237781	0
	2.15976	1.34829	0.012921	1.58148	1.77143	0.288166	0
	1.76522	0.39454	0.70573	1.59813	0.01665	1.483445	0
	2.2527	0.48748	0.558214	4.10688	2.51075	1.628514	0
	1.65925	0.59345	0.411096	1.85438	2.2545	1.04016	0
	1.33464	0.32461	0.828114	3.84904	1.99466	0.577665	0
	3.45224	2.1176	0.779658	3.07281	0.77623	0.210119	0
	1.88209	1.57015	0.112582	6.94076	3.86795	6.93444	0
	2.38122	0.49913	0.540942	3.4493	3.49146	5.093338	0
	4.30565	1.92443	0.475841	5.09845	1.64915	0.171837	0
	2.24181	2.06384	0.68761	2.96343	2.13502	0.810725	0
	2.69748	0.65567	0.33518	2.2063	0.75513	0.229908	0
	1.87849	1.01899	0.046495	1.33428	0.87402	0.130031	0
	0.99817	0.88032	0.125527	3.70307	2.36879	1.286347	0
	4.03124	3.03307	3.234431	1.9855	1.71757	0.233243	0
	2.64701	1.38423	0.022384	1.42879	0.55671	0.459559	0
	1.00248	1.64453	0.168028	2.63034	1.20155	0.001093	0
	3.00551	2.00303	0.590458	3.02565	0.39531	0.704437	0
	1.71786	1.28765	0.002812	2.30793	0.71772	0.267183	0
	1.09607	0.62179	0.376558	1.61462	0.89331	0.293014	0
	2.32542	1.22935	2.8E-06	2.13612	0.5215	0.508537	0
	1.12327	1.20215	0.001054	1.01064	1.12548	0.011911	0
	3.31009	2.18682	0.90669	1.9222	0.91156	0.104366	0
	2.47822	0.83187	0.162206	0.77492	1.14728	0.007628	0
	3.60301	1.12479	0.012062	4.06389	3.28897	4.220364	0
	2.02372	1.57929	0.118799	3.10839	0.9555	0.077907	0
	4.4306	2.40688	1.374199	1.85345	1.25494	0.000413	0
	0.47303	3.95757	7.41447	3.16142	1.30797	0.005381	0
	4.06493	3.5919	5.556781	3.26808	0.10666	1.272288	0
	4.61555	0.55062	0.467853	3.3447	0.07662	1.340958	0
	3.77706	0.83849	0.156917	2.89318	0.45152	0.613242	0
	1.7336	2.04346	0.654226	3.08008	0.1869	1.097712	0
	1.61067	0.12293	1.235849	2.9304	0.14968	1.177089	0
	2.03211	0.42144	0.661258	1.57448	1.35592	0.014714	0
	1.49172	0.54039	0.481952	1.844	0.26952	0.931413	0
	2.12146	0.62974	0.365877	4.93944	3.09544	3.46266	0
	2.89361	0.77215	0.213878	2.71643	2.22301	0.97692	0
	1.87735	1.01626	0.04768	2.17464	0.54179	0.48001	0
	3.07456	1.19721	0.001399	1.24451	0.93013	0.092713	0
	4.24346	1.1689	0.004319	1.99316	0.74865	0.236164	0
	2.32625	1.91721	0.465932	1.38552	0.60764	0.393101	0
	2.84001	0.51376	0.519636	1.02385	0.36167	0.762037	0
	1.22033	1.61968	0.148273	3.18004	2.15619	0.849296	0
	2.09993	0.8796	0.126037	2.06508	1.11496	0.014318	0
	5.96812	3.86819	6.935704	3.30394	1.23886	1.6E-05	0
	3.00293	2.96519	2.994881	1.70218	1.60176	0.134794	0
	4.30388	1.30095	0.0044	4.16766	2.46548	1.515022	0

5	Alpha=5						
1	Beta=1	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	2.9028			5.8053	1.5059	0.955403	
0	4.0098	1.107	1.894332	4.8731	0.9322	2.406058	0
0	4.8418	0.832	2.726948	7.6612	2.7881	0.092874	0
0	5.3451	0.5033	3.920588	4.6775	2.9837	0.250353	0
0	3.3801	1.965	0.268684	5.7102	1.0327	2.104376	0
0	9.5113	6.1312	13.30683	7.3141	1.6039	0.773428	0
0	4.7212	4.7901	5.321108	3.1602	4.1539	2.790746	0
0	4.8319	0.1107	5.629456	3.4271	0.2669	4.912639	0
0	6.1617	1.3298	1.330672	3.8513	0.4242	4.240088	0
0	3.0317	3.13	0.41816	3.548	0.3033	4.752607	0
0	6.0751	3.0434	0.313659	8.1881	4.6401	4.651582	0
0	4.5401	1.535	0.899363	6.243	1.9451	0.28971	0
0	3.0363	1.5038	0.959513	2.7294	3.5136	1.06142	0
0	2.418	0.6183	3.478402	3.9991	1.2697	1.47294	0
0	7.2346	4.8166	5.444068	4.4425	0.4434	4.161385	0
0	5.465	1.7696	0.509435	6.768	2.3255	0.024916	0
0	6.3506	0.8856	2.552797	4.6819	2.0861	0.157805	0
0	8.4171	2.0665	0.173762	6.2089	1.527	0.9146	0
0	2.8594	5.7577	10.72139	6.9431	0.7342	3.059517	0
0	9.4098	6.7505	18.20859	7.2146	0.2715	4.892269	0
0	4.4822	4.9277	5.97486	4.1417	3.0729	0.347572	0
0	3.7217	0.7605	2.968203	3.7831	0.3586	4.514551	0
0	4.8478	1.1261	1.84212	3.8423	0.0592	5.87649	0
0	3.6596	1.1882	1.677407	1.9378	1.9045	0.335064	0
0	3.8524	0.1928	5.246607	5.9215	3.9837	2.251058	0
0	3.7283	0.1241	5.566048	3.4378	2.4837	1.2E-07	0
0	10.0638	6.3355	14.83908	6.0055	1.5677	0.83841	0
0	2.8474	7.2164	22.40179	5.202	0.1965	5.229671	0
0	4.9375	2.0901	0.154643	7.6526	2.4506	0.001072	0
0	10.3067	5.3692	8.328145	3.3658	4.287	3.253183	0
0	4.1397	6.167	13.5693	5.1781	1.8125	0.450036	0
0	2.3684	1.7713	0.507011	1.7685	3.4096	0.857944	0
0	3.6165	1.2481	1.525836	3.0285	1.26	1.496579	0
0	4.2854	0.6689	3.292219	5.0444	2.0159	0.218507	0
0	4.6129	0.3275	4.647678	6.8924	1.848	0.403666	0
0	3.724	0.8889	2.542262	1.1065	5.7859	10.90685	0
0	6.2091	2.4851	3.1E-06	1.9758	0.8693	2.605149	0
0	5.3706	0.8385	2.705523	9.3182	7.3424	23.61039	0
0	5.1275	0.2431	5.018708	7.5587	1.7595	0.523955	0
0	13.6759	8.5484	36.78466	4.1831	3.3756	0.796116	1
0	6.0884	7.5875	26.06237	4.2546	0.0717	5.816043	0
0	6.2878	0.1994	5.216416	8.9983	4.7435	5.10629	0
0	7.4279	1.1401	1.804314	2.6687	6.3296	14.79366	0
0	4.5954	2.8325	0.121906	4.5941	1.9254	0.311305	0
0	7.7005	3.1051	0.386576	3.968	0.6261	3.449366	0
0	4.9689	2.7116	0.052099	5.0231	1.0551	2.039691	0
0	9.4249	4.436	3.812852	3.5135	1.5096	0.946184	0
0	5.4208	4.0041	2.312689	3.7159	0.2024	5.202721	0
0	3.8004	1.6204	0.744678	5.5596	1.8439	0.406893	0
0	6.1422	2.3418	0.020036	4.6346	0.9252	2.427623	0
0	4.8534	1.2888	1.426943	10.951	6.3164	14.69229	0
0	3.7603	1.0931	1.932788	7.8552	3.0958	0.375098	0
0	4.5953	0.835	2.717049	3.4505	4.4047	3.691596	0
0	4.2874	0.3079	4.732571	3.5423	0.0918	5.719499	0
0	6.8226	2.5352	0.002689	4.3877	0.8454	2.682872	0
0	3.3983	3.4243	0.885392	2.1502	2.2375	0.060441	0
0	3.0878	0.3105	4.721266	4.1031	1.9529	0.281374	0
0	3.6079	0.5201	3.85434	2.8759	1.2272	1.577906	0
0	5.2042	1.5963	0.786853	1.5196	1.3563	1.270236	0
0	7.1467	1.9425	0.292516	4.5615	3.0419	0.311961	0
0	3.8615	3.2852	0.642968	4.7221	0.1606	5.395155	0
0	3.5359	0.3256	4.655874	5.8864	1.1643	1.739686	0
0	2.8881	0.6478	3.369234	7.661	1.7746	0.502323	0
0	6.4054	3.5173	1.069058	5.8033	1.8577	0.391435	0
0	7.72	1.3146	1.36597	3.6565	2.1468	0.113264	0
0	2.7681	4.9519	6.093752	7.5867	3.9302	2.093383	0
0	7.8499	5.0818	6.751956	2.9613	4.6254	4.588389	0
0	4.8654	2.9845	0.251154	7.7513	4.79	5.320646	0
0	5.9251	1.0597	2.026772	6.8644	0.8869	2.548644	0
0	3.4273	2.4978	0.000209	3.943	2.9214	0.19189	0
0	1.7698	1.6575	0.682024	3.4624	0.4806	4.010997	0
0	8.8697	7.0999	21.31256	3.8781	0.4157	4.275166	0
0	6.8754	1.9943	0.239167	5.0307	1.1526	1.770889	0
0	2.2251	4.6503	4.695684	5.2079	0.1772	5.318316	0

5	Alpha=5						
5	Beta=5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	14.0566			23.5536	17.5218	26.78122	
0	25.4499	11.3933	0.909053	44.4789	20.9253	73.59165	0
0	40.3492	14.8993	6.515549	18.3213	26.1576	190.7398	0
0	31.4187	8.9325	11.65705	11.6542	6.6671	32.25834	0
0	9.5314	21.8853	90.98408	27.6438	15.9896	13.27041	0
0	35.6469	26.1155	189.5787	25.1313	2.5125	96.71233	0
0	31.4873	4.1596	67.0293	30.6232	5.4919	46.98887	0
0	16.1144	15.3729	9.157628	34.2675	3.6443	75.73251	0
0	24.173	8.0586	18.38817	12.4174	21.8501	90.3138	0
0	21.4919	2.6811	93.42465	15.68	3.2626	82.52165	0
0	31.9523	10.4604	3.558289	15.7537	0.0737	150.6276	0
0	19.6712	12.2811	0.004309	27.144	11.3903	0.914783	0
0	6.0328	13.6384	1.668379	23.0431	4.1009	67.99392	0
0	15.6912	9.6584	7.227186	40.5657	17.5226	26.7895	0
0	20.7629	5.0717	52.92625	16.7119	23.8538	132.4124	0
0	31.1203	10.3574	3.957484	8.7386	7.9733	19.127	0
0	29.7864	1.3339	121.2827	26.1925	17.4539	26.08306	0
0	25.1823	4.6041	59.94851	20.4607	5.7318	43.75747	0
0	45.207	20.0247	58.95103	38.0633	17.6226	27.83467	0
0	12.7298	32.4772	405.2353	28.5072	9.5761	7.676461	0
0	39.9856	27.2558	222.28	17.3281	11.1791	1.363389	0
0	19.4914	20.4942	66.36106	19.9486	2.6205	94.5998	0
0	14.2924	5.199	51.09022	14.9826	4.966	54.47536	0
0	33.6909	19.3985	49.72728	22.5898	7.6072	22.46326	0
0	28.4786	5.2123	50.90027	37.945	15.3552	9.050616	0
0	31.3989	2.9203	88.85782	17.1542	20.7908	71.3021	0
0	28.7054	2.6935	93.18509	30.2959	13.1417	0.631957	0
0	32.4725	3.7671	73.61027	18.6966	11.5973	0.561664	0
0	19.9523	12.5202	0.030087	22.2286	3.53	77.73495	0
0	34.5111	14.5588	4.893198	32.1611	9.9325	5.828567	0
0	8.4931	26.018	186.9033	19.9392	12.2219	0.015586	0
0	15.1147	6.6216	32.77726	24.2164	4.2772	65.11752	0
0	26.3924	11.2777	1.142852	28.7765	4.5601	60.6318	0
0	27.9103	1.5179	117.2638	8.157	20.6195	68.43851	0
0	6.1798	21.7305	88.0549	30.8015	22.6445	106.0438	0
0	30.5554	24.3756	144.6934	15.5187	15.2828	8.620433	0
0	13.342	17.2134	23.68435	23.5203	8.0016	18.88026	0
0	24.5342	11.1922	1.332969	23.3912	0.1291	149.2708	0
0	19.3137	5.2205	50.78333	13.5566	9.8346	6.310861	0
0	28.6365	9.3228	9.144229	25.9201	12.3835	0.000281	0
0	27.1418	1.4947	117.7668	22.5496	3.3705	80.57293	0
0	37.1343	9.9925	5.542458	27.0152	4.4656	62.11241	0
0	40.7288	3.5945	76.60176	29.0543	2.0391	106.2475	0
0	24.6629	16.0659	13.83213	32.8174	3.7631	73.67892	0
0	32.3984	7.7335	21.28201	22.2032	10.6142	3.001704	0
0	23.1528	9.2436	9.629494	48.7179	26.5147	200.731	0
0	26.8842	3.7314	74.22413	30.2057	18.5122	38.01286	0
0	15.149	11.7352	0.373984	25.7358	4.4699	62.04465	0
0	23.1036	7.9546	19.29092	32.1289	6.3931	35.44586	0
0	21.0657	2.0379	106.2722	58.7729	26.644	204.4116	0
0	13.4114	7.6543	22.01902	16.9816	41.7913	866.982	0
0	13.4964	0.085	150.3503	16.2469	0.7347	134.8395	0
0	21.4896	7.9932	18.95333	8.2698	7.9771	19.09378	0
0	28.0439	6.5543	33.55239	22.5865	14.3187	3.880732	0
0	30.0154	1.9715	107.6457	18.0672	4.5193	61.26886	0
0	9.3019	20.7135	70.00263	22.0302	3.963	70.28714	0
0	16.9011	7.5992	22.53916	28.7574	6.7272	31.57926	0
0	15.6544	1.2467	123.2109	12.949	15.8084	11.98307	0
0	24.8412	9.1868	9.965237	37.9036	24.9546	158.9581	0
0	54.4351	29.5939	297.4644	17.1275	20.7761	71.05407	0
0	28.8847	25.5504	174.3366	25.6534	8.5259	14.59884	0
0	38.7447	9.86	6.183889	21.5338	4.1196	67.68568	0
0	16.4604	22.2843	98.75506	17.7079	3.8259	72.60476	0
0	19.1916	2.7312	92.45866	15.8457	1.8622	109.9256	0
0	22.9957	3.8041	72.97674	47.659	31.8133	378.9469	0
0	14.4218	8.5739	14.23434	24.455	23.204	117.88	0
0	22.0397	7.6179	22.36195	39.7073	15.2523	8.442264	0
0	11.04	10.9997	1.814524	46.1979	6.4906	34.29441	0
0	12.1094	1.0694	127.1785	39.2146	6.9833	28.76652	0
0	28.0852	15.9758	13.17006	45.4972	6.2826	36.77383	0
0	20.9351	7.1501	27.00509	25.4543	20.0429	59.23084	0
0	21.0988	0.1637	148.4265	33.0417	7.5874	22.65134	0
0	22.3713	1.2725	122.6388	23.6972	9.3445	9.013461	0
0	21.4318	0.9395	130.1252	21.5696	2.1276	104.4309	0

5	Alpha=5							
10	Beta=10	MR	(MRi-MR)^2		MR	(MRi-MR)^2		
0	47.753			55.456	34.944	112.9781		0
0	43.843	3.91	416.3594	61.712	6.256	326.1233	0	0
0	9.371	34.472	103.167	64.321	2.609	471.1455	0	0
0	60.056	50.685	695.3829	53.49	10.831	181.6152	0	0
0	53.4	6.656	311.8362	39.042	14.448	97.35543	0	0
0	45.843	7.557	280.8267	28.12	10.922	179.3694	0	0
0	53.14	7.297	289.6084	55.281	27.161	8.100367	0	0
0	37.348	15.792	72.63958	81.337	26.056	3.031479	0	0
0	42.199	4.851	378.8428	26.84	54.497	910.96	0	0
0	91.068	48.869	602.9045	19.022	7.818	272.1472	0	0
0	67.18	23.888	0.182231	46.657	27.635	11.02316	0	0
0	46.847	20.333	15.85541	50.036	3.379	438.3113	0	0
0	18.102	28.745	19.62591	38.716	11.321	168.8411	0	0
0	23.242	5.14	367.6762	71.39	32.675	69.89151	0	0
0	70.509	47.267	526.7996	39.334	32.056	59.92485	0	0
0	38.485	32.024	59.43045	22.144	17.19	50.76399	0	0
0	78.768	40.283	254.9807	67.409	45.265	438.9073	0	0
0	45.792	32.976	75.0149	72.564	5.155	367.1012	0	0
0	63.486	17.694	43.83613	24.742	47.822	552.5844	0	0
0	55.063	8.423	252.552	91.259	66.517	1781.018	0	0
0	53.736	1.327	528.4429	70.802	20.457	14.88328	0	0
0	62.861	9.125	230.7326	17.551	53.251	837.2987	0	0
0	47.574	15.287	81.50272	32.907	15.356	80.26163	0	0
0	45.888	1.686	512.0665	55.172	22.265	4.202031	0	0
0	40.803	5.085	369.7885	27.474	27.698	11.44546	0	0
0	16.892	23.911	0.163124	87.041	59.567	1242.712	0	0
0	39.499	22.607	2.916873	32.543	54.498	911.0204	0	0
0	63.314	23.815	0.249886	49.224	16.681	58.27621	0	0
0	101.912	38.598	204.0074	84.966	35.742	130.6769	0	0
0	26.623	75.289	2598.36	34.351	50.615	691.696	0	0
0	46.628	20.005	18.57511	44.461	10.11	201.7788	0	0
0	94.165	47.537	539.2666	52.243	7.782	273.3363	0	0
0	62.169	31.996	58.99952	47.94	4.303	400.4766	0	0
0	59.092	3.077	451.0478	43.286	4.654	386.5504	0	0
0	25.279	33.813	90.21418	37.388	5.898	339.1817	0	0
0	116.865	91.586	4525.403	26.076	11.312	169.075	1	0
0	28.543	88.322	4096.911	30.916	4.84	379.2712	1	0
0	21.292	7.251	291.1762	43.816	12.899	130.3224	0	0
0	33.422	12.13	148.4714	87.813	43.998	387.425	0	0
0	36.969	3.547	431.3051	45.078	42.735	339.3006	0	0
0	32.093	4.876	377.8703	35.917	9.161	229.6402	0	0
0	31.265	0.828	551.6338	87.415	51.498	738.9217	0	0
0	67.032	35.767	131.1509	18.374	69.041	2000.425	0	0
0	21.026	46.006	470.5044	59.373	40.999	278.3597	0	0
0	20.629	0.397	572.0653	82.421	23.048	1.604999	0	0
0	45.259	24.63	0.099297	24.849	57.572	1106.036	0	0
0	105.443	60.184	1286.593	47.26	22.411	3.62478	0	0
0	43.894	61.549	1386.379	43.601	3.659	426.6656	0	0
0	54.692	10.798	182.7062	32.547	11.054	175.8511	0	0
0	51.716	2.976	455.348	68.638	36.091	138.6769	0	0
1	37.747	13.969	107.0373	26.251	42.387	326.6013	0	0
0	38.317	0.57	563.8196	23.955	2.296	484.8313	0	0
0	67.933	29.616	28.10181	49.284	25.329	1.028426	0	0
0	38.501	29.432	26.18486	40.422	8.862	238.7917	0	0
0	38.757	0.256	578.83	38.85	1.572	517.2388	0	0
0	38.072	0.685	558.3715	71.961	33.111	77.37163	0	0
0	49.698	11.626	161.0078	43.12	28.841	20.48571	0	0
0	44.402	5.296	361.718	74.893	31.773	55.62347	0	0
0	28.634	15.768	73.04925	27.567	47.326	529.5114	0	0
0	79.907	51.273	726.7399	37.58	10.013	204.5439	0	0
0	73.834	6.073	332.7664	66.966	29.386	25.7162	0	0
0	12.699	61.135	1355.721	33.122	33.844	90.80402	0	0
0	29.091	16.392	62.77212	69.746	36.624	161.5143	0	0
0	35.391	6.3	324.5361	26.151	43.595	371.7228	0	0
0	25.973	9.418	221.9172	33.249	7.098	296.4211	0	0
0	74.474	48.501	564.9651	18.402	14.847	89.64086	0	0
0	51.677	22.797	2.303977	40.709	22.307	4.031605	0	0
0	54.036	2.359	482.0609	101.911	61.202	1360.659	0	0
0	47.12	6.916	302.7212	70.565	31.346	49.43657	0	0
0	14.704	32.416	65.62805	27.824	42.741	339.5217	0	0
0	20.75	6.046	333.7522	54.785	26.961	7.001921	0	0
0	29.496	8.746	242.3902	59.036	4.251	402.5595	0	0
0	26.588	2.908	458.2548	25.883	33.153	78.11227	0	0
0	24.766	1.822	505.9299	22.82	3.063	451.6426	0	0

	1 58767	2 25556	1 042324	
	6 32837	4 7407	12 29261	
	0 70575	5 62262	19 25457	
	1 28319	0 57744	0 431882	
	1 29391	0 01072	1 497925	
	3 92502	2 63111	1 950191	
	2 00296	1 92206	0 472577	
	2 4507	0 44774	0 619176	
	2 89182	0 44112	0 629638	
	5 69255	2 80073	2 452708	
	2 86582	2 82673	2 534822	
	0 92797	1 93785	0 494536	
	4 47004	3 54207	5 324337	
	2 97975	1 49029	0 065368	
	5 23164	2 25189	1 034843	
	2 68479	2 54685	1 721954	
	2 6106	0 07419	1 346592	
	3 24464	0 63404	0 360693	
	2 83602	0 40862	0 682272	
	2 18888	0 64714	0 34513	
	1 83126	0 35762	0 769125	
	4 00033	2 16907	0 873201	
	3 60401	0 39632	0 702743	
	1 62635	1 97766	0 552112	
	3 46141	1 83506	0 360531	
	2 00324	1 45817	0 049976	
	1 94828	0 05496	1 391592	
	2 41004	0 46176	0 597309	
	1 87374	0 5363	0 487647	
	1 409	0 46474	0 592711	
	2 36462	0 95562	0 07764	
	5 9116	3 54698	5 34702	
	1 05545	4 85615	13 1155	
	2 88086	1 82541	0.349036	
	2 0714	0 80946	0 180759	
	2 87818	0 80678	0 183045	
	4 10763	1 22945	2.7E-05	
	1 92318	2 18445	0 902182	
	2 26336	0 34018	0 800018	
	4 83043	2.56707	1.77543	
	1 25407	3 57636	5 483758	
	1 80311	0 54904	0 470017	
	2 01204	0 20893	1 052035	
	2 77569	0 76365	0.22181	
	2 25416	0.52153	0 508494	
	1 33296	0 9212	0 098231	
	2 37064	1 03768	0 038784	
	2 34732	0 02332	1 467242	
	1 13815	1 20917	0 000648	
	0 98563	0 15252	1 170935	
	3 71177	2 72614	2 224639	
	2 5484	1 16337	0.005076	
	1 64925	0 89915	0 112538	
	2 06215	0 4129	0.67522	
	2 94673	0 88458	0 122526	
	1 51116	1 43557	0.040382	
Sum MR > UCLmr				
Sum X	20148 89			4931.105
X Average	2 508			
MR Average	1 234818			
Normal constant d2 (n=2)	1 128			
Normal constant D4 (n=2)	3 268			
Upper contro limit for X (UCLx	5 791557			
Lower control limit for X (LCLx	-0 77556			
Upper control limit MR (UCLmr	4 03473			
MR Standard deviation	0.997153			
Process standard deviation	1 118034			
Gamma d2	1 104275			
Gamma d3	0 891881			
Gamma D4	3 422985			
5 Alpha=5				
0 5 Beta=0 5				
Proportion MR > UCLmr	0 016202			
Percentage	1 620162			
ARL for MR	61 72222			

	0		3 9194	3 7792	1 679234	
	1		8 5446	4 6252	4 587533	
	1		3 9542	4 5904	4 439671	
	0		10 1981	6 2439	14 14176	
	0		6 0758	4 1223	2 686166	
	0		6 4503	0 3745	4 447237	
	0		1 7938	4 6565	4 722592	
	0		8 3348	6 541	16 46454	
	0		3 0281	5 3067	7 97132	
	0		5 0815	2 0534	0 184855	
	0		6 5176	1 4361	1 096727	
	0		8 3015	1 7839	0 489227	
	0		4 7321	3 5694	1.17951	
	0		4 2538	0 4783	4 020215	
	0		3 9871	0 2667	4 913526	
	0		4 4203	0 4332	4.203104	
	0		2 0929	2 3274	0 02432	
	0		12 4445	10 3516	61 9094	
	0		6.8579	5 5866	9 630177	
	0		4 8303	2 0276	0 207706	
	0		3 0771	1 7532	0.533115	
	0		13 1329	10.0558	57 34204	
	0		1.806	11 3269	78 20842	
	0		2 0614	0.2554	4.96375	
	0		4.5561	2 4947	0.000129	
	0		3 4022	1 1539	1.76743	
	0		7 0557	3 6535	1.369257	
	0		1.9579	5.0978	6 835363	
	0		4 4673	2 5094	0 000679	
	0		1.897	2.5703	0 007561	
	0		4 8838	2.9868	0.253465	
	0		1.8504	3 0334	0.302558	
	1		8 8296	6.9792	20.21269	
	0		3.5055	5.3241	8 069875	
	0		6 2197	2 7142	0.053293	
	0		4.8608	1.3589	1 264382	
	0		3.0598	1.801	0 465598	
	0		1.7304	1.3294	1 331595	
	0		1.6601	0.0703	5 822798	
	0		6 7943	5 1342	7 02702	
	0		6 2525	0 5418	3 769606	
	0		7 8566	1.6041	0.773076	
	0		5.2234	2.6332	0.022456	
	0		2.9746	2.2488	0 055012	
	0		3.3522	0.3776	4 434172	
	0		1 4025	1.9497	0.28478	
	0		3.6647	2.2622	0.048906	
	0		4.5439	0 8792	2.573289	
	0		3.8428	0.7011	3.176406	
	0		8 1261	4.2833	3.239829	
	0		5.675	2 4511	0.00104	
	0		4 4511	1 2239	1.586208	
	0		3.8726	0.5785	3.628444	
	0		4 0164	0 1438	5.473482	
	0		5 1765	1.1601	1.750984	
	0		7 3112	2 1347	0.121555	
	125	37				
Sum X			40133.31			9931 408
X Average			5 006472			
MR Average			2 483347			
Normal constant d2 (n=2)			1 128			
Normal constant D4 (n=2)			3.268			
Upper contro limit for X (UCLx			11.61112			
Lower control limit for X (LCLx			-1.59818			
Upper control limit MR (UCLmr			8 115579			
MR Standard deviation			2.001456			
Process standard deviation			2.236068			
Gamma d2			1.110587			
Gamma d3			0.895078			
Gamma D4			3 417853			
5 Alpha=5						
1 Beta=1						
Proportion MR > UCLmr			0.016302			
Percentage			1.630163			
ARL for MR			61.34356			

	0		13 4849	2 0713	105 5847	
	0		20 253	6 7681	31 12125	
	0		32 172	11.919	0 182964	
	0		20 9336	11.2384	1 228423	
	0		38 0435	17 1099	22 68767	
	0		8 7951	29.2484	285 666	
	0		35 6191	26 824	209.591	
	0		16 1141	19.505	51.24065	
	0		21 924	5 8099	42 73031	
	0		17 6107	4 3133	64 5362	
	0		12 8899	4 7208	58 155	
	0		25 6902	12 8003	0.205714	
	0		21 1203	4 5699	60 47928	
	0		27 1342	6 0139	40 1049	
	0		10.9266	16.2076	14 90622	
	0		40 4286	29.502	294.3029	
	0		25 9821	14 4465	4 408981	
	1		14 2669	11 7152	0.398846	
	0		18 49	4.2231	65 99357	
	0		8 4126	10.0774	5 149916	
	0		11 0242	2 6116	94.773	
	1		33.84	22 8158	109.6012	
	1		18 9113	14.9287	6.666504	
	0		15.8563	3 055	86 33648	
	0		26.6714	10.8151	2.345929	
	0		21 5148	5 1566	51.69815	
	0		38 7034	17 1886	23.44358	
	0		30 1095	8.5939	14 08383	
	0		21 6454	8 4641	15.07491	
	0		56 3517	34.7063	499.9498	
	0		31 7265	24.6252	150 7605	
	0		33 3052	1.5787	115.9507	
	0		17 1896	16 1156	14.20429	
	0		11 417	5 7726	43 21935	
	0		20 1894	8 7724	12 77593	
	0		16 6211	3.5683	77 06108	
	0		52 7417	36 1206	565.1963	
	0		33.704	19.0377	44 76891	
	0		23 6455	10 0585	5 236054	
	0		13 9967	9 6488	7 278894	
	0		18 7171	4 7204	58 1611	
	0		19 0236	0.3065	144.9674	
	0		43 8729	24.8493	156.3139	
	0		16 1313	27 7416	237 0016	
	0		28 5568	12.4255	0.006203	
	0		31 1521	2 5953	95.09063	
	0		17 2671	13.885	2.366236	
	0		35.688	18 4209	36 89539	
	0		27 7642	7 9238	19 56242	
	0		7 6298	20 1344	60 64761	
	0		29 7713	22 1415	95 93727	
	0		33 3711	3.5998	76 50901	
	0		14 9362	18 4349	37 06566	
	0		17 0003	2.0641	105.7327	
	0		21 9666	4 9663	54 47093	
	0		41 0754	19 1088	45 72542	
	122	41				
Sum X			200090 1			49861 53
X Average			24 99516			
MR Average			12.34674			
Normal constant d2 (n=2)			1 128			
Normal constant D4 (n=2)			3.268			
Upper contro limit for X (UCLx			57 83224			
Lower control limit for X (LCLx			-7 84192			
Upper control limit MR (UCLmr			40.34915			
MR Standard deviation			10.05138			
Process standard deviation			11 18034			
Gamma d2			1 104326			
Gamma d3			0 899023			
Gamma D4			3 442275			
5 Alpha=5						
5 Beta=5						
Proportion MR > UCLmr			0 018302			
Percentage			1 830183			
ARL for MR			54.63934			

	0		30 246	34 317	100 0423	
	0		54 826	24 58	0 070286	
	0		59 22	4 394	396.8417	
	0		40 853	18 367	35 37734	
	0		62 386	21 533	7 738887	
	0		80 037	17 651	44 40737	
	0		40 173	39 864	241 775	
	0		69 802	29 629	28 23981	
	0		61.27	8 532	249 0995	
	0		47 771	13 499	116 9834	
	0		34 46	13 311	121 0855	
	0		29 691	4 769	382.0416	
	0		49 714	20 023	18 42028	
	0		37 709	12 006	151 5333	
	0		32 597	5 112	368 7508	
	0		65 384	32 787	71 77672	
	0		71 275	5 891	339 4396	
	0		62.262	9 013	234 1477	
	0		22 855	39 407	227 7719	
	0		64 992	42 137	317 8278	
	0		43 534	21 458	8 161795	
	0		85 901	42 367	325 8788	
	0		36.85	49 051	611.8754	
	0		54 433	17 583	45 31828	
	0		66 709	12 276	144.9348	
	0		64 466	2 243	487 1681	
	0		44 838	19 628	21 9669	
	0		30 388	14 45	97 31597	
	0		97 045	66 657	1792 855	
	0		26 781	70.264	2111.321	
	0		48 452	21 671	6.990131	
	0		24 14	24 312	8.3E-06	
	0		12 673	11 467	165.0682	
	0		88 473	75 8	2650 717	
	0		37 673	50.8	701 4613	
	0		30 664	7.009	299 4937	
	0		30 304	0.36	673 8365	
	0		36 686	6 382	321.5884	
	0		58.366	21 68	6 942622	
	0		33 825	24 541	0 051128	
	0		62 961	29 136	23 24314	
	0		65 149	2 188	489 5991	
	0		102 156	37 007	161 0898	
	0		25 738	76 418	2714 735	
	0		78 351	52 613	800 7833	
	0		49 263	29 088	22 78262	
	0		65 194	15 931	70 28954	
	0		32 615	32 579	68.29559	
	0		29 003	3 612	428 6095	
	0		70 977	41 974	311 8443	
	0		40 713	30 264	35 39196	
	0		27 775	12 938	129 4335	
	0		45 725	17 95	40 51177	
	0		27 066	18 659	31.98904	
	0		69 83	42 764	340 3698	
	0		20 512	49 318	625 1557	
	143	40				
Sum X			399443 5			98979 13
X Average			49 84226			
MR Average			24 31489			
Normal constant d2 (n=2)			1 128			
Normal constant D4 (n=2)			3 268			
Upper contro limit for X (UCLx			114 5095			
Lower control limit for X (LCLx			-14 825			
Upper control limit MR (UCLmr			79 46105			
MR Standard deviation			19 54583			
Process standard deviation			22 36068			
Gamma d2			1 087395			
Gamma d3			0 874116			
Gamma D4			3 411588			
5 Alpha=5						
10 Beta=10						
Proportion MR > UCLmr			0 015502			
Percentage			1 550155			
ARL for MR			64 50968			

10	Alpha=10						
0.5	Beta=0.5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
	3.4631			6.4753	4.1724	5.956123	
	5.6872	2.2241	0.242277	4.8123	1.663	0.004745	0
	6.4087	0.7215	1.020874	4.2244	0.5879	1.308697	0
	7.6504	1.2417	0.240279	7.7396	3.5152	3.180219	0
	1.8374	5.813	16.65552	6.2977	1.4419	0.08409	1
	4.6458	2.8084	1.158889	2.9202	3.3775	2.708055	0
	3.7845	0.8613	0.757915	7.5086	4.5884	8.159689	0
	4.7956	1.0111	0.519528	2.7414	4.7672	9.213149	0
	8.9884	4.1928	6.056112	3.6398	0.8984	0.694694	0
	3.9825	5.0059	10.71919	3.4151	0.2247	2.271601	0
	4.2194	0.2369	2.234975	3.272	0.1431	2.524232	0
	5.0726	0.8532	0.772084	3.7788	0.5068	1.500829	0
	4.8661	0.2065	2.326794	3.9785	0.1997	2.347585	0
	5.6818	0.8157	0.839392	5.9505	1.972	0.057656	0
	10.1263	4.4445	7.35829	7.4488	1.4983	0.054561	0
	10.0258	0.1005	2.661411	5.0762	2.3726	0.410518	0
	6.4517	3.5741	3.393763	7.3569	2.2807	0.3012	0
	2.9275	3.5242	3.2124	4.0829	3.274	2.378124	0
	4.0081	1.0806	0.42417	4.7711	0.6882	1.089274	0
	4.1126	0.1045	2.648376	5.7125	0.9414	0.624864	0
	4.8684	0.7558	0.952738	2.3628	3.3497	2.617331	0
	7.3476	2.4792	0.558483	5.6716	3.3088	2.486667	0
	3.6901	3.6575	3.708	5.7433	0.0717	2.756208	0
	4.0165	0.3264	1.975383	7.1665	1.4232	0.095285	0
	7.5475	3.531	3.236822	11.1938	4.0273	5.268939	0
	7.8327	0.2852	2.092892	6.7401	4.4537	7.408287	0
	3.1433	4.6894	6.746906	6.7568	0.0167	2.941853	0
	6.9937	3.8504	4.488114	3.364	3.3928	2.758645	0
	4.3953	2.5984	0.750852	3.997	0.633	1.207544	0
	4.3332	0.0621	2.788176	4.5387	0.5417	1.418536	0
	3.4475	0.8857	0.716026	4.2059	0.3328	1.957434	0
	2.4885	0.959	0.597348	2.4999	1.706	0.00067	0
	4.3171	1.8286	0.009354	5.1164	2.6165	0.782547	0
	5.739	1.4219	0.09609	6.4583	1.3419	0.152087	0
	3.7707	1.9683	0.055893	3.2859	3.1724	2.075089	0
	4.1532	0.3825	1.820835	5.0064	1.7205	0.00013	0
	4.9869	0.8337	0.806733	4.9762	0.0302	2.895725	0
	4.0562	0.9307	0.641894	4.3453	0.6309	1.212164	0
	4.6103	0.5541	1.387173	5.5876	1.2423	0.239692	0
	5.4626	0.8523	0.773666	4.8342	0.7534	0.957429	0
	4.5328	0.9298	0.643337	8.3174	3.4832	3.067111	0
	4.6151	0.0823	2.721124	4.2975	4.0199	5.235021	0
	4.0537	0.5614	1.370031	4.4376	0.1401	2.533773	0
	5.6804	1.6267	0.011063	2.1108	2.3268	0.353926	0
	8.4349	2.7545	1.045745	4.5016	2.3908	0.434171	0
	4.798	3.6369	3.629089	3.2399	1.2617	0.221072	0
	7.4941	2.6961	0.929714	3.6341	0.3942	1.789396	0
	4.1843	3.3098	2.489822	4.4714	0.8373	0.800279	0
	6.5995	2.4152	0.466922	7.6936	3.2222	2.221044	0
	3.4332	3.1663	2.057552	2.6568	5.037	10.9238	0
	6.1768	2.7436	1.023571	7.4877	4.8311	9.605145	0
	7.1914	1.0146	0.514495	6.6862	0.8015	0.865613	0
	2.4044	4.787	9.333739	5.2915	1.3947	0.113692	0
	6.5159	3.1115	1.903343	4.7398	0.5517	1.392832	0
	7.3511	1.8352	0.010674	6.2888	1.549	0.033446	0
	3.5122	3.8389	4.43952	7.1022	0.8134	0.843611	0
	3.682	0.1698	2.440104	6.6038	0.4984	1.521481	0
	3.6644	0.0176	2.938767	4.0135	2.5903	0.73688	0
	6.2597	2.5953	0.745489	3.3198	0.6937	1.077824	0
	5.2649	0.9948	0.543292	6.8442	3.5244	3.213117	0
	5.197	0.0679	2.76884	7.5542	0.71	1.044245	0
	7.6037	2.4067	0.455378	5.3817	2.1725	0.194143	0
	2.8585	4.7452	9.080079	6.5208	1.1391	0.351392	0
	4.3194	1.4609	0.073432	3.3987	3.1221	1.932703	0
	2.6693	1.6501	0.006688	3.8703	0.4716	1.588314	0
	5.2386	2.5693	0.701267	5.3455	1.4752	0.065886	0
	5.1559	0.0827	2.719805	4.1742	1.1713	0.314253	0
	6.3998	1.2439	0.238128	6.0292	1.855	0.015158	0
	4.6936	1.7062	0.00066	4.3956	1.6336	0.00966	0
	4.8346	0.141	2.530909	3.329	1.0666	0.442602	0
	6.7811	1.9465	0.04606	5.3294	2.0004	0.072101	0
	5.1102	1.6709	0.003719	5.5343	0.2049	2.331677	0
	4.9005	0.2097	2.317041	5.7963	0.262	2.160556	0
	8.1949	3.2944	2.441459	3.5601	2.2362	0.254336	0

10	Alpha=10						
1	Beta=1	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	15.3092			13.6984	2.3218	1.411002	
0	6.8521	8.4571	24.4772	7.7992	5.8992	5.70992	0
0	8.527	1.6749	3.36633	10.857	3.0578	0.204174	0
0	16.4922	7.9652	19.85187	10.2296	0.6274	8.3074	0
0	10.4939	5.9983	6.193349	8.7417	1.4879	4.087498	0
0	10.2233	0.2706	10.49148	11.4685	2.7268	0.612864	0
0	3.8104	6.4129	8.428825	11.7721	0.3036	10.2788	0
0	18.0181	14.2077	114.4481	8.0543	3.7178	0.043324	1
0	8.7146	9.3035	33.56863	7.5206	0.5337	8.856315	0
0	8.1937	0.5209	8.932663	11.7271	4.2065	0.485591	0
0	13.4176	5.2239	2.938632	11.6934	0.0337	12.08227	0
0	8.6124	4.8052	1.678434	7.3	4.3934	0.781003	0
0	14.9947	6.3823	8.252083	9.4187	2.1187	1.934759	0
0	6.43	8.5647	25.55347	8.2417	1.177	5.441284	0
0	12.9856	6.5556	9.277774	6.4469	1.7948	2.940731	0
0	10.9177	2.0679	2.078661	11.0813	4.6344	1.265049	0
0	11.7932	0.8755	6.938778	7.1037	3.9776	0.218972	0
0	6.607	5.1862	2.8108	13.5001	6.3964	8.333291	0
0	9.6362	3.0292	0.230838	7.2671	6.233	7.416602	0
0	8.8768	0.7594	7.563908	7.6938	0.4267	9.504818	0
0	7.323	1.5538	3.825373	10.2511	2.5573	0.906982	0
0	13.6242	6.3012	7.792718	8.3277	1.9234	2.516208	0
0	12.1688	1.4554	4.219968	12.6009	4.2732	0.582999	0
0	7.6797	4.4891	0.95931	12.7879	0.187	11.04004	0
0	9.9537	2.274	1.526846	8.7168	4.0711	0.315219	0
0	4.5697	5.384	3.513165	15.3777	6.6609	9.930338	0
0	11.6588	7.0891	12.81242	11.8722	3.5055	1.7E-05	0
0	8.3419	3.3169	0.037155	4.96	6.9222	11.64546	0
0	12.8432	4.5013	0.983358	12.7268	7.7768	18.20852	0
0	8.9166	3.9266	0.173842	7.7966	4.9282	2.012267	0
0	4.876	4.0406	0.281901	12.1994	4.4008	0.794138	0
0	9.6951	4.8191	1.714643	6.3205	5.8789	5.813317	0
0	10.2038	0.5087	9.005737	9.3443	3.0238	0.236056	0
0	20.4229	10.2191	45.01664	10.078	0.7337	7.705932	0
0	15.3697	5.0532	2.382528	13.2384	3.1604	0.12198	0
0	6.3717	8.998	30.12192	11.7862	1.4522	4.233125	0
0	14.2903	7.9186	19.43879	4.292	7.4942	15.87659	0
0	16.1757	1.8854	2.638208	8.3922	4.1002	0.348742	0
0	7.6044	8.5713	25.62024	9.8874	1.4952	4.058033	0
0	11.7749	4.1705	0.436715	9.3765	0.5109	8.992538	0
0	14.5425	2.7676	0.550647	15.011	5.6345	4.514962	0
0	13.1225	1.42	4.366662	6.6867	8.3243	23.1808	0
0	14.5862	1.4637	4.185936	9.5713	2.8846	0.390895	0
0	11.529	3.0572	0.204716	12.8394	3.2681	0.058349	0
0	11.2675	0.2615	10.55052	9.6555	3.1839	0.106117	0
0	11.6869	0.4194	9.549683	7.6004	2.0551	2.115733	0
0	9.3112	2.3757	1.285856	15.3098	7.7094	17.63785	0
0	9.5215	0.2103	10.88575	13.4739	1.8359	2.801459	0
0	6.4074	3.1141	0.156465	6.0147	7.4592	15.5989	0
0	8.9899	2.5825	0.859618	13.0921	7.0774	12.7288	0
0	10.8426	1.8527	2.745503	11.8628	1.2293	5.200024	0
0	9.8851	0.9575	6.513501	11.3026	0.5602	8.699291	0
0	10.445	0.5599	8.701061	8.5897	2.7129	0.63482	0
0	7.7476	2.6974	0.65976	9.2984	0.7087	7.845355	0
0	6.7817	0.9659	6.470695	14.4947	5.1963	2.844768	0
0	18.5112	11.7295	67.56583	8.9969	5.4978	3.952716	1
0	12.1944	6.3168	7.880057	8.4434	0.5535	8.738859	0
0	6.3612	5.8332	5.398856	8.9859	0.5425	8.804015	0
0	5.1499	1.2113	5.282441	9.7257	0.7398	7.672103	0
0	18.8726	13.7227	104.3063	10.5879	0.8622	7.009024	1
0	8.7822	10.0904	43.30619	6.3229	4.265	0.570544	0
0	11.114	2.3318	1.387345	6.6332	0.3103	10.23588	0
0	14.884	3.77	0.067779	10.655	4.0218	0.262291	0
0	14.5467	0.3373	10.06384	9.8743	0.7807	7.447201	0
0	9.3354	5.2113	2.895592	9.3683	0.506	9.02195	0
0	12.2794	2.944	0.319967	9.2781	0.0902	11.69268	0
0	13.5037	1.2243	5.222852	9.8487	0.5706	8.638051	0
0	11.6386	1.8651	2.704565	11.0593	1.2106	5.285659	0
0	9.0781	2.5605	0.900897	8.6671	2.3922	1.248708	0
0	11.1639	2.0858	2.027366	10.5957	1.9286	2.499738	0
0	20.7764	9.6125	37.2447	9.1029	1.4928	4.067708	0
0	7.4567	13.3197	96.23696	14.2593	5.1564	2.711766	1
0	11.144	3.6873	0.031557	10.4205	3.8388	0.108336	0
0	13.0434	1.8994	2.592925	10.6977	0.2772	10.44877	0

10	Alpha=10						
5	Beta=5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	58.91			33.093	7.724	95.45219	
0	47.867	11.043	41.61494	50.355	17.262	0.053807	0
0	50.443	2.576	222.5456	51.244	0.889	275.7248	0
0	61.53	11.087	41.04919	34.931	16.313	1.394676	0
0	34.152	27.378	97.69417	52.067	17.136	0.128138	0
0	66.508	32.356	220.8801	55.345	3.278	202.0936	0
0	57.015	9.493	64.01542	49.18	6.165	128.3454	0
0	42.204	14.811	7.198295	56.562	7.382	102.2518	0
0	84.159	41.955	598.3423	22.931	33.631	260.4039	0
0	87.257	3.098	207.2438	42.713	19.782	5.235109	0
0	62.572	24.685	51.711	70.845	28.132	113.1678	0
0	81.041	18.469	0.950695	55.581	15.264	4.972739	0
0	44.203	36.838	374.1917	34.014	21.567	16.58962	0
0	48.237	4.034	181.1706	58.083	24.069	43.2311	0
0	49.952	1.715	248.9757	52.032	6.051	130.9414	0
0	63.765	13.813	13.5495	32.019	20.013	6.345543	0
0	42.77	20.995	12.25725	77.832	45.813	801.9678	0
0	33.236	9.534	63.36103	27.906	49.926	1051.837	0
0	44.121	10.885	43.6784	64.618	36.712	369.3329	0
0	55.865	11.744	33.06208	39.885	24.733	52.40364	0
0	53.435	2.43	226.923	75.208	35.323	317.8745	0
0	57.469	4.034	181.1706	53.311	21.897	19.38673	0
0	68.756	11.287	38.5264	65.856	12.545	24.49224	0
0	56.667	12.089	29.21363	20.706	45.15	764.8563	0
0	69.992	13.325	17.38026	40.094	19.388	3.587373	0
0	71.428	1.436	257.8582	65.994	25.9	70.66144	0
0	53.615	17.813	0.101784	32.926	33.068	242.5506	0
0	69.968	16.353	1.301799	38.765	5.859	135.3724	0
0	68.967	11.001	42.15858	54.541	15.756	3.020519	0
0	40.479	18.488	0.988108	42.616	11.925	31.01336	0
0	60.755	20.276	7.739725	33.919	8.697	77.38657	0
0	49.158	11.597	34.77418	50.314	16.395	1.207722	0
0	41.858	7.3	103.9169	43.743	6.571	119.3111	0
0	55.975	14.117	11.40389	85.195	41.452	573.9875	0
0	39.606	16.369	1.265544	62.906	22.289	22.99237	0
0	64.455	24.849	54.09656	45.809	17.097	0.15758	0
0	46.011	18.444	0.902569	60.571	14.762	7.463627	0
0	35.132	10.879	43.75775	50.94	9.631	61.8262	0
0	57.379	22.247	22.59135	76.882	25.942	71.36931	0
0	31.336	26.043	73.08602	45.996	30.886	179.3466	0
0	40.517	9.181	69.10537	38.763	7.233	105.2874	0
0	35.035	5.482	144.2873	70.982	32.219	216.8267	0
0	50.706	15.671	3.323197	61.271	9.711	80.57453	0
0	43.649	7.057	108.9302	71.34	10.069	55.13009	0
0	46.124	2.475	225.5693	76.425	5.085	153.9824	0
0	59.513	13.389	16.85073	51.846	24.579	50.19774	0
0	60.007	0.494	288.9988	56.327	4.481	169.3372	0
0	56.864	3.143	205.9502	38.425	17.902	0.166493	0
0	34.315	22.549	25.55339	35.052	3.373	199.4016	0
0	54.697	20.382	8.340753	34.144	0.908	275.0942	0
0	82.498	27.801	106.235	52.674	18.53	1.073371	0
0	57.099	25.399	62.4896	27.882	24.792	53.26133	0
0	63.882	6.783	114.7247	48.551	20.669	10.08085	0
0	46.092	17.79	0.087637	57.15	8.599	79.12038	0
0	73.052	26.96	89.60584	52.491	4.659	164.7363	0
0	36.682	36.37	356.3047	26.755	25.736	67.93116	0
0	72.77	36.088	345.7382	58.322	31.567	198.0503	0
0	47.02	25.75	68.16213	30.16	28.162	113.807	0
0	37.32	9.7	60.74587	38.311	8.151	87.29097	0
0	45.183	7.863	92.75547	25.502	12.809	21.94889	0
0	29.049	16.134	1.849502	45.199	19.697	4.853368	0
0	34.538	5.489	144.1192	48.591	3.392	198.8654	0
0	47.396	12.858	21.49216	50.727	2.136	235.8671	0
0	47.44	0.044	304.5012	80.466	29.739	149.9409	0
0	48.788	1.348	260.6922	41.987	38.479	440.3717	0
0	34.998	13.79	13.71935	66.876	24.889	54.68656	0
0	53.457	18.459	0.931295	50.075	16.801	0.480199	0
0	74.377	20.92	11.73772	58.072	7.997	90.19232	0
0	54.588	19.789	5.267191	49.156	8.916	73.58146	0
0	43.294	11.294	38.43955	28.244	20.912	11.68297	0
0	49.618	6.324	124.7681	41.692	13.448	16.36982	0
0	53.745	4.127	178.6757	44.657	2.965	211.0908	0
0	36.961	16.784	0.504049	46.224	1.567	253.6682	0
0	39.055	2.094	237.1589	59.353	13.129	19.05291	0

10	Alpha=10							
10	Beta=10	MR	(MRi-MR)^2		MR	(MRi-MR)^2		
0	120.651			83.031	0.913	1160.81		0
0	54.089	66.562	997.1919	75.773	7.258	768.7119	0	0
0	88.029	33.94	1.089215	74.859	0.914	1160.741	0	0
0	114.822	26.793	67.08683	102.875	28.016	48.54821	0	0
0	130.929	16.107	356.3281	85.145	17.73	297.6886	0	0
0	94.707	36.222	1.533499	132.982	47.837	165.2085	0	0
0	98.553	3.846	969.5535	82.426	50.556	242.4979	0	0
0	115.071	16.518	340.9804	127.597	45.171	103.782	0	0
0	97.292	17.779	296.0001	73.846	53.751	352.2132	0	0
0	141.118	43.826	78.18707	70.955	2.891	1029.938	0	0
0	89.398	51.72	280.1053	80.103	9.148	667.4811	0	0
0	135.601	46.203	125.8737	131.119	51.016	257.0361	0	0
0	129.396	6.205	828.211	71.219	59.9	620.8243	0	0
0	93.509	35.887	0.816033	87.95	16.731	333.1594	0	0
0	48.579	44.93	98.92978	90.624	2.674	1043.914	0	0
0	93.614	45.035	101.0295	71.775	18.849	260.3271	0	0
0	45.202	48.412	180.3205	96.292	24.517	109.5509	0	0
0	90.688	45.486	110.2993	195.458	99.166	4119.373	0	0
0	113.94	23.252	137.6317	64.307	131.151	9248.158	0	1
0	100.799	13.141	477.1016	81.061	16.754	332.3203	0	0
0	64.718	36.081	1.204167	140.603	59.542	803.1123	0	0
0	80.118	15.4	383.5195	101.385	39.218	17.92968	0	0
0	153.783	73.665	1496.246	103.4	2.015	1086.932	0	0
0	143.679	10.104	618.9972	50.986	52.414	303.8169	0	0
0	148.083	4.404	935.1153	89.761	38.775	14.3743	0	0
0	96.372	51.711	279.8041	116.344	26.583	70.571	0	0
0	99.919	3.547	988.2633	65.745	50.599	243.839	0	0
0	128.372	28.453	42.64945	80.61	6.135	890.9422	0	0
0	150.233	21.861	172.2041	111.355	50.745	248.42	0	0
0	90.943	59.29	590.7984	124.517	13.162	476.1846	0	0
0	81.995	8.948	677.8553	47.134	77.383	1797.704	0	0
0	93.241	11.246	563.4763	120.12	72.986	1444.178	0	0
0	140.936	47.695	161.5783	86.359	33.761	1.494885	0	0
0	123.532	17.404	309.0443	115.358	28.999	35.81609	0	0
0	114.088	9.444	652.274	53.989	61.369	696.1864	0	0
0	89.863	24.225	115.7487	90.916	36.927	3.776591	0	0
0	96.254	6.391	817.5399	82.793	8.123	721.4948	0	0
0	139.844	43.59	74.06918	80.957	1.836	1098.767	0	0
0	164.994	25.15	96.70077	93.989	13.032	481.8751	0	0
0	71.736	93.258	3395.899	106.657	12.668	497.9884	0	0
0	79.405	7.669	746.0904	52.998	53.659	348.7685	0	0
0	83.344	3.939	963.7706	75.854	22.856	147.08	0	0
0	69.241	14.103	436.0017	81.728	5.874	847.372	0	0
0	74.558	5.317	880.1104	96.459	14.731	410.17	0	0
0	122.813	48.255	178.1286	90	6.459	813.6559	0	0
0	177.431	54.618	385.5075	83.037	6.963	785.1571	0	0
0	139.26	38.171	10.15917	81.121	1.916	1093.47	0	0
0	113.599	25.661	86.91189	103.546	22.425	157.7198	0	0
0	72.038	41.561	43.26147	119.395	15.849	366.135	0	0
0	114.111	42.073	50.25882	77.903	41.492	42.35856	0	0
0	110.136	3.975	961.5367	174.133	96.23	3751.115	0	0
0	142.96	32.824	4.664109	72.57	101.563	4432.809	0	0
0	158.23	15.27	388.6282	105.28	32.71	5.169506	0	0
0	88.404	69.826	1213.989	144.349	39.069	16.69005	0	0
0	124.767	36.363	1.902593	147.462	3.113	1015.739	0	0
0	79.285	45.482	110.2153	115.323	32.139	8.092061	0	0
0	92.441	13.156	476.4465	94.985	20.338	214.4952	0	0
0	129.849	37.408	5.87745	108.922	13.937	442.9617	0	0
0	102.544	27.305	58.96174	126.338	17.416	308.6225	0	0
0	91.94	10.604	594.3676	154.406	28.068	47.82628	0	0
0	75.207	16.733	333.0864	96.362	58.044	531.7795	0	0
0	105.931	30.724	18.14466	128.991	32.629	5.544399	0	0
0	148.298	42.367	54.51379	91.672	37.319	5.453837	0	0
0	158.245	9.947	826.8341	73.051	18.621	267.7365	0	0
0	81.174	77.071	1771.345	61.734	11.317	560.1105	0	0
0	101.604	20.43	211.8089	38.6	23.134	140.4143	0	0
0	55.783	45.821	117.4481	194.624	156.024	14650.77	0	1
0	92.977	37.194	4.885626	80.818	113.806	6212.962	0	0
0	67.73	25.247	94.80245	95.77	14.952	401.2672	0	0
0	112.579	44.849	97.32504	105.821	10.051	621.6373	0	0
0	97.891	14.688	411.9136	87.501	18.32	277.6774	0	0
0	58.342	39.549	20.84238	116.412	28.911	36.87714	0	0
0	100.448	42.106	50.7278	72.588	43.824	78.1517	0	0
0	65.283	15.165	392.7791	68.076	4.512	928.5217	0	0

3 259	0 2833	2 098393
3 676	0 417	1 728918
3 4962	0 1798	2 408962
1 5129	1 9833	0 06321
7 0403	5 5274	14 40595
5 128	1 9123	0 03255
4 4491	0 6789	1 108773
5 4935	1 0444	0 472633
7 1881	1 6946	0 00139
3 8028	3 3855	2 734449
4 6459	0 8433	0 78958
6 1427	1 4968	0 055264
5 5737	0 569	1 352297
6 6372	1 0635	0 446736
4 6567	1 9805	0 06181
6 95	2 2933	0 315189
5 9605	0 9895	0 551133
5 1238	0 8367	0 801353
4 3936	0 7302	1 003369
6 6256	2 232	0 250117
4 8778	1 7478	0 000253
3 4141	1 4637	0 071922
6 6063	3 1922	2 132525
3 5438	3 0625	1 770541
5 3057	1 7619	0 000901
3 3877	1 918	0 034639
2 918	0 4697	1 593106
6 5211	3 6031	3 501453
3 0681	3 453	2 962243
6 5546	3 4865	3 07868
6 1113	0 4433	1 660446
6 6735	0 5622	1 368159
5 1995	1 474	0 066504
6 4329	1 2334	0 248485
2 524	3 9089	4 739403
4 3588	1 8348	0 010592
5 5136	1 1548	0 333025
3 8297	1 6839	0 002302
5 8439	2 0142	0 079703
4 0949	1 749	0.000293
2 358	1 7369	2 5E-05
4 2639	1 9059	0 030282
4 9046	0 6407	1 190681
3 7388	1 1658	0.32045
6 3068	2 568	0.699091
5 1172	1 1896	0.294071
1 9019	3 2153	2 200526
5 2358	3 3339	2.566458
3.538	1 6978	0.001162
3 0371	0 5009	1 515319
6 4653	3 4282	2 877491
3 826	2 6393	0.823405
2 8897	0 9363	0 632952
6 3917	3.502	3 133314
3 9775	2 4142	0 465556
10 6477	6.6702	24 38697

Sum MR > UCLmr		
Sum X	39805 68	10046 13
X Average	4 985181	
MR Average	1 731883	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3 268	
Upper contro limit for X (UCLx	9 591253	
Lower control limit for X (LCLx	0 379109	
Upper control limit MR (UCLmr	5 659794	
MR Standard deviation	1 357156	
Process standard deviation	1 581139	
Gamma d2	1 095339	
Gamma d3	0 858341	
Gamma D4	3 350891	
10 Alpha=10		
0 5 Beta=0 5		
Proportion MR > UCLmr	0 012901	
Percentage	1 290129	
ARL for MR	77 51163	

0	9 6511	3 2039	0 093487
0	9 2422	0 4089	9 614688
0	7 3127	1 9295	2 496893
0	8 4681	1 1554	5 542522
0	6 4769	1 9912	2 305709
0	7 034	0 5571	8 717587
0	7 6448	0 6108	8 403366
0	12 8102	5 1654	2 741488
0	7 0009	5 8093	5 288362
0	6 9108	0 0901	11 69336
0	7 4307	0 5199	8 938641
0	10 8845	3 4538	0 00312
0	8 3832	2 5013	1 016782
0	10 2557	1 8725	2 68028
0	14 9374	4 6817	1 373687
0	4 3835	10 5539	49 62137
0	16 0784	11 6949	66 99822
0	7 0234	9 055	30 75084
0	7 0283	0 0049	12.28332
0	6 94	1 9117	2 553464
0	9 6149	0 6749	8 035842
0	9 0306	0 5843	8 557708
0	12 8177	3 7871	0 076975
0	12 281	0 5367	8 838468
0	9 2929	2 9881	0 272021
0	9 4765	0 1836	11 06265
0	9.5456	0 0691	11 83743
0	6 417	3 1286	0 145204
0	10.9997	4 5827	1 151423
0	7 7576	3.2421	0.071586
0	14 5698	6 8122	10.9068
0	9 6202	4 9496	2 073439
0	7 1201	2 5001	1 019203
0	9 824	2 7039	0 649243
0	9 0833	0 7407	7 667118
0	14 5846	6 5013	3 966646
0	5.3894	9 1952	32.32541
0	11 1724	5 783	5 168093
0	3 9349	7 2375	13.89682
0	14 2016	10 2667	45 65764
0	10 5324	3 6692	0 025454
0	7 3107	3.2217	0 082919
0	8 5364	1.2257	5.216455
0	10 3898	1.8534	2 743184
0	6.9717	3 4181	0 008383
0	3 9768	2 9949	0.264974
0	8 7765	4 7997	1 664213
0	5 478	3.2985	0 044587
0	10 7198	5 2418	3 000323
0	15 2875	4 5677	1.119457
0	8 6207	6.6668	9.967558
0	14 4055	5 7848	5 17628
0	8 8207	5 5848	4.306222
0	8 9654	0 1447	11 32293
0	12 1043	3 1389	0 13746
1	11 3766	0 7277	7 73928
103	26		

Sum X	79561 21	19861 73
X Average	9 942294	
MR Average	3.509656	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	19.27649	
Lower control limit for X (LCLx	0 608102	
Upper control limit MR (UCLmr	11 46956	
MR Standard deviation	2 747928	
Process standard deviation	3 162278	
Gamma d2	1 109851	
Gamma d3	0 868971	
Gamma D4	3 348887	
10 Alpha=10		
1 Beta=1		
Proportion MR > UCLmr	0 012901	
Percentage	1.290129	
ARL for MR	77 51163	

0	47 702	0 149	300 8478
0	50 838	3 136	206 1511
0	61 078	10 24	52 61999
0	45 577	15 501	3 971905
0	64 466	18 889	1 946126
0	76 4	11 934	30 9132
0	36 387	40 013	507 107
0	27 909	8 478	81 2876
0	49 492	21 583	16 72022
0	37 267	12 225	27 76198
0	55 124	17 857	0 131795
0	38 173	16 951	0 29481
0	72 356	34 183	278 5239
0	58 569	13 787	13 74158
0	48 346	10 223	52 86692
0	34 092	14.254	10 49737
1	45 633	11 541	35 43778
0	55 277	9 644	61 62193
0	34 313	20 964	12 04115
0	47 471	13 158	18 80058
0	54 358	6 887	112 5077
0	33 932	20 426	8.596836
0	61 515	27 583	101 7886
0	49 499	12 016	30 00809
0	67 286	17 787	0 08587
0	46 517	20 769	10 72586
0	44 033	2 484	225.299
0	27 888	16 145	1 819704
0	65 181	37 293	392.0018
0	51 187	13.994	12.24975
0	34 87	16 317	1 385244
0	49.242	14 372	9 746659
0	48 788	0 454	290.3604
0	37 935	10 853	44 1024
0	36 117	1 818	245 7358
0	41 126	5 009	155 8743
0	43 196	2 07	237 8987
0	52 856	9 66	61 37099
0	35 088	17 768	0 075096
0	44 555	9 467	64 43215
0	48 776	4 221	176 1716
0	42 772	6 004	132.0193
0	49.83	7 058	108.9093
0	74.884	25.054	57 15415
0	69 026	5.858	135.3957
0	49 384	19 842	4 614059
0	68 014	18 63	1 290578
0	36 894	31.12	185 6689
0	50 628	13 734	14 13733
0	36 552	14 076	11 68248
0	52 89	16.338	1 336253
0	37 48	15 41	4 342906
0	34.635	2 845	214 5921
0	66 211	31.578	198 3037
0	64 472	1 739	248 2189
0	40.817	23.655	37 95837
99	30		

Sum X	399638 6	101670 2
X Average	50 13088	
MR Average	17 49396	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3 268	
Upper contro limit for X (UCLx	96 65738	
Lower control limit for X (LCLx	3.604379	
Upper control limit MR (UCLmr	57 17027	
MR Standard deviation	13 72334	
Process standard deviation	15 81139	
Gamma d2	1 106415	
Gamma d3	0 86794	
Gamma D4	3 353385	
10 Alpha=10		
5 Beta=5		
Proportion MR > UCLmr	0 014301	
Percentage	1 430143	
ARL for MR	69 92308	

0	111 505	30 404	20 97324
0	99 214	12 291	514 9566
0	96 403	2 811	1035 08
0	66 9	29 503	30.03758
0	177 602	110 702	5733 268
0	91 959	85 643	2566 369
0	94 643	2 684	1043 268
0	134 229	39 586	21 18158
0	117 974	16 255	350 7625
0	112 948	5 026	897 4611
0	125 011	12 063	525 3564
0	129 624	4 613	922 3767
0	83 146	46 478	132 12
0	39 719	43 427	71 29008
0	70 257	30 538	19 76385
0	99 848	29 591	29 08073
0	108 252	8 404	706 478
0	95 762	12 49	505 9645
0	117 18	21 418	184.027
0	92 321	24 859	102 5086
0	113 768	21 447	183 241
0	132 773	19 005	255 3174
0	121 134	11 639	544 9729
0	128 677	7 543	752 9895
0	82 37	46 307	128 2181
0	79 231	3 139	1014 082
0	48 026	31 205	14 27823
0	236 414	188 388	23532 89
0	95.551	140 863	11210 44
0	92 338	3 213	1009 375
0	65 268	27 07	62 62593
0	122 227	56 959	482.9158
0	81 375	40 852	34 43748
0	83 609	2 234	1072.54
0	70.595	13 014	482 6657
0	104 27	33 675	1 712577
0	62 743	41 527	42.81537
0	133 775	71 032	1299 483
0	88 21	45 565	111 9649
0	109 265	21 055	194 0074
0	81 194	28 071	47 7848
0	109 498	28 304	44 61779
0	74 686	34 812	0.029465
0	89 043	14.357	425 4589
0	65 833	23.21	138 6189
0	85 456	19 623	235 9497
0	103 41	17 954	290 0091
0	64 627	38 783	14 43502
0	85 651	21 024	194 872
0	90 195	4 544	926 5726
0	62 681	27 514	55 79574
0	113 72	51 039	257 7741
0	114 409	0 689	1176.123
0	123 757	9 348	657 1868
0	91 759	31 998	8 914134
0	82 118	9 641	642 2502
113	30		

Sum X	806414 7	199957 1
X Average	100 6372	
MR Average	34 98365	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3 268	
Upper contro limit for X (UCLx	193 6788	
Lower control limit for X (LCLx	7 595542	
Upper control limit MR (UCLmr	114 3286	
MR Standard deviation	27 5975	
Process standard deviation	31 62278	
Gamma d2	1 10628	
Gamma d3	0 87271	
Gamma D4	3 366605	
10 Alpha=10		
10 Beta=10		
Proportion MR > UCLmr	0 015602	
Percentage	1 560156	
ARL for MR	64 09615	

50	Alpha=50						
0 5	Beta=0 5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
	23 0138			23 2331	2 2212	3 148789	
	23 0601	0 0463	15 59762	19 0161	4 217	0 048981	0
	27 9239	4 8638	0 753627	22 6801	3 664	0 110014	0
	29 3374	1 4135	6 667668	24 4067	1 7266	5 148737	0
	33 9665	4 6291	0 401217	30 7957	6 389	5 727967	0
	25 0522	8 9143	24 19279	30 2402	0 5555	11 83486	0
	26 1158	1 0636	8 59711	26 8944	3 3458	0 422348	0
	27 3085	1 1927	7 856713	19 4029	7 4915	12 22074	0
	19 3172	7 9913	15 96496	21 946	2 5431	2 109997	0
	26 2268	6 9096	8 490913	24 7966	2 8506	1 311215	0
	26 2825	0 0557	15 52346	28 3409	3 5443	0 203746	0
	34 4624	8 1799	17 50767	27 2299	1 111	8 321395	0
	18 5971	15 8653	140 8878	33 0112	5 7813	3 188429	1
	25 8471	7 25	10 59058	25 8079	7 2033	10 28881	0
	31 2117	5 3646	1 873934	26 114	0 3061	13 61302	0
	31 2038	0 0079	15 90241	23 1941	2 9199	1 157309	0
	28 727	2 4768	2 307005	25 1811	1 987	4 034807	0
	26 6547	2 0723	3 699402	23 8266	1 3545	6 975847	0
	26 5616	0 0931	15 23015	26 2604	2 4338	2 439478	0
	24 4137	2 1479	3 414301	25 1022	1 1582	8 051309	0
	27 936	3 5223	0 224091	27 3722	2 27	2 977981	0
	21 2278	6 7082	7 357749	23 5007	3.8715	0 015421	0
	23 8269	2 5991	1 950444	20 7937	2 707	1 660703	0
	27 2138	3 3869	0 370617	34 4327	13 639	92 99357	0
	24 5348	2 679	1 733854	24 8044	9 6283	31 72638	0
	27 663	3 1282	0 752526	23 0667	1 7377	5 098486	0
	21 0221	6 6409	6 997174	30 2036	7 1369	9 867245	0
	25 6962	4 6741	0 46025	20 6129	9 5907	31 30422	0
	26 1491	0 4529	12 55131	24 3869	3 774	0 049143	0
	29 5001	3 351	0 415616	21 3925	2 9944	1 002567	0
	29 0812	0 4189	12 79338	24 327	2 9345	1 126109	0
	29 1017	0 0205	15 80208	26 0715	1 7445	5 067824	0
	24 906	4 1957	0 040007	27 1126	1 0411	8 72956	0
	22 9591	1 9469	4 197511	22 4366	4 676	0 462831	0
	23 3944	0 4353	12 67633	26 8373	4 4007	0 164039	0
	22 9224	0 472	12 41634	20 9241	5 9132	3 676872	0
	27 1432	4 2208	0 050678	26 4704	5 5463	2 404414	0
	32 2708	5 1276	1 281236	22 7817	3 6887	0 094238	0
	23 6718	8.599	21 19053	19 5211	3 2606	0 540347	0
	19 124	4 5478	0.304833	25 9869	6 4658	6 101479	0
	28 4042	9 2802	27 92612	24 8975	1 0894	8 44648	0
	20 6572	7 747	14.07238	21 9535	2 944	1 106037	0
	26.338	5 6808	2 83962	20 7495	1 204	7 793493	0
	27 5462	1 2082	7 770061	27 0266	6 2771	5 204864	0
	31 0232	3 477	0 269032	22 7031	4 3235	0 107464	0
	22 9604	8 0628	16 54144	19 1721	3.531	0 21593	0
	31 2213	8 2609	18 19208	22 5606	3.3885	0 368671	0
	26 408	4 8133	0.668498	26 6488	4 0882	0 008559	0
	27 0966	0 6886	10 9368	27 9413	1 2925	7 307197	0
	22 2136	4.883	0 787332	20 1383	7 803	14 49566	0
	27 7292	5 5156	2 310148	29 394	9 2557	27 66778	0
	25 2702	2 459	2 361394	25 9564	3 4376	0 311456	0
	20 0268	5 2434	1.556798	22 3353	3 6211	0 140312	0
	32 9457	12 9189	79 6238	32 1902	9 8549	34 33043	0
	29 8439	3 1018	0 799027	20 4905	11 6997	59.35188	0
	22 0394	7 8045	14 50709	27 4005	6 91	8 493245	0
	23 6055	1 5661	5 902873	28 3543	0 9538	9 253051	0
	23 5067	0 0988	15 1857	24 4005	3 9538	0.001754	0
	28 7396	5 2329	1 530706	25 5544	1 1539	8 07573	0
	28 5278	0 2118	14 31777	32 5664	7 012	9 098169	0
	30 9647	2 4369	2 429804	26 3391	6 2273	4 980115	0
	24 446	6 5187	6.365616	26 8017	0 4626	12 48267	0
	26 9435	2 4975	2 244552	35 2994	8 4977	20 26816	0
	22 5851	4 3584	0 131564	24 7531	10 5463	42 91059	0
	21 9199	0 6652	11 09212	30 5168	5 7637	3 125885	0
	26 2472	4 3273	0 10997	26 1013	4 4155	0 176246	0
	25 3012	0 946	9 300565	26 0803	0 021	15 7981	0
	21 2613	4 0399	0 001955	20 9081	5 1722	1 384193	0
	24 5174	3 2561	0.546983	20 4895	0 4186	12 79552	0
	29 5649	5 0475	1 106319	29 8841	9 3946	29 14831	0
	22 7202	6 8447	8 116899	23 5136	6 3705	5 639757	0
	25 0088	2 2886	2 914132	21 8825	1 6311	5 591252	0
	23 7172	1 2916	7 312064	27 474	5 5915	2 546632	0
	20 4089	3 3083	0 472495	28 723	1 249	7 544267	0

50	Alpha=50						
1	Beta=1	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	52 8053			53 5046	9 1094	1 425593	
0	56 0993	3 294	21 35751	51 7471	1 7575	37 91996	0
0	52 9364	3 1629	22 58643	52 4583	0 7112	51 90076	0
0	53 7075	0 7711	51 04128	57 0872	4 6289	10 8012	0
0	58 4356	4 7281	10 159	49 6025	7 4847	0 185518	0
0	54 2687	4 1669	14 05139	48 7821	0 8204	50 33928	0
0	53 4664	0 8023	50 59645	42 8609	5 9212	3 976908	0
0	55 5256	2 0592	34 29529	38 5331	4 3278	12 871	0
0	58 5568	3 0312	23 85559	48 7305	10 1974	5 207441	0
0	53 3667	5 1901	7 427359	48 8322	0 1017	61 05419	0
0	40 9188	12 4479	20 54339	54 6841	5 8519	4 258107	0
0	45 1186	4 1998	13 80582	57 384	2 6999	27 20163	0
0	58 7524	13 6338	32 69989	57 5218	0 1378	60 49134	0
0	52 1147	6 6377	1 632564	50 1662	7 3556	0 313396	0
0	55 2983	3 1836	22 3901	41 2476	8 9186	1 006374	0
0	66 4081	11 1098	10 20408	47 0064	5 7588	4 651002	0
0	54 8853	11 5228	13 0132	51 8222	4 8158	9 607633	0
0	49 207	5 6783	5 004698	41 1761	10 6461	7 456623	0
0	47 8126	1 3944	42 52368	51 324	10 1479	4 983975	0
0	47 8092	0 0034	62 60003	47 4297	3 8943	16 16939	0
0	47 9287	0 1195	60 77634	40 1159	7 3138	0 361944	0
0	47 0219	0 9068	49 12073	49.9963	9 8804	3 861153	0
0	58 4958	11 4739	12 66279	49 9039	0.0924	61 19961	0
1	47 5074	10 9884	9 443217	48 0727	1 8312	37 01771	0
0	49 1222	1 6148	39 69779	50 1009	2 0282	34 65934	0
0	51 2167	2 0945	33 88309	42 6563	7 4446	0 22167	0
0	40 9355	10 2812	5 596924	43 4272	0 7709	51 04414	0
0	53 6475	12 712	23 0072	54.9139	11 4867	12 75406	0
0	56 6849	3 0374	23 79506	40 6301	14.2838	40 55629	0
0	41 1917	15 4932	57 42278	40 5248	0 1053	60.99795	0
0	60 2526	19 0609	124.2218	58 7984	18 2738	107 2919	0
0	45 0916	15.161	52 49846	60 0581	8 7403	0 68043	0
0	50 7162	5.6246	5.247848	54 5274	4 4693	11.87573	0
0	37 1189	13 5973	32 28378	49 1187	5 4087	6 283636	0
0	38 6641	1 5452	40.57968	55 7912	6.6725	1 544846	0
0	42 2058	3 5417	19 12941	49 3682	6.423	2.227312	0
0	60 5173	18 3115	108 0785	50.3064	0 9382	48.68157	0
0	39 5367	20 9806	170 699	54 5849	4 2785	13 22717	0
0	52 6311	13 0944	26 82185	50 0291	4 5558	11 28703	0
0	46 9139	5 7172	4.832163	55 1284	5 0993	7 930522	0
0	60 8764	13 9625	36 5872	48 2499	6 8785	1 075199	0
0	40 9194	19 957	144.9997	48 1147	0 1352	60.5318	0
0	51 5806	10 6612	7 539318	48 0388	0.0759	61 45805	0
0	62 0124	10 4318	6 332177	55.2781	7.2373	0 459844	0
0	65 3128	3.3004	21.29839	42.9084	12.3677	19.82281	0
0	44 1051	21 2077	176 6848	50 1142	7 2058	0.503558	0
0	40 0065	4 0986	14.5681	56 2498	6 1356	3 167753	0
0	51 5116	11 5051	12.88582	45.5569	10 6929	7 714405	0
0	37 2679	14 2437	40 04715	55 6782	10 1213	4 865915	0
0	53 8294	16 5615	74 75473	51 5855	4 0927	14.61317	0
0	56 6811	2 8517	25 64124	48 4896	3 0959	23 22778	0
0	43.8518	12 8293	24 14623	50.3703	1 8807	36 41782	0
0	51 6947	7 8429	0 005259	48 6404	1 7299	38 26064	0
0	52 9118	1 2171	44.86747	45 0817	3 5587	18 98099	0
0	47 9026	5 0092	8 446104	48.6384	3 5587	18.99842	0
0	55 9961	8 0935	0 031713	51 9058	3 2674	21 60407	0
0	49 7976	6 1985	2 947808	59 9259	8 0201	0 010958	0
0	49 5902	0 2074	59 41354	26 8763	33 0496	631 7271	0
0	56 6413	7 0511	0 747046	65 1797	38 3034	923 4294	0
0	41 2805	15 3608	55 43371	47 7935	17 3862	89 69571	0
0	47 6963	6 4158	2 248855	57 1062	9 3127	1 952398	0
0	44 7055	2 9908	24 25186	40 4195	16 6867	76.93538	0
0	53 1201	8 4146	0 249182	52 4513	12 0318	16.9446	0
0	52 3114	0.8087	50 50544	49 9499	2 5014	29 31159	0
0	38 3235	13 9879	36 87504	50 0086	0 0587	61 72802	0
0	53 8065	15 483	57 26829	55.8247	5 8161	4 407137	0
0	53.0535	0 753	51 30023	35.9118	19 9129	143.9396	0
0	50 7247	2 3288	31 2103	40 4567	4 5449	11 36039	0
0	47 3552	3 3695	20.66537	56 4732	16 0185	65 62753	0
0	39 9843	7 3709	0.2965	52 2109	4 2623	13 34527	0
0	46 6556	6 6713	1 54783	42 1543	10 0566	4 584659	0
0	47 3407	0 6851	52 2775	54 0623	11 908	15.94071	0
0	48 8456	1 5049	41 09474	44 0333	10 029	4.467228	0
0	47 7426	1 103	46 40904	42.3972	1 6361	39 42984	0

50	Alpha=50						
5	Beta=5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	220 85			260 104	30 554	79 2106	
0	213 801	7 049	1050 086	243 956	16 148	543 1712	0
0	243 819	30 018	89 03873	204 732	39 224	0 052915	0
0	199 648	44 171	22 24977	293 93	89 198	2474 462	0
0	268 439	66 791	860 6576	318 368	24 438	225 4813	0
0	255 396	13 043	697 5427	216 074	102.294	3948 861	0
0	196 19	59 206	390 1402	252 884	36 81	6 990913	0
0	278 588	82 398	1844 184	247 96	4 924	1192 323	0
0	258 971	19.617	393 5079	258 301	10 341	847 5687	0
0	281 561	22 59	284 3956	237 591	20 71	351 3388	0
0	298 904	17 343	488 8978	207 926	29 665	95.82518	0
0	267 782	31 122	69 42278	266 152	58 226	352 3867	0
0	245 942	21 84	310 2542	253 055	13 097	694 6932	0
0	214 223	31 719	59 83074	246 266	6 789	1067 004	0
0	277 647	63 424	574 5593	275 544	29 278	103 5517	0
0	241 17	36 477	8 862728	295 796	20 252	368 7181	0
0	317 557	76 387	1364 044	201 643	94 153	2991 977	0
0	254 371	63 186	563 2062	244 706	43 063	13 02464	0
0	264 82	10 449	841.292	200 037	44 669	27 19588	0
0	211 997	52 823	178 7293	257 404	57 367	320 8744	0
0	188 524	23 473	255 3934	242 848	14 556	619 9121	0
0	295 814	107 29	4601 718	216 872	25.976	181 6574	0
0	268 11	27 704	138 0633	237 242	20 37	364 2003	0
0	244.026	24 084	236 2379	260 891	23 649	249 7991	0
0	273 101	29 075	107 7243	262 192	1 301	1455 654	0
0	262 895	10 206	855 4475	257 423	4 769	1203 052	0
0	207 02	55.875	269 6481	223 66	33 763	32 38786	0
0	236.375	29 355	101.9905	219 924	3 736	1275 778	0
0	197 729	38 646	0 652918	242 74	22 816	276 8242	0
0	275 692	77 963	1482.941	258 62	15 88	555 7351	0
0	235 614	40 078	0 389334	266 357	7 737	1005 97	0
0	218 727	16 887	509 271	278 336	11 979	754.8775	0
0	242.027	23.3	260 9528	244 817	33 519	35 22462	0
0	268 18	26 153	176 9175	288.5	43 683	17 88416	0
0	239 266	28 914	111 0923	169 341	119 159	6352 882	0
0	226.594	12 672	717 2773	250 587	81 246	1746 568	0
0	241 455	14 861	604.8173	189 33	61.257	475 3693	0
0	166 391	75 064	1268.07	269 84	80 51	1685 592	0
0	207 151	40 76	1 705548	301 403	31 563	62 26841	0
0	219 818	12 667	717 5452	224 532	76 871	1400 029	0
0	236 734	16 916	507 963	268 145	43 613	17 297	0
0	253 544	16 81	512 7523	237 197	30 948	72.35261	0
0	279 554	26 01	180 742	258 702	21.505	322 1678	0
0	281 79	2.236	1385 162	261 998	3 298	1307 403	0
0	233 55	48 24	77 19321	224 468	37 53	3 701905	0
0	352.62	119 07	6338 702	183 12	41 348	3 587109	0
0	244.498	108 122	4715 29	209 164	26 044	179 829	0
0	209 82	34.678	22.8105	225 979	16 815	512 5258	0
0	303 933	94 113	2987 603	217 46	8.519	956 9763	0
0	222 267	81 666	1781 85	315.31	97 85	3410 089	0
0	252 018	29 751	94 14886	225 923	89 387	2493 301	0
0	248 696	3 322	1305.524	314 475	88 552	2410 61	0
0	208 681	40 015	0 314683	266 712	47 763	69 03892	0
0	220 889	12 208	742.3463	232 481	34 231	27 28008	0
0	270 272	49 383	98 58438	270 27	37 789	2 772337	0
0	288 229	17 957	462 1224	249 17	21 1	336 8705	0
0	231 775	56 454	288 9989	249 674	0 504	1517 105	0
1	240 177	8 402	964 2288	211 362	38 312	1 304241	0
1	211 252	28 925	110 8605	230 766	19 404	402 0038	0
0	274 164	62 912	550 2762	239 125	8 359	966 9011	0
0	255 71	18 454	441 0014	221 127	17 998	460 3614	0
0	226 727	28 983	109 6425	209 249	11 878	760 4376	0
0	240 147	13 42	677 7709	267 85	58 601	366 6063	0
0	227 584	12 563	723 1277	260 021	7 829	1000 143	0
0	301 223	73.639	1168 612	260 263	0 242	1537 584	0
0	218 906	82 317	1837 234	233 425	26 838	159 1643	0
0	324 622	105 716	4390 648	237 699	4 274	1237 635	0
0	317 891	6 731	1070 797	314 681	76 982	1408 348	0
0	238 072	79 819	1629 331	267 666	47 015	57 16821	0
0	230 931	7 141	1044 132	156 889	110 777	5086 966	0
0	178 211	52 72	175 9859	277 145	120 256	6528 958	0
0	220 477	42 266	7 907156	204 714	72 431	1087 48	0
0	257 061	36 584	8 237092	280 5	75 786	1320 012	0
0	292 775	35 714	13 98785	218 447	62 053	510 7133	0

50	Alpha=50							
10	Beta=10	MR	(MRi-MR)^2		MR	(MRi-MR)^2		
0	418 021			471 304	164 508	7099 156		0
0	499 132	81 111	0 738745	514 087	42 783	1403 888	0	0
0	544 082	44 95	1246 198	480 409	33 678	2169 091	0	0
0	456 981	87 101	46 91569	478 675	1 734	6164.997	0	0
0	511 006	54 025	687 8292	470 063	8 612	5132 218	0	0
0	514 13	3 124	5948 651	526 993	56 93	543 8922	0	0
0	480 76	33 37	2197 875	577 002	50 009	914.6086	0	0
0	559 99	79 23	1 043456	575 854	1 148	6257 363	0	0
0	550 126	9 864	4954 4	487 767	88 087	61 3951	0	0
0	565 716	15 59	4181 109	480 35	7 417	5304 864	0	0
0	498 587	67 129	172 1999	582 372	102 022	473 9548	0	0
0	500 54	1 953	6130 655	519.6	62 772	305 5328	0	0
0	466 314	34 226	2118 346	537 757	18 157	3855 727	0	0
0	608 74	142 426	3865 669	525 506	12 251	4624 068	0	0
0	422 277	186 463	11280 88	594 558	69 052	125 4287	0	0
0	433 651	11 374	4744 11	424 531	170 027	8059.641	0	0
0	519 987	86 336	37 02117	485 294	60 763	379.8015	0	0
0	557 518	37 531	1825 041	634 566	149 272	4763 83	0	0
0	503 715	53 803	699 523	443 55	191 016	12268 78	0	0
0	485 56	18 155	3655 975	420 146	23 404	3231.638	0	0
0	507 816	22 256	3363 478	479 205	59 059	449 1219	0	0
0	448 362	59 454	432 5359	510 83	31 625	2364 536	0	0
0	613 335	164 973	7177 733	463 53	47.3	1085 801	0	0
0	481 827	131 508	2627 229	474 492	10 962	4801 034	0	0
0	418 215	63 612	276 8729	543 358	68 866	129 6295	0	0
0	546 435	128 22	2300 977	441 003	102 355	488 5648	0	0
0	430 175	116.26	1296 612	538 745	97 742	305 9177	0	0
0	621 441	191 266	12324 22	434 937	103 808	554 9088	0	0
0	548 828	72 613	58 34664	558 905	123 968	1911 133	0	0
0	441 102	107 726	754 8483	529 06	29 845	2540 815	0	0
0	589 106	148 004	4590 402	500 558	28 502	2678.01	0	0
0	458 143	130 963	2571 657	401 733	98 825	344.975	0	0
0	435 922	22 221	3367 539	685 524	283 791	41428 33	0	1
0	539 834	103 912	559 8194	399 095	286 429	42509 18	0	1
0	499 025	40 809	1555 711	469 464	70 369	97 66375	0	0
0	407 882	91 143	118 6248	534 804	65 34	222.3527	0	0
0	454 334	46 452	1142 406	452 526	82 278	4 106714	0	0
0	530 958	76 624	13 15874	580 599	128 073	2286.896	0	0
0	417 102	113 856	1129.263	533 136	47 463	1075 086	0	0
0	742 92	325 818	60302 91	495 777	37 359	1839 766	1	0
0	549 38	193 54	12834 28	517 626	21 849	3410.852	0	0
0	418 272	131 108	2586 384	521 912	4 286	5770 757	0	0
0	441 448	23 176	3257 612	502 579	19 333	3711.063	0	0
0	501 528	60.08	406 8893	396 927	105 652	645 1855	0	0
0	456 248	45 28	1223.006	523 156	126 229	2113 931	0	0
0	540 161	83 913	13 4066	673 732	150 576	4945 536	0	0
0	454 86	85 301	25 49748	475 021	198 711	14032 65	0	0
0	469 764	14 904	4270 295	457 777	17 244	3969 945	0	0
0	489 331	19 567	3682 608	487 82	30 043	2520.893	0	0
0	469 421	19 91	3641 096	441 959	45 861	1182 706	0	0
0	523 078	53 657	707 2673	505 565	63 606	277 0726	0	0
0	653 588	130 51	2525 917	488 116	17 449	3944 154	0	0
0	501 697	151 891	5132 218	595 273	107 157	723 9061	0	0
0	472 982	28 715	2656 011	394 988	200 285	14408 04	0	0
0	504 33	31 348	2391 552	537 962	142 974	3934 112	0	0
0	481 784	22 546	3329 924	463 421	74 541	32 60978	0	0
0	408 587	73 197	49 76593	500 546	37 125	1859 895	0	0
0	525 458	116 871	1340 988	452 264	48 282	1022 049	0	0
0	537 526	12 068	4648 989	501 019	48 755	992 0293	0	0
0	444 949	92 577	151 918	471 956	29 063	2620 262	0	0
0	553 577	108 628	805 2259	544 064	72 108	66 31655	0	0
0	477 55	76 027	17 84638	428 549	115 515	1243 515	0	0
0	430 231	47 319	1084 549	516 431	87 882	58 22457	0	0
0	460 388	30 157	2509 459	511 758	4 673	5712 109	0	0
0	500 622	40 234	1601 4	575 073	63 315	286 8449	0	0
0	397 836	102 786	507 8038	533 443	41 63	1491 62	0	0
0	455 973	58 137	489 051	570 62	37 177	1855 412	0	0
0	394 767	61 206	362 731	466 541	104 079	567 7499	0	0
0	512 771	118 004	1425 251	627 564	161 023	6524 036	0	0
0	450 707	62 064	330 7851	416 348	211 216	17151 7	0	0
0	487 132	36 425	1920 762	607 045	190 697	12198 21	0	0
0	388 697	98 435	330 6398	575 994	31 051	2420 689	0	0
0	537 254	148 557	4665 642	459 356	116 638	1323 978	0	0
0	489 54	47 714	1058 689	687 774	228 418	21953 31	0	0

	25 8875	3 6774	0 101304	
	22 9539	2 9336	1 12802	
	21 0238	1 9301	4 266632	
	19 7915	1 2323	7 636285	
	18 2803	1 5112	6 172655	
	18 9351	0 6548	11 1615	
	28 3962	9 4611	29 87078	
	22 1974	6 1988	4 853725	
	32 9361	10 7387	45 46828	
	21 3682	11 5679	57 33847	
	18 0137	3 3545	0 411115	
	22 2931	4 2794	0 080495	
	27 4453	5 1522	1 337532	
	22 0199	5 4254	2 044091	
	26 3911	4 3712	0 141013	
	23 3819	3 0092	0 973148	
	25 5077	2 1258	3 496462	
	23 6796	1 8281	4 698415	
	25 1585	1 4789	6 334196	
	23 2011	1 9574	4 154597	
	25 8193	2 6182	1 897459	
	20 7501	5 0692	1 152439	
	26 0146	5 2645	1 609897	
	29 6192	3 6046	0 152946	
	21 1769	8 4423	19 7724	
	18 6655	2 5114	2 203096	
	28 2797	9 8142	31 56774	
	22 194	6 0857	4 368172	
	24 5376	2 3436	2 729378	
	21 7251	2 8125	1 399922	
	19 929	1 7961	4 838165	
	24 3417	4 4127	0 173903	
	25 7328	1 3911	6 783852	
	29 4727	3 7399	0 065425	
	26 9881	2 4846	2 283371	
	23 2675	3 7208	0 075671	
	22 9608	0 3067	13 60859	
	24 3356	1 3748	6 869027	
	25 6848	1 3492	7 003871	
	25 5403	0 1445	14.83161	
	18 0021	7 5382	12 54943	
	25 3836	7 3815	11 46376	
	27 4515	2 0679	3 716347	
	26 1261	1 3254	7 13041	
	29 3415	3 2154	0.608841	
	25 9595	3 382	0 376607	
	28 9801	1 0206	8 851118	
	21 0246	5.9555	3 840883	
	25 9906	4 966	0.941515	
	25 438	0 5526	11.85482	
	26 2063	0 7683	10 416	
	21 1683	5 038	1 086425	
	27 4567	6 2884	5 256552	
	25 0258	2 4309	2 448545	
	30 0607	5 0349	1 079972	
	21 0119	9 0488	25.53399	
Sum MR > UCLmr				
Sum X	199499 8			50184 43
X Average	24 96842			
MR Average	3 995683			
Normal constant d2 (n=2)	1 128			
Normal constant D4 (n=2)	3 268			
Upper contro limit for X (UCLx	35.59524			
Lower control limit for X (LCLx	14 34161			
Upper control limit MR (UCLmr	13 05789			
MR Standard deviation	3 020592			
Process standard deviation	3 535534			
Gamma d2	1 13015			
Gamma d3	0 854352			
Gamma D4	3.267891			
50 Alpha=50				
0 5 Beta=0 5				
Proportion MR > UCLmr	0 010001			
Percentage	1 0001			
ARL for MR	99 99			

	0		45 9415	5 6333	5 208063	
	0		54 2768	8 3353	0 176301	
	0		56 7891	2 5123	29 19369	
	0		44 1125	12 6766	22 66885	
	0		59 5968	15 4843	57 28797	
	0		52 7226	6 8742	1 084135	
	0		56 9424	4 2198	13 65759	
	0		51 3713	5 5711	5 495828	
	0		49 9244	1 4469	41 84173	
	0		58 1562	8 2318	0 100097	
	0		45 1442	13 012	25 97515	
	0		55 5913	10 4471	6 409413	
	0		54 1757	1 4156	42 24764	
	0		43 5666	10 6091	7 255922	
	0		45 5961	2 0295	34 64403	
	0		39 5812	6 0149	3 611969	
	0		49 5085	9 9273	4 047668	
	0		62 2885	12 78	23 66416	
	0		55 5072	6 7813	1 286224	
	0		53 5702	1 937	35 74148	
	0		55 044	1 4738	41 49445	
	0		48 7122	6 3318	2 507847	
	0		43 6483	5 0639	8 131156	
	0		37 4552	6 1931	2 96638	
	0		47 9223	10 4671	6 51108	
	0		54 9326	7 0103	0.819239	
	0		40 2408	14 6918	45.91935	
	0		49 3083	9 0675	1 327292	
	0		51 8529	2.5446	28.84569	
	0		41 0653	10 7876	8.249428	
	0		45 7819	4 7166	10 23244	
	0		51 2925	5 5106	5 783151	
	0		48 9871	2 3054	31.4723	
	0		44 9569	4 0302	15 09492	
	0		58 3347	13 3778	29 83761	
	0		55.0977	3.237	21.8878	
	0		38 183	16 9147	80.98707	
	0		46 4465	8 2635	0 121161	
	0		37 9642	8 4823	0 321355	
	0		47 0203	9 0561	1 301155	
	0		44 7558	2.2645	31 93288	
	0		56 1939	11 4381	12 40929	
	0		54 6679	1 528	40.82466	
	0		40 2996	14 3683	41.63968	
	0		44 5275	4.2279	13.59779	
	0		47 7249	3 1974	22.2597	
	0		57 1525	9 4276	2.286694	
	0		43.83	13.3225	29.23653	
	0		48 8367	5.0067	8 460642	
	0		54 4537	5 617	5.282726	
	0		54 2568	0 1969	59.57552	
	0		44 1295	10 1273	4.892421	
	0		43.6945	0.435	55.95666	
	0		51 2583	7 5638	0.123635	
	0		50 7683	0 49	55 13684	
	0		62.614	11 8457	15 44712	
	64	36				
Sum X			399465.3			100121.8
X Average			49.95871			
MR Average			7 915418			
Normal constant d2 (n=2)			1 128			
Normal constant D4 (n=2)			3.268			
Upper contro limit for X (UCLx			71 01036			
Lower control limit for X (LCLx			28.90707			
Upper control limit MR (UCLmr			25.86759			
MR Standard deviation			6 047264			
Process standard deviation			7 071068			
Gamma d2			1 119409			
Gamma d3			0 855212			
Gamma D4			3 291956			
50 Alpha=50						
1 Beta=1						
Proportion MR > UCLmr			0.011201			
Percentage			1 120112			
ARL for MR			89 27679			

	0		287 049	7 145	1043 874	
	0		236 268	50 781	128 3002	
	0		213 171	23 097	267 5525	
	0		214 094	0 923	1484 641	
	0		244 011	29 917	90.95501	
	0		306 386	62 375	525 3707	
	0		291 257	15 129	591 7073	
	0		281 718	9 539	894.9092	
	0		227 279	54 439	224 5492	
	0		234 732	7 453	1024 066	
	0		271 92	37 188	5 134908	
	0		280 898	8 978	928 7886	
	0		308 98	28 082	129 3231	
	0		251.808	57 172	313 9263	
	0		214 611	37 197	5 0942	
	0		283 328	68 717	856.3212	
	0		242 107	41 221	3 122171	
	0		228 373	13 734	661 5201	
	0		162 308	66 065	708 1435	
	0		251 712	89 404	2494.999	
	0		237 793	13 919	652.0379	
	0		193 902	43 891	19 68667	
	0		221 053	27 151	151 3646	
	0		204 154	16.899	508 7295	
	0		223.564	19 41	401 7633	
	0		274.2	50 836	125 0364	
	0		223 311	50 889	130 7585	
	0		210 178	13 133	692 7968	
	0		254.067	43 889	19 66893	
	0		265.91	11.843	762 3692	
	0		288 695	22.785	277 8567	
	0		229 788	58 907	378 4179	
	0		184 757	45 031	31 10256	
	0		231 686	46.929	55.87512	
	0		216 668	15 018	597.1197	
	0		248 618	31 95	56 31052	
	0		240 084	8 534	956.0485	
	0		213 717	26 367	171.2704	
	0		245 317	31 6	61 68584	
	0		287 645	42 328	8.259683	
	0		232 333	55 312	251.4751	
	0		271 259	38 926	0.278819	
	0		269 609	1.65	1429 145	
	0		214 483	55 126	245.6105	
	0		343 48	128 997	8017 943	
	0		257 503	85 977	2184 386	
	0		264 528	7 025	1051 642	
	0		201 497	63 031	555.8733	
	0		224 847	23.35	259.3399	
	0		192 922	31 925	56 68635	
	0		227 342	34 42	25.34149	
	0		311 182	83 84	1970 114	
	0		312 087	0 905	1486 028	
	0		254 432	57 655	331.2752	
	0		287 505	33 073	40 71759	
	0		229 55	57 955	342.2858	
	91	21				
Sum X			2001376			501134 9
X Average			250 2511			
MR Average			39 45403			
Normal constant d2 (n=2)			1 128			
Normal constant D4 (n=2)			3.268			
Upper contro limit for X (UCLx			355 182			
Lower control limit for X (LCLx			145.3202			
Upper control limit MR (UCLmr			128 9358			
MR Standard deviation			29 95508			
Process standard deviation			35.35534			
Gamma d2			1 115929			
Gamma d3			0 847258			
Gamma D4			3 27772			
50 Alpha=50						
5 Beta=5						
Proportion MR > UCLmr			0 010401			
Percentage			1 040104			
ARL for MR			96 14423			

	0		400 819	142.61	3888 583	
	0		569 881	169 062	7887 305	
	0		431 916	137 965	3330 848	
	0		523 052	91 136	118 4724	
	0		429 152	93 9	186 2816	
	0		530 667	101 515	452 1366	
	0		522 607	8 06	5211 612	
	0		463 075	59 532	429 2976	
	0		507 701	44 626	1269 176	
	0		515 218	7 517	5290 307	
	0		497 537	17 681	3915 067	
	0		482 391	15 146	4238 726	
	0		482 848	0 457	6367 162	
	0		659 356	176 508	9265 314	
	0		502 543	156 813	5861 664	
	0		550 168	47 625	1064 488	
	0		538 721	11 447	4734 059	
	0		495 889	42 832	1400 219	
	0		480 287	15 602	4179 557	
	0		493 716	13 429	4465 246	
	0		633 088	139 372	3495 234	
	0		490 846	142 242	3842 822	
	0		614 281	123 435	1864 815	
	0		441 597	172 684	8543 768	
	0		435 168	6 429	5449 761	
	0		645 562	210 394	16937 07	
	0		332 897	312 665	54016 04	
	0		522 139	189 242	11878.93	
	0		487 668	34 471	2095.854	
	0		510 048	22 38	3349 11	
	0		443 238	66 61	180 6738	
	0		557 388	114 15	1149 108	
	0		428 196	129 192	2395 173	
	0		501 896	73 7	42 92211	
	0		512 443	10 547	4858 717	
	0		470 931	41 512	1500 749	
	0		597 788	126 857	2172.073	
	0		383 519	214 269	17960.69	
	0		458 574	75 055	27 00358	
	0		429 468	29 106	2615 862	
	0		469 725	40 257	1599.56	
	0		483 3	13 575	4445 755	
	0		562 672	79 372	0 773515	
	0		431 848	130 824	2557 578	
	1		466 271	34 423	2100 251	
	0		506 978	40 707	1563 767	
	0		535 629	28 651	2662 611	
	0		468 663	66 966	176 5044	
	0		519 524	50 861	663 8013	
	0		422 684	96 64	268 583	
	0		445 091	22 207	3369 164	
	0		672 942	227 851	21785 61	
	0		545 795	127 147	2199 188	
	0		722 253	176 458	9255 691	
	0		539 979	182 274	10408 59	
	0		635 812	95 833	242 7832	
	84	20				
Sum X			4005407			1002796
X Average			500 8203			
MR Average			80 2515			
Normal constant d2 (n=2)			1 128			
Normal constant D4 (n=2)			3.268			
Upper contro limit for X (UCLx			714 2551			
Lower control limit for X (LCLx			287 3855			
Upper control limit MR (UCLmr			262 2619			
MR Standard deviation			60 69407			
Process standard deviation			70 71068			
Gamma d2			1 134928			
Gamma d3			0 858344			
Gamma D4			3 268895			
50 Alpha=50						
10 Beta=10						
Proportion MR > UCLmr			0 008901			
Percentage			0 890089			
ARL for MR			112 3483			

100	Alpha=100						
0 5	Beta=0 5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
	49 7119			54 8286	4 525	1 256447	
	45 7292	3 9827	2 766279	43 5644	11 2642	31 56514	0
	48 6756	2 9464	7 287373	49 1222	5 5578	0 007764	0
	49 6362	0 9606	21 95216	44 8564	4 2658	1 904713	0
	60 9238	11 2876	31 82863	56 0504	11 194	30 78126	0
	46 9439	13 9799	69 45533	49 3748	6 6756	1 060254	0
	50 6789	3 735	3 65159	51 8006	2 4258	10 36913	0
	44 7317	5 9472	0 090774	53 8974	2 0968	12 59621	0
	48 6668	3 9351	2 926883	41 1123	12 7851	50 96798	0
	44 6955	3 9713	2 80433	55 821	14 7087	82 1341	0
	55 3033	10 6078	24 62032	49 9181	5 9029	0 066042	0
	51 7999	3 5034	4 590364	46 3031	3 615	4 124609	0
	45 5407	6 2592	0 37612	46 646	0 3429	28 12195	0
	47 09	1 5493	16 78224	57 1925	10 5465	24 01575	0
	50 0401	2 9501	7 26741	54 6637	2 5288	9 716396	0
	48 7599	1 2802	19 05945	52 5618	2 1019	12 56003	0
	44 0279	4 732	0 835238	46 7704	5 7914	0 021166	0
	54 588	10 5601	24 14923	54 2833	7 5129	3 485639	0
	45 4056	9 1824	12 50674	51 8102	2 4731	10 06675	0
	51 9878	6 5822	0 876633	49 0608	2 7494	8 38979	0
	54 3215	2 3337	10 97076	56 9378	7 877	4 977747	0
	56 29	1 9685	13 52337	44 2211	12 7167	49 99602	0
	53 0121	3 2779	5 607488	50 176	5 9549	0 095473	0
	49 5297	3 4824	4 68079	51 3186	1 1426	20 27983	0
	53 099	3 5693	4 312323	40 018	11 3006	31 97548	0
	44 505	8 594	8 691214	54 4716	14 4536	77 57534	0
	44 8015	0 2965	28 61622	56 6018	2 1302	12.36024	0
	38 0258	6 7757	1 276418	50 4809	6 1209	0 225612	0
	49 8187	11 7929	37 78544	55 7435	5 2626	0 146929	0
	38 762	11 0567	29 27661	48 2817	7 4618	3 297444	0
	53 2418	14 4798	78 03755	49 6404	1 3587	18 3802	0
	51 2975	1 9443	13 70194	48 5326	1 1078	20 59447	0
	45 3927	5 9048	0 067022	38 7351	9 7975	17 23567	0
	55 9042	10 5115	23 67393	54 1384	15 4033	95.20659	0
	53 1583	2 7459	8 410078	45 5804	8 558	8 480248	0
	53 4703	0.312	28 45063	53 1235	7 5431	3 599317	0
	58 9704	5 5001	0 021262	53 2696	0 1461	30 24795	0
	47 8789	11 0915	29 65441	44 5127	8 7569	9 678237	0
	44 5821	3 2968	5.518334	53 243	8 7303	9 513441	0
	44 9048	0 3227	28 3366	48 8969	4 3461	1 689515	0
	50 393	5 4882	0.024874	51 449	2.5521	9 571682	0
	50 3379	0 0551	31 25719	51 167	0 282	28.77157	0
	48 8489	1 489	17 27993	50 8026	0 3644	27 89438	0
	49 7291	0 8802	22 71202	46 7426	4 06	2 515121	0
	51 3333	1 6042	16 33545	50 7946	4 052	2.54056	0
	49 6155	1 7178	15 43008	48 1971	2.5975	9 292824	0
	45 7041	3 9114	3 008537	46 7734	1 4237	17 82709	0
	41 4618	4 2423	1 970131	41 9376	4 8358	0 656284	0
	44 6164	3 1546	6 206643	51 3052	9 3676	13 85095	0
	50 6201	6 0037	0 128011	45 8858	5 4194	0 051308	0
	46 2119	4 4082	1 531935	46 5725	0 6867	24.5938	0
	57 2111	10 9992	28 65768	43 9954	2 5771	9 417616	0
	61 022	3 8109	3 367274	44 576	0 5806	25 6574	0
	48 616	12 406	45 69877	52 0204	7 4444	3 234554	0
	47 4515	1 1645	20 08307	59 5994	7 579	3 736824	0
	50 9857	3 5342	4 459334	43 9179	15 6815	100 713	0
	49 8379	1 1478	20 23302	49 2651	5 3472	0 08923	0
	56 5326	6 6947	1 099953	47 5944	1 6707	15.80232	0
	44 7507	11 7819	37 65033	51 7371	4 1427	2 259651	0
	51 9382	7 1875	2 376489	46 4933	5 2438	0 161695	0
	53 8415	1 9033	14.00716	50 4403	3 947	2 886307	0
	45 4821	8 3594	7 363009	47 3077	3 1326	6 316744	0
	60 8038	15 3217	93 62085	51 566	4 2583	1 925471	0
	48 4945	12 3093	44 40072	56 3725	4 8065	0 704615	0
	44 1364	4 3581	1 658463	53 429	2 9435	7 303038	0
	49 6631	5 5267	0 014212	47 6314	5 7976	0 023009	0
	46 2411	3 422	4.945791	50.3706	2 7392	8 448983	0
	47 1769	0 9358	22 18517	45 0385	5 3321	0 098479	0
	41 4632	5 7137	0.004595	54 1468	9 1083	11 98812	0
	50 3831	8 9199	10 71899	44 7563	9 3905	14 02193	0
	46 832	3 5511	4 388243	48 1003	3 344	5 298805	0
	41 82	5 012	0 401846	47 3839	0 7164	24.3001	0
	45 7241	3 9041	3 033914	56 6268	9 2429	12 93831	0
	54 8939	9 1698	12 41778	59 6455	3 0187	6 90225	0

100	Alpha=100						
1	Beta=1	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	107 415			109 449	4 86	40 69063	
0	81 271	26 144	222 1614	99 137	10 312	0 859182	0
0	106 115	24 844	185 0982	88 504	10 633	0 36714	0
0	111 817	5 702	30 65749	103 404	14 9	13 4035	0
0	121 301	9 484	3 079746	85 107	18 297	49 81649	0
0	106 267	15 034	14 40263	107 887	22 78	133 1965	0
0	111 283	5 016	38 72474	129 738	21 851	112 6162	0
0	106 311	4 972	39 27429	93 087	36 651	645 7738	0
0	102 257	4 054	51 62308	97 682	4 595	44 14168	0
0	87 941	14 316	9 468418	99 11	1 428	96 25416	0
0	89 263	1 322	98 34531	93 108	6 002	27 42534	0
0	96 642	7 379	14 89899	103 372	10 264	0 95047	0
0	101 11	4 468	45 84536	103 214	0 158	122 7868	0
0	86 225	14 885	13 2939	103 026	0 188	122 1228	0
0	95 145	8 92	5 377392	101 529	1 497	94 90501	0
0	98 001	2 856	70 27336	93 329	8 2	9 235038	0
0	116 483	18 482	52 4622	96 95	3 621	58 03271	0
0	116 15	0 333	118 9391	97 809	0 859	107 7427	0
0	98 406	17 744	42 31606	106 79	8 981	5 098205	0
0	94 003	4 403	46 72981	85 803	20 987	95 02505	0
0	88 679	5 324	34 98628	100 654	14 851	13 04712	0
0	103 28	14 601	11 30358	92 125	8 529	7 343669	0
0	98 702	4 578	44 36786	94 961	2 836	70 60907	0
0	93 249	5 453	33 47688	103 376	8 415	7 974527	0
0	117 403	24 154	166 7993	85 746	17 63	40 8459	0
0	116 721	0 682	111 4486	95 051	9 305	3 740048	0
0	102 018	14 703	11 99985	95 382	0 331	118 9827	0
0	106.505	4 487	45 58843	95 287	0.095	124 187	0
0	103 718	2 787	71 43496	91 507	3 78	55 63549	0
0	107 445	3 727	56 42895	90 883	0 644	112 2523	0
0	93 65	13 795	6 533542	91 414	0 551	114 2316	0
0	103 379	9 729	2 27986	115 598	24 184	167 5751	0
0	104 902	1 523	94 39911	95 301	20 297	82 0488	0
0	96 506	8 396	8 082197	94 143	1 158	101.625	0
0	103 334	6 828	19 45622	104 9	10 757	0 232247	0
0	95 332	8 002	10 47765	114 145	9 245	3 975719	0
0	92 753	2 579	74.99422	105 119	9 026	4 897017	0
0	90 008	2 745	72 14669	94 113	11 006	0.054252	0
0	104 568	14 56	11 02957	108 587	14 474	10 46574	0
0	107 859	3 291	63 16944	100 82	7 767	12 05423	0
0	97 997	9 862	1 89591	93 639	7 181	16 46672	0
0	106 01	8 013	10 40656	89 833	3 806	55.24831	0
0	108 332	2 322	79 51147	89 944	0 111	123 8306	0
0	101 423	6 909	18 74821	114 21	24 266	169 7048	0
0	114 195	12 772	2.350333	96 868	17 342	37 24758	0
0	101.614	12 381	1 304346	106 561	9 693	2 38987	0
0	120 132	18 318	50 11337	93 46	13 101	3 46734	0
0	89 188	30 944	388 2902	88 701	4.759	41 98937	0
0	107 304	18 116	47 29422	90.956	2 255	80 71083	0
0	75 072	32.232	440 7094	107 661	16 705	29 87803	0
0	93.35	18 278	49 54864	119 389	11 708	0.220036	0
0	109 829	16 479	27 45843	110 838	8 531	7 332833	0
0	109 162	0 667	111.7655	112 989	2 151	82 5903	0
0	93 774	15 388	17 21486	86 822	26 167	222 8476	0
0	95 719	1 945	86.37696	96 053	9 231	4 031745	0
0	85 406	10 313	0.857329	106 381	10 328	0.829776	0
0	114 095	28.689	304 5053	89 863	16 518	27 86868	0
0	106 117	7 978	10.6336	103.223	13 36	4 498978	0
0	121 871	15 754	20.38594	96 465	6 758	20 07865	0
0	99 548	22.323	122.8568	81 463	15 002	14 16077	0
0	107 959	8 411	7 997134	124 627	43 164	1019 211	0
0	129.01	21 051	96.2769	90 073	34 554	543 5929	0
0	110 198	18 812	57 35153	93 465	3 392	61.57416	0
0	111 084	0 886	107 183	92.962	0 503	115 26	0
0	97 422	13 662	5.871314	97 574	4 612	43 91608	0
0	90 394	7 028	17 73185	96 203	1 371	97 37585	0
0	102 728	12 334	1 199199	81 675	14 328	9 542412	0
0	110 403	7 675	12 70153	109 055	27 18	254 118	0
0	85 852	24 551	177 2115	103 956	5.099	37 69862	0
0	108 581	22 729	132 0219	83 456	20 5	85 76759	0
0	116 735	8 154	9 516734	110 734	27 278	257 2521	0
0	100 278	16 457	27 22835	97 067	13 667	5 89557	0
0	115 349	15 071	14 68483	96 778	0 289	119.9008	0
0	110 934	4 415	46 58589	108 983	12.205	0 93331	0

100	Alpha=100						
5	Beta=5	MR	(MRi-MR)^2		MR	(MRi-MR)^2	
0	417 135			545 89	49 602	35 00012	
0	551 624	134 489	6236 405	473 462	72 428	285 9451	0
0	483 302	68 322	163 9401	481 468	8 006	2257 399	0
0	586 201	102 899	2244 951	483 193	1 725	2893 697	0
0	513 984	72 217	278 8536	489 944	6 751	2378 229	0
0	474 983	39 001	272 8143	573 316	83 372	775 8403	0
0	439 716	35 267	410 1066	574 471	1 155	2955 346	0
0	485 228	45 512	100 1218	456 133	118 338	3946 341	0
0	472 264	12 964	1810 851	509 622	53 489	4 117205	0
0	522 362	50 098	29 37737	548 462	38 84	278 1587	0
0	481 574	40 788	216 9755	537 028	11 434	1943 407	0
0	528 962	47 388	66 09836	494 15	42 878	159 7719	0
0	446 882	82 08	705 5351	427 728	66 422	118 8953	0
0	512 827	65 945	108 7205	468 295	40 567	223 5351	0
0	503 651	9 176	2147 589	464 663	3 632	2692 166	0
0	463 244	40 407	228 345	429 826	34 837	427 7075	0
0	433 704	29 54	674 8612	504 949	75 123	384 3525	0
0	456 777	23 073	1052 684	466 246	38 703	282 7472	0
0	568 777	112	3190 208	599 241	132 995	6002 672	0
0	472 873	95 904	1631 022	578 842	20 399	1233 35	0
0	467 178	5 695	2482 34	582 672	3 83	2671 659	0
0	516 985	49 807	32 61655	449 666	133 006	6004 378	0
0	509 331	7 654	2290.971	379 573	70 093	212 428	0
0	490.268	19 063	1328 974	490 231	110.658	3040 41	0
0	509 631	19 363	1307 191	481 894	8 337	2226 055	0
0	447 98	61 651	37 61259	378 055	103.839	2334 91	0
0	485 521	37 541	323 1758	406 795	28 74	717 0661	0
0	528 849	43 328	148 5983	506 721	99.926	1972 062	0
0	408 638	120 211	4185 173	587 399	80 678	633 0211	0
0	498 813	90 175	1201 101	647 749	60 35	23 34738	0
0	477 842	20 971	1193.501	490 235	157 514	10403 17	0
0	512 446	34 604	437 3992	444 221	46 014	90 32772	0
0	453 331	59 115	12 93776	551 024	106 803	2630 142	0
0	474 691	21 36	1166 775	434.383	116 641	3736.01	0
0	484 395	9 704	2098 931	491 431	57 048	2 340625	0
0	467 042	17 353	1456 574	540 556	49 125	40 8716	0
0	617 808	150 766	9072 164	486 499	54 057	2 134783	0
0	455 933	161 875	11311.79	475 362	11 137	1969 681	0
0	559 515	103 582	2310 139	482 521	7 159	2338 602	0
0	563 559	4 044	2649 582	582 854	100 333	2008 376	0
0	559 462	4 097	2644 128	584 365	1 511	2916 766	0
0	521 25	38 212	299.5007	564.877	19 488	1298 167	0
0	503 743	17 507	1444.843	535.66	29.217	691 7473	0
0	531 9	28 157	748 6292	498 034	37 626	320 1269	0
0	417 418	114 484	3476.979	479 042	18.992	1334 155	0
0	523 058	105 642	2512 406	517 079	38 037	305.5885	0
0	465 193	57 865	5 507987	510 906	6 173	2434 938	0
0	456 271	8 922	2171 196	507 336	3 57	2698 604	0
0	515 17	58 899	11 43055	505 802	1 534	2914 282	0
0	606 712	91 542	1297 722	500 855	4 947	2557 435	0
0	434 165	172.547	13695 77	566 541	65 686	103 3864	0
0	509.33	75 165	386.0011	428 297	138 244	6843 576	0
0	462 072	47 258	68 22908	574 927	146 63	8301 38	0
0	562 235	100 163	1993 168	566.22	8 707	2191 278	0
0	503 39	58 845	11 06833	438 796	127 424	5170 46	0
0	508 807	5 417	2510 119	508 605	69 809	204 2301	0
0	432 513	76 294	431 6384	470 034	38 571	287 2039	0
0	496 728	64 215	75 63625	510 555	40 521	224 9127	0
0	551 075	54 347	1 371451	482 774	27 781	769 3462	0
0	447 372	103 703	2321 786	488 228	5 454	2506 413	0
1	549 057	101 685	2131 384	518 997	30 769	612 5174	0
0	556 162	7 105	2343 827	486 115	32 882	512 3926	0
0	526 45	29 712	665.9543	514 332	28 217	745 3495	0
0	512.395	14 055	1719 188	527 311	12 979	1809 574	0
0	487 25	25 145	922 5246	562 549	35 238	411 282	0
0	490 762	3 512	2704.633	547 057	15 492	1602 088	0
0	566 017	75 255	389 5456	485 932	61 125	31 43744	0
0	455 173	110 844	3060 956	422 671	63 261	59 95266	0
0	534 045	78 872	545 4051	453 015	30 344	633 7348	0
0	484 315	49 73	33 50198	447 684	5 331	2518 744	0
0	460 916	23 399	1031 636	423 792	23 892	1000 21	0
0	429 573	31 343	584 435	470 207	46 415	82 86624	0
0	454 753	25 18	920 3997	517 817	47 61	62 53788	0
0	518 666	63 913	70 47452	562 313	44 496	121 4865	0

100	Alpha=100							
10	Beta=10	MR	(MRi-MR)^2		MR	(MRi-MR)^2		
0	1022 24			1069 17	38 77	5504 705		0
0	898 38	123 86	118 7294	964 5	104 67	68 7854	0	0
0	906 29	7 91	11036 28	1170 71	206 21	8694 873	0	0
0	914 49	8 2	10975 43	985 62	185 09	5202 204	0	0
0	1094 17	179 68	4451 065	1016 34	30 72	6764 026	0	0
0	1096 32	2 15	12279 68	975 11	41 23	5145 723	0	0
0	1075 69	20 63	8525 511	995 02	19 91	8658 99	0	0
0	1095 59	19 9	8660 852	762 31	232 71	14339 18	0	0
0	971 05	124 54	134 0108	896 97	134 66	470 7296	0	0
0	934 96	36 09	5909 565	1047 98	151 01	1447 521	0	0
0	922 74	12 22	10149 29	1225 58	177 6	4177 852	0	0
0	923 67	0 93	12551 55	993 81	231 97	14162.5	0	0
0	942 05	18 38	8946 076	1059 68	66 07	2199 019	0	0
0	878 19	63.86	2411 173	1085 73	26 05	7553 991	0	0
0	1082 52	204 33	8347 801	934 5	151 23	1464 31	0	0
0	926 75	155 77	1832 38	938 5	4	11873 09	0	0
0	1117 9	191 15	6113 098	1032 15	93 65	373 0189	0	0
0	823 74	294 16	32832 1	963 64	68 51	1976 131	0	0
0	949 42	125 68	161 7044	833 34	130.3	300 5474	0	0
0	982 93	33 51	6312 89	1145 98	312 64	39870 63	0	0
0	1048 76	65 83	2221 585	1144 34	1 64	12392 97	0	0
0	1171 73	122 97	100 1261	912 2	232 14	14202 99	0	0
0	970 39	201 34	7810 371	1109 64	197 44	7136 246	0	0
0	1122 82	152 23	1541 843	921 53	188 11	5646 967	0	0
0	1015 37	107 25	32 64633	1078 26	156 73	1915 489	0	0
0	1046 59	31 22	6682 032	1097 71	19 45	8744 811	0	0
0	1050 22	3 63	11953 86	871 48	226 23	12829 26	0	0
0	987 26	62 96	2500 37	914 54	43 06	4886 527	0	0
0	957 11	30 15	6858 108	936.7	22 16	8245 311	0	0
0	1095 33	138 22	637 8809	1068 59	131 89	358 205	0	0
0	1093 68	1 65	12390 74	989 41	79 18	1141 338	0	0
0	1024 67	69 01	1931 927	1054 13	64 72	2327 454	0	0
0	941 2	83 47	869 9781	1015 47	38 66	5521 039	0	0
0	1035 78	94 58	337 9603	893 92	121 55	73 72461	0	0
0	813 51	222 27	11947 87	973 67	79 75	1103 15	0	0
0	787 63	25 88	7583 57	1061 32	87 65	640 7632	0	0
0	1168 67	381 04	71864 9	920 14	141 18	796 1598	1	0
0	1044 61	124 06	123 128	1014 24	94 1	355 839	0	0
0	1166 51	121 9	79 85752	934 45	79 79	1100 494	0	0
0	958 38	208 13	9056 625	979 7	45 25	4585 145	0	0
0	929 52	28 86	7073 432	955 63	24 07	7902 089	0	0
0	795 06	134 46	462 0911	1034 13	78.5	1187 746	0	0
0	1109 04	313 98	40407 55	930 36	103 77	84.52405	0	0
0	800 47	308 57	38261 83	1131 1	200 74	7704 679	0	0
0	999 96	199 49	7486 801	1219 27	88 17	614 7274	0	0
0	938 02	61 94	2603 418	1011 03	208 24	9077 574	0	0
0	1060 14	122 12	83 8379	1079 09	68 06	2016.342	0	0
0	993 21	66 93	2119 101	1106.9	27 81	7251 152	0	0
0	1118 47	125 26	151 1991	1071 21	35 69	5971 224	0	0
0	958 77	159 7	2184 282	913 35	157 86	2015 678	0	0
0	994 86	36 09	5909 565	1026 55	113 2	0 055839	0	0
0	1028 98	34 12	6216 328	1042 91	16 36	9332 274	0	0
0	968 53	60 45	2757 688	1090 21	47 3	4311 721	0	0
0	1033 13	64 6	2339 047	945 89	144 32	983 2178	0	0
0	944 45	88 68	589 6979	1048 6	102 71	105 1383	0	0
0	1037 58	93 13	393 3755	986 79	61 81	2616 701	0	0
0	960 26	77 32	1270 473	880 49	106 3	44 40485	0	0
0	1207 41	247 15	18005 96	1022 46	141 97	841 3657	0	0
0	1133 62	73 79	1534 578	976 64	45 82	4508 276	0	0
0	1026 67	106 95	36 16454	1160 07	183 43	4965 5	0	0
0	827 52	199 15	7428 079	1070 85	89 22	563 7631	0	0
0	1090 24	262 72	22426 95	896 37	174 48	3784 256	0	0
0	1029 82	60 42	2760 84	945 45	49 08	4081 127	0	0
0	1067 27	37 45	5702 318	1022 26	76 81	1307 09	0	0
0	921 93	145 34	1048 225	954 65	67 61	2056 958	0	0
0	1102 36	180 43	4551 702	1002 17	47 52	4282 877	0	0
0	1000.3	102 06	118 8906	1085 08	82 91	903.2247	0	0
0	703 45	296 85	33814 17	972 93	112 15	0 662102	0	0
0	961 05	257 6	20919 66	897 3	75 63	1393 805	0	0
0	861 01	80 04	1083 97	1032 61	135 31	499 3573	0	0
0	896 42	15 41	9516 724	937 46	95 15	317 3278	0	0
0	981 15	84 73	797 1416	1056 84	119 38	41 16895	0	0
0	1382 98	401 83	83443 74	987 17	69 67	1874 344	1	0
0	895 59	487 39	140195 1	976 41	10 76	10445 6	1	0

50 8	0 6376	25 0832
39 8012	10 9988	28 65339
51 1327	11 3315	32 32589
46 5228	4 6099	1 073324
63 4832	16 9604	128 0176
49 0508	14 4324	77 20235
61 2407	12 1899	42 82376
52 3248	8 9159	10 69281
54 1882	1 8634	14 30741
57 4604	3 2722	5 634515
50 2376	7 2228	2 486571
39 7905	10 4471	23 05139
42 5873	2 7968	8 117447
48 5994	6 0121	0 134093
40 8235	7 7759	4 536843
43 4051	2 5816	9 390017
40 8649	2 5402	9 645456
45 7194	4 8545	0 626335
48 7091	2 9897	7 05547
51 6244	2 9153	7 45625
48 6022	3 0222	6 883872
57 8276	9 2254	12 81272
56 0327	1 7949	14 8303
52 021	4 0117	2 670854
52 6619	0 6409	25.05016
48 3452	4 3167	1 766808
41 3711	6 9741	1 76408
55 0652	13 6941	64 77331
42 3529	12 7123	49 93382
50 8694	8 5165	8 240267
46 9979	3 8715	3 148543
48 7157	1 7178	15 43008
43 7879	4 9278	0 515687
46 8038	3 0159	6 916971
48 936	2 1322	12 34618
54 7885	5 8525	0 042678
65 5382	10 7497	26 04864
48 5561	16 9821	128 5091
42 6657	5 6904	0 059774
51 8809	9 2152	12 73981
43 4357	8 4452	7 836005
44 4385	1 0028	21 5585
50 0488	5 6103	0.001268
47 5075	2 5413	9 638625
51 421	3 9135	3 001256
49 6073	1 8137	14.68586
50 8998	1 2925	18 95221
45 2947	5 6051	0 001666
52 373	7 0783	2 051731
45 5679	6 8051	1 343714
53 747	8 1791	6 417034
47 2843	6 4627	0.66714
52 5739	5 2896	0 126959
44 23	8.3439	7 279132
47 509	3.279	5 602279
50 3036	2 7946	8 129988

Sum MR > UCLmr		
Sum X	399933 1	99910 3
X Average	49 98434	
MR Average	5 645913	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3 268	
Upper contro limit for X (UCLx	65 00006	
Lower control limit for X (LCLx	34 96861	
Upper control limit MR (UCLmr	18 45085	
MR Standard deviation	4 289753	
Process standard deviation	5	
Gamma d2	1 129183	
Gamma d3	0 857951	
Gamma D4	3 279394	
100 Alpha=100		
0 5 Beta=0 5		
Proportion MR > UCLmr	0 010701	
Percentage	1 070107	
ARL for MR	93 4486	

0	97 099	5 514	32 77471
0	88 061	9 038	4 844051
0	103 579	15 518	18 31052
0	98 946	4 633	43 63819
0	105 138	6 192	25 47141
0	84 24	20 898	93 29782
0	95 836	11 596	0 127506
0	120 193	24 357	172 084
0	99 735	20 458	84 99143
0	98 648	1 087	103 0615
0	101 178	2 53	75 8453
0	106 319	5 141	37 18463
0	101 625	4 694	42 83598
0	84 563	17 062	33.90825
0	109 673	25 11	192 4068
0	106 14	3 533	59 38121
0	104 724	1 416	96 48977
0	91 446	13 278	4 157845
0	100 423	8 977	5 116284
0	95 785	4 638	43 57215
0	95 7	0 085	124 4099
0	93 365	2 335	79 2798
0	112 542	19 177	63 01311
0	96 944	15 598	19 00157
0	101 268	4 324	47 81613
0	101 501	0.233	121.1303
0	95 488	6 013	27 31024
0	99 3	3 812	55 15915
0	94 512	4 788	41 61438
0	98 22	3.708	56 71476
0	92 583	5.637	31.38151
0	94 701	2 118	83 19119
0	95 09	0.389	117.7208
0	88 769	6 321	24 18594
0	107 275	18 506	52 81044
0	114 382	7 107	17.07277
0	114 425	0 043	125.3486
0	95 804	18 621	54 4951
0	103 444	7 64	12 95223
0	107 053	3 609	58 21569
0	101 477	5 576	32 06867
0	98 72	2 757	71.94298
0	90 287	8 433	7 87319
0	95 109	4 822	41.17687
0	126 567	31 458	408.8112
0	96 552	30 015	352.5412
0	113.346	16 794	30.85891
0	119.68	6 334	24.05825
0	88 364	31 316	403.0891
0	104 842	16 478	27 44795
0	86 909	17 933	44.8107
0	100.872	13 963	7 420609
0	114 327	13 455	4.911008
0	80 498	33.829	510.3117
0	119 183	38 685	753 2873
0	104 589	14 594	11 25656
85	22		

Sum X	800969 6	200262.9
X Average	100 1233	
MR Average	11 23892	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3.268	
Upper contro limit for X (UCLx	130.014	
Lower control limit for X (LCLx	70 23251	
Upper control limit MR (UCLmr	36 72879	
MR Standard deviation	8 491407	
Process standard deviation	10	
Gamma d2	1 123892	
Gamma d3	0 849141	
Gamma D4	3 266607	
100 Alpha=100		
1 Beta=1		
Proportion MR > UCLmr	0 008701	
Percentage	0 870087	
ARL for MR	114 931	

0	456 2	3 573	2698 292
0	467 923	11 723	1918 01
0	480 057	12 134	1882 179
0	494 365	14 308	1698 272
0	447 83	46 535	80 6959
0	593 979	146 149	8213 962
0	391 083	202 896	21720 25
0	415 123	24.04	990 8701
0	553 509	138 386	6867 091
0	420 2	133 309	6051 426
0	535 255	115 055	3544 844
0	578 793	43 538	143 5226
0	410 57	168 223	12702 4
0	493 422	82 852	747 1426
0	484 925	8 497	2210 983
0	565 427	80 502	624 1958
0	501 774	63 653	66 17676
0	489 618	12 156	1880 271
0	447 107	42 511	169 1844
0	545 388	98 281	1828 666
0	491 489	53 899	2.621452
0	436 122	55 367	0 022828
0	514 237	78 115	510.6204
0	465 108	49 131	40 79492
0	509 586	44 48	121 8394
0	566 107	56 521	1 005829
0	552 812	13 295	1782.789
0	499 077	53 735	3 179409
0	457 321	41 756	169 3951
0	515 273	57 952	5.923919
0	469 177	46 098	88 77578
0	492 681	23 504	1024.902
0	491 281	1 4	2928 768
0	516 732	25 451	904 0299
0	469 713	47 019	72 23453
0	465 712	4 001	2654 011
0	462 067	3.645	2690 817
0	574 447	112.38	3233 277
0	513 311	61 136	31 56091
0	468 082	45 229	105 8654
0	539 615	71 533	256 4773
0	472 917	66 698	124 9904
0	447 41	25 507	900 6655
0	498 058	50 648	23.71777
0	587 526	89 468	1152 596
0	529.275	68 251	7 468798
0	546 927	17 652	1433 841
0	530 515	16 412	1529 286
0	579 008	48 493	49 35189
0	431 373	147 635	8485 525
0	462.59	31 217	590 543
0	471 261	8 671	2194 65
0	548 399	77 138	467 4205
0	525 894	22 505	1089 864
1	398 848	127 046	5116 242
0	496 288	97 44	1757 447
70	17		

Sum X	3998864	1000351
X Average	499 9215	
MR Average	55 51809	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3 268	
Upper contr⁻ limit for X (UCLx	647 576	
Lower control limit for X (LCLx	352 267	
Upper control limit MR (UCLmr	181 4331	
MR Standard deviation	42 17469	
Process standard deviation	50	
Gamma d2	1 110362	
Gamma d3	0.843494	
Gamma D4	3 27897	
100 Alpha=100		
5 Beta=5		
Proportion MR > UCLmr	0 009901	
Percentage	0 990099	
ARL for MR	101	

0	846 04	415 79	91703 77
0	1020 7	174 66	3806 434
0	966 67	54 03	3473 181
0	947 98	18 69	8887 53
0	1119 86	171 88	3471 131
0	1104 06	15 8	9440 784
1	894 47	209 59	9336 643
0	826 41	68 06	2016 342
0	789 49	36 92	5782.644
0	1051 03	261 54	22074.92
0	963 51	87 52	647 3817
0	972 57	9 06	10795 98
0	928 13	44 44	4695 497
0	840 38	87 75	635 7305
0	1077 72	237 34	15469 46
0	1016 32	61 4	2658 815
0	955 82	60 5	2752 439
0	1006 71	50 89	3853 144
0	850 4	156 31	1878 902
0	944 53	94 13	354 7081
0	1146.8	202 27	7975 616
0	921 75	225 05	12563.34
0	1076 88	155 13	1777 997
0	870 86	206 02	8659 476
0	1195 16	324.3	44663.03
0	1022 13	173 03	3807 961
0	1022.7	0 57	12832 34
0	876 69	146 01	1092 058
0	929.9	53.21	3570 504
0	989 21	59 31	2878 719
0	932 79	56 42	3197 19
0	1205 99	273.2	25675 67
0	931	274 99	26252 52
0	1046 31	115 31	5 505141
0	1177 55	131 24	334 0233
0	1013 1	164 45	2650 839
0	1167 59	154 49	1724 434
0	897 32	270 27	24745 27
0	1048 84	151 52	1486 589
0	1016 61	32 23	6517 93
0	1239 56	222 95	12096 99
0	1214 58	24 98	7741 131
0	1069 28	145.3	1045 637
0	888 47	180 81	4603 121
0	946 75	58 28	2990 307
0	1037 89	91 14	476.2737
0	794 47	243 42	17018 85
0	1151 38	356 91	59509 8
0	1007 4	143 98	962 0111
0	901 08	106 32	44 1387
0	1136 13	235 05	14905 07
0	983 18	152 95	1598 904
0	943 53	39 65	5374 898
0	957 7	14 17	9760 194
0	904 04	53 66	3518 928
0	1030 4	126 36	179 461
81	18		

Sum X	8005017	2008212
X Average	1001 323	
MR Average	112 9637	
Normal constant d2 (n=2)	1 128	
Normal constant D4 (n=2)	3 268	
Upper contro limit for X (UCLx	1301 758	
Lower control limit for X (LCLx	700 8875	
Upper control limit MR (UCLmr	369 1654	
MR Standard deviation	85 69263	
Process standard deviation	100	
Gamma d2	1 129637	
Gamma d3	0 856926	
Gamma D4	3 275757	
100 Alpha=100		
10 Beta=10		
Proportion MR > UCLmr	0 009601	
Percentage	0 960096	
ARL for MR	104 1562	

APPENDIX E

PROBABILITIES OF DETECTION AND AVERAGE RUN LENGTH (ARL) SPREADSHEETS

Objective #1 ARL curves

Alpha 0.5
Beta 0.5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	0.353553	0	1.085119	-0.58988	1.085119	-0.58988	0.037216	26.87016
0.2	0.353553	0.070711	1.085119	-0.58988	1.014408	-0.66059	0.043972	22.74174
0.4	0.353553	0.141421	1.085119	-0.58988	0.943698	-0.7313	0.05203	19.21968
0.6	0.353553	0.212132	1.085119	-0.58988	0.872987	-0.80201	0.061668	16.21587
0.8	0.353553	0.282843	1.085119	-0.58988	0.802276	-0.87272	0.07323	13.65561
1	0.353553	0.353553	1.085119	-0.58988	0.731566	-0.94343	0.087149	11.4746
1.2	0.353553	0.424264	1.085119	-0.58988	0.660855	-1.01414	0.10398	9.617234
1.4	0.353553	0.494975	1.085119	-0.58988	0.590144	-1.08485	0.124436	8.03626
1.6	0.353553	0.565685	1.085119	-0.58988	0.519434	-1.15557	0.149462	6.690664
1.8	0.353553	0.636396	1.085119	-0.58988	0.448723	-1.22628	0.180331	5.545358
2	0.353553	0.707107	1.085119	-0.58988	0.378012	-1.29699	0.218827	4.56982
2.2	0.353553	0.777817	1.085119	-0.58988	0.307302	-1.3677	0.267562	3.737452
2.4	0.353553	0.848528	1.085119	-0.58988	0.236591	-1.43841	0.330647	3.024373
2.6	0.353553	0.919239	1.085119	-0.58988	0.16588	-1.50912	0.41532	2.407782
2.8	0.353553	0.989949	1.085119	-0.58988	0.09517	-1.57983	0.537241	1.861362
3	0.353553	1.06066	1.085119	-0.58988	0.024459	-1.65054	0.754443	1.325481

Alpha 0.5
Beta 1

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	0.707107	0	2.199737	-1.19075	2.199737	-1.19075	0.03595	27.81641
0.2	0.707107	0.141421	2.199737	-1.19075	2.058316	-1.33217	0.042464	23.54936
0.4	0.707107	0.282843	2.199737	-1.19075	1.916894	-1.47359	0.050229	19.90882
0.6	0.707107	0.424264	2.199737	-1.19075	1.775473	-1.61501	0.059512	16.80333
0.8	0.707107	0.565685	2.199737	-1.19075	1.634052	-1.75644	0.070639	14.15649
1	0.707107	0.707107	2.199737	-1.19075	1.49263	-1.89786	0.084026	11.90108
1.2	0.707107	0.848528	2.199737	-1.19075	1.351209	-2.03928	0.100196	9.980438
1.4	0.707107	0.989949	2.199737	-1.19075	1.209788	-2.1807	0.119827	8.345365
1.6	0.707107	1.131371	2.199737	-1.19075	1.068366	-2.32212	0.143808	6.953716
1.8	0.707107	1.272792	2.199737	-1.19075	0.926945	-2.46354	0.173332	5.769275
2	0.707107	1.414214	2.199737	-1.19075	0.785523	-2.60496	0.210055	4.760658
2.2	0.707107	1.555635	2.199737	-1.19075	0.644102	-2.74638	0.256379	3.900475
2.4	0.707107	1.697056	2.199737	-1.19075	0.502681	-2.88781	0.316017	3.164387
2.6	0.707107	1.838478	2.199737	-1.19075	0.361259	-3.02923	0.395319	2.529603
2.8	0.707107	1.979899	2.199737	-1.19075	0.219838	-3.17065	0.507279	1.971302
3	0.707107	2.12132	2.199737	-1.19075	0.078417	-3.31207	0.692089	1.444901

Alpha 0.5
Beta 5

Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0		3.535534	0	10.67373	-5.76877	10.67373	-5.76877	0.038803	25.7712
0.2		3.535534	0.707107	10.67373	-5.76877	9.966623	-6.47588	0.045862	21.80454
0.4		3.535534	1.414214	10.67373	-5.76877	9.259516	-7.18298	0.054289	18.41994
0.6		3.535534	2.12132	10.67373	-5.76877	8.55241	-7.89009	0.064373	15.53446
0.8		3.535534	2.828427	10.67373	-5.76877	7.845303	-8.5972	0.076482	13.07497
1		3.535534	3.535534	10.67373	-5.76877	7.138196	-9.3043	0.091074	10.98008
1.2		3.535534	4.242641	10.67373	-5.76877	6.431089	-10.0114	0.10874	9.196248
1.4		3.535534	4.949747	10.67373	-5.76877	5.723983	-10.7185	0.130244	7.677897
1.6		3.535534	5.656854	10.67373	-5.76877	5.016876	-11.4256	0.1566	6.385696
1.8		3.535534	6.363961	10.67373	-5.76877	4.309769	-12.1327	0.189191	5.285664
2		3.535534	7.071068	10.67373	-5.76877	3.602662	-12.8398	0.229967	4.34845
2.2		3.535534	7.778175	10.67373	-5.76877	2.895555	-13.5469	0.281835	3.548175
2.4		3.535534	8.485281	10.67373	-5.76877	2.188449	-14.2541	0.34947	2.861476
2.6		3.535534	9.192388	10.67373	-5.76877	1.481342	-14.9612	0.44144	2.265314
2.8		3.535534	9.899495	10.67373	-5.76877	0.774235	-15.6683	0.577868	1.730499
3		3.535534	10.6066	10.67373	-5.76877	0.067128	-16.3754	0.869838	1.149639

Alpha 0.5
Beta 10

Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0		7.071068	0	21.76866	-11.8308	21.76866	-11.8308	0.036928	27.07972
0.2		7.071068	1.414214	21.76866	-11.8308	20.35445	-13.245	0.043628	22.92106
0.4		7.071068	2.828427	21.76866	-11.8308	18.94023	-14.6592	0.05162	19.37234
0.6		7.071068	4.242641	21.76866	-11.8308	17.52602	-16.0734	0.061176	16.34628
0.8		7.071068	5.656854	21.76866	-11.8308	16.11181	-17.4877	0.072639	13.76671
1		7.071068	7.071068	21.76866	-11.8308	14.69759	-18.9019	0.086437	11.56912
1.2		7.071068	8.485281	21.76866	-11.8308	13.28338	-20.3161	0.103116	9.697816
1.4		7.071068	9.899495	21.76866	-11.8308	11.86917	-21.7303	0.123384	8.104779
1.6		7.071068	11.31371	21.76866	-11.8308	10.45495	-23.1445	0.14817	6.749005
1.8		7.071068	12.72792	21.76866	-11.8308	9.040738	-24.5587	0.178731	5.595
2		7.071068	14.14214	21.76866	-11.8308	7.626524	-25.9729	0.216818	4.612163
2.2		7.071068	15.55635	21.76866	-11.8308	6.212311	-27.3871	0.264997	3.773628
2.4		7.071068	16.97056	21.76866	-11.8308	4.798097	-28.8014	0.327283	3.05546
2.6		7.071068	18.38478	21.76866	-11.8308	3.383884	-30.2156	0.410699	2.434873
2.8		7.071068	19.79899	21.76866	-11.8308	1.96967	-31.6298	0.530239	1.885942
3		7.071068	21.2132	21.76866	-11.8308	0.555457	-33.044	0.738905	1.353354

Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
Alpha	1								
Beta	0.5								
0		0.5	0	1.827984	-0.83481	1.827984	-0.83481	0.025836	38.70568
0.2		0.5	0.1	1.827984	-0.83481	1.727984	-0.93481	0.031557	31.68869
0.4		0.5	0.2	1.827984	-0.83481	1.627984	-1.03481	0.038544	25.94438
0.6		0.5	0.3	1.827984	-0.83481	1.527984	-1.13481	0.047077	21.2418
0.8		0.5	0.4	1.827984	-0.83481	1.427984	-1.23481	0.0575	17.3913
1		0.5	0.5	1.827984	-0.83481	1.327984	-1.33481	0.070231	14.23873
1.2		0.5	0.6	1.827984	-0.83481	1.227984	-1.43481	0.08578	11.65773
1.4		0.5	0.7	1.827984	-0.83481	1.127984	-1.53481	0.104772	9.544535
1.6		0.5	0.8	1.827984	-0.83481	1.027984	-1.63481	0.127969	7.814393
1.8		0.5	0.9	1.827984	-0.83481	0.927984	-1.73481	0.156302	6.397871
2		0.5	1	1.827984	-0.83481	0.827984	-1.83481	0.190907	5.238153
2.2		0.5	1.1	1.827984	-0.83481	0.727984	-1.93481	0.233175	4.288624
2.4		0.5	1.2	1.827984	-0.83481	0.627984	-2.03481	0.2848	3.511236
2.6		0.5	1.3	1.827984	-0.83481	0.527984	-2.13481	0.347856	2.874753
2.8		0.5	1.4	1.827984	-0.83481	0.427984	-2.23481	0.424872	2.35365
3		0.5	1.5	1.827984	-0.83481	0.327984	-2.33481	0.518939	1.927009

Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
Alpha	1								
Beta	1								
0		1	0	3.673837	-1.63234	3.673837	-1.63234	0.025379	39.40266
0.2		1	0.2	3.673837	-1.63234	3.473837	-1.83234	0.030998	32.26015
0.4		1	0.4	3.673837	-1.63234	3.273837	-2.03234	0.037861	26.4124
0.6		1	0.6	3.673837	-1.63234	3.073837	-2.23234	0.046243	21.62489
0.8		1	0.8	3.673837	-1.63234	2.873837	-2.43234	0.056482	17.70476
1		1	1	3.673837	-1.63234	2.673837	-2.63234	0.068987	14.49548
1.2		1	1.2	3.673837	-1.63234	2.473837	-2.83234	0.084261	11.86789
1.4		1	1.4	3.673837	-1.63234	2.273837	-3.03234	0.102917	9.716568
1.6		1	1.6	3.673837	-1.63234	2.073837	-3.23234	0.125703	7.95526
1.8		1	1.8	3.673837	-1.63234	1.873837	-3.43234	0.153533	6.513258
2		1	2	3.673837	-1.63234	1.673837	-3.63234	0.187526	5.332594
2.2		1	2.2	3.673837	-1.63234	1.473837	-3.83234	0.229045	4.365954
2.4		1	2.4	3.673837	-1.63234	1.273837	-4.03234	0.279756	3.574544
2.6		1	2.6	3.673837	-1.63234	1.073837	-4.23234	0.341695	2.926587
2.8		1	2.8	3.673837	-1.63234	0.873837	-4.43234	0.417347	2.396088
3		1	3	3.673837	-1.63234	0.673837	-4.63234	0.509749	1.96175

Alpha 1
Beta 5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	5	0	18.10885	-8.19452	18.10885	-8.19452	0.026735	37.40415
0.2	5	1	18.10885	-8.19452	17.10885	-9.19452	0.032654	30.62412
0.4	5	2	18.10885	-8.19452	16.10885	-10.1945	0.039884	25.07271
0.6	5	3	18.10885	-8.19452	15.10885	-11.1945	0.048715	20.52756
0.8	5	4	18.10885	-8.19452	14.10885	-12.1945	0.0595	16.80672
1	5	5	18.10885	-8.19452	13.10885	-13.1945	0.072674	13.76008
1.2	5	6	18.10885	-8.19452	12.10885	-14.1945	0.088764	11.26583
1.4	5	7	18.10885	-8.19452	11.10885	-15.1945	0.108417	9.223646
1.6	5	8	18.10885	-8.19452	10.10885	-16.1945	0.132421	7.551672
1.8	5	9	18.10885	-8.19452	9.10885	-17.1945	0.161739	6.182801
2	5	10	18.10885	-8.19452	8.10885	-18.1945	0.197549	5.062035
2.2	5	11	18.10885	-8.19452	7.10885	-19.1945	0.241286	4.144459
2.4	5	12	18.10885	-8.19452	6.10885	-20.1945	0.294708	3.393189
2.6	5	13	18.10885	-8.19452	5.10885	-21.1945	0.359957	2.77811
2.8	5	14	18.10885	-8.19452	4.10885	-22.1945	0.439653	2.274521
3	5	15	18.10885	-8.19452	3.10885	-23.1945	0.536993	1.862222

Alpha 1
Beta 10

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	10	0	36.8536	-16.9254	36.8536	-16.9254	0.025088	39.85969
0.2	10	2	36.8536	-16.9254	34.8536	-18.9254	0.030643	32.63388
0.4	10	4	36.8536	-16.9254	32.8536	-20.9254	0.037427	26.71868
0.6	10	6	36.8536	-16.9254	30.8536	-22.9254	0.045714	21.87514
0.8	10	8	36.8536	-16.9254	28.8536	-24.9254	0.055835	17.90991
1	10	10	36.8536	-16.9254	26.8536	-26.9254	0.068197	14.6634
1.2	10	12	36.8536	-16.9254	24.8536	-28.9254	0.083296	12.00538
1.4	10	14	36.8536	-16.9254	22.8536	-30.9254	0.101737	9.829266
1.6	10	16	36.8536	-16.9254	20.8536	-32.9254	0.124262	8.047513
1.8	10	18	36.8536	-16.9254	18.8536	-34.9254	0.151774	6.588744
2	10	20	36.8536	-16.9254	16.8536	-36.9254	0.185378	5.394383
2.2	10	22	36.8536	-16.9254	14.8536	-38.9254	0.226421	4.416551
2.4	10	24	36.8536	-16.9254	12.8536	-40.9254	0.276551	3.61597
2.6	10	26	36.8536	-16.9254	10.8536	-42.9254	0.33778	2.960507
2.8	10	28	36.8536	-16.9254	8.8536	-44.9254	0.412566	2.423855
3	10	30	36.8536	-16.9254	6.8536	-46.9254	0.503909	1.984485

Alpha	1.5								
Beta	0.5								
Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0		0.612372	0	2.420511	-0.93029	2.420511	-0.93029	0.021472	46.57228
0.2		0.612372	0.122474	2.420511	-0.93029	2.298037	-1.05276	0.026842	37.25505
0.4		0.612372	0.244949	2.420511	-0.93029	2.175562	-1.17524	0.033523	29.83027
0.6		0.612372	0.367423	2.420511	-0.93029	2.053088	-1.29771	0.041821	23.91143
0.8		0.612372	0.489898	2.420511	-0.93029	1.930613	-1.42019	0.05211	19.19017
1		0.612372	0.612372	2.420511	-0.93029	1.808139	-1.54266	0.064843	15.42187
1.2		0.612372	0.734847	2.420511	-0.93029	1.685664	-1.66514	0.080569	12.41172
1.4		0.612372	0.857321	2.420511	-0.93029	1.56319	-1.78761	0.09994	10.006
1.6		0.612372	0.979796	2.420511	-0.93029	1.440715	-1.91009	0.123735	8.081788
1.8		0.612372	1.10227	2.420511	-0.93029	1.318241	-2.03256	0.152866	6.541677
2		0.612372	1.224745	2.420511	-0.93029	1.195766	-2.15503	0.188389	5.308166
2.2		0.612372	1.347219	2.420511	-0.93029	1.073292	-2.27751	0.231498	4.319692
2.4		0.612372	1.469694	2.420511	-0.93029	0.950817	-2.39998	0.283506	3.527262
2.6		0.612372	1.592168	2.420511	-0.93029	0.828343	-2.52246	0.345786	2.891962
2.8		0.612372	1.714643	2.420511	-0.93029	0.705868	-2.64493	0.41965	2.382938
3		0.612372	1.837117	2.420511	-0.93029	0.583394	-2.76741	0.506119	1.97582

Alpha	1.5								
Beta	1								
Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0		1.224745	0	4.826731	-1.84273	4.826731	-1.84273	0.021754	45.96856
0.2		1.224745	0.244949	4.826731	-1.84273	4.581782	-2.08768	0.027193	36.77417
0.4		1.224745	0.489898	4.826731	-1.84273	4.336833	-2.33263	0.03396	29.44641
0.6		1.224745	0.734847	4.826731	-1.84273	4.091884	-2.57758	0.042363	23.6055
0.8		1.224745	0.979796	4.826731	-1.84273	3.846935	-2.82253	0.052781	18.94621
1		1.224745	1.224745	4.826731	-1.84273	3.601986	-3.06747	0.065673	15.22696
1.2		1.224745	1.469694	4.826731	-1.84273	3.357037	-3.31242	0.081592	12.2561
1.4		1.224745	1.714643	4.826731	-1.84273	3.112088	-3.55737	0.101199	9.881521
1.6		1.224745	1.959592	4.826731	-1.84273	2.867139	-3.80232	0.125279	7.982184
1.8		1.224745	2.204541	4.826731	-1.84273	2.62219	-4.04727	0.154752	6.461952
2		1.224745	2.44949	4.826731	-1.84273	2.377241	-4.29222	0.190684	5.244278
2.2		1.224745	2.694439	4.826731	-1.84273	2.132292	-4.53717	0.234275	4.268488
2.4		1.224745	2.939388	4.826731	-1.84273	1.887343	-4.78212	0.286844	3.486216
2.6		1.224745	3.184337	4.826731	-1.84273	1.642394	-5.02707	0.349765	2.859063
2.8		1.224745	3.429286	4.826731	-1.84273	1.397445	-5.27202	0.424342	2.35659
3		1.224745	3.674235	4.826731	-1.84273	1.152496	-5.51696	0.511565	1.954786

Alpha	1.5								
Beta	5								
Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0		6.123724	0	24.47972	-9.37413	24.47972	-9.37413	0.020421	48.9692
0.2		6.123724	1.224745	24.47972	-9.37413	23.25498	-10.5989	0.025534	39.16347
0.4		6.123724	2.44949	24.47972	-9.37413	22.03023	-11.8236	0.031896	31.35189
0.6		6.123724	3.674235	24.47972	-9.37413	20.80549	-13.0484	0.039802	25.12437
0.8		6.123724	4.898979	24.47972	-9.37413	19.58074	-14.2731	0.049608	20.15804
1		6.123724	6.123724	24.47972	-9.37413	18.356	-15.4979	0.061749	16.19459
1.2		6.123724	7.348469	24.47972	-9.37413	17.13125	-16.7226	0.076751	13.02915
1.4		6.123724	8.573214	24.47972	-9.37413	15.90651	-17.9473	0.095241	10.49968
1.6		6.123724	9.797959	24.47972	-9.37413	14.68176	-19.1721	0.11797	8.476731
1.8		6.123724	11.0227	24.47972	-9.37413	13.45702	-20.3968	0.145818	6.857864
2		6.123724	12.24745	24.47972	-9.37413	12.23227	-21.6216	0.179809	5.561457
2.2		6.123724	13.47219	24.47972	-9.37413	11.00753	-22.8463	0.221106	4.522718
2.4		6.123724	14.69694	24.47972	-9.37413	9.782782	-24.0711	0.271001	3.690023
2.6		6.123724	15.92168	24.47972	-9.37413	8.558037	-25.2958	0.330858	3.022445
2.8		6.123724	17.14643	24.47972	-9.37413	7.333292	-26.5206	0.402021	2.487432
3		6.123724	18.37117	24.47972	-9.37413	6.108547	-27.7453	0.485603	2.059295

Alpha	1.5								
Beta	10								
Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0		12.24745	0	48.82124	-18.7641	48.82124	-18.7641	0.02068	48.3559
0.2		12.24745	2.44949	48.82124	-18.7641	46.37175	-21.2136	0.025857	38.67425
0.4		12.24745	4.898979	48.82124	-18.7641	43.92226	-23.6631	0.032298	30.96167
0.6		12.24745	7.348469	48.82124	-18.7641	41.47277	-26.1126	0.040301	24.81328
0.8		12.24745	9.797959	48.82124	-18.7641	39.02328	-28.5621	0.050226	19.91001
1		12.24745	12.24745	48.82124	-18.7641	36.57379	-31.0115	0.062514	15.99642
1.2		12.24745	14.69694	48.82124	-18.7641	34.1243	-33.461	0.077695	12.87084
1.4		12.24745	17.14643	48.82124	-18.7641	31.67481	-35.9105	0.096403	10.37312
1.6		12.24745	19.59592	48.82124	-18.7641	29.22532	-38.36	0.119396	8.37549
1.8		12.24745	22.04541	48.82124	-18.7641	26.77583	-40.8095	0.147563	6.776767
2		12.24745	24.4949	48.82124	-18.7641	24.32634	-43.259	0.181933	5.496529
2.2		12.24745	26.94439	48.82124	-18.7641	21.87685	-45.7085	0.22368	4.470672
2.4		12.24745	29.39388	48.82124	-18.7641	19.42736	-48.158	0.2741	3.648304
2.6		12.24745	31.84337	48.82124	-18.7641	16.97787	-50.6075	0.33456	2.989
2.8		12.24745	34.29286	48.82124	-18.7641	14.52838	-53.057	0.406398	2.460642
3		12.24745	36.74235	48.82124	-18.7641	12.07889	-55.5064	0.490704	2.037888

Alpha 2
Beta 0.5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	0.707107	0	2.952427	-0.9582	2.952427	-0.9582	0.018824	53.12367
0.2	0.707107	0.141421	2.952427	-0.9582	2.811006	-1.09962	0.023954	41.74668
0.4	0.707107	0.282843	2.952427	-0.9582	2.669584	-1.24104	0.030427	32.86555
0.6	0.707107	0.424264	2.952427	-0.9582	2.528163	-1.38246	0.038572	25.92554
0.8	0.707107	0.565685	2.952427	-0.9582	2.386742	-1.52389	0.048791	20.49558
1	0.707107	0.707107	2.952427	-0.9582	2.24532	-1.66531	0.061569	16.24194
1.2	0.707107	0.848528	2.952427	-0.9582	2.103899	-1.80673	0.077487	12.90539
1.4	0.707107	0.989949	2.952427	-0.9582	1.962478	-1.94815	0.097233	10.28457
1.6	0.707107	1.131371	2.952427	-0.9582	1.821056	-2.08957	0.121609	8.223076
1.8	0.707107	1.272792	2.952427	-0.9582	1.679635	-2.23099	0.151531	6.59931
2	0.707107	1.414214	2.952427	-0.9582	1.538213	-2.37241	0.18802	5.318583
2.2	0.707107	1.555635	2.952427	-0.9582	1.396792	-2.51383	0.232173	4.307133
2.4	0.707107	1.697056	2.952427	-0.9582	1.255371	-2.65526	0.2851	3.507541
2.6	0.707107	1.838478	2.952427	-0.9582	1.113949	-2.79668	0.347821	2.875042
2.8	0.707107	1.979899	2.952427	-0.9582	0.972528	-2.9381	0.421082	2.374834
3	0.707107	2.12132	2.952427	-0.9582	0.831107	-3.07952	0.505071	1.97992

Alpha 2
Beta 1

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	1.414214	0	5.945399	-2.02037	5.945399	-2.02037	0.018182	54.99945
0.2	1.414214	0.282843	5.945399	-2.02037	5.662556	-2.30321	0.023143	43.20961
0.4	1.414214	0.565685	5.945399	-2.02037	5.379714	-2.58606	0.029405	34.00782
0.6	1.414214	0.848528	5.945399	-2.02037	5.096871	-2.8689	0.037288	26.81828
0.8	1.414214	1.131371	5.945399	-2.02037	4.814028	-3.15174	0.047182	21.19452
1	1.414214	1.414214	5.945399	-2.02037	4.531185	-3.43458	0.059559	16.79007
1.2	1.414214	1.697056	5.945399	-2.02037	4.248343	-3.71743	0.074988	13.33547
1.4	1.414214	1.979899	5.945399	-2.02037	3.9655	-4.00027	0.094139	10.62259
1.6	1.414214	2.262742	5.945399	-2.02037	3.682657	-4.28311	0.117797	8.489181
1.8	1.414214	2.545584	5.945399	-2.02037	3.399815	-4.56595	0.146863	6.809067
2	1.414214	2.828427	5.945399	-2.02037	3.116972	-4.8488	0.182345	5.48411
2.2	1.414214	3.11127	5.945399	-2.02037	2.834129	-5.13164	0.225331	4.437916
2.4	1.414214	3.394113	5.945399	-2.02037	2.551286	-5.41448	0.276934	3.610969
2.6	1.414214	3.676955	5.945399	-2.02037	2.268444	-5.69733	0.338196	2.956865
2.8	1.414214	3.959798	5.945399	-2.02037	1.985601	-5.98017	0.409917	2.439518
3	1.414214	4.242641	5.945399	-2.02037	1.702758	-6.26301	0.492389	2.030915

Alpha 2
Beta 5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	7.071068	0	29.43801	-9.63351	29.43801	-9.63351	0.019104	52.34506
0.2	7.071068	1.414214	29.43801	-9.63351	28.0238	-11.0477	0.024307	41.14041
0.4	7.071068	2.828427	29.43801	-9.63351	26.60958	-12.4619	0.030872	32.39181
0.6	7.071068	4.242641	29.43801	-9.63351	25.19537	-13.8762	0.039132	25.55453
0.8	7.071068	5.656854	29.43801	-9.63351	23.78116	-15.2904	0.049492	20.20529
1	7.071068	7.071068	29.43801	-9.63351	22.36694	-16.7046	0.062444	16.01435
1.2	7.071068	8.485281	29.43801	-9.63351	20.95273	-18.1188	0.078575	12.72669
1.4	7.071068	9.899495	29.43801	-9.63351	19.53852	-19.533	0.098579	10.14415
1.6	7.071068	11.31371	29.43801	-9.63351	18.1243	-20.9472	0.123266	8.112537
1.8	7.071068	12.72792	29.43801	-9.63351	16.71009	-22.3614	0.153558	6.512197
2	7.071068	14.14214	29.43801	-9.63351	15.29587	-23.7756	0.190482	5.24984
2.2	7.071068	15.55635	29.43801	-9.63351	13.88166	-25.1899	0.235139	4.252804
2.4	7.071068	16.97056	29.43801	-9.63351	12.46745	-26.6041	0.288636	3.464571
2.6	7.071068	18.38478	29.43801	-9.63351	11.05323	-28.0183	0.351982	2.841054
2.8	7.071068	19.79899	29.43801	-9.63351	9.63902	-29.4325	0.4259	2.347969
3	7.071068	21.2132	29.43801	-9.63351	8.224807	-30.8467	0.51053	1.958749

Alpha 2
Beta 10

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	14.14214	0	60.49687	-20.3249	60.49687	-20.3249	0.016627	60.14314
0.2	14.14214	2.828427	60.49687	-20.3249	57.66844	-23.1533	0.021178	47.21881
0.4	14.14214	5.656854	60.49687	-20.3249	54.84002	-25.9818	0.026926	37.13882
0.6	14.14214	8.485281	60.49687	-20.3249	52.01159	-28.8102	0.03417	29.26544
0.8	14.14214	11.31371	60.49687	-20.3249	49.18316	-31.6386	0.043271	23.11017
1	14.14214	14.14214	60.49687	-20.3249	46.35473	-34.467	0.054673	18.29056
1.2	14.14214	16.97056	60.49687	-20.3249	43.52631	-37.2955	0.068904	14.51295
1.4	14.14214	19.79899	60.49687	-20.3249	40.69788	-40.1239	0.086597	11.54774
1.6	14.14214	22.62742	60.49687	-20.3249	37.86945	-42.9523	0.108495	9.217015
1.8	14.14214	25.45584	60.49687	-20.3249	35.04103	-45.7807	0.135455	7.382526
2	14.14214	28.28427	60.49687	-20.3249	32.2126	-48.6092	0.168448	5.93655
2.2	14.14214	31.1127	60.49687	-20.3249	29.38417	-51.4376	0.208537	4.795312
2.4	14.14214	33.94113	60.49687	-20.3249	26.55574	-54.266	0.256835	3.89355
2.6	14.14214	36.76955	60.49687	-20.3249	23.72732	-57.0945	0.314425	3.180409
2.8	14.14214	39.59798	60.49687	-20.3249	20.89889	-59.9229	0.382222	2.616281
3	14.14214	42.42641	60.49687	-20.3249	18.07046	-62.7513	0.460744	2.170403

Alpha	3								
Beta	0.5								
Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0		0.866025	0	4.017402	-1.01388	4.017402	-1.01388	0.013385	74.7105
0.2		0.866025	0.173205	4.017402	-1.01388	3.844197	-1.18709	0.01752	57.07763
0.4		0.866025	0.34641	4.017402	-1.01388	3.670992	-1.36029	0.022862	43.74071
0.6		0.866025	0.519615	4.017402	-1.01388	3.497787	-1.5335	0.029735	33.6304
0.8		0.866025	0.69282	4.017402	-1.01388	3.324582	-1.7067	0.038536	25.94976
1		0.866025	0.866025	4.017402	-1.01388	3.151377	-1.87991	0.049746	20.10212
1.2		0.866025	1.03923	4.017402	-1.01388	2.978172	-2.05311	0.063945	15.63844
1.4		0.866025	1.212436	4.017402	-1.01388	2.804966	-2.22632	0.081814	12.22285
1.6		0.866025	1.385641	4.017402	-1.01388	2.631761	-2.39952	0.10414	9.602458
1.8		0.866025	1.558846	4.017402	-1.01388	2.458556	-2.57273	0.131809	7.586735
2		0.866025	1.732051	4.017402	-1.01388	2.285351	-2.74593	0.16578	6.032091
2.2		0.866025	1.905256	4.017402	-1.01388	2.112146	-2.91914	0.207045	4.829868
2.4		0.866025	2.078461	4.017402	-1.01388	1.938941	-3.09234	0.256548	3.897906
2.6		0.866025	2.251666	4.017402	-1.01388	1.765736	-3.26555	0.315065	3.173948
2.8		0.866025	2.424871	4.017402	-1.01388	1.592531	-3.43875	0.38303	2.610762
3		0.866025	2.598076	4.017402	-1.01388	1.419326	-3.61196	0.460291	2.172539

Alpha	3								
Beta	1								
Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0		1.732051	0	8.017063	-1.96106	8.017063	-1.96106	0.013572	73.68111
0.2		1.732051	0.34641	8.017063	-1.96106	7.670653	-2.30747	0.017762	56.29997
0.4		1.732051	0.69282	8.017063	-1.96106	7.324243	-2.65388	0.023174	43.15181
0.6		1.732051	1.03923	8.017063	-1.96106	6.977833	-3.00029	0.030135	33.18401
0.8		1.732051	1.385641	8.017063	-1.96106	6.631422	-3.3467	0.039047	25.61016
1		1.732051	1.732051	8.017063	-1.96106	6.285012	-3.69311	0.050395	19.84324
1.2		1.732051	2.078461	8.017063	-1.96106	5.938602	-4.03952	0.064765	15.44044
1.4		1.732051	2.424871	8.017063	-1.96106	5.592192	-4.38593	0.082842	12.07117
1.6		1.732051	2.771281	8.017063	-1.96106	5.245782	-4.73234	0.10542	9.485866
1.8		1.732051	3.117691	8.017063	-1.96106	4.899372	-5.07875	0.133387	7.496982
2		1.732051	3.464102	8.017063	-1.96106	4.552961	-5.42516	0.167708	5.962745
2.2		1.732051	3.810512	8.017063	-1.96106	4.206551	-5.77157	0.209373	4.776165
2.4		1.732051	4.156922	8.017063	-1.96106	3.860141	-6.11798	0.259321	3.856225
2.6		1.732051	4.503332	8.017063	-1.96106	3.513731	-6.46439	0.318315	3.141542
2.8		1.732051	4.849742	8.017063	-1.96106	3.167321	-6.8108	0.386766	2.585543
3		1.732051	5.196152	8.017063	-1.96106	2.820911	-7.15721	0.464484	2.152927

Alpha 3
Beta 5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	8.660254	0	40.17331	-9.9389	40.17331	-9.9389	0.013387	74.69934
0.2	8.660254	1.732051	40.17331	-9.9389	38.44126	-11.671	0.017522	57.07111
0.4	8.660254	3.464102	40.17331	-9.9389	36.70921	-13.403	0.022865	43.73497
0.6	8.660254	5.196152	40.17331	-9.9389	34.97716	-15.1351	0.029738	33.62701
0.8	8.660254	6.928203	40.17331	-9.9389	33.24511	-16.8671	0.03854	25.94707
1	8.660254	8.660254	40.17331	-9.9389	31.51306	-18.5992	0.049751	20.1001
1.2	8.660254	10.3923	40.17331	-9.9389	29.78101	-20.3312	0.063952	15.63673
1.4	8.660254	12.12436	40.17331	-9.9389	28.04895	-22.0633	0.081822	12.22165
1.6	8.660254	13.85641	40.17331	-9.9389	26.3169	-23.7953	0.104151	9.601444
1.8	8.660254	15.58846	40.17331	-9.9389	24.58485	-25.5274	0.131822	7.585987
2	8.660254	17.32051	40.17331	-9.9389	22.8528	-27.2594	0.165796	6.031509
2.2	8.660254	19.05256	40.17331	-9.9389	21.12075	-28.9915	0.207064	4.829425
2.4	8.660254	20.78461	40.17331	-9.9389	19.3887	-30.7235	0.25657	3.897572
2.6	8.660254	22.51666	40.17331	-9.9389	17.65665	-32.4556	0.315091	3.173686
2.8	8.660254	24.24871	40.17331	-9.9389	15.9246	-34.1876	0.38306	2.610557
3	8.660254	25.98076	40.17331	-9.9389	14.19255	-35.9197	0.460325	2.172378

Alpha 3
Beta 10

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	17.32051	0	80.08158	-19.8368	80.08158	-19.8368	0.013667	73.16895
0.2	17.32051	3.464102	80.08158	-19.8368	76.61748	-23.3009	0.017884	55.9159
0.4	17.32051	6.928203	80.08158	-19.8368	73.15338	-26.765	0.023332	42.85959
0.6	17.32051	10.3923	80.08158	-19.8368	69.68928	-30.2291	0.030338	32.96196
0.8	17.32051	13.85641	80.08158	-19.8368	66.22517	-33.6932	0.039306	25.44141
1	17.32051	17.32051	80.08158	-19.8368	62.76107	-37.1573	0.050724	19.71453
1.2	17.32051	20.78461	80.08158	-19.8368	59.29697	-40.6214	0.06518	15.34213
1.4	17.32051	24.24871	80.08158	-19.8368	55.83287	-44.0855	0.083363	11.99573
1.6	17.32051	27.71281	80.08158	-19.8368	52.36877	-47.5496	0.106067	9.428003
1.8	17.32051	31.17691	80.08158	-19.8368	48.90467	-51.0137	0.134186	7.452342
2	17.32051	34.64102	80.08158	-19.8368	45.44056	-54.4778	0.168683	5.92828
2.2	17.32051	38.10512	80.08158	-19.8368	41.97646	-57.9419	0.210549	4.749488
2.4	17.32051	41.56922	80.08158	-19.8368	38.51236	-61.406	0.260721	3.835518
2.6	17.32051	45.03332	80.08158	-19.8368	35.04826	-64.8701	0.319955	3.12544
2.8	17.32051	48.49742	80.08158	-19.8368	31.58416	-68.3342	0.38865	2.573009
3	17.32051	51.96152	80.08158	-19.8368	28.12006	-71.7983	0.466597	2.143177

Alpha 4
Beta 0.5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	1	0	4.876142	-0.88234	4.876142	-0.88234	0.012382	80.7624
0.2	1	0.2	4.876142	-0.88234	4.676142	-1.08234	0.016522	60.52536
0.4	1	0.4	4.876142	-0.88234	4.476142	-1.28234	0.021954	45.54979
0.6	1	0.6	4.876142	-0.88234	4.276142	-1.48234	0.029039	34.43645
0.8	1	0.8	4.876142	-0.88234	4.076142	-1.68234	0.038223	26.16226
1	1	1	4.876142	-0.88234	3.876142	-1.88234	0.050046	19.98162
1.2	1	1.2	4.876142	-0.88234	3.676142	-2.08234	0.065151	15.34896
1.4	1	1.4	4.876142	-0.88234	3.476142	-2.28234	0.084287	11.86423
1.6	1	1.6	4.876142	-0.88234	3.276142	-2.48234	0.108302	9.23344
1.8	1	1.8	4.876142	-0.88234	3.076142	-2.68234	0.138123	7.239924
2	1	2	4.876142	-0.88234	2.876142	-2.88234	0.174715	5.723607
2.2	1	2.2	4.876142	-0.88234	2.676142	-3.08234	0.219007	4.566064
2.4	1	2.4	4.876142	-0.88234	2.476142	-3.28234	0.271788	3.679338
2.6	1	2.6	4.876142	-0.88234	2.276142	-3.48234	0.333552	2.998033
2.8	1	2.8	4.876142	-0.88234	2.076142	-3.68234	0.404299	2.473417
3	1	3	4.876142	-0.88234	1.876142	-3.88234	0.483295	2.06913

Alpha 4
Beta 1

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	2	0	9.844274	-1.83792	9.844274	-1.83792	0.011581	86.34833
0.2	2	0.4	9.844274	-1.83792	9.444274	-2.23792	0.015467	64.65378
0.4	2	0.8	9.844274	-1.83792	9.044274	-2.63792	0.020573	48.6074
0.6	2	1.2	9.844274	-1.83792	8.644274	-3.03792	0.027241	36.70937
0.8	2	1.6	9.844274	-1.83792	8.244274	-3.43792	0.035898	27.85671
1	2	2	9.844274	-1.83792	7.844274	-3.83792	0.047061	21.24902
1.2	2	2.4	9.844274	-1.83792	7.444274	-4.23792	0.061349	16.30018
1.4	2	2.8	9.844274	-1.83792	7.044274	-4.63792	0.079486	12.58083
1.6	2	3.2	9.844274	-1.83792	6.644274	-5.03792	0.1023	9.775171
1.8	2	3.6	9.844274	-1.83792	6.244274	-5.43792	0.130701	7.651051
2	2	4	9.844274	-1.83792	5.844274	-5.83792	0.16565	6.036825
2.2	2	4.4	9.844274	-1.83792	5.444274	-6.23792	0.208095	4.805497
2.4	2	4.8	9.844274	-1.83792	5.044274	-6.63792	0.258866	3.863002
2.6	2	5.2	9.844274	-1.83792	4.644274	-7.03792	0.318542	3.139303
2.8	2	5.6	9.844274	-1.83792	4.244274	-7.43792	0.387257	2.582264
3	2	6	9.844274	-1.83792	3.844274	-7.83792	0.46447	2.152992

Alpha	4								
Beta	5								
Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0		10	0	49.39925	-9.50742	49.39925	-9.50742	0.011285	88.6132
0.2		10	2	49.39925	-9.50742	47.39925	-11.5074	0.015077	66.32619
0.4		10	4	49.39925	-9.50742	45.39925	-13.5074	0.020061	49.84796
0.6		10	6	49.39925	-9.50742	43.39925	-15.5074	0.026574	37.63077
0.8		10	8	49.39925	-9.50742	41.39925	-17.5074	0.035035	28.54289
1		10	10	49.39925	-9.50742	39.39925	-19.5074	0.045952	21.76184
1.2		10	12	49.39925	-9.50742	37.39925	-21.5074	0.059934	16.68502
1.4		10	14	49.39925	-9.50742	35.39925	-23.5074	0.077697	12.87051
1.6		10	16	49.39925	-9.50742	33.39925	-25.5074	0.100058	9.994203
1.8		10	18	49.39925	-9.50742	31.39925	-27.5074	0.127924	7.817141
2		10	20	49.39925	-9.50742	29.39925	-29.5074	0.162252	6.163252
2.2		10	22	49.39925	-9.50742	27.39925	-31.5074	0.203993	4.902129
2.4		10	24	49.39925	-9.50742	25.39925	-33.5074	0.253996	3.93707
2.6		10	26	49.39925	-9.50742	23.39925	-35.5074	0.312866	3.196257
2.8		10	28	49.39925	-9.50742	21.39925	-37.5074	0.380788	2.626133
3		10	30	49.39925	-9.50742	19.39925	-39.5074	0.457289	2.186801

								Probabil. of detection	Average run length
Alpha	4								
Beta	10								
Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	P	ARL (1/P)
0		20	0	98.83547	-18.4051	98.83547	-18.4051	0.011254	88.8573
0.2		20	4	98.83547	-18.4051	94.83547	-22.4051	0.015037	66.50263
0.4		20	8	98.83547	-18.4051	90.83547	-26.4051	0.020008	49.98001
0.6		20	12	98.83547	-18.4051	86.83547	-30.4051	0.026506	37.72731
0.8		20	16	98.83547	-18.4051	82.83547	-34.4051	0.034946	28.61558
1		20	20	98.83547	-18.4051	78.83547	-38.4051	0.045838	21.81596
1.2		20	24	98.83547	-18.4051	74.83547	-42.4051	0.059788	16.72576
1.4		20	28	98.83547	-18.4051	70.83547	-46.4051	0.077513	12.90106
1.6		20	32	98.83547	-18.4051	66.83547	-50.4051	0.099828	10.01723
1.8		20	36	98.83547	-18.4051	62.83547	-54.4051	0.127638	7.834657
2		20	40	98.83547	-18.4051	58.83547	-58.4051	0.161902	6.176576
2.2		20	44	98.83547	-18.4051	54.83547	-62.4051	0.203571	4.912291
2.4		20	48	98.83547	-18.4051	50.83547	-66.4051	0.253494	3.944867
2.6		20	52	98.83547	-18.4051	46.83547	-70.4051	0.312281	3.202244
2.8		20	56	98.83547	-18.4051	42.83547	-74.4051	0.38012	2.630748
3		20	60	98.83547	-18.4051	38.83547	-78.4051	0.456546	2.19036

Alpha 5
Beta 0.5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	1.118034	0	5.791557	-0.77556	5.791557	-0.77556	0.010149	98.53188
0.2	1.118034	0.223607	5.791557	-0.77556	5.56795	-0.99917	0.013778	72.57947
0.4	1.118034	0.447214	5.791557	-0.77556	5.344343	-1.22277	0.018611	53.73166
0.6	1.118034	0.67082	5.791557	-0.77556	5.120737	-1.44638	0.025002	39.9968
0.8	1.118034	0.894427	5.791557	-0.77556	4.89713	-1.66999	0.033394	29.9455
1	1.118034	1.118034	5.791557	-0.77556	4.673523	-1.89359	0.044325	22.56063
1.2	1.118034	1.341641	5.791557	-0.77556	4.449916	-2.1172	0.058439	17.11186
1.4	1.118034	1.565248	5.791557	-0.77556	4.226309	-2.34081	0.076487	13.07412
1.6	1.118034	1.788854	5.791557	-0.77556	4.002703	-2.56441	0.099323	10.06816
1.8	1.118034	2.012461	5.791557	-0.77556	3.779096	-2.78802	0.127876	7.820076
2	1.118034	2.236068	5.791557	-0.77556	3.555489	-3.01163	0.163106	6.130982
2.2	1.118034	2.459675	5.791557	-0.77556	3.331882	-3.23523	0.205931	4.855995
2.4	1.118034	2.683282	5.791557	-0.77556	3.108275	-3.45884	0.257115	3.88931
2.6	1.118034	2.906888	5.791557	-0.77556	2.884669	-3.68245	0.317116	3.15342
2.8	1.118034	3.130495	5.791557	-0.77556	2.661062	-3.90606	0.385897	2.591365
3	1.118034	3.354102	5.791557	-0.77556	2.437455	-4.12966	0.46271	2.161181

Alpha 5
Beta 1

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	2.236068	0	11.61112	-1.59818	11.61112	-1.59818	0.009956	100.4419
0.2	2.236068	0.447214	11.61112	-1.59818	11.16391	-2.04539	0.013519	73.96997
0.4	2.236068	0.894427	11.61112	-1.59818	10.71669	-2.49261	0.018266	54.74652
0.6	2.236068	1.341641	11.61112	-1.59818	10.26948	-2.93982	0.024548	40.73652
0.8	2.236068	1.788854	11.61112	-1.59818	9.822266	-3.38703	0.0328	30.4878
1	2.236068	2.236068	11.61112	-1.59818	9.375052	-3.83425	0.043554	22.96
1.2	2.236068	2.683282	11.61112	-1.59818	8.927838	-4.28146	0.057447	17.40735
1.4	2.236068	3.130495	11.61112	-1.59818	8.480625	-4.72868	0.075226	13.29328
1.6	2.236068	3.577709	11.61112	-1.59818	8.033411	-5.17589	0.097736	10.23164
1.8	2.236068	4.024922	11.61112	-1.59818	7.586198	-5.6231	0.125902	7.942686
2	2.236068	4.472136	11.61112	-1.59818	7.138984	-6.07032	0.160686	6.223318
2.2	2.236068	4.91935	11.61112	-1.59818	6.69177	-6.51753	0.203011	4.925841
2.4	2.236068	5.366563	11.61112	-1.59818	6.244557	-6.96474	0.253654	3.942378
2.6	2.236068	5.813777	11.61112	-1.59818	5.797343	-7.41196	0.313098	3.193888
2.8	2.236068	6.26099	11.61112	-1.59818	5.35013	-7.85917	0.381342	2.622318
3	2.236068	6.708204	11.61112	-1.59818	4.902916	-8.30638	0.45769	2.184885

Alpha 5
Beta 5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	11.18034	0	57.83224	-7.84192	57.83224	-7.84192	0.010267	97.39944
0.2	11.18034	2.236068	57.83224	-7.84192	55.59617	-10.078	0.013935	71.76175
0.4	11.18034	4.472136	57.83224	-7.84192	53.3601	-12.3141	0.018818	53.14061
0.6	11.18034	6.708204	57.83224	-7.84192	51.12404	-14.5501	0.025276	39.56322
0.8	11.18034	8.944272	57.83224	-7.84192	48.88797	-16.7862	0.033752	29.62787
1	11.18034	11.18034	57.83224	-7.84192	46.6519	-19.0223	0.044789	22.32691
1.2	11.18034	13.41641	57.83224	-7.84192	44.41583	-21.2583	0.059036	16.93882
1.4	11.18034	15.65248	57.83224	-7.84192	42.17976	-23.4944	0.077247	12.94549
1.6	11.18034	17.88854	57.83224	-7.84192	39.9437	-25.7305	0.100279	9.972178
1.8	11.18034	20.12461	57.83224	-7.84192	37.70763	-27.9665	0.129063	7.748154
2	11.18034	22.36068	57.83224	-7.84192	35.47156	-30.2026	0.16456	6.076811
2.2	11.18034	24.59675	57.83224	-7.84192	33.23549	-32.4387	0.207685	4.814984
2.4	11.18034	26.83282	57.83224	-7.84192	30.99942	-34.6747	0.259192	3.858144
2.6	11.18034	29.06888	57.83224	-7.84192	28.76336	-36.9108	0.319524	3.129655
2.8	11.18034	31.30495	57.83224	-7.84192	26.52729	-39.1469	0.388623	2.573188
3	11.18034	33.54102	57.83224	-7.84192	24.29122	-41.3829	0.465709	2.147264

Alpha 5
Beta 10

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	Probabil. of detection P	Average run length ARL (1/P)
0	22.36068	0	114.5095	-14.825	114.5095	-14.825	0.011115	89.96851
0.2	22.36068	4.472136	114.5095	-14.825	110.0374	-19.2971	0.015067	66.37021
0.4	22.36068	8.944272	114.5095	-14.825	105.5652	-23.7693	0.020319	49.21502
0.6	22.36068	13.41641	114.5095	-14.825	101.0931	-28.2414	0.027251	36.6959
0.8	22.36068	17.88854	114.5095	-14.825	96.62096	-32.7135	0.036333	27.52319
1	22.36068	22.36068	114.5095	-14.825	92.14882	-37.1857	0.048133	20.77577
1.2	22.36068	26.83282	114.5095	-14.825	87.67668	-41.6578	0.063326	15.7913
1.4	22.36068	31.30495	114.5095	-14.825	83.20455	-46.13	0.082697	12.09234
1.6	22.36068	35.77709	114.5095	-14.825	78.73241	-50.6021	0.107123	9.335063
1.8	22.36068	40.24922	114.5095	-14.825	74.26028	-55.0742	0.13755	7.270084
2	22.36068	44.72136	114.5095	-14.825	69.78814	-59.5464	0.174933	5.716474
2.2	22.36068	49.1935	114.5095	-14.825	65.316	-64.0185	0.22016	4.542151
2.4	22.36068	53.66563	114.5095	-14.825	60.84387	-68.4906	0.27392	3.650701
2.6	22.36068	58.13777	114.5095	-14.825	56.37173	-72.9628	0.336547	2.971353
2.8	22.36068	62.6099	114.5095	-14.825	51.8996	-77.4349	0.407817	2.45208
3	22.36068	67.08204	114.5095	-14.825	47.42746	-81.907	0.48673	2.054527

Alpha 10
Beta 0.5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	UCLx Probabil. of detection P1	LCLx Probabil. of detection P2	Average run length ARL (1/(P1+P2))
0	1.581139	0	9.591253	0.379109	9.591253	0.379109	0.007989	*	125.1721
0.2	1.581139	0.316228	9.591253	0.379109	9.275025	0.062881	0.011383	*	87.8503
0.4	1.581139	0.632456	9.591253	0.379109	8.958797	-0.25335	0.016082		62.18132
0.6	1.581139	0.948683	9.591253	0.379109	8.64257	-0.56957	0.022516		44.41286
0.8	1.581139	1.264911	9.591253	0.379109	8.326342	-0.8858	0.031227		32.02357
1	1.581139	1.581139	9.591253	0.379109	8.010114	-1.20203	0.04287		23.32634
1.2	1.581139	1.897367	9.591253	0.379109	7.693886	-1.51826	0.058225		17.17475
1.4	1.581139	2.213594	9.591253	0.379109	7.377659	-1.83449	0.078181		12.79083
1.6	1.581139	2.529822	9.591253	0.379109	7.061431	-2.15071	0.103709		9.642365
1.8	1.581139	2.84605	9.591253	0.379109	6.745203	-2.46694	0.135805		7.363499
2	1.581139	3.162278	9.591253	0.379109	6.428975	-2.78317	0.175402		5.701189
2.2	1.581139	3.478505	9.591253	0.379109	6.112748	-3.0994	0.223247		4.479344
2.4	1.581139	3.794733	9.591253	0.379109	5.79652	-3.41562	0.279751		3.574607
2.6	1.581139	4.110961	9.591253	0.379109	5.480292	-3.73185	0.344804		2.900198
2.8	1.581139	4.427189	9.591253	0.379109	5.164064	-4.04808	0.417608		2.39459
3	1.581139	4.743416	9.591253	0.379109	4.847837	-4.36431	0.496535		2.013957

Alpha 10
Beta 1

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	UCLx Probabil. of detection P1	LCLx Probabil. of detection P2	Average run length ARL (1/(P1+P2))
0	3.162278	0	19.27649	0.608102	19.27649	0.608102	0.007574	*	132.0306
0.2	3.162278	0.632456	19.27649	0.608102	18.64403	-0.02435	0.010805		92.54975
0.4	3.162278	1.264911	19.27649	0.608102	18.01158	-0.65681	0.015285		65.42362
0.6	3.162278	1.897367	19.27649	0.608102	17.37912	-1.28926	0.021431		46.66138
0.8	3.162278	2.529822	19.27649	0.608102	16.74667	-1.92172	0.029764		33.59763
1	3.162278	3.162278	19.27649	0.608102	16.11421	-2.55418	0.040925		24.43494
1.2	3.162278	3.794733	19.27649	0.608102	15.48176	-3.18663	0.055674		17.96171
1.4	3.162278	4.427189	19.27649	0.608102	14.8493	-3.81909	0.074887		13.35345
1.6	3.162278	5.059644	19.27649	0.608102	14.21685	-4.45154	0.099524		10.04783
1.8	3.162278	5.6921	19.27649	0.608102	13.58439	-5.084	0.130582		7.658023
2	3.162278	6.324555	19.27649	0.608102	12.95193	-5.71645	0.169011		5.916775
2.2	3.162278	6.957011	19.27649	0.608102	12.31948	-6.34891	0.215595		4.638326
2.4	3.162278	7.589466	19.27649	0.608102	11.68702	-6.98136	0.270804		3.692708
2.6	3.162278	8.221922	19.27649	0.608102	11.05457	-7.61382	0.334618		2.988482
2.8	3.162278	8.854377	19.27649	0.608102	10.42211	-8.24628	0.406352		2.460921
3	3.162278	9.486833	19.27649	0.608102	9.789657	-8.87873	0.484507		2.063954

								UCLx Probabil. of detection	LCLx Probabil. of detection	Average run length
Alpha	10									
Beta	5									
Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	P1	P2	ARL (1/(P1+P2))
0		15.81139	0	96.65738	3.604379	96.65738	3.604379	0.007341	*	136.2212
0.2		15.81139	3.162278	96.65738	3.604379	93.4951	0.442101	0.01048	*	95.41985
0.4		15.81139	6.324555	96.65738	3.604379	90.33282	-2.72018	0.014837		67.39907
0.6		15.81139	9.486833	96.65738	3.604379	87.17055	-5.88245	0.020818		48.03535
0.8		15.81139	12.64911	96.65738	3.604379	84.00827	-9.04473	0.028937		34.55783
1		15.81139	15.81139	96.65738	3.604379	80.84599	-12.207	0.039824		25.11049
1.2		15.81139	18.97367	96.65738	3.604379	77.68371	-15.3693	0.054228		18.44066
1.4		15.81139	22.13594	96.65738	3.604379	74.52144	-18.5316	0.073016		13.69563
1.6		15.81139	25.29822	96.65738	3.604379	71.35916	-21.6938	0.097142		10.29421
1.8		15.81139	28.4605	96.65738	3.604379	68.19688	-24.8561	0.127602		7.836868
2		15.81139	31.62278	96.65738	3.604379	65.0346	-28.0184	0.165356		6.047558
2.2		15.81139	34.78505	96.65738	3.604379	61.87233	-31.1807	0.211206		4.734714
2.4		15.81139	37.94733	96.65738	3.604379	58.71005	-34.343	0.265658		3.764238
2.6		15.81139	41.10961	96.65738	3.604379	55.54777	-37.5052	0.328741		3.041908
2.8		15.81139	44.27189	96.65738	3.604379	52.38549	-40.6675	0.399833		2.501044
3		15.81139	47.43416	96.65738	3.604379	49.22322	-43.8298	0.477511		2.094193

								UCLx Probabil. of detection	LCLx Probabil. of detection	Average run length
Alpha	10									
Beta	10									
Shift k		Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	P1	P2	ARL (1/(P1+P2))
0		31.62278	0	193.6788	7.595542	193.6788	7.595542	0.00719	*	139.0821
0.2		31.62278	6.324555	193.6788	7.595542	187.3542	1.270987	0.01027	*	97.37098
0.4		31.62278	12.64911	193.6788	7.595542	181.0297	-5.05357	0.014546		68.74742
0.6		31.62278	18.97367	193.6788	7.595542	174.7051	-11.3781	0.020421		48.9692
0.8		31.62278	25.29822	193.6788	7.595542	168.3806	-17.7027	0.028401		35.21003
1		31.62278	31.62278	193.6788	7.595542	162.056	-24.0272	0.03911		25.56891
1.2		31.62278	37.94733	193.6788	7.595542	155.7315	-30.3518	0.053289		18.7656
1.4		31.62278	44.27189	193.6788	7.595542	149.4069	-36.6763	0.071799		13.92777
1.6		31.62278	50.59644	193.6788	7.595542	143.0824	-43.0009	0.095591		10.46124
1.8		31.62278	56.921	193.6788	7.595542	136.7578	-49.3255	0.12566		7.957982
2		31.62278	63.24555	193.6788	7.595542	130.4332	-55.65	0.162969		6.136136
2.2		31.62278	69.57011	193.6788	7.595542	124.1087	-61.9746	0.208337		4.799916
2.4		31.62278	75.89466	193.6788	7.595542	117.7841	-68.2991	0.262287		3.812617
2.6		31.62278	82.21922	193.6788	7.595542	111.4596	-74.6237	0.324883		3.078031
2.8		31.62278	88.54377	193.6788	7.595542	105.135	-80.9482	0.395545		2.528157
3		31.62278	94.86833	193.6788	7.595542	98.81047	-87.2728	0.472898		2.114621

Alpha 50
Beta 0.5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	UCLx Probabil. of detection P1	LCLx Probabil. of detection P2	Average run length ARL (1/(P1+P2))
0	3.535534	0	35.59524	14.34161	35.59524	14.34161	0.003464	0.000194	273.351
0.2	3.535534	0.707107	35.59524	14.34161	34.88813	13.6345	0.00553	6.03E-05	178.8813
0.4	3.535534	1.414214	35.59524	14.34161	34.18103	12.9274	0.008675	1.64E-05	115.0563
0.6	3.535534	2.12132	35.59524	14.34161	33.47392	12.22029	0.013367	3.8E-06	74.78984
0.8	3.535534	2.828427	35.59524	14.34161	32.76681	11.51318	0.020215	*	49.46822
1	3.535534	3.535534	35.59524	14.34161	32.05971	10.80608	0.029992	*	33.34222
1.2	3.535534	4.242641	35.59524	14.34161	31.3526	10.09897	0.04363	*	22.92001
1.4	3.535534	4.949747	35.59524	14.34161	30.64549	9.391863	0.062192	*	16.07924
1.6	3.535534	5.656854	35.59524	14.34161	29.93839	8.684756	0.086824	*	11.51755
1.8	3.535534	6.363961	35.59524	14.34161	29.23128	7.977649	0.118649	*	8.428221
2	3.535534	7.071068	35.59524	14.34161	28.52417	7.270542	0.158634	*	6.303819
2.2	3.535534	7.778175	35.59524	14.34161	27.81707	6.563435	0.207417	*	4.821206
2.4	3.535534	8.485281	35.59524	14.34161	27.10996	5.856329	0.265128	*	3.771763
2.6	3.535534	9.192388	35.59524	14.34161	26.40285	5.149222	0.331221	*	3.019132
2.8	3.535534	9.899495	35.59524	14.34161	25.69575	4.442115	0.404373	*	2.472964
3	3.535534	10.6066	35.59524	14.34161	24.98864	3.735008	0.482472	*	2.072659

Alpha 50
Beta 1

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	UCLx Probabil. of detection P1	LCLx Probabil. of detection P2	Average run length ARL (1/(P1+P2))
0	7.071068	0	71.01036	28.90707	71.01036	28.90707	0.00368	0.000231	255.676
0.2	7.071068	1.414214	71.01036	28.90707	69.59615	27.49286	0.005862	7.32E-05	168.4863
0.4	7.071068	2.828427	71.01036	28.90707	68.18193	26.07864	0.009175	2.03E-05	108.7512
0.6	7.071068	4.242641	71.01036	28.90707	66.76772	24.66443	0.014104	4.9E-06	70.87725
0.8	7.071068	5.656854	71.01036	28.90707	65.35351	23.25022	0.02128	*	46.99248
1	7.071068	7.071068	71.01036	28.90707	63.93929	21.836	0.031494	*	31.75208
1.2	7.071068	8.485281	71.01036	28.90707	62.52508	20.42179	0.045697	*	21.88327
1.4	7.071068	9.899495	71.01036	28.90707	61.11087	19.00758	0.064968	*	15.39219
1.6	7.071068	11.31371	71.01036	28.90707	59.69665	17.59336	0.090456	*	11.0551
1.8	7.071068	12.72792	71.01036	28.90707	58.28244	16.17915	0.123271	*	8.112208
2	7.071068	14.14214	71.01036	28.90707	56.86822	14.76493	0.16435	*	6.084576
2.2	7.071068	15.55635	71.01036	28.90707	55.45401	13.35072	0.214275	*	4.6669
2.4	7.071068	16.97056	71.01036	28.90707	54.0398	11.93651	0.273099	*	3.661676
2.6	7.071068	18.38478	71.01036	28.90707	52.62558	10.52229	0.340183	*	2.939594
2.8	7.071068	19.79899	71.01036	28.90707	51.21137	9.10808	0.414098	*	2.414887
3	7.071068	21.2132	71.01036	28.90707	49.79716	7.693867	0.492639	*	2.029884

Alpha 50
Beta 5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	UCLx Probabil. of detection P1	LCLx Probabil. of detection P2	Average run length ARL (1/(P1+P2))
0	35.35534	0	355.182	145.3202	355.182	145.3202	0.003648	0.000261	255.8395
0.2	35.35534	7.071068	355.182	145.3202	348.1109	138.2491	0.005813	8.36E-05	169.5893
0.4	35.35534	14.14214	355.182	145.3202	341.0399	131.1781	0.009102	2.36E-05	109.5818
0.6	35.35534	21.2132	355.182	145.3202	333.9688	124.107	0.013995	5.8E-06	71.42449
0.8	35.35534	28.28427	355.182	145.3202	326.8977	117.0359	0.021123	*	47.34176
1	35.35534	35.35534	355.182	145.3202	319.8267	109.9649	0.031273	*	31.97647
1.2	35.35534	42.42641	355.182	145.3202	312.7556	102.8938	0.045393	*	22.02983
1.4	35.35534	49.49747	355.182	145.3202	305.6845	95.82273	0.064561	*	15.48923
1.6	35.35534	56.56854	355.182	145.3202	298.6135	88.75166	0.089923	*	11.12063
1.8	35.35534	63.63961	355.182	145.3202	291.5424	81.68059	0.122595	*	8.15694
2	35.35534	70.71068	355.182	145.3202	284.4713	74.60952	0.163514	*	6.115684
2.2	35.35534	77.78175	355.182	145.3202	277.4003	67.53845	0.213275	*	4.688782
2.4	35.35534	84.85281	355.182	145.3202	270.3292	60.46739	0.271939	*	3.677295
2.6	35.35534	91.92388	355.182	145.3202	263.2581	53.39632	0.33888	*	2.950897
2.8	35.35534	98.99495	355.182	145.3202	256.1871	46.32525	0.412687	*	2.423144
3	35.35534	106.066	355.182	145.3202	249.116	39.25418	0.491167	*	2.035967

Alpha 50
Beta 10

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	UCLx Probabil. of detection P1	LCLx Probabil. of detection P2	Average run length ARL (1/(P1+P2))
0	70.71068	0	714.2551	287.3855	714.2551	287.3855	0.0032	0.000203	293.867
0.2	70.71068	14.14214	714.2551	287.3855	700.113	273.2434	0.005123	6.33E-05	192.8157
0.4	70.71068	28.28427	714.2551	287.3855	685.9708	259.1012	0.00806	1.73E-05	123.8037
0.6	70.71068	42.42641	714.2551	287.3855	671.8287	244.9591	0.012456	4.1E-06	80.25618
0.8	70.71068	56.56854	714.2551	287.3855	657.6866	230.817	0.018897	*	52.91845
1	70.71068	70.71068	714.2551	287.3855	643.5444	216.6748	0.028127	*	35.55303
1.2	70.71068	84.85281	714.2551	287.3855	629.4023	202.5327	0.041052	*	24.35935
1.4	70.71068	98.99495	714.2551	287.3855	615.2602	188.3906	0.058718	*	17.03055
1.6	70.71068	113.1371	714.2551	287.3855	601.118	174.2484	0.082261	*	12.15643
1.8	70.71068	127.2792	714.2551	287.3855	586.9759	160.1063	0.112818	*	8.863834
2	70.71068	141.4214	714.2551	287.3855	572.8337	145.9641	0.151391	*	6.605412
2.2	70.71068	155.5635	714.2551	287.3855	558.6916	131.822	0.198687	*	5.033042
2.4	70.71068	169.7056	714.2551	287.3855	544.5495	117.6799	0.254932	*	3.922615
2.6	70.71068	183.8478	714.2551	287.3855	530.4073	103.5377	0.319702	*	3.127913
2.8	70.71068	197.9899	714.2551	287.3855	516.2652	89.3956	0.391807	*	2.552277
3	70.71068	212.132	714.2551	287.3855	502.1231	75.25347	0.469261	*	2.13101

Alpha 100
Beta 0.5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	UCLx Probabil. of detection P1	LCLx Probabil. of detection P2	Average run length ARL (1/(P1+P2))
0	5	0	65.00006	34.96861	65.00006	34.96861	0.002755	0.000418	315.1393
0.2	5	1	65.00006	34.96861	64.00006	33.96861	0.00457	0.000161	211.3941
0.4	5	2	65.00006	34.96861	63.00006	32.96861	0.007422	5.66E-05	133.7149
0.6	5	3	65.00006	34.96861	62.00006	31.96861	0.011797	1.83E-05	84.63602
0.8	5	4	65.00006	34.96861	61.00006	30.96861	0.018339	5.4E-06	54.51255
1	5	5	65.00006	34.96861	60.00006	29.96861	0.027867	*	35.88474
1.2	5	6	65.00006	34.96861	59.00006	28.96861	0.041377	*	24.16802
1.4	5	7	65.00006	34.96861	58.00006	27.96861	0.060005	*	16.66528
1.6	5	8	65.00006	34.96861	57.00006	26.96861	0.084956	*	11.7708
1.8	5	9	65.00006	34.96861	56.00006	25.96861	0.117394	*	8.518323
2	5	10	65.00006	34.96861	55.00006	24.96861	0.15828	*	6.317918
2.2	5	11	65.00006	34.96861	54.00006	23.96861	0.208185	*	4.80342
2.4	5	12	65.00006	34.96861	53.00006	22.96861	0.267108	*	3.743804
2.6	5	13	65.00006	34.96861	52.00006	21.96861	0.334317	*	2.991173
2.8	5	14	65.00006	34.96861	51.00006	20.96861	0.408279	*	2.449305
3	5	15	65.00006	34.96861	50.00006	19.96861	0.486699	*	2.054658

Alpha 100
Beta 1

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	UCLx Probabil. of detection P1	LCLx Probabil. of detection P2	Average run length ARL (1/(P1+P2))
0	10	0	130.014	70.23251	130.014	70.23251	0.002745	0.000478	310.2314
0.2	10	2	130.014	70.23251	128.014	68.23251	0.004554	0.000186	210.9749
0.4	10	4	130.014	70.23251	126.014	66.23251	0.007398	6.64E-05	133.9692
0.6	10	6	130.014	70.23251	124.014	64.23251	0.01176	2.17E-05	84.87739
0.8	10	8	130.014	70.23251	122.014	62.23251	0.018284	6.5E-06	54.67319
1	10	10	130.014	70.23251	120.014	60.23251	0.027788	*	35.98676
1.2	10	12	130.014	70.23251	118.014	58.23251	0.041267	*	24.23244
1.4	10	14	130.014	70.23251	116.014	56.23251	0.059855	*	16.70704
1.6	10	16	130.014	70.23251	114.014	54.23251	0.084758	*	11.7983
1.8	10	18	130.014	70.23251	112.014	52.23251	0.117141	*	8.536721
2	10	20	130.014	70.23251	110.014	50.23251	0.157965	*	6.330516
2.2	10	22	130.014	70.23251	108.014	48.23251	0.207807	*	4.812157
2.4	10	24	130.014	70.23251	106.014	46.23251	0.266669	*	3.749967
2.6	10	26	130.014	70.23251	104.014	44.23251	0.333825	*	2.995582
2.8	10	28	130.014	70.23251	102.014	42.23251	0.407748	*	2.452495
3	10	30	130.014	70.23251	100.014	40.23251	0.486145	*	2.056999

Alpha 100
Beta 5

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	UCLx Probabil. of detection P1	LCLx Probabil. of detection P2	Average run length ARL (1/(P1+P2))
0	50	0	647.576	352.267	647.576	352.267	0.00312	0.000529	274.0852
0.2	50	10	647.576	352.267	637.576	342.267	0.00515	0.000207	186.6682
0.4	50	20	647.576	352.267	627.576	332.267	0.008322	7.47E-05	119.0944
0.6	50	30	647.576	352.267	617.576	322.267	0.013156	2.47E-05	75.8685
0.8	50	40	647.576	352.267	607.576	312.267	0.02034	7.4E-06	49.14633
1	50	50	647.576	352.267	597.576	302.267	0.030736	*	32.53514
1.2	50	60	647.576	352.267	587.576	292.267	0.045378	*	22.03711
1.4	50	70	647.576	352.267	577.576	282.267	0.065428	*	15.28398
1.6	50	80	647.576	352.267	567.576	272.267	0.092092	*	10.85871
1.8	50	90	647.576	352.267	557.576	262.267	0.126502	*	7.905013
2	50	100	647.576	352.267	547.576	252.267	0.169541	*	5.898278
2.2	50	110	647.576	352.267	537.576	242.267	0.221658	*	4.511455
2.4	50	120	647.576	352.267	527.576	232.267	0.282687	*	3.537481
2.6	50	130	647.576	352.267	517.576	222.267	0.351705	*	2.843292
2.8	50	140	647.576	352.267	507.576	212.267	0.426985	*	2.342003
3	50	150	647.576	352.267	497.576	202.267	0.506067	*	1.976023

Alpha 100
Beta 10

Shift k	Sigma	k*Sigma	UCLx	LCLx	Altered UCLx	Altered LCLx	UCLx Probabil. of detection P1	LCLx Probabil. of detection P2	Average run length ARL (1/(P1+P2))
0	100	0	1301.758	700.8875	1301.758	700.8875	0.002632	0.000448	324.6542
0.2	100	20	1301.758	700.8875	1281.758	680.8875	0.004374	0.000173	219.9204
0.4	100	40	1301.758	700.8875	1261.758	660.8875	0.007119	6.15E-05	139.2661
0.6	100	60	1301.758	700.8875	1241.758	640.8875	0.011337	2E-05	88.05142
0.8	100	80	1301.758	700.8875	1221.758	620.8875	0.017658	5.9E-06	56.61264
1	100	100	1301.758	700.8875	1201.758	600.8875	0.026887	*	37.1927
1.2	100	120	1301.758	700.8875	1181.758	580.8875	0.040003	*	24.99813
1.4	100	140	1301.758	700.8875	1161.758	560.8875	0.058132	*	17.20223
1.6	100	160	1301.758	700.8875	1141.758	540.8875	0.08248	*	12.12415
1.8	100	180	1301.758	700.8875	1121.758	520.8875	0.114218	*	8.755187
2	100	200	1301.758	700.8875	1101.758	500.8875	0.154332	*	6.479538
2.2	100	220	1301.758	700.8875	1081.758	480.8875	0.203435	*	4.915575
2.4	100	240	1301.758	700.8875	1061.758	460.8875	0.261584	*	3.822864
2.6	100	260	1301.758	700.8875	1041.758	440.8875	0.328115	*	3.047712
2.8	100	280	1301.758	700.8875	1021.758	420.8875	0.401566	*	2.490251
3	100	300	1301.758	700.8875	1001.758	400.8875	0.479703	*	2.084623

APPENDIX F

MINITAB OUTPUTS - MULTIPLE REGRESSION MODELS FOR d_2, d_3, AND D_4

1. Bias correction factor d_2

1.1 Regression Analysis

```
The regression equation is

d2 = 1.03 + 0.00433 Alpha - 0.0021 Beta -0.000035 Alpha^2 + 0.00025 Beta^2
       -0.000003 Alph*Bet

Predictor     Coef           Stdev         t-ratio       p
Constant      1.02930        0.02107       48.86         0.000
Alpha         0.004333       0.001404      3.09          0.004
Beta          -0.00211       0.01125       -0.19         0.852
Alpha^2       -0.00003451    0.00001400    -2.47         0.019
Beta^2        0.000254       0.001044      0.24          0.810
Alph*Bet      -0.00000306    0.00008224    -0.04         0.971

s = 0.06122    R-sq = 33.9%    R-sq(adj) = 24.2%

Analysis of Variance

SOURCE        DF          SS            MS            F       p
Regression    5           0.065297      0.013059      3.48    0.012
Error         34          0.127431      0.003748
Total         39          0.192729
```

1.2 Regression Analysis

```
* NOTE *    Alpha is highly correlated with other  predictor variables
* NOTE *  Alpha^2 is highly correlated with other  predictor variables
* NOTE *  Alpha^3 is highly correlated with other  predictor variables

The regression equation is

d2 = 0.979 + 0.0234 Alpha - 0.00211 Beta -0.000600 Alpha^2 +0.000254 Beta^2
      -0.000003 Alph*Bet +0.000004 Alpha^3
```

Predictor	Coef	Stdev	t-ratio	p
Constant	0.97908	0.01905	51.39	0.000
Alpha	0.023366	0.003973	5.88	0.000
Beta	-0.002112	0.008631	-0.24	0.808
Alpha^2	-0.0005997	0.0001141	-5.26	0.000
Beta^2	0.0002535	0.0008011	0.32	0.754
Alph*Bet	-0.00000306	0.00006309	-0.05	0.962
Alpha^3	0.00000381	0.00000076	4.98	0.000

s = 0.04697   R-sq = 62.2%   R-sq(adj) = 55.4%

Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	6	0.119937	0.019989	9.06	0.000
Error	33	0.072792	0.002206		
Total	39	0.192729			

1.3 Regression Analysis

The regression equation is

d2 = 1.03 + 0.00432 Alpha -0.000035 Alpha^2

Predictor	Coef	Stdev	t-ratio	p
Constant	1.02859	0.01205	85.36	0.000
Alpha	0.004321	0.001308	3.30	0.002
Alpha^2	-0.00003451	0.00001344	-2.57	0.014

s = 0.05877   R-sq = 33.7%   R-sq(adj) = 30.1%

Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	2	0.064942	0.032471	9.40	0.000
Error	37	0.127787	0.003454		
Total	39	0.192729			

1.4 Regression Analysis

```
* NOTE *    Alpha is highly correlated with other  predictor variables
* NOTE *  Alpha^2 is highly correlated with other  predictor variables
* NOTE *  Alpha^3 is highly correlated with other  predictor variables

The regression equation is

d2 = 0.978 + 0.0234 Alpha -0.000600 Alpha^2 +0.000004 Alpha^3

Predictor      Coef          Stdev         t-ratio      p
Constant       0.97836       0.01339       73.08        0.000
Alpha          0.023354      0.003805      6.14         0.000
Alpha^2        -0.0005997    0.0001095    -5.48         0.000
Alpha^3        0.00000381    0.00000073    5.19         0.000

s = 0.04508    R-sq = 62.0%    R-sq(adj) = 58.9%

Analysis of Variance

SOURCE        DF          SS            MS            F       p
Regression     3          0.119582      0.039861      19.62   0.000
Error         36          0.073147      0.002032
Total         39          0.192729
```

1.5 Regression Analysis

```
The regression equation is

d2 = 0.760 + 0.351 1-e^-x

Predictor      Coef          Stdev         t-ratio      p
Constant       0.759508      0.009801      77.49        0.000
1-e^-x         0.35134       0.01113       31.58        0.000

s = 0.01365    R-sq = 96.3%    R-sq(adj) = 96.2%

Analysis of Variance

SOURCE        DF          SS            MS            F             p
Regression     1          0.18565       0.18565       996.99        0.000
Error         38          0.00708       0.00019
```

```
Total          39             0.19273
```

1.6 Regression Analysis

```
The regression equation is

d2 = 0.878 + 0.250 1-e^-.5x

Predictor      Coef           Stdev          t-ratio        p
Constant       0.87794        0.01042        84.22          0.000
1-e^-.5x       0.25036        0.01339        18.70          0.000

s = 0.02230    R-sq = 90.2%    R-sq(adj) = 89.9%

Analysis of Variance

SOURCE         DF             SS             MS             F              p
Regression     1              0.17384        0.17384        349.67         0.000
Error          38             0.01889        0.00050
Total          39             0.19273
```

1.7 Regression Analysis

```
The regression equation is

d2 = 0.505 + 0.591 1-e^-2x

Predictor      Coef           Stdev          t-ratio        p
Constant       0.50466        0.03128        16.13          0.000
1-e^-2x        0.59064        0.03296        17.92          0.000

s = 0.02316    R-sq = 89.4%    R-sq(adj) = 89.1%

Analysis of Variance

SOURCE         DF             SS             MS             F              p
Regression     1              0.17234        0.17234        321.18         0.000
Error          38             0.02039        0.00054
Total          39             0.19273
```

1.8 Regression Analysis

```
The regression equation is

d2 = 1.00 + 0.149 1-e^-.1x

Predictor      Coef         Stdev        t-ratio      p
Constant       1.00080      0.01234      81.13        0.000
1-e^-.1x       0.14879      0.02339      6.36         0.000

s = 0.04957    R-sq = 51.6%    R-sq(adj) = 50.3%

Analysis of Variance

SOURCE         DF           SS           MS           F      p
Regression     1            0.099374     0.099374     40.45  0.000
Error          38           0.093355     0.002457
Total          39           0.192729
```

1.9 Regression Analysis

```
The regression equation is

d2 = 0.772 + 0.308 1-e^-x + 0.0331 1-e^-.5x

Predictor      Coef         Stdev        t-ratio      p
Constant       0.77222      0.01452      53.17        0.000
1-e^-x         0.30830      0.03809      8.09         0.000
1-e^-.5x       0.03312      0.02805      1.18         0.245

s = 0.01358    R-sq = 96.5%    R-sq(adj) = 96.3%

Analysis of Variance

SOURCE         DF           SS           MS           F            p
Regression     2            0.185909     0.092955     504.36       0.000
Error          37           0.006819     0.000184
Total          39           0.192729
```

1.10 Regression Analysis

```
* NOTE *   1-e^-x is highly correlated with other  predictor variables

The regression equation is

d2 = 0.624 - 0.150 1-e^-x + 0.197 1-e^-.5x + 0.448 1-e^-2x

Predictor     Coef        Stdev       t-ratio     p
Constant      0.62359     0.03547     17.58       0.000
1-e^-x        -0.1499     0.1077      -1.39       0.172
1-e^-.5x      0.19707     0.04339     4.54        0.000
1-e^-2x       0.4479      0.1008      4.44        0.000

s = 0.01106    R-sq = 97.7%    R-sq(adj) = 97.5%

Analysis of Variance

SOURCE       DF          SS          MS          F           p
Regression    3          0.188325    0.062775    513.25      0.000
Error        36          0.004403    0.000122
Total        39          0.192729
```

2. Bias correction factor d_3

2.1 Regression Analysis

```
The regression equation is

d3 = 0.959 - 0.00457 Alpha - 0.0016 Beta +0.000036 Alpha^2 +0.000192 Beta^2
      -0.000002 Alph*Bet

Predictor     Coef          Stdev         t-ratio     p
Constant      0.95909       0.01966       48.78       0.000
Alpha         -0.004572     0.001311      -3.49       0.001
Beta          -0.00164      0.01050       -0.16       0.877
Alpha^2       0.00003595    0.00001306    2.75        0.009
Beta^2        0.0001919     0.0009747     0.20        0.845
Alph*Bet      -0.00000222   0.00007676    -0.03       0.977

s = 0.05714    R-sq = 41.1%    R-sq(adj) = 32.5%
```

```
Analysis of Variance

SOURCE      DF       SS          MS          F      p
Regression   5       0.077564    0.015513    4.75   0.002
Error       34       0.111016    0.003265
Total       39       0.188580
```

2.2 Regression Analysis

```
* NOTE *   Alpha is highly correlated with other  predictor variables
* NOTE *  Alpha^2 is highly correlated with other  predictor variables
* NOTE *  Alpha^3 is highly correlated with other  predictor variables

The regression equation is

d3 = 1.01 - 0.0240 Alpha - 0.00164 Beta +0.000614 Alpha^2 +0.000192 Beta^2
       -0.000002 Alph*Bet -0.000004 Alpha^3

Predictor    Coef           Stdev         t-ratio      p
Constant     1.01046        0.01639       61.66        0.000
Alpha        -0.024039      0.003417      -7.03        0.000
Beta         -0.001636      0.007424      -0.22        0.827
Alpha^2      0.00061404     0.00009811    6.26         0.000
Beta^2       0.0001919      0.0006890      0.28        0.782
Alph*Bet     -0.00000222    0.00005426    -0.04        0.968
Alpha^3      -0.00000389    0.00000066    -5.92        0.000

s = 0.04040    R-sq = 71.4%    R-sq(adj) = 66.3%

Analysis of Variance

SOURCE      DF       SS          MS          F      p
Regression   6       0.134729    0.022455    13.76  0.000
Error       33       0.053851    0.001632
Total       39       0.188580
```

2.3 Regression Analysis

```
The regression equation is

d3 = 0.958 - 0.00458 Alpha +0.000036 Alpha^2
```

```
Predictor     Coef          Stdev         t-ratio       p
Constant      0.95840       0.01124       85.25         0.000
Alpha         -0.004581     0.001220      -3.75         0.001
Alpha^2       0.00003595    0.00001253    2.87          0.007

s = 0.05482    R-sq = 41.0%    R-sq(adj) = 37.8%

Analysis of Variance

SOURCE        DF            SS            MS            F       p
Regression    2             0.077375      0.038687      12.87   0.000
Error         37            0.111206      0.003006
Total         39            0.188580
```

2.4 Regression Analysis

```
* NOTE *   Alpha is highly correlated with other  predictor variables
* NOTE *  Alpha^2 is highly correlated with other  predictor variables
* NOTE *  Alpha^3 is highly correlated with other  predictor variables

The regression equation is

d3 = 1.01 - 0.0240 Alpha +0.000614 Alpha^2 -0.000004 Alpha^3

Predictor     Coef          Stdev         t-ratio       p
Constant      1.00977       0.01151       87.75         0.000
Alpha         -0.024048     0.003270      -7.35         0.000
Alpha^2       0.00061404    0.00009410    6.53          0.000
Alpha^3       -0.00000389   0.00000063    -6.17         0.000

s = 0.03874    R-sq = 71.3%    R-sq(adj) = 69.0%

Analysis of Variance

SOURCE        DF            SS            MS            F       p
Regression    3             0.134540      0.044847      29.88   0.000
Error         36            0.054040      0.001501
Total         39            0.188580
```

2.5 Regression Analysis

```
The regression equation is

d3 = 0.875 + 0.342 e^-x

Predictor      Coef          Stdev         t-ratio       p
Constant       0.874665      0.003557      245.91        0.000
e^-x           0.34207       0.01484       23.05         0.000

s = 0.01820    R-sq = 93.3%    R-sq(adj) = 93.1%

Analysis of Variance

SOURCE         DF            SS            MS            F        p
Regression      1            0.17599       0.17599       531.09 0.000
Error          38            0.01259       0.00033
Total          39            0.18858
```

2.6 Regression Analysis

```
The regression equation is

d3 = 0.856 + 0.251 e^-0.5x

Predictor      Coef          Stdev         t-ratio       p
Constant       0.855758      0.004323      197.95        0.000
e^-0.5x        0.25090       0.01152       21.78         0.000

s = 0.01919    R-sq = 92.6%    R-sq(adj) = 92.4%

Analysis of Variance

SOURCE         DF            SS            MS            F        p
Regression      1            0.17459       0.17459       474.17 0.000
Error          38            0.01399       0.00037
Total          39            0.18858
```

2.7 Regression Analysis

```
The regression equation is
```

```
d3 = 0.891 + 0.561 e^-2x

Predictor     Coef        Stdev       t-ratio     p
Constant      0.890590    0.005238    170.04      0.000
e^-2x         0.56135     0.04187     13.41       0.000

s = 0.02943   R-sq = 82.5%   R-sq(adj) = 82.1%

Analysis of Variance

SOURCE        DF          SS          MS          F       p
Regression    1           0.15567     0.15567     179.74 0.000
Error         38          0.03291     0.00087
Total         39          0.18858
```

2.8 Regression Analysis

```
The regression equation is

d3 = 0.828 + 0.160 e^-0.1x

Predictor     Coef        Stdev       t-ratio     p
Constant      0.82809     0.01418     58.41       0.000
e^-0.1x       0.15981     0.02082     7.68        0.000

s = 0.04411   R-sq = 60.8%   R-sq(adj) = 59.8%

Analysis of Variance

SOURCE        DF          SS          MS          F       p
Regression    1           0.11464     0.11464     58.92   0.000
Error         38          0.07394     0.00195
Total         39          0.18858
```

2.9 Regression Analysis

```
The regression equation is

d3 = 0.865 + 0.190 e^-x + 0.117 e^-0.5x
```

```
Predictor      Coef          Stdev         t-ratio       p
Constant       0.864807      0.004173      207.26        0.000
e^-x           0.19025       0.04471       4.26          0.000
e^-0.5x        0.11685       0.03293       3.55          0.001

s = 0.01593    R-sq = 95.0%    R-sq(adj) = 94.7%

Analysis of Variance

SOURCE         DF            SS            MS            F       p
Regression     2             0.179186      0.089593      352.86 0.000
Error          37            0.009394      0.000254
Total          39            0.188580
```

2.10 Regression Analysis

```
The regression equation is

d3 = 0.857 + 0.255 e^-0.5x - 0.0044 e^-0.1x

Predictor      Coef          Stdev         t-ratio       p
Constant       0.857133      0.006655      128.80        0.000
e^-0.5x        0.25545       0.02026       12.61         0.000
e^-0.1x        -0.00437      0.01593       -0.27         0.785

s = 0.01943    R-sq = 92.6%    R-sq(adj) = 92.2%

Analysis of Variance

SOURCE         DF            SS            MS            F       p
Regression     2             0.174617      0.087308      231.35 0.000
Error          37            0.013963      0.000377
Total          39            0.188580
```

3. Control chart constant D_4

3.1 Regression Analysis

```
The regression equation is
```

```
D4 = 3.82 - 0.0246 Alpha + 0.0021 Beta +0.000196 Alpha^2 - 0.00022 Beta^2
        +0.000002 Alph*Bet

Predictor      Coef           Stdev          t-ratio        p
Constant       3.8201         0.1213         31.50          0.000
Alpha          -0.024634      0.008083       -3.05          0.004
Beta           0.00211        0.06477        0.03           0.974
Alpha^2        0.00019614     0.00008059     2.43           0.020
Beta^2         -0.000223      0.006012       -0.04          0.971
Alph*Bet       0.0000016      0.0004734      0.00           0.997

s = 0.3525     R-sq = 33.5%     R-sq(adj) = 23.7%

 Analysis of Variance

SOURCE       DF          SS             MS             F       p
Regression    5          2.1300         0.4260         3.43    0.013
Error        34          4.2236         0.1242
Total        39          6.3536
```

3.2 Regression Analysis

```
* NOTE *    Alpha is highly correlated with other  predictor variables
* NOTE *  Alpha^2 is highly correlated with other  predictor variables
* NOTE *  Alpha^3 is highly correlated with other  predictor variables

The regression equation is

D4 = 4.11 - 0.136 Alpha + 0.0021 Beta + 0.00351 Alpha^2 - 0.00022 Beta^2
        +0.000002 Alph*Bet -0.000022 Alpha^3

Predictor      Coef           Stdev          t-ratio        p
Constant       4.1143         0.1082         38.02          0.000
Alpha          -0.13613       0.02257        -6.03          0.000
Beta           0.00211        0.04902        0.04           0.966
Alpha^2        0.0035071      0.0006479      5.41           0.000
Beta^2         -0.000223      0.004550       -0.05          0.961
Alph*Bet       0.0000016      0.0003583      0.00           0.996
Alpha^3        -0.00002230    0.00000434     -5.13          0.000

s = 0.2668     R-sq = 63.0%     R-sq(adj) = 56.3%
```

```
Analysis of Variance

SOURCE      DF          SS          MS          F       p
Regression   6          4.00517     0.66753     9.38    0.000
Error       33          2.34844     0.07116
Total       39          6.35361
```

3.3 Regression Analysis

```
The regression equation is

D4 = 3.82 - 0.0246 Alpha +0.000196 Alpha^2

Predictor    Coef         Stdev        t-ratio     p
Constant     3.82174      0.06928      55.16       0.000
Alpha        -0.024627    0.007519     -3.28       0.002
Alpha^2      0.00019614   0.00007725   2.54        0.015

s = 0.3379     R-sq = 33.5%     R-sq(adj) = 29.9%

Analysis of Variance

SOURCE      DF          SS          MS          F       p
Regression   2          2.1298      1.0649      9.33    0.001
Error       37          4.2238      0.1142
Total       39          6.3536
```

3.4 Regression Analysis

```
* NOTE *   Alpha is highly correlated with other  predictor variables
* NOTE *  Alpha^2 is highly correlated with other  predictor variables
* NOTE *  Alpha^3 is highly correlated with other  predictor variables

The regression equation is

D4 = 4.12 - 0.136 Alpha + 0.00351 Alpha^2 -0.000022 Alpha^3

Predictor    Coef         Stdev        t-ratio     p
Constant     4.11598      0.07586      54.26       0.000
Alpha        -0.13613     0.02156      -6.31       0.000
Alpha^2      0.0035071    0.0006203    5.65        0.000
```

```
Alpha^3       -0.00002230  0.00000416   -5.36         0.000

s = 0.2554     R-sq = 63.0%    R-sq(adj) = 60.0%

Analysis of Variance
SOURCE       DF          SS          MS          F       p
Regression    3          4.0050      1.3350      20.46   0.000
Error        36          2.3486      0.0652
Total        39          6.3536
```

3.5 Regression Analysis

```
The regression equation is

D4 = 3.35 + 2.03 e^-x

Predictor      Coef         Stdev        t-ratio      p
Constant       3.34869      0.01312      255.19       0.000
e^-x           2.02745      0.05476      37.02        0.000

s = 0.06716    R-sq = 97.3%    R-sq(adj) = 97.2%

Analysis of Variance
SOURCE       DF          SS          MS          F             p
Regression    1          6.1822      6.1822      1370.67       0.000
Error        38          0.1714      0.0045
Total        39          6.3536
```

3.6 Regression Analysis

```
The regression equation is

D4 = 3.25 + 1.44 e^-0.5x

Predictor      Coef         Stdev        t-ratio      p
Constant       3.24989      0.02885      112.64       0.000
e^-0.5x        1.43744      0.07690      18.69        0.000

s = 0.1281     R-sq = 90.2%    R-sq(adj) = 89.9%

Analysis of Variance
```

```
SOURCE       DF          SS          MS          F          p
Regression    1          5.7304      5.7304      349.41     0.000
Error        38          0.6232      0.0164
Total        39          6.3536
```

3.7 Regression Analysis

```
The regression equation is

D4 = 3.44 + 3.44 e^-2x

Predictor    Coef        Stdev       t-ratio     p
Constant     3.43660     0.02059     166.93      0.000
e^-2x        3.4398      0.1646      20.90       0.000

s = 0.1157    R-sq = 92.0%    R-sq(adj) = 91.8%

Analysis of Variance
SOURCE       DF          SS          MS          F          p
Regression    1          5.8451      5.8451      436.82     0.000
Error        38          0.5085      0.0134
Total        39          6.3536
```

3.8 Regression Analysis

```
The regression equation is

D4 = 3.13 + 0.856 e^-0.1x

Predictor    Coef        Stdev       t-ratio     p
Constant     3.12678     0.09128     34.25       0.000
e^-0.1x      0.8558      0.1341      6.38        0.000

s = 0.2840    R-sq = 51.7%    R-sq(adj) = 50.5%

Analysis of Variance
SOURCE       DF          SS          MS          F          p
Regression    1          3.2878      3.2878      40.75      0.000
Error        38          3.0658      0.0807
Total        39          6.3536
```

APPENDIX G

MINITAB OUTPUTS - MULTIPLE REGRESSION MODELS SELECTED FOR d_2, d_3, AND D_4

1. Bias correction factor d_2

```
The regression equation is

d2 = 0.643 + 0.0977 1-e^-.5x + 0.357 1-e^-2x + 0.0248 1-e^-.1x
```

Where x represents the shape parameter α.

```
Predictor     Coef       Stdev      t-ratio    p
Constant      0.64282    0.02142    30.01      0.000
1-e^-.5x      0.09775    0.02083    4.69       0.000
1-e^-2x       0.35736    0.03317    10.77      0.000
1-e^-.1x      0.02483    0.01035    2.40       0.022

s = 0.01054    R-sq = 97.9%    R-sq(adj) = 97.8%

Analysis of Variance

SOURCE        DF         SS         MS         F          p
Regression    3          0.188728   0.062909   566.07     0.000
Error         36         0.004001   0.000111
Total         39         0.192729

SOURCE        DF         SEQ SS
1-e^-.5x      1          0.173837
1-e^-2x       1          0.014251
1-e^-.1x      1          0.000639
```

2. Bias correction factor d_3

```
The regression equation is

d3 = 0.859 - 0.296 e^-x + 0.291 e^-0.5x + 0.476 e^-2x
```

Where x represents the shape parameter α.

```
Predictor     Coef       Stdev      t-ratio    p
Constant      0.859457   0.003827   224.56     0.000
e^-x          -0.2964    0.1325     -2.24      0.032
e^-0.5x       0.29099    0.05340    5.45       0.000
e^-2x         0.4758     0.1240     3.84       0.000
```

```
s = 0.01361     R-sq = 96.5%     R-sq(adj) = 96.2%

Analysis of Variance

SOURCE       DF          SS           MS           F          p
Regression    3          0.181911     0.060637     327.34     0.000
Error        36          0.006669     0.000185
Total        39          0.188580

SOURCE       DF          SEQ SS
e^-x          1          0.175988
e^-0.5x       1          0.003198
e^-2x         1          0.002726
```

3. Control chart constant D_4

```
The regression equation is

D4 = 3.29 + 1.87 e^-x + 0.137 e^-0.1x
```

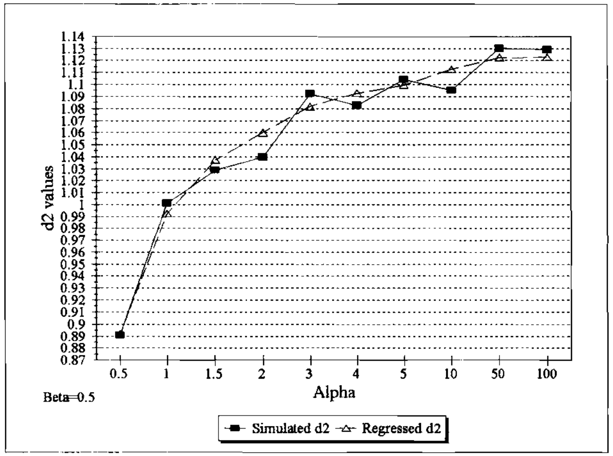
Where x represents the shape parameter α.

```
Predictor     Coef         Stdev        t-ratio      p
Constant      3.28976      0.01945      169.18       0.000
e^-x          1.87067      0.06329      29.56        0.000
e^-0.1x       0.13663      0.03663      3.73         0.001

s = 0.05802     R-sq = 98.0%     R-sq(adj) = 97.9%

Analysis of Variance

SOURCE       DF          SS           MS           F          p
Regression    2          6.2290       3.1145       925.12     0.000
Error        37          0.1246       0.0034
Total        39          6.3536

SOURCE       DF          SEQ SS
e^-x          1          6.1822
e^-0.1x       1          0.0468
```

APPENDIX H

GRAPHS - SIMULATED VALUES OF d_2, d_3, AND D_4 VERSUS REGRESSED VALUES OF d_2, d_3, AND D_4

Alpha	Beta	d2	Fits	d3	Fits	D4	Fits
0.5	0.5	0.89067	0.89154	1.05376	1.08131	4.54932	4.55435
1	0.5	1.00121	0.99263	0.9958	0.99129	3.98377	4.10157
1.5	0.5	1.0287	1.03741	0.95218	0.95446	3.77682	3.82477
2	0.5	1.03973	1.05992	0.90597	0.9351	3.61405	3.6548
3	0.5	1.09221	1.08166	0.93153	0.91081	3.55866	3.48412
4	0.5	1.08259	1.09276	0.88364	0.89357	3.44866	3.41561
5	0.5	1.10427	1.09965	0.89188	0.88137	3.42299	3.38524
10	0.5	1.09534	1.11296	0.85834	0.8614	3.35089	3.34011
50	0.5	1.13015	1.12259	0.85435	0.85946	3.26789	3.29069
100	0.5	1.12918	1.12275	0.85795	0.85946	3.27939	3.28977
0.5	1	0.90144	0.89154	1.11124	1.08131	4.69825	4.55435
1	1	0.99756	0.99263	1.00081	0.99129	4.00977	4.10157
1.5	1	1.02377	1.03741	0.93738	0.95446	3.74683	3.82477
2	1	1.05894	1.05992	0.93746	0.9351	3.65586	3.6548
3	1	1.08304	1.08166	0.92004	0.91081	3.54847	3.48412
4	1	1.09813	1.09276	0.89817	0.89357	3.45373	3.41561
5	1	1.11059	1.09965	0.89508	0.88137	3.41785	3.38524
10	1	1.10985	1.11296	0.86897	0.8614	3.34889	3.34011
50	1	1.11941	1.12259	0.85521	0.85946	3.29196	3.29069
100	1	1.12389	1.12275	0.84914	0.85946	3.26661	3.28977
0.5	5	0.87432	0.89154	1.06679	1.08131	4.66041	4.55435
1	5	0.98901	0.99263	1.00668	0.99129	4.05361	4.10157
1.5	5	1.03932	1.03741	0.94953	0.95446	3.7408	3.82477
2	5	1.0388	1.05992	0.91038	0.9351	3.62913	3.6548
3	5	1.08785	1.08166	0.90309	0.91081	3.49047	3.48412
4	5	1.10745	1.09276	0.89646	0.89357	3.42846	3.41561
5	5	1.10433	1.09965	0.89902	0.88137	3.44228	3.38524
10	5	1.10642	1.11296	0.86794	0.8614	3.35338	3.34011
50	5	1.11593	1.12259	0.84726	0.85946	3.27772	3.29069
100	5	1.11036	1.12275	0.84349	0.85946	3.27897	3.28977
0.5	10	0.89332	0.89154	1.08193	1.08131	4.63341	4.55435
1	10	1.01105	0.99263	1.00519	0.99129	3.98262	4.10157
1.5	10	1.03744	1.03741	0.96472	0.95446	3.7897	3.82477
2	10	1.07441	1.05992	0.93263	0.9351	3.6041	3.6548
3	10	1.08453	1.08166	0.90925	0.91081	3.51513	3.48412
4	10	1.10206	1.09276	0.90751	0.89357	3.4704	3.41561
5	10	1.08739	1.09965	0.87412	0.88137	3.41159	3.38524
10	10	1.10628	1.11296	0.87271	0.8614	3.36661	3.34011
50	10	1.13493	1.12259	0.85834	0.85946	3.26889	3.29069
100	10	1.12964	1.12275	0.85693	0.85946	3.27576	3.28977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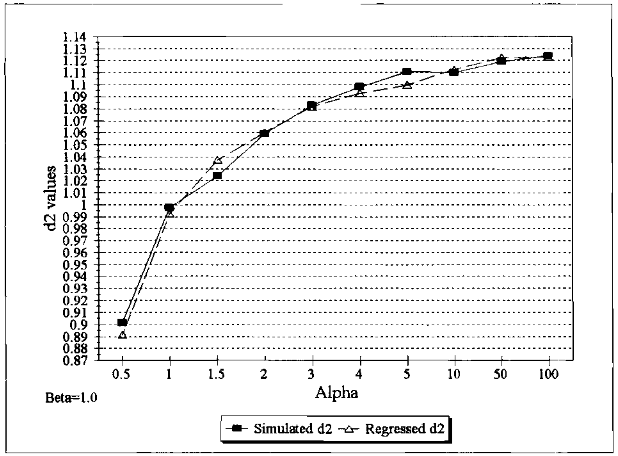
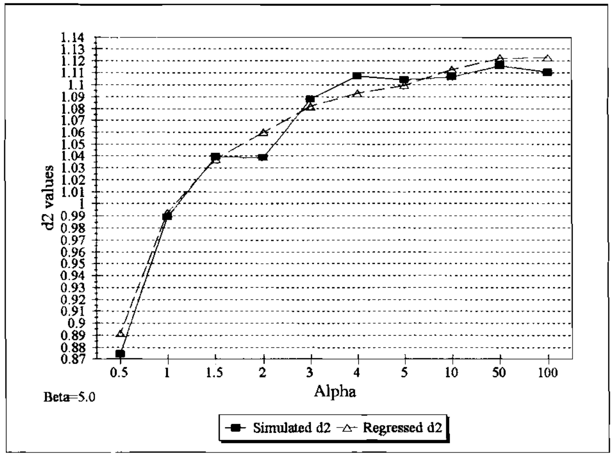
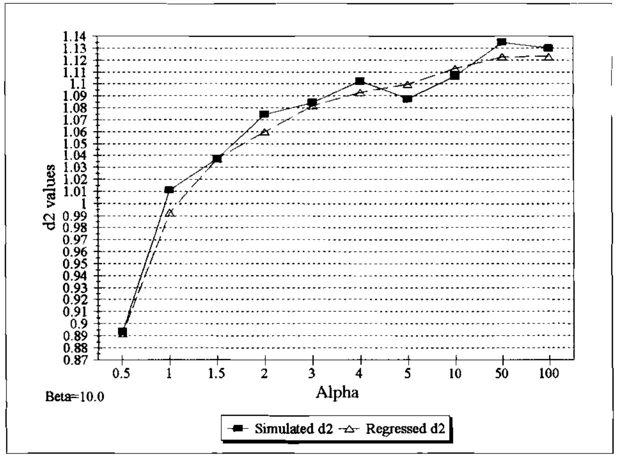
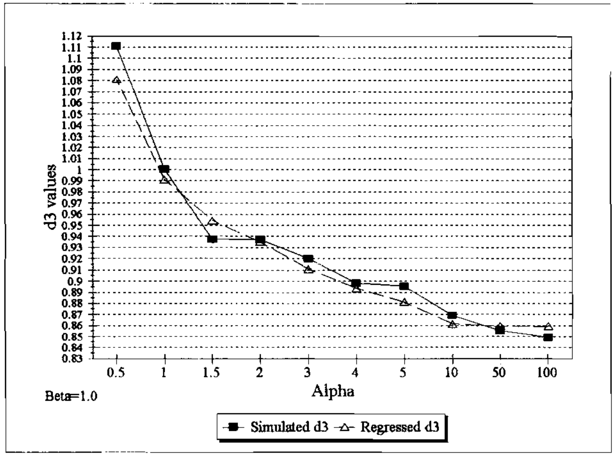
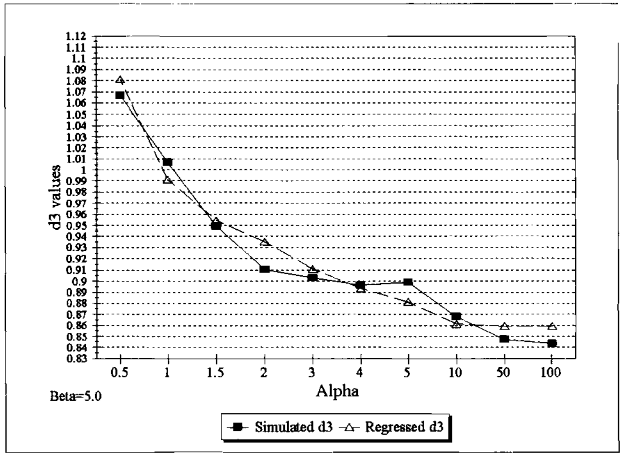
1.13
1.12
1.11
1.1
1.09
1.08
1.07
1.06
1.05
1.04
1.03
1.02
1.01
1
0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
0.89
0.88
0.87
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=0.5
Simulated d2
Regressed d2

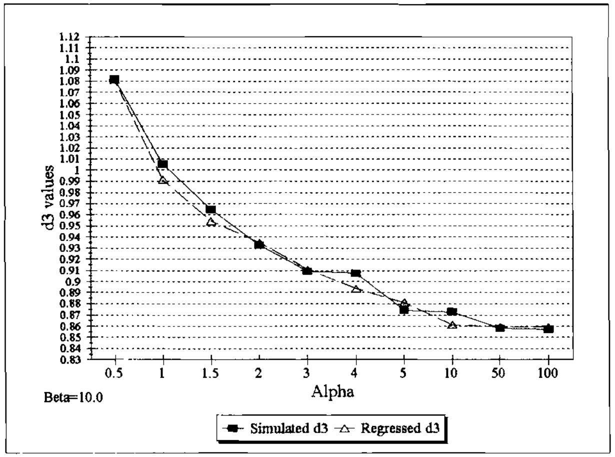

d2 values
1.14
1.13
1.12
1.11
1.1
1.09
1.08
1.07
1.06
1.05
1.04
1.03
1.02
1.01
1
0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
0.89
0.88
0.87
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=1.0
Simulated d2
Regressed d2


d2 values
1.14
1.13
1.12
1.11
1.1
1.09
1.08
1.07
1.06
1.05
1.04
1.03
1.02
1.01
1
0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
0.89
0.88
0.87
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=5.0
Simulated d2
Regressed d2


d2 values
1.14
1.13
1.12
1.11
1.1
1.09
1.08
1.07
1.06
1.05
1.04
1.03
1.02
1.01
1
0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
0.89
0.88
0.87
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=10.0
Simulated d2
Regressed d2


1.12
1.11
1.1
1.09
1.08
1.07
1.06
1.05
1.04
1.03
1.02
1.01
1
0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
0.89
0.88
0.87
0.86
0.85
0.84
0.83
d3 values
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=1.0
Simulated d3
Regressed d3


1.12
1.11
1.1
1.09
1.08
1.07
1.06
1.05
1.04
1.03
1.02
1.01
1
0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
0.89
0.88
0.87
0.86
0.85
0.84
0.83
d3 values
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=5.0
Simulated d3
Regressed d3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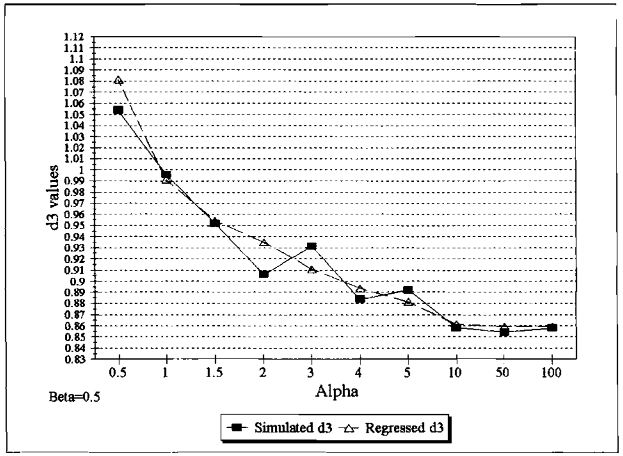
1.11
1.1
1.09
1.08
1.07
1.06
1.05
1.04
1.03
1.02
1.01
1
0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
0.89
0.88
0.87
0.86
0.85
0.84
0.83
d3 values
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=10.0
Simulated d3
Regressed d3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1.08
1.07
1.06
1.05
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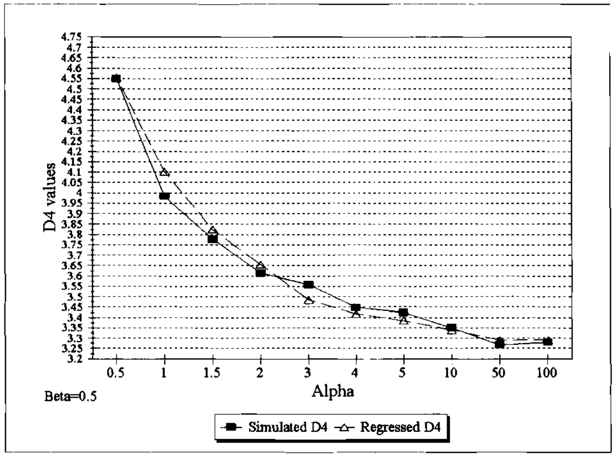
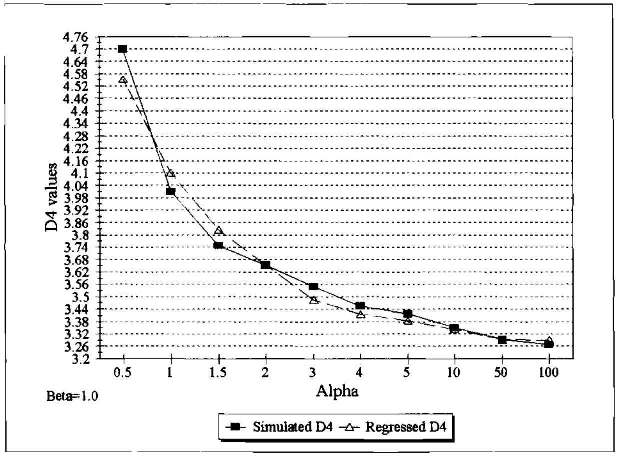
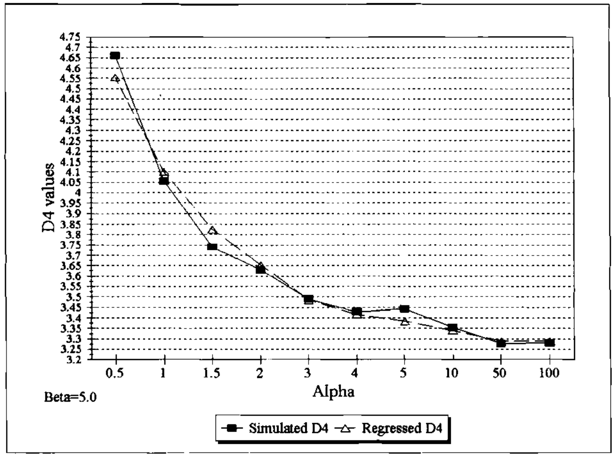
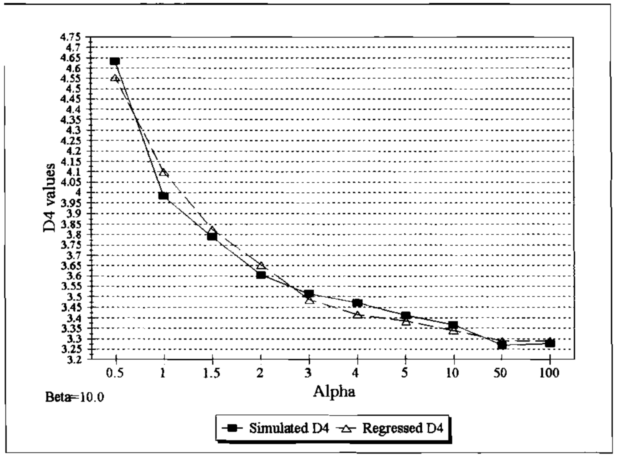
1.03
1.02
1.01
1
0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
0.91
0.9
0.89
0.88
0.87
0.86
0.85
0.84
0.83
d3 values
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=0.5
Simulated d3
Regressed d3


D4 values
4.75
4.7
4.65
4.6
4.55
4.5
4.45
4.4
4.35
4.3
4.25
4.2
4.15
4.1
4.05
4
3.95
3.9
3.85
3.8
3.75
3.7
3.65
3.6
3.55
3.5
3.45
3.4
3.35
3.3
3.25
3.2
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=0.5
Simulated D4
Regressed D4


D4 values
4.76
4.7
4.64
4.58
4.52
4.46
4.4
4.34
4.28
4.22
4.16
4.1
4.04
3.98
3.92
3.86
3.8
3.74
3.68
3.62
3.56
3.5
3.44
3.38
3.32
3.26
3.2
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=1.0
Simulated D4
Regressed D4


D4 values
4.75
4.7
4.65
4.6
4.55
4.5
4.45
4.4
4.35
4.3
4.25
4.2
4.15
4.1
4.05
4
3.95
3.9
3.85
3.8
3.75
3.7
3.65
3.6
3.55
3.5
3.45
3.4
3.35
3.3
3.25
3.2
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=5.0
Simulated D4
Regressed D4


D4 values
4.75
4.7
4.65
4.6
4.55
4.5
4.45
4.4
4.35
4.3
4.25
4.2
4.15
4.1
4.05
4
3.95
3.9
3.85
3.8
3.75
3.7
3.65
3.6
3.55
3.5
3.45
3.4
3.35
3.3
3.25
3.2
0.5
1
1.5
2
3
4
5
10
50
100
Alpha
Beta=10.0
Simulated D4
Regressed D4

APPENDIX I

SPREADSHEETS OBJECTIVE THREE (#3)

OBJECTIVE # 3

LOGNORMAL (0 1*2) k = 10 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			0.90933	0.74235	12.0984	2.02527	5.06459	3.16817	1.6994	0.9574	24.4833	0.43398	1.40347	1.27975	1.9639	4.17241	5.59196	0.58361	3.09531	0.65944	1.01703	0.80704	1.96354	1.21492	0.56108	6.41334	0.15837	0.57395	2.1259	1.84957	0.83218	1.7517	0.92577
			0.06006	0.43557	1.2361	2.26523	0.32492	0.26893	2.43912	0.92663	0.7409	1.49156	1.8035	2.93498	1.262	0.56359	0.51681	0.46921	0.34381	1.24232	0.33269	5.59295	0.16796	1.16542	0.98657	6.29224	1.60659	0.59792	21.7181	0.53782	7.18009	12.2725	5.89475
			0.41314	1.09019	0.7044	0.6239	3.44082	0.94364	0.09601	2.82852	3.2063	2.08928	0.89905	3.79451	3.5208	0.52844	1.95024	1.3152	0.49653	0.34248	0.40732	0.58875	0.46621	1.59664	0.6748	0.42954	1.32822	0.58088	2.7405	0.62831	0.6168	1.9329	0.2426
			0.97985	1.21272	0.5938	0.77835	0.33681	1.06297	1.16242	1.64279	0.3114	0.0946	2.64674	2.82946	1.4358	6.5072	3.07247	1.3503	0.46159	0.31687	1.37288	1.34503	0.48805	1.04896	0.54248	3.9554	7.78834	0.84248	0.6985	0.6648	4.49002	2.2528	0.74748
			0.86798	1.83678	0.8218	0.38281	1.3101	2.68091	0.14609	4.77449	0.3911	2.22557	2.75726	0.72772	0.7661	1.81735	0.54733	2.44167	3.39634	0.31856	0.19546	0.2478	0.65997	0.33875	1.18228	1.07739	1.04672	0.93747	0.4703	2.75667	0.21241	0.7646	1.0955
			0.85231	1.37397	0.5813	0.13227	1.66504	1.54192	0.99491	0.52592	7.8246	0.12034	0.16324	0.92987	4.0795	1.31643	0.21606	0.46992	1.93406	2.20212	0.46392	2.57911	1.56375	0.36816	7.83487	0.66453	1.31582	1.06438	6.1051	3.90629	1.37675	0.6053	0.3767
			0.94625	0.45018	0.7775	0.20096	0.04768	1.30249	2.66456	5.57667	0.8321	3.71546	0.63284	2.57209	0.7486	1.03431	0.70273	0.55993	1.04814	0.49707	0.36445	0.44253	1.96956	2.41293	[illegible]	0.34668	1.25263	1.07977	0.3111	0.29211	2.21115	2.4695	0.62019
			0.59629	0.4371	1.2762	1.20942	0.61854	0.83152	2.24405	0.09086	0.5045	2.45539	2.1704	0.61633	0.1212	0.48486	0.74966	1.35007	0.77186	2.06428	4.03791	0.19709	0.46234	0.57467	1.33979	0.70984	0.80119	2.00046	0.4728	0.34599	0.16701	4.9616	6.63023
			7.56636	0.65176	2.5768	0.05033	1.60896	0.35643	0.0942	0.36018	1.9496	0.69522	6.50499	1.07468	0.1966	1.9159	0.71852	2.66593	0.26002	0.16336	0.34294	2.65745	1.05449	0.71079	0.45451	0.18234	0.92668	0.33692	0.3527	0.9006	0.9659	4.2885	3.22745
			0.73953	1.39088	1.8439	0.41204	3.23952	0.63228	1.05648	1.61143	0.8575	4.03295	7.32444	0.69012	10.2838	1.58663	0.24687	0.13306	0.90923	0.51713	0.54623	0.3177	0.49698	0.49601	1.24114	1.10416	0.33603	1.57501	0.4476	5.06875	0.79532	1.6663	1.2662
Average			1.39351	0.98215	2.25102	0.80806	1.7877	1.27893	1.25972	1.92949	4.11013	1.75544	2.63059	1.74495	2.43805	1.97269	1.43147	1.13389	1.27169	0.83236	0.91009	1.47755	0.92949	0.99273	1.72385	2.11775	1.67606	0.95912	3.54426	1.71449	1.88496	3.31859	2.10269
Moving range average			1.79304	0.45127	1.6335	0.58664	1.90411	0.87906	1.2463	2.50619	5.16369	1.9377	1.43532	1.13607	2.57219	1.93398	1.27995	0.97639	1.07327	0.99117	1.20906	2.35078	0.69467	0.66688	1.81433	1.65854	1.86984	0.48425	5.8495	1.48801	2.69715	3.36438	2.6456
T statistic			1.5933	8.33194	1.82865	1.87225	1.63204	3.6338	1.80913	1.8318	0.95478	1.81612	2.22537	4.76434	1.44318	2.83535	1.91158	3.16841	2.78846	2.9539	2.28864	1.7586	3.90219	5.37372	2.37431	1.51306	2.03159	8.15268	0.91915	2.2775	1.66091	2.76627	1.81617
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0.59158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.57234	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0	0	0	0	0	0	0	0	0	0	0.84945	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.879	0.92752	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8858	0	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0.94766	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.96267	0	0
35	1.7	0.983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.01347	0	0	0	0	0	0	0	0	0	0	0	0
36	1.8	1.035	0	0	1.04961	1.07185	0	0	1.03966	1.05122	0	1.04322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.04325
37	1.9	1.086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.09202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1.138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.15411	0	0	0	0	0	0	0
39	2.1	1.189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	2.2	1.24	0	0	0	0	0	0	0	0	0	0	1.25294	0	0	0	0	0	0	0	1.2852	0	0	0	0	0	0	0	0	1.27953	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3289	0	0	0	0	0	0	0	0	0
42	2.4	1.342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2.5	1.393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.54012	0	0	0	0	0	0	0	0	0	0	0	0	1.5288	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	1.56367	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.62349	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.73221	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3.3	1.799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	2.0679	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.10212	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	2.53617	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.84273	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.2362	0	0	0	0	0
79	8.2	4.26	0	4.32597	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######
Estimator shape parameter			0.92752	4.32597	1.04961	1.07185	0.94766	2.0879	1.03966	1.05122	0.59158	1.04322	1.25294	2.53617	0.84945	1.56367	1.09202	1.73221	1.54012	1.62349	1.2852	1.01347	2.10212	2.84273	1.3289	0.8858	1.15411	4.2362	0.57234	1.27953	0.96267	1.5288	1.04325
Estimator scale parameter			1.50241	0.22704	2.14462	0.75389	1.86643	0.61847	1.21167	1.63548	6.94771	1.68271	2.09954	0.68803	2.87015	1.26157	1.31084	0.65459	0.82571	0.5127	0.70613	1.4579	0.44217	0.34922	1.2972	2.39077	1.45227	0.22841	6.19256	1.33994	1.95805	2.17072	2.01552
Control chart constant d2			0.98274	1.09535	0.99677	1.00137	0.98561	1.06209	0.99758	0.99696	0.91717	0.99601	1.01945	1.07375	0.97067	1.04113	1.00364	1.04958	1.0398	1.04434	1.02218	0.99436	1.06313	1.07927	1.02587	0.97649	1.01021	1.09467	0.91213	1.02171	0.98769	1.03914	0.99801
Control chart constant d3			0.99967	0.88908	0.98618	0.98402	0.99723	0.93306	0.98717	0.98802	1.05764	0.98681	0.96914	0.92085	1.01001	0.9514	0.98213	0.9443	0.95251	0.94873	0.96691	0.98987	0.93206	0.91404	0.98407	1.00501	0.97671	0.89026	1.06226	0.9673	0.99547	0.95305	0.98681
Control chart constant D4			4.1542	3.40314	4.06765	4.05296	4.13919	3.63741	4.07432	4.08658	4.45387	4.07193	3.94468	3.54388	4.21525	3.79827	4.03994	3.73557	3.80787	3.77483	3.92733	4.09219	3.62906	3.50158	3.90466	4.18624	4.00139	3.40626	4.47423	3.93034	4.1282	3.81257	4.07191
Upper contro limit X			6.86709	2.21812	7.15754	2.58558	7.58341	3.76193	5.00768	9.45587	21.0001	7.58013	6.85442	4.81906	10.3678	7.5454	6.25739	3.92467	4.36827	3.67962	4.45858	8.56993	2.88975	2.84644	7.03061	7.21316	7.22892	2.28622	22.7833	6.06368	10.6847	13.0318	10.0553
Lower control limit X			-4.08007	-0.25382	-2.6555	-0.94946	-4.00801	-1.20408	-2.48823	-5.59889	-12.7799	-4.06926	-1.59324	-1.42916	-8.51166	-3.60001	-2.39445	-1.65689	-1.82489	-2.01489	-2.63641	-5.61484	-1.03078	-0.86099	-3.58291	-2.97767	-3.87676	-0.36797	-15.6947	-2.65469	-6.91481	-6.39436	-6.8499
Upper control limit MR			7.44867	1.53574	6.64451	2.37764	7.88149	3.19751	5.07782	10.1916	22.9984	7.89018	5.6619	4.02608	10.6424	7.34575	5.17093	3.64736	4.08688	3.7415	4.74638	9.61987	2.52102	2.33515	7.08438	6.94305	7.48196	1.64947	26.172	5.84836	11.96	12.8269	10.7726
Normal upper control limit X			6.16225	2.18234	6.59543	2.36827	6.85183	3.61665	4.57435	8.5949	17.8433	6.9089	6.44794	4.7664	9.27896	7.11624	4.8356	3.73067	4.12614	3.46845	4.12566	7.72963	2.77701	2.76635	6.54919	6.52876	6.64907	2.24701	19.1014	5.67196	9.59016	12.2664	9.13885
Normal lower control limit X			-3.37523	-0.21804	-2.09339	-0.75216	-3.27643	-1.059	-2.0549	-4.73592	-9.62309	-3.39803	-1.18676	-1.2765	-4.40288	-3.17086	-1.97266	-1.46289	-1.58275	-1.80373	-2.30651	-4.77454	-0.91804	-0.7809	-3.10149	-2.29326	-3.29691	-0.32877	-12.0129	-2.24297	-5.82023	-5.62922	-4.93348
Normal upper control limit MR			5.85967	1.47476	5.33628	1.91714	6.22264	2.87277	4.0729	8.19024	16.8749	6.33241	4.69084	3.71266	8.40591	6.32023	4.18288	3.19084	3.50745	3.23914	3.95122	7.68236	2.27019	2.17937	5.92923	5.42011	6.11065	1.58252	19.1162	4.86281	9.4679	10.9948	8.64582

OBJECTIVE # 3

Lognormal (0 1^2)

k = 10 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	0.39900	1.08479	0.20246	0.54569	1.28190	1.43632	1.60850	1.46830	0.75230	0.43878	0.57873	2.98142	1.00308	0.28226	1.63230	0.91054	0.29900	3.84874	2.24579	0.36815	0.78740	1.81332	0.22520	0.87802	0.88507	0.88244	1.01500	0.20420	0.48512	2.10021	2.48441
			1.18150	2.48763	4.08795	0.44878	8.41420	2.62895	0.87550	0.51686	0.33021	0.88995	0.48158	2.81087	1.08803	4.53271	0.83340	8.98426	0.88880	2.08738	0.25703	0.13152	0.88282	0.80837	0.88480	1.00382	5.61985	0.80357	1.83340	2.42300	1.34848	0.24738	4.24027
			0.74230	0.18629	1.70084	0.36355	0.40510	1.57092	0.81150	1.63838	0.13880	0.53211	2.07890	0.23579	0.48851	5.88887	0.40270	1.88095	0.45770	3.32838	0.40408	0.92017	0.40105	0.50851	1.15580	0.75283	0.18291	0.39877	1.57580	0.28740	2.05888	4.87339	1.42419
			3.45330	1.67967	3.80530	1.78198	0.38020	0.24628	1.74840	0.29781	1.74994	0.54122	5.54485	2.03680	0.98988	5.88898	3.25780	1.28580	0.43850	1.10478	1.40914	0.42801	0.87803	1.58792	3.83750	0.15088	1.88045	1.24548	1.01480	1.12170	0.55478	3.81198	0.37270
			1.14430	2.87576	0.33234	0.61300	0.22400	1.80332	0.55800	1.20884	0.94824	1.44258	0.48257	1.03612	1.05853	0.85104	1.03840	1.00238	13.12880	0.38518	0.80832	0.92951	0.77152	1.13011	0.97280	0.48388	0.37547	0.45841	4.05890	1.23880	1.72147	0.44394	1.10988
			2.52000	0.44349	5.19482	1.88100	1.80050	3.52914	0.32780	8.44585	8.24530	0.49244	1.42383	2.23118	1.70254	1.83180	0.42030	1.48704	8.08780	1.87080	0.37565	0.20873	3.84580	0.78250	2.42410	5.38370	2.73825	1.10082	1.93840	0.88370	3.74240	0.28038	0.88890
			0.83320	2.86578	0.31873	1.32143	1.88120	3.72994	0.24780	0.13592	0.40540	0.42583	2.20758	8.00411	0.38889	2.02278	1.82020	2.88287	0.32080	2.81217	2.01731	0.92080	4.45121	2.35778	3.15210	1.08795	0.28034	0.42390	0.83810	2.54780	0.84880	2.21127	2.78473
			0.88250	1.07198	1.01895	1.41528	0.27780	2.99288	0.58720	0.45724	2.34893	0.43285	4.13705	3.78408	0.88997	0.87240	0.79520	1.47738	1.27410	1.44158	1.20000	2.72431	2.85329	0.83711	0.32350	1.88884	4.82843	0.71830	0.55850	12.07380	0.44784	0.42421	0.88402
			0.10190	1.81573	0.33277	0.47849	0.28870	0.15003	0.78240	0.42512	0.88325	1.37038	0.23454	1.70030	0.32408	2.82373	0.27020	0.86241	1.15030	4.70178	2.07437	0.80441	5.82698	0.38210	0.21880	0.38088	0.14338	1.88475	1.73230	0.41530	2.07777	0.77805	0.80111
		10	4.38020	0.34997	1.29578	0.34575	0.87790	2.11284	2.14580	2.87414	0.88448	7.78963	0.38024	1.10190	0.78512	1.31875	0.16850	5.40835	0.81780	1.80800	0.36280	2.16882	2.20383	3.00072	0.72800	1.17423	8.34814	0.74887	0.21310	2.13250	2.48881	4.75580	1.83520
			2.77700	3.80985	0.82175	0.40871	0.80080	2.58174	1.07170	0.32538	0.88708	0.55541	0.58787	0.24452	1.33138	0.18894	0.71480	1.48480	0.45580	1.45788	0.43122	0.25278	0.41378	2.23852	3.08840	1.13001	0.28811	1.01735	1.44180	0.80830	3.38244	1.00208	4.04855
			0.50750	0.93893	0.50895	0.47507	0.19070	0.78635	1.10080	1.53310	0.49980	5.80809	1.19740	2.24753	0.38843	0.88150	0.35008	2.88218	0.53870	0.27188	1.71898	1.08030	4.41888	3.83447	8.84000	2.15148	1.87040	0.88028	0.58030	0.30400	0.33484	1.81885	0.81080
			5.81520	0.77978	1.28790	3.07858	3.23180	0.44851	0.89810	5.30878	5.85822	0.35194	4.80850	3.61380	0.88451	0.80530	0.83830	0.58249	0.88850	1.42881	0.84807	2.58772	2.31888	1.19774	3.87450	0.28978	1.27835	4.28885	2.84780	0.48470	0.25518	1.38002	2.88485
			1.02060	0.69604	0.80430	3.21995	1.44400	0.86943	1.05810	0.20131	0.34813	3.77617	8.08735	1.51557	0.08189	0.28233	1.08280	2.27146	4.35550	0.88828	2.80297	0.85563	0.23334	0.28357	11.70710	0.45383	1.43758	0.22724	0.70880	0.88230	0.80883	0.58685	0.18300
New observations k =			0.96600	0.08042	0.70908	0.50854	1.88770	0.81879	8.86810	0.09883	1.53456	0.84725	1.81153	2.48712	0.84941	3.08837	5.80130	0.88438	1.30770	2.03398	8.57568	2.72353	0.78021	0.98488	3.14480	1.85780	1.78715	1.83288	32.81400	0.10780	1.38578	3.52731	0.17851
			2.11100	1.38031	0.14985	0.57897	8.19100	0.82142	0.52780	0.45842	0.50591	0.87838	0.88822	2.28318	0.53188	1.24185	0.52010	0.88102	0.51170	0.05113	0.32863	2.32591	0.98117	1.13183	0.38420	0.53858	1.28043	3.37510	0.38130	0.70880	8.11573	1.47488	0.86985
			0.26670	0.94990	0.74815	1.75523	2.29800	1.23853	1.33830	1.38500	0.22198	0.45448	4.10036	0.44085	0.84780	0.48852	3.78510	2.48992	2.75170	0.25831	1.12580	0.48504	1.54453	3.07238	0.80880	8.88435	0.54739	0.85385	0.25700	0.24880	0.78874	0.83301	1.28288
			1.00790	0.35428	0.45302	3.83553	0.84590	1.87821	0.51830	1.32847	0.82615	0.44232	1.34227	0.88330	0.33363	1.74338	1.58480	0.88803	0.40380	0.70037	2.14288	1.27140	0.18802	0.27518	2.84840	1.85107	2.44039	0.59520	0.85380	1.85870	0.24885	2.19414	0.33885
			1.02620	0.18408	1.17813	0.53997	10.58020	0.34214	1.69080	5.83829	0.55388	5.25322	5.17848	3.74715	1.10338	0.98880	26.58090	0.45568	0.88580	6.88548	0.80948	8.52338	0.98484	0.24383	2.83140	1.47732	0.53484	3.85385	1.53270	0.77210	0.55182	0.79880	0.48012
		20	0.99840	2.17830	0.33351	2.42458	3.01130	1.07517	0.80340	1.24383	0.83405	0.38703	2.57228	1.88988	1.57435	0.88815	0.53800	0.61571	4.75470	1.54244	2.11383	2.82510	1.31898	0.48040	0.48580	1.03247	0.20475	0.78123	0.42880	0.23880	1.11838	0.42494	0.80837
			5.27120	3.01599	0.88741	1.19831	0.31798	0.18179	0.34810	0.08823	0.73850	0.75188	0.51148	2.02818	2.85100	1.58508	1.03070	0.88819	0.54920	2.45838	5.88787	1.17854	0.75328	0.23187	8.88340	0.45217	0.48887	0.58088	0.38180	1.71730	1.07301	0.24791	0.85004
			0.09210	0.46835	0.74434	0.49838	2.02340	0.31877	0.81340	2.08470	1.20110	4.37834	1.08114	0.71707	2.31354	0.88498	0.41400	0.42084	3.10840	1.13898	1.88720	1.00305	0.80237	0.20284	8.43770	0.31881	0.54188	1.03858	0.30850	2.47770	2.82555	7.22984	0.87342
			2.90080	0.83570	0.39837	0.35880	0.86170	0.82734	0.83170	0.12798	1.58488	1.33532	0.47802	0.28055	0.52502	0.81824	0.88310	1.13213	2.78850	2.02420	1.18841	0.31221	0.38012	0.54218	1.81350	0.81453	3.18843	1.20798	0.75480	1.24580	0.28850	0.30194	2.84772
			0.77740	0.28833	0.88962	1.32988	1.29230	0.12575	1.06200	1.75458	0.44002	0.88108	0.98001	0.38318	2.38084	7.01843	4.02850	1.73895	0.52120	2.05122	2.08517	0.24521	0.44028	0.34085	2.48090	0.83433	2.20888	0.88418	0.78580	1.18830	0.30523	0.87512	0.89858
			14.43110	1.88819	0.59318	1.21727	1.78420	0.87241	2.17830	2.10078	1.25355	0.82714	0.58885	1.33238	1.34705	1.81873	7.64050	0.38048	0.28580	0.58783	2.83480	2.27482	2.78244	3.82138	1.01870	1.88220	0.83008	1.40587	1.38280	3.52450	0.18844	0.59587	0.12718
			0.16200	0.30887	0.18558	0.58570	0.44870	0.93105	15.89810	1.30847	0.37071	1.38884	4.24158	0.78831	0.24178	3.45541	0.61300	0.12173	4.42880	1.78000	2.23112	0.12122	0.17747	0.32585	2.38470	1.81081	0.85857	1.54801	0.77880	1.23480	1.49221	0.77718	0.27844
			2.78710	0.73885	0.38987	0.18831	0.37830	2.44858	3.48570	0.28880	1.42862	0.27455	0.74758	0.58572	0.72587	0.45254	2.12480	3.88815	8.10170	0.15204	0.71534	1.43772	0.58803	0.58782	0.49080	0.38284	0.73382	0.88888	0.13480	2.88350	1.33338	1.50305	0.42878
			0.54580	0.15148	0.55482	1.27882	0.41330	0.24942	0.82980	0.79448	3.88823	3.11348	0.84415	0.48288	2.38245	8.17588	2.29000	1.38840	0.24080	1.83448	0.94437	1.81238	3.80128	8.38314	1.33080	4.53127	3.00084	0.47372	3.10240	1.81250	0.88845	0.34185	0.19474
			1.65720	0.95478	0.25857	1.32888	3.87810	2.40938	0.82820	0.84193	0.38821	0.41421	0.81451	2.22890	0.88885	2.15848	1.75730	0.43288	1.14230	1.42505	0.08573	1.88833	0.23811	0.73584	1.58220	0.38583	0.58854	2.78415	0.53880	2.88800	0.87545	2.30828	0.88938
		30	1.13840	2.47143	0.81284	0.18564	1.59590	2.21112	0.88680	3.40833	1.08838	0.31448	1.38338	0.52251	0.41488	0.27480	0.78780	0.48778	0.20880	5.81810	1.48288	3.32828	0.35401	0.83801	0.11930	0.05314	1.18881	0.84841	0.31380	4.82800	0.22780	3.88894	1.78557
Estimator shape parameter			0.927517	4.32597	1.04981	1.071846	0.947863	2.0879	1.038856	1.051217	0.501581	1.043222	1.252837	2.536188	0.849451	1.563874	1.09202	1.732207	1.540124	1.623491	1.285204	1.013472	2.102118	2.842727	1.329999	0.885802	1.154109	4.236202	0.572341	1.278528	0.982875	1.528798	1.043247
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.50241	0.227038	2.144824	0.753894	1.886428	0.618488	1.211874	1.835484	0.947708	1.882708	2.099541	0.888027	2.870147	1.281575	1.310843	0.854593	0.825707	0.512899	0.708125	1.457805	0.442188	0.349218	1.297202	2.380787	1.452271	0.228411	6.192583	1.338842	1.958047	2.170718	2.015521
Control chart constant d2			0.982745	1.095348	0.998773	1.001387	0.985814	1.062094	0.987582	0.998864	0.917173	0.998011	1.019447	1.073748	0.870873	1.041133	1.003843	1.049584	1.030798	1.044344	1.022178	0.994355	1.083131	1.078285	1.02587	0.97849	1.01021	1.094874	0.912131	1.021705	0.987092	1.03914	0.998014
Control chart constant d3			0.999668	0.89908	0.988175	0.984017	0.987231	0.933061	0.987188	0.998017	1.057838	0.988811	0.98814	0.820849	1.010011	0.951404	0.98213	0.944301	0.952598	0.948732	0.988813	0.989887	0.832083	0.814043	0.984085	1.005006	0.978709	0.998284	1.082258	0.987287	0.985473	0.95305	0.988808
Control chart constant D4			4.154202	3.40314	4.087849	4.052975	4.138184	3.837414	4.074323	4.088578	4.453887	4.071825	3.944884	3.543883	4.215254	3.788288	4.038837	3.735568	3.807874	3.774828	3.827328	4.002194	3.629078	3.50158	3.984883	4.188241	4.001381	3.408282	4.474227	3.930342	4.128203	3.812574	4.071908
Upper contro limit X			6.867081	2.21812	7.15754	2.585578	7.583408	3.761929	5.007881	9.495875	21.00014	7.580133	6.854422	4.819082	10.38778	7.545387	5.257387	3.824874	4.388288	3.878815	4.45858	8.508835	2.888745	2.84644	7.030812	7.213158	7.228819	2.288222	22.78327	6.083878	10.88473	13.03158	10.05528
Lower control limit X			-4.08007	-0.25382	-2.8555	-0.84948	-4.00801	-1.20408	-2.48823	-5.59889	-12.7799	-4.00828	-1.50324	-1.42816	-5.51186	-3.80001	-2.38445	-1.05888	-1.82488	-2.01488	-2.63841	-5.61484	-1.03078	-0.88099	-3.58281	-2.97787	-3.87878	-0.38797	-15.8847	-2.85488	-8.81481	-8.39438	-5.84991
Upper control limit MR			7.448889	1.635743	6.844505	2.377642	7.88149	3.18751	5.07782	10.18184	22.98838	7.880183	5.881897	4.028083	10.84243	7.345753	5.170928	3.847384	4.088881	3.741488	4.748384	8.819885	2.521015	2.335145	7.084378	6.943048	7.481878	1.849471	26.17189	5.848378	11.98004	12.82894	10.77284
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	1	0	0	1	1	0	0	1	0	0	1	0	0	0
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	1	0	0	0	0	0	0	0	1	0	1	1	1	0	1	1	1	0	0	1	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	1	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1	1	1	0	1	1	1	0	0	1	0	0	0	0	0
Total false alarm in X			1	1	0	1	1	0	1	0	0	1	0	1	0	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	1	0	1	0	0	0	0	0	0	0	1	1	0	1	1	0	1	1	1	0	1	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	0	0	1	1	1	0	0	1	0	0	0	0	0
Total false alarm in MR			1	1	0	1	1	0	1	0	0	0	1	1	0	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							164																										
Sub-total MR control charts with at least one false alarm k 30 =							159																										
Normal upper control limit X			6.182245	2.182342	6.585435	2.388274	6.851828	3.618854	4.574348	8.584902	17.84335	6.908901	6.447842	4.788402	8.278878	7.118244	4.835595	3.730888	4.128135	3.488453	4.125878	7.729831	2.777015	2.786351	6.548193	6.528757	6.64907	2.247014	19.10144	5.671858	9.590158	12.2884	9.138854
Normal lower control limit X			-3.37523	-0.21804	-2.08338	-0.75218	-3.27843	-1.058	-2.0548	-4.73592	-8.62308	-3.30803	-1.18878	-1.2785	-4.40298	-3.17088	-1.97288	-1.46288	-1.58275	-1.80373	-2.30551	-4.77454	-0.81804	-0.7808	-3.10149	-2.29328	-3.20891	-0.32877	-12.0128	-2.24287	-5.82023	-5.82922	-4.93348
Normal upper control limit MR			5.858889	1.474758	5.338278	1.817143	6.222838	2.872772	4.072901	8.180243	18.87494	6.332414	4.880837	3.712662	8.405913	6.320232	4.182884	3.180835	3.50745	3.238144	3.951215	7.882364	2.270185	2.178375	5.929227	5.420109	6.110852	1.582518	19.11817	4.862808	8.487897	10.99479	8.845817
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	1	1	1	0	0	1	1	0	0	1	0	0	1	0	0	0
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	1	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	0	1	1	1	0	0	1	0	0	0	0	0
Total false alarm in X			1	1	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	1	0	1	1	1	1	0	0	1	1	1	0	0	1	1	0	0	1	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	1	0	1	0	0	1	0	0	0	0	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	0	1	1	1	0	0	1	0	0	0	0	0
Total false alarm in MR			1	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							180																										
Sub-total MR control charts with at least one false alarm k 30 =							180																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							12																										
Sub-total MR control charts with at least one false alarm k 1 =							13																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							14																										
Sub-total MR control charts with at least one false alarm k 1 =							20																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	1	0	0	1	1	0	0	1	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							97																										
Sub-total MR control charts with at least one false alarm k 10 =							88																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	1	1	1	0	0	1	1	0	0	1	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	1	0	1	1	1	1	0	0	1	1	1	0	0	1	1	0	0	1	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							106																										
Sub-total MR control charts with at least one false alarm k 10 =							111																										

OBJECTIVE # 3

Lognormal (0, 1^2)   k = 10 obs   Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	5.38058	2.62009	4.28832	11.18130	14.42380	2.83358	2.44987	2.51873	2.27273	4.20537	7.87845	2.48937	3.98084	2.81320	4.48480	8.08551	5.88850	3.78127	3.33250	3.39291	2.88910	7.84428	8.88800	2.81387	3.38580	2.79820	11.12380	2.83880	2.44740	2.88389	4.88000
			3.34577	3.33891	4.13858	4.18880	3.18710	2.38234	2.81205	2.81844	2.58335	2.36138	4.32818	8.18333	3.43208	8.00880	3.11280	6.51452	3.28050	3.47349	15.77750	5.85221	2.47150	2.27580	5.85980	2.48378	2.88000	3.55000	4.18310	2.79830	4.07380	3.30295	2.68310
			2.84873	2.81194	5.85703	3.84710	2.53800	2.28417	2.80958	8.18808	4.20747	3.48138	2.58308	4.88291	2.81518	2.88130	2.83880	2.48323	2.34480	8.38800	2.30830	2.99442	2.43880	3.13155	8.40580	2.48725	2.54050	8.51880	2.21380	2.75800	3.25880	4.50442	2.81850
			2.54049	3.28921	3.70077	3.00570	2.58480	5.47775	2.58131	2.48778	3.95121	8.14225	2.38801	8.41831	3.70828	2.42310	2.83450	4.90110	2.53810	2.97835	2.87470	2.48053	5.23340	4.08388	3.82820	3.34819	3.18880	5.52130	3.58120	2.55580	3.15300	8.87046	2.57740
			4.02787	2.71213	3.88199	2.91800	4.84180	2.44574	3.22885	3.08579	2.42438	3.13850	3.88383	3.87191	7.55371	3.88870	15.29800	2.45098	4.83010	2.73082	3.01500	2.35934	2.85880	7.38712	2.23290	2.79503	3.88510	5.12240	2.41140	3.80740	3.61880	3.88615	5.80620
			3.04343	2.38378	2.82048	3.08340	2.44840	3.84848	3.85480	3.07131	4.58318	4.05721	4.84501	2.81921	3.88532	7.15810	5.39000	2.57448	4.07700	3.42548	3.83040	4.83190	2.52740	3.87015	2.48450	2.94588	2.74470	3.05820	8.12350	2.85820	2.88520	2.70552	2.84980
			2.80282	3.58588	3.88408	8.35880	3.03800	2.84047	3.77754	2.88074	2.82128	2.24048	2.43502	2.83784	4.10320	2.81730	2.77300	2.58203	20.22340	2.81538	3.82170	2.26325	3.30820	2.88407	2.58290	2.77707	5.58850	4.23870	5.42870	5.58150	2.85830	2.31713	3.08580
			3.83388	2.32277	4.34987	2.45840	5.52780	2.38595	2.78817	3.83775	3.74510	2.88845	4.78872	2.98254	4.34044	4.78580	2.55220	5.12772	2.73800	2.93012	8.43240	5.03834	22.98880	2.88878	2.44450	3.49855	3.84240	3.88830	4.88480	2.42780	20.31280	4.38180	4.78510
			2.78448	4.13507	4.88832	4.80020	3.24800	2.38585	2.48254	4.42828	2.34424	2.98533	3.87885	2.71854	3.11880	2.45580	2.83180	2.35081	2.88800	2.80580	2.88290	8.80813	3.98410	2.72448	2.78480	2.35721	2.54980	3.82140	2.82250	3.28420	2.58170	2.89258	2.32980
		10	3.82089	3.57275	4.14104	3.48480	3.88850	3.58017	5.42503	3.12818	4.02018	2.78738	5.58837	3.01538	8.83523	2.22410	2.72880	4.08528	2.78180	8.33881	4.05880	3.89555	2.88180	2.75381	4.28480	4.84112	3.52320	2.77420	4.74800	3.27370	2.88920	7.89284	3.88880
			3.87481	4.58300	8.72818	3.22530	2.58870	2.77778	4.52580	2.88884	2.23178	4.24888	2.85707	3.80197	2.87423	2.34710	2.82750	2.81512	3.12280	2.43550	3.78500	4.04481	3.80810	3.72202	3.54050	4.77415	2.24090	3.23700	5.28840	2.58290	2.32080	3.91512	2.81180
			3.07823	2.38822	3.38340	2.73070	3.01470	8.82885	2.85877	2.53038	2.83248	4.57585	2.50562	3.88590	8.29563	3.28840	2.45580	2.31881	2.83820	4.23788	8.37830	2.87338	2.95380	2.83538	2.72070	2.54288	2.88470	5.87820	4.12880	8.81480	2.83230	3.43733	3.05580
			3.30022	2.80070	3.84152	2.52180	4.83980	2.58884	2.48804	5.40431	2.50729	3.40183	2.73885	2.58481	2.58528	4.88840	2.71080	4.52751	4.00890	8.58435	2.31100	3.88342	3.50980	2.43008	4.88400	2.70473	2.52880	2.78880	2.45200	3.58870	3.85410	2.27832	2.87880
			2.98148	3.48531	2.94825	3.01200	3.00300	5.30878	2.83208	2.88085	3.84548	3.13888	3.01337	2.44884	8.13838	4.70770	2.72830	3.50398	2.48180	4.13027	2.27830	7.07285	3.08110	7.01391	3.73350	2.31008	2.77800	7.42040	2.19800	7.18580	3.98250	8.87855	3.21820
New observations k =			3.41448	3.32478	2.70848	18.23740	3.98310	8.18515	3.52328	2.56200	2.88242	3.48827	3.20208	2.48738	3.43598	12.73830	2.88280	3.38891	2.51710	4.88822	12.80210	2.73721	5.50310	4.85830	3.93820	8.05087	2.74210	2.58250	2.58830	2.72050	3.50310	8.45028	2.88490
			2.82080	2.74024	2.58254	3.01410	8.78210	3.72882	4.43530	2.84885	7.84842	2.23788	2.38230	2.88137	3.55387	8.77780	2.51540	3.15572	2.87580	2.42380	7.83710	5.05783	3.33520	2.88783	4.54780	2.81814	3.87870	2.82830	3.24870	2.71870	4.04540	3.81118	2.84220
			2.87871	4.43354	3.35883	3.82280	4.48300	8.45248	3.47888	3.15438	2.50883	4.51812	2.57030	3.43018	6.00454	3.35720	4.34210	7.27583	2.88100	3.18283	3.83470	5.38810	5.14720	2.78880	2.70830	3.71151	3.57050	2.38980	5.98120	2.84400	4.88880	3.32503	3.58990
			5.02488	2.49837	2.73532	2.83800	2.50880	2.48245	2.52987	3.33358	2.42788	3.98038	4.00281	3.84112	8.02108	3.20850	4.88220	2.27880	2.78810	4.57118	3.01810	2.38235	3.02140	4.75212	4.80550	2.82888	7.84810	2.98320	5.74870	2.38770	4.38810	3.58948	14.95940
			2.91598	2.78874	6.35411	8.73270	3.00200	2.88858	2.35280	3.87113	3.53780	3.38880	2.52083	2.83271	8.83170	6.54980	2.45810	2.45884	3.27400	5.21840	2.38480	5.55752	2.28480	2.85735	3.88890	8.83088	3.72380	5.12090	3.88450	6.08810	5.83210	3.77558	3.43950
		20	3.91540	3.33738	2.87508	2.83350	3.21120	3.58583	2.78700	2.44212	7.75088	3.33854	3.88172	2.77088	2.40750	2.83550	3.88880	3.15800	12.88570	7.77185	2.58830	2.47855	2.55800	2.88832	4.01840	8.43725	2.42810	3.88570	4.18150	3.18430	2.70880	2.58307	2.85520
			2.51429	3.51215	2.35375	2.88220	4.48210	3.07587	8.72282	2.85045	4.50283	2.28107	3.70880	2.48825	2.43842	3.84580	5.84810	4.88270	3.71820	3.70142	6.37220	2.48443	4.07320	2.79802	3.15480	3.03888	3.84170	2.85720	2.38200	8.10850	2.28880	3.24721	12.82480
			5.84202	2.54108	2.32288	5.52870	6.72880	2.58873	3.08745	2.83782	2.38420	3.87858	4.30418	7.38881	4.38784	3.03570	2.83750	4.73807	2.74130	3.08158	2.54880	4.37770	3.82230	2.70833	3.38420	2.48274	2.38880	2.55520	2.38440	2.78080	2.84400	3.03881	8.71850
			2.44020	2.85878	4.83885	2.72120	8.34740	4.33138	2.78114	2.88588	2.51252	2.37533	6.88018	2.81442	2.58887	2.87590	4.81210	3.20073	2.31840	3.80335	3.02010	3.81323	2.77180	2.48824	2.35440	2.78844	13.59580	3.28830	3.88080	38.70800	2.84080	5.47880	2.81240
			2.87233	8.44771	4.87288	2.25400	2.83050	3.88898	3.23880	4.38183	5.81140	2.94885	2.88727	3.10884	2.73284	7.73750	2.38320	4.04251	3.01830	3.37081	3.02150	2.38252	2.41780	3.48187	2.84810	4.34332	2.74800	3.79400	18.84870	2.78820	3.85880	4.50861	3.18240
			2.40861	3.28886	4.50386	13.01830	3.83150	3.85044	4.15215	4.08832	4.50782	4.88730	2.88877	2.98874	2.31383	10.38810	3.75130	2.88842	3.74410	5.13870	3.23300	4.72448	2.92340	3.03740	14.29290	5.18014	2.88210	2.72400	2.57880	3.70810	4.40570	2.88138	2.58890
			3.05888	3.23283	4.54728	3.01300	2.23530	2.57782	2.88722	5.54858	2.32551	3.88588	2.84211	5.87418	2.45551	5.38250	5.21740	2.45823	2.87880	4.84758	3.13480	2.70388	3.88810	3.17804	3.37520	3.71727	2.58870	2.43300	2.45850	2.88230	3.72100	5.17788	3.20580
			8.13757	3.88517	3.14886	2.52320	2.38340	2.88392	2.38017	5.38383	3.03510	3.33880	2.93777	3.48754	3.23241	3.81730	3.32400	3.53882	3.48730	2.57342	3.08820	5.22057	8.37580	2.88022	8.14820	3.70585	13.30580	2.78480	3.48850	5.08870	2.85480	2.85809	2.78880
			2.22508	3.14417	4.28808	3.17500	2.84230	3.78807	2.38357	3.34844	3.58874	4.94818	3.30840	5.58808	2.88950	2.39240	4.14320	8.28108	2.88710	3.30408	2.88180	3.18151	28.11800	4.42748	2.40510	3.29583	2.87810	10.71420	2.52370	4.48210	4.88280	6.53054	4.48100
			3.08812	8.88138	2.85418	3.85580	2.77820	2.58827	2.78384	4.12151	4.41131	3.44832	2.98808	2.82528	3.93807	3.04700	3.38580	2.74857	2.31140	8.33525	4.10580	5.93241	3.57080	8.58818	3.58080	3.42508	3.08130	2.88880	2.88730	3.05490	2.32780	5.04733	2.90240
		30	3.84382	2.28158	3.01248	3.72380	3.01420	3.95788	3.18878	2.88888	5.24871	3.20185	2.82738	2.84780	3.72858	8.57430	2.42020	2.72031	2.73450	2.48328	8.85520	3.98851	2.58420	3.88543	2.70580	2.33218	3.88380	13.20180	2.41220	20.88300	3.72130	5.77170	3.73450
Estimator shape parameter			0.927517	4.32597	1.04981	1.071948	0.947663	2.0679	1.039858	1.051217	0.591581	1.043222	1.252837	2.538188	0.848451	1.583874	1.08202	1.732207	1.540124	1.823481	1.285204	1.013472	2.102118	2.842727	1.328888	0.885802	1.154108	4.238202	0.572341	1.278528	0.882875	1.528788	1.043247
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.50241	0.227038	2.144824	0.753884	1.886428	0.818488	1.211874	1.835484	0.947708	1.882708	2.888541	0.888027	2.870147	1.281575	1.310843	0.854583	0.825707	0.512888	0.708125	1.457805	0.442108	0.348218	1.287202	2.380787	1.452271	0.228411	0.182583	1.338842	1.958047	2.170718	2.015521
Control chart constant d2			0.982745	1.085348	0.888773	1.001387	0.985814	1.082084	0.887582	0.888884	0.917173	0.888011	1.018447	1.073748	0.870873	1.041133	1.003843	1.048584	1.038788	1.044344	1.022178	0.884355	1.083131	1.078285	1.02587	0.87849	1.01021	1.084874	0.812131	1.021705	0.887882	1.03814	0.988014
Control chart constant d3			0.999888	0.88908	0.988175	0.984017	0.887231	0.833081	0.987188	0.888017	1.057838	0.888011	0.98814	0.820848	1.010011	0.851404	0.98213	0.944301	0.952508	0.848732	0.888813	0.888887	0.832083	0.814043	0.884085	1.005008	0.878708	0.880284	1.082258	0.887287	0.885473	0.95305	0.988808
Control chart constant D4			4.154202	3.40314	4.087849	4.052875	4.138194	3.837414	4.074323	4.088579	4.453887	4.071825	3.844884	3.543883	4.215254	3.788288	4.039837	3.735588	3.807874	3.774828	3.827328	4.082194	3.828078	3.50158	3.984883	4.188241	4.001381	3.408282	4.474227	3.930342	4.128203	3.812574	4.071908
Upper contro limit X			8.887081	2.21812	7.15754	2.585578	7.583408	3.781828	5.007881	8.455875	21.00014	7.580133	8.854422	4.818082	10.38778	7.545387	5.257387	3.824874	4.388288	3.878815	4.45858	8.588935	2.888745	2.84844	7.030812	7.213158	7.228818	2.288222	22.78327	8.883878	10.88473	13.03158	10.05528
Lower control limit X			-4.08007	-0.25382	-2.8555	-0.84848	-4.00801	-1.20408	-2.48823	-5.58889	-12.7788	-4.08828	-1.58324	-1.42818	-5.51188	-3.80001	-2.38445	-1.85888	-1.82488	-2.01488	-2.83841	-5.81484	-1.03078	-0.88888	-3.58281	-2.87787	-3.87878	-0.38787	-15.8847	-2.85488	-8.81481	-8.38438	-5.84881
Upper control limit MR			7.448888	1.535743	8.844505	2.377842	7.88149	3.19751	5.07782	10.18184	22.88838	7.890183	5.881897	4.028883	10.84243	7.345753	5.170828	3.847384	4.088881	3.741498	4.748384	8.818885	2.521015	2.335145	7.084378	8.843048	7.481878	1.848471	28.17188	5.848378	11.88004	12.82884	10.77284
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	0	0	1	0	0	1	0	0
False alarm in X? (Y=1/N=0)			0	1	1	1	0	1	0	0	0	0	0	0	0	1	0	1	1	1	1	0	1	1	0	1	1	1	0	1	0	0	1
False alarm in X? (Y=1/N=0)			0	1	0	1	0	1	1	0	0	0	0	1	0	1	1	1	0	1	1	0	1	1	1	0	1	1	0	1	0	0	1
Total false alarm in X			0	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	1	0	0	0	0	0	0	1	0	0	1	1	1	0	1	0	1	1	1	0	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0	0	0	0	1	0	1	1	1	1	0	0	1	0	0	0	1	0	1	0	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	0	1	1	1	0	1	1	0	1	0	0	0
Total false alarm in MR			0	1	0	1	1	1	0	0	0	0	0	1	0	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	1	0	1
Sub-total X control charts with at least one false alarm k 30 =							190																										
Sub-total MR control charts with at least one false alarm k 30 =							146																										
Normal upper control limit X			8.182245	2.182342	8.585435	2.388274	8.851828	3.818854	4.574348	8.584802	17.84335	8.808801	8.447842	4.768402	8.278878	7.118244	4.835585	3.730888	4.128135	3.488453	4.125878	7.728831	2.777015	2.788351	8.549183	8.528757	8.84907	2.247014	19.10144	5.871958	9.580158	12.2884	9.138854
Normal lower control limit X			-3.37523	-0.21804	-2.08338	-0.75218	-3.27843	-1.059	-2.0549	-4.73592	-8.82308	-3.38803	-1.18878	-1.2785	-4.40288	-3.17088	-1.87288	-1.48288	-1.58275	-1.80373	-2.30551	-4.77454	-0.91804	-0.7808	-3.10149	-2.28328	-3.28881	-0.32877	-12.0128	-2.24287	-5.82023	-5.82822	-4.83348
Normal upper control limit MR			5.858888	1.474758	8.338278	1.817143	8.222838	2.872772	4.072801	8.190243	16.87494	8.332414	4.890837	3.712882	8.405813	8.320232	4.182884	3.180835	3.50745	3.238144	3.851215	7.882384	2.270185	2.178375	5.828227	5.420108	8.110852	1.582518	19.11817	4.882808	9.487887	10.88478	8.845817
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	0	0	1	0	0	1	0	0
False alarm in X? (Y=1/N=0)			0	1	1	1	0	1	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	0	1
False alarm in X? (Y=1/N=0)			0	1	0	1	0	1	1	0	0	0	1	1	0	1	1	1	0	1	1	0	1	1	1	0	1	1	0	1	0	0	1
Total false alarm in X			0	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	1	1	0	0	0	0	0	1	0	0	1	1	1	1	1	0	1	1	1	0	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	1	1	0	1	0	0	0	0	0	0	0	1	0	1	1	1	1	0	1	1	0	1	0	1	0	1	0	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	1	1	1	0	0	1	1	1	1	1	1	0	1	0	0	1
Total false alarm in MR			0	1	1	1	1	1	0	0	0	0	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	0	1
Sub-total X control charts with at least one false alarm k 30 =							204																										
Sub-total MR control charts with at least one false alarm k 30 =							185																										
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							60																										
Sub-total MR control charts with at least one false alarm k 1 =							45																										
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							64																										
Sub-total MR control charts with at least one false alarm k 1 =							55																										
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	0	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	1	0	0	0	0	0	0	1	0	0	1	1	1	0	1	0	1	1	1	0	0	1	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							151																										
Sub-total MR control charts with at least one false alarm k 10 =							101																										
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	0	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	1	1	0	0	0	0	0	1	0	0	1	1	1	1	1	0	1	1	1	0	0	1	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							181																										
Sub-total MR control charts with at least one false alarm k 10 =							117																										

OBJECTIVE # 3

Lognormal (0, 1^2) k = 10 obs Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	6.10077	5.01524	6.36590	4.57569	9.00719	5.54859	4.49000	5.00315	6.27027	9.73033	6.40565	5.53063	4.80179	5.19158	6.06049	4.77214	14.68790	10.17487	6.65186	5.09538	6.03010	4.81348	6.13850	8.64017	4.87254	5.38210	14.36300	4.40819	7.08725	5.14347	4.98739
			4.45770	5.05277	4.05020	4.00900	5.02560	7.53559	5.57110	5.30036	7.00053	4.38200	5.45424	5.45242	7.53267	4.00065	4.72900	5.25090	4.40480	7.30193	7.08861	5.45432	4.77573	6.18080	5.05489	8.20894	4.03823	7.32810	5.81909	4.05670	5.54408	6.94740	5.20320
			4.70742	6.12070	4.77000	4.72600	7.44900	5.74570	4.92000	5.20451	4.73577	8.17100	4.84013	4.51110	5.15703	6.80414	5.04700	4.82447	4.70790	5.17022	7.63435	5.20233	4.80950	4.57705	5.98318	6.22300	5.37338	4.73700	4.96729	5.14505	5.07230	5.43432	5.24420
			4.40550	4.91407	4.52050	5.95570	10.61075	5.40700	4.70000	5.50010	5.37900	4.87725	10.04245	4.09420	5.64253	6.62907	5.51720	4.54705	6.22310	4.63460	4.55061	4.05291	5.48431	6.48820	5.52450	4.49770	6.08343	4.49020	5.08049	5.01701	4.94730	4.59087	5.56550
			4.51205	5.70015	5.03320	4.91030	4.00570	5.10707	7.27330	5.21103	5.00037	6.44440	5.29078	6.30390	4.03664	6.44310	6.09000	4.70316	4.63000	4.64430	4.82523	4.78688	4.41021	4.45302	4.05300	6.55077	5.22257	4.05350	5.32820	4.60555	7.70823	5.19540	5.64289
			5.01020	5.07272	5.10020	5.01010	7.05400	6.41032	6.10020	7.50200	4.55013	5.51117	6.60707	4.01936	4.63700	6.37010	5.52500	4.60095	5.63310	6.05870	7.58180	4.42864	5.16505	6.93301	10.78090	6.58372	4.05507	4.98540	6.08700	4.00330	4.64471	4.06905	6.43900
			6.10752	6.07150	5.40460	7.47040	7.11421	13.67503	5.00520	6.03000	6.12703	6.03074	5.38251	4.02757	5.45300	5.50544	5.21900	4.70007	5.20050	4.70900	5.88232	4.62346	5.15009	4.51870	5.82150	4.57011	4.78084	10.13090	6.30810	4.75425	6.62705	4.90282	4.76339
			6.21220	5.63032	5.02000	5.72020	4.45405	4.70010	4.42000	5.35020	10.38738	4.05004	6.29324	10.10485	9.00234	5.08155	7.11400	4.95004	5.00900	5.31051	6.32401	5.40084	8.22905	5.01780	10.12380	4.81501	5.34942	4.78070	4.43150	5.48385	10.58173	6.61813	4.48059
			5.42047	7.07045	5.47430	4.05700	7.40023	4.02515	5.15070	5.00733	4.70136	5.09334	6.92413	4.53012	4.50173	4.40173	4.40920	5.10275	4.80580	5.57080	6.81164	5.30706	6.38074	4.80730	8.60659	4.55032	5.12852	5.00780	5.11310	6.61800	4.98343	5.08208	4.87059
		10	6.17330	5.01600	9.02430	4.30950	5.05407	4.40503	6.10070	6.07044	5.20400	5.20252	5.40020	5.05012	9.00502	4.73717	5.06500	4.70500	6.00500	4.63472	4.53827	4.93202	7.07278	5.13310	5.21229	5.14033	8.01490	4.51050	4.42590	4.70731	10.82043	4.00570	8.14749
			6.17040	5.90903	6.02510	5.00100	5.07420	4.44533	4.47000	5.25074	4.45240	4.03070	4.02673	5.10029	9.72507	4.01525	5.34110	5.07093	5.62149	7.33045	4.62380	4.40030	5.37282	5.40370	5.20990	5.28172	9.58901	4.04549	4.70730	6.64009	6.08508	5.03105	4.97090
			4.70050	4.99600	4.00090	6.57050	4.53202	5.29904	4.93230	4.72572	5.10046	11.37083	13.50302	6.03706	4.77070	5.04202	5.01349	6.07410	4.75760	5.01558	5.15277	4.05455	5.58157	5.04353	6.53549	4.05549	4.92777	5.08549	4.87070	4.62484	4.98853	5.08870	4.77059
			6.07020	6.90453	6.41470	10.13009	5.17430	6.26041	4.71100	5.05046	7.20007	5.70504	5.55000	4.51024	5.02050	6.30700	4.90250	5.40072	4.63050	4.05705	5.10006	5.24580	6.32701	4.06426	4.78590	6.27387	6.01009	5.45030	5.00078	5.75212	6.44411	5.24283	6.42910
			4.00002	4.77704	6.05000	7.13090	4.45312	5.06097	5.00710	5.01007	4.07705	4.53210	5.24015	4.01170	4.40100	4.03045	5.01449	12.50040	6.00510	5.28707	6.51397	5.00002	8.82500	4.40087	8.77000	5.05893	5.70533	6.98349	4.50340	4.48013	6.28221	5.02774	5.08790
New observations k =			6.77275	4.90507	6.03000	4.07200	4.00770	5.00020	14.42400	6.94240	8.13402	4.05017	5.20030	4.00701	5.05030	5.12310	12.11300	5.31200	5.81419	6.64872	4.50151	9.58900	6.40510	5.10053	6.08420	5.43803	5.05014	5.62720	5.41440	4.83304	6.10485	6.75137	5.47580
			5.40750	5.14514	4.05000	4.06320	5.53000	4.90002	4.09000	4.70030	4.03270	5.11300	4.03032	6.24300	4.01017	5.03774	6.47710	4.02701	4.80750	6.90228	5.01017	4.05044	5.31795	4.87805	5.20000	5.00091	4.48055	4.61539	4.04770	5.06403	6.10004	5.17257	4.56070
			4.63090	4.09002	7.29430	4.70000	6.47453	7.00170	5.47900	4.90400	5.40003	4.05730	4.50040	5.10400	5.07472	5.04050	4.60370	7.57077	4.82900	5.81587	4.80580	5.44870	4.89445	5.30854	8.77520	5.63042	6.30025	12.30830	4.43350	6.21637	6.17043	4.75119	10.57140
			4.75325	6.50311	4.00030	5.20700	5.10340	5.31320	4.55130	5.25072	4.57501	4.73020	5.22145	4.40304	4.47401	5.40311	5.52200	9.90400	4.90070	5.07735	6.04363	6.40132	4.90381	6.84741	4.79749	4.62238	7.31070	4.00749	5.34600	5.49280	5.65723	4.00443	5.00500
			6.30250	6.25722	6.40700	6.11020	4.51007	5.49201	4.00700	5.10501	6.44107	7.53001	4.51000	4.00057	6.74270	4.40175	4.00249	4.00330	4.90010	7.56005	10.14038	4.57905	4.52733	5.40822	8.84470	6.42085	5.34204	4.75900	6.15049	4.79740	4.70013	5.18912	6.40910
		20	5.03037	4.00040	4.02300	5.35520	5.05300	7.03131	9.72030	9.11000	4.72545	4.00002	4.50000	6.72000	4.47520	4.00004	4.42010	5.01010	4.50700	6.13005	8.00116	6.20701	6.20233	5.64770	4.52000	5.10032	4.00519	6.37700	4.70310	4.59035	4.05000	4.70025	4.53200
			4.74007	4.61632	21.24020	7.17730	5.14405	6.30315	9.57050	5.10300	5.19300	4.51027	13.00345	6.70011	5.47705	5.77141	6.34730	4.07410	4.30700	4.82150	5.43221	6.05000	6.52353	8.37355	4.71539	6.71223	5.01195	14.92009	5.57450	5.22813	4.45220	5.33292	5.11810
			4.03302	5.39105	10.50450	5.24040	4.72575	6.01530	20.04010	7.53475	4.01405	4.00304	4.54407	7.01550	5.05274	5.00735	4.00000	7.01000	7.10070	5.10370	4.50100	5.40046	8.32572	5.33072	7.07418	5.50300	6.62532	7.30730	7.14009	5.44535	4.50010	4.04030	4.00318
			6.03201	4.03200	4.00040	5.30730	6.75420	7.07203	9.15570	5.30077	6.45117	4.01240	4.01070	4.79357	5.00030	6.40000	7.53100	7.00671	5.54700	8.97500	5.47433	6.25004	4.89403	5.00851	4.05089	5.00737	8.78477	6.42100	5.10030	6.20375	6.05654	4.00003	5.40340
			4.02471	4.00041	6.07570	4.05100	4.57123	9.13031	5.04200	5.00305	5.32000	5.70700	5.11003	7.27745	5.04030	5.00305	5.02300	4.74049	6.83150	5.10523	6.76253	5.80054	7.20007	4.03611	4.57850	5.05204	11.05401	6.27520	6.50049	5.02353	5.11710	5.00021	5.00450
			5.46135	4.03300	4.50500	6.00350	4.41400	4.00453	4.02320	4.00707	5.20400	6.17050	9.23573	7.00000	7.53611	5.34003	4.50450	6.22471	5.00070	7.41734	10.01700	5.51149	8.10007	4.77070	7.55539	5.71573	4.50152	5.10710	4.80020	4.81815	6.24001	4.49057	4.90140
			7.10600	4.63545	6.33020	10.00700	10.30270	5.13700	5.50520	4.05007	7.02100	5.07007	5.37153	5.32062	13.02050	5.70031	9.45300	7.54313	5.35049	5.74040	7.30044	5.01223	4.48018	4.71574	6.03909	4.73514	5.00026	5.71600	4.72400	4.91565	4.51085	4.00904	5.11320
			6.41101	5.93141	4.90400	5.04420	4.70150	4.03071	4.47550	7.01035	5.01000	4.92230	5.07017	6.04562	5.01500	6.05007	10.90300	5.03003	4.00049	5.22700	4.77020	5.54520	5.58507	4.01900	7.00700	4.07059	6.77700	5.35149	7.05430	5.21404	5.32004	5.30856	6.30630
			4.00000	5.10030	9.41020	5.00210	4.00590	4.70010	6.27070	4.50020	4.77104	5.23244	4.00342	5.10772	4.02224	6.03701	13.20500	9.77144	4.89000	5.57490	4.50279	7.00233	4.04503	4.05131	7.30718	4.50289	6.30044	4.90540	8.03000	5.41310	5.04440	4.52031	14.79400
			4.70017	5.72734	4.47130	6.00470	5.05007	5.10445	5.07700	4.03416	4.07301	6.00010	4.00304	5.00010	12.00104	4.04750	4.50020	4.03000	5.50390	6.11290	13.20244	7.17020	5.41303	4.82052	5.34400	5.41778	6.58705	5.05219	4.50020	4.07450	5.00005	7.34730	4.05150
		30	4.40507	10.70107	4.40000	5.13530	4.53005	4.52003	6.51010	4.04532	4.73030	4.53020	4.72304	5.50024	5.02000	12.04506	4.77500	5.07033	4.00770	5.43178	7.12507	5.20730	8.20000	5.67507	4.57700	11.70750	5.43640	6.00400	9.17510	4.00373	4.90060	6.33900	7.02380
Estimator shape parameter			0.827517	4.32587	1.04861	1.071848	0.947663	2.0870	1.030856	1.051217	0.581581	1.043222	1.252837	2.538168	0.849451	1.583674	1.08202	1.732207	1.540124	1.823481	1.285204	1.013472	2.102118	2.842727	1.328890	0.885802	1.154108	4.238202	0.572341	1.278526	0.862875	1.528788	1.043247
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.50241	0.227036	2.144824	0.753864	1.886428	0.618486	1.211874	1.835484	0.947708	1.882708	2.088541	0.888027	2.870147	1.281575	1.310843	0.654583	0.825707	0.512088	0.708125	1.457805	0.442188	0.348218	1.287202	2.380767	1.452271	0.228411	0.192563	1.339842	1.858047	2.170718	2.015521
Control chart constant d2			0.982745	1.095348	0.888773	1.001367	0.985614	1.082084	0.987582	0.898964	0.917173	0.888011	1.018447	1.073748	0.970873	1.041133	1.003843	1.048584	1.038798	1.044344	1.022178	0.984355	1.063131	1.078285	1.02567	0.87649	1.01021	1.004674	0.912131	1.021705	0.987602	1.03914	0.898014
Control chart constant d3			0.999866	0.88908	0.886175	0.984017	0.987231	0.933061	0.887108	0.888017	1.057836	0.888011	0.88914	0.920848	1.010011	0.951404	0.98213	0.944301	0.952508	0.948732	0.988813	0.888867	0.832083	0.814043	0.984085	1.005006	0.978708	0.880264	1.082258	0.987287	0.885473	0.95305	0.886808
Control chart constant D4			4.154202	3.40314	4.087849	4.052875	4.139194	3.837414	4.074323	4.086579	4.453867	4.071825	3.944884	3.543883	4.215254	3.788286	4.038837	3.735566	3.807874	3.774828	3.827328	4.092194	3.628078	3.50158	3.904883	4.188241	4.001391	3.408282	4.474227	3.830342	4.128203	3.812574	4.071808
Upper contro limit X			6.867081	2.21812	7.15754	2.565578	7.583408	3.781829	5.007881	8.455875	21.00014	7.580133	6.854422	4.018082	10.38778	7.545387	5.257387	3.924874	4.308288	3.878815	4.45858	8.589835	2.888745	2.84644	7.030812	7.213158	7.228819	2.286222	22.78327	6.083676	10.88473	13.03158	10.05528
Lower control limit X			-4.08007	-0.25382	-2.8555	-0.94848	-4.00801	-1.20408	-2.48823	-5.50688	-12.7799	-4.08828	-1.58324	-1.42818	-5.51168	-3.80001	-2.38445	-1.85888	-1.82489	-2.01488	-2.63841	-5.61484	-1.03078	-0.88089	-3.58291	-2.87767	-3.87876	-0.38797	-15.8847	-2.85488	-6.81481	-8.39438	-5.84881
Upper control limit MR			7.448869	1.535743	6.844505	2.377842	7.88149	3.18751	5.07782	10.19184	22.08838	7.890183	5.881887	4.828083	10.84243	7.345753	5.170826	3.847384	4.088881	3.741498	4.748384	8.819865	2.521015	2.335145	7.084378	8.843848	7.481978	1.849471	28.17188	5.848376	11.88884	12.82694	10.77284
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	0	1	1	1	0	0	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	0	0
False alarm in X? (Y=1/N=0)			1	1	1	1	0	1	1	0	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	0	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	0	0	1
Total false alarm in X			1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0	0	1	0	0	0	1	1	1	1	0	1	1	1	1	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	1	0	0	0	1	0	0	0	1	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	1	1	0	0	1	0	0	0	1	0	0	1	1	0	0	1	1	0	1	1	0	0	0	1	0	0	0	0	0
Total false alarm in MR			0	1	1	1	0	1	1	0	0	0	1	1	0	1	1	1	1	1	1	0	1	1	1	1	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							222																										
Sub-total MR control charts with at least one false alarm k 30 =							156																										
Normal upper control limit X			6.182245	2.182342	6.505435	2.368274	6.851826	3.618854	4.574346	8.594902	17.84335	6.008001	6.447842	4.768402	0.278978	7.118244	4.835595	3.730666	4.120135	3.468453	4.125676	7.729631	2.777015	2.786351	6.549193	6.528757	8.64907	2.247014	10.10144	5.671958	9.590158	12.2664	9.138854
Normal lower control limit X			-3.37523	-0.21804	-2.00338	-0.75216	-3.27643	-1.059	-2.0549	-4.73582	-8.82308	-3.38803	-1.18076	-1.2785	-4.40288	-3.17086	-1.87288	-1.46288	-1.58275	-1.80373	-2.30651	-4.77454	-0.91804	-0.7809	-3.10148	-2.28328	-3.28681	-0.32877	-12.0128	-2.24297	-5.02023	-5.62922	-4.93348
Normal upper control limit MR			6.859860	1.474758	5.338278	1.917143	6.222639	2.872772	4.072801	8.180243	18.87494	6.332414	4.890837	3.712082	8.405913	6.320232	4.182884	3.180835	3.50745	3.238144	3.951215	7.682384	2.270185	2.178375	5.828227	5.420108	8.110652	1.582518	18.11617	4.862808	9.487897	10.98478	8.645817
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	0	0
False alarm in X? (Y=1/N=0)			1	1	1	1	0	1	1	1	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	0	0	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1
Total false alarm in X			1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0	1	1	0	0	1	1	1	1	1	0	1	1	1	1	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	1	0	0	1	1	0	0	0	1	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	1	1	0	0	1	0	0	0	1	0	1	1	1	0	0	1	1	0	1	1	0	1	1	1	0	0	0	0	1
Total false alarm in MR			0	1	1	1	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 30 =							220																										
Sub-total MR control charts with at least one false alarm k 30 =							182																										
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	0	0	0	1	0	1	0	0	0	1	1	1	1	0	1	1	0	1	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0	0	1	0	0	0	1	1	1	1	0	1	1	0	1	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							123																										
Sub-total MR control charts with at least one false alarm k 1 =							98																										
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	0	0	0	1	0	1	0	0	1	1	1	1	1	0	1	1	0	1	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	1	1	1	1	0	1	1	0	1	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							132																										
Sub-total MR control charts with at least one false alarm k 1 =							110																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	0	1	1	1	0	0	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0	0	1	0	0	0	1	1	1	1	0	1	1	1	1	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							199																										
Sub-total MR control charts with at least one false alarm k 10 =							123																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0	1	1	0	0	1	1	1	1	1	0	1	1	1	1	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							208																										
Sub-total MR control charts with at least one false alarm k 10 =							150																										

OBJECTIVE # 3

LOGNORMAL (0, 1^2)   k = 30 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			2.11556	0.20428	0.3489	1.52338	0.80372	0.27583	4.56022	3.7905	2.313	5.12232	3.44183	0.64878	0.55256	0.38273	0.8837	0.72909	3.10118	3.83465	1.3238	0.21816	0.56879	0.88744	0.1978	11.7784	0.16838	1.1434	0.2134	3.91281	1.88377	0.81748	1.85474
			3.71053	0.6099	4.3753	0.31144	0.17109	3.48583	2.08873	11.1526	0.5114	1.95778	0.78327	0.84388	0.08555	4.15738	2.221	0.52281	0.08849	2.08478	1.1712	0.21784	0.14819	0.30881	0.4303	0.4449	1.842	1.8852	1.8854	1.02851	0.58228	0.32958	4.01404
			1.00127	1.10135	2.2155	0.73343	1.52982	1.5758	4.4105	3.1403	0.2052	2.31177	0.2778	0.47923	1.11829	0.14894	1.0543	1.08814	1.2898	0.47429	2.8089	3.89275	0.71018	4.18888	2.7408	0.3307	0.73848	1.5287	1.7381	0.81284	0.30432	0.91728	3.80287
			2.14941	0.80387	1.0273	0.36313	0.21037	2.88322	1.70812	0.585	0.8355	0.70892	0.30843	1.82398	1.08628	0.53874	0.9082	0.14551	1.27555	0.72282	0.355	0.21202	0.47081	0.85101	1.7877	2.0837	1.20431	0.8041	0.7227	4.8707	0.51802	3.82854	0.50868
			1.84051	0.39782	0.2859	0.89507	0.57389	2.68225	1.22157	0.3168	0.8282	0.14845	1.79103	1.92389	0.43318	1.88287	2.8718	0.91075	0.41907	1.32852	1.0277	2.91822	0.88813	0.10843	0.3722	0.4848	1.57906	0.2433	1.2918	0.5518	0.80587	2.025	4.04125
			0.54009	0.44865	0.8236	0.84989	1.1909	0.78005	1.26882	2.6588	1.1076	0.1803	1.75794	2.09829	2.57748	0.34404	0.327	0.82388	3.1517	1.18343	0.8204	1.70798	0.83882	1.72898	1.3898	0.5018	0.89849	0.882	1.1528	0.72808	0.63532	2.28888	0.75993
			1.15629	0.10705	2.7213	7.84952	8.29659	0.08395	0.13784	1.1879	0.2421	0.82211	1.2788	0.83448	0.78017	0.98723	0.3813	0.42884	0.40918	0.81448	2.4045	1.32225	0.25119	0.38488	2.0988	1.1804	0.58862	1.312	3.8244	0.98238	0.84874	3.84078	9.85517
			0.1773	0.21405	1.0645	0.70754	1.72207	0.48418	0.1803	1.6581	0.3098	0.08578	3.50953	0.92578	0.82082	3.98057	1.7841	3.52353	0.18301	0.58354	2.7143	1.57521	1.23165	2.84471	0.4638	0.5391	0.30409	0.2982	0.8807	0.87878	2.42373	2.47398	1.8355
			0.0248	0.92178	0.1229	2.13901	1.03686	4.24318	2.54284	0.8178	0.1088	1.2881	0.59257	0.2358	1.81782	0.49814	1.3785	0.88331	0.08582	0.83314	1.7217	0.44893	0.38236	0.3732	4.857	0.5172	0.98728	3.8544	0.5883	3.08314	0.87448	0.24955	2.38988
			0.12181	0.05186	2.1789	0.79674	3.38485	0.82822	2.10271	0.8183	7.584	0.95227	2.72474	0.38418	3.79803	0.89828	0.9288	0.28705	4.00548	0.77848	2.8838	0.80443	0.88118	0.45547	0.4211	1.9252	0.21025	1.0728	4.2514	0.38281	7.14849	1.00888	4.33037
			1.58423	0.701	3.3399	2.07820	0.2282	0.34115	0.62978	0.8219	0.645	2.74825	0.90894	2.64837	2.42949	0.16003	1.4828	0.08532	0.27288	1.1838	0.411	1.48842	0.85387	3.57242	12.518	1.8848	5.6837	3.8988	0.7501	2.80809	0.21201	0.38049	2.18923
			0.7308	3.38715	1.4154	1.08834	8.88737	2.69493	1.08483	3.0387	0.1998	0.6291	0.43185	2.48434	1.48128	4.21989	2.7238	0.83134	1.48285	1.87029	2.5284	0.83884	0.45885	0.80035	1.4129	1.112	1.03813	1.7847	2.8412	1.21893	1.28051	0.88133	0.17581
			0.31005	1.63575	2.4569	1.41005	5.87305	0.48436	2.48886	0.9981	0.6809	0.1858	0.17271	0.68813	1.42887	0.85973	0.1114	0.42288	0.80843	0.07878	1.0883	1.49453	3.14378	0.38978	0.5022	2.2808	1.57598	0.8243	2.8238	0.82832	0.9823	1.54758	0.77325
			0.52107	0.26981	0.5503	0.17343	7.95048	0.57441	1.84082	0.5956	0.2286	0.30811	0.71322	0.11808	0.35531	7.87821	0.4418	2.19181	1.08988	1.08758	0.5198	0.38288	0.48857	0.70018	0.7582	1.3818	1.65588	10.0857	8.0058	0.78808	1.27808	0.87008	1.58809
			1.0746	0.20828	0.7421	0.6504	2.01867	0.38481	2.81537	0.4085	0.9053	0.57982	0.24275	0.40807	1.08828	0.40703	1.8273	1.80018	0.28118	3.22305	3.8851	0.28828	1.05898	2.08215	3.1157	0.2821	4.84728	0.7143	0.2881	5.47834	0.41251	0.25355	0.33828
			1.83700	3.40059	0.1381	0.20198	0.98454	0.35038	2.11752	1.0072	1.5018	0.54883	0.49874	3.81883	4.89365	1.42977	1.2812	1.82437	0.8148	0.49484	4.3849	2.13287	1.28158	0.87552	1.4287	1.8733	1.65578	1.1888	0.4518	1.3414	0.20895	0.2885	1.94848
			1.19001	1.22101	0.9272	0.12084	3.59524	1.21778	1.88137	0.3822	0.4092	3.38474	0.85533	0.39056	4.01657	0.28917	3.1808	5.88882	2.84197	0.70281	15.2408	1.84578	0.5501	2.44508	1.3447	0.481	0.54028	4.128	0.8138	0.58838	7.0018	0.35928	0.52495
			1.01901	0.79371	0.6639	1.87333	0.34984	1.44946	0.89209	2.8578	1.5037	0.48881	0.29395	1.33287	0.87448	0.85737	10.0752	1.14404	1.5811	1.50858	3.1481	1.38112	0.88358	3.45472	1.6557	0.507	0.85129	1.3597	2.8138	8.2287	0.08878	1.10471	0.79015
			0.73001	0.15601	1.0501	7.72497	0.75741	1.58857	0.90787	0.2843	1.551	2.1887	0.37581	0.12884	3.45847	1.31165	0.485	1.5837	2.95088	0.82782	0.8432	0.35815	1.73834	1.7232	0.4378	0.8057	0.84838	1.051	0.817	0.3237	0.18187	1.2484	3.32089
			0.4154	5.00833	0.4564	0.48019	0.23485	0.08501	0.7585	0.5007	0.5195	0.57202	0.21842	0.74387	2.97088	0.38844	0.3433	3.43315	5.40923	0.52178	1.1382	0.82012	1.07828	0.23712	0.3231	0.22	0.10787	0.3187	0.8742	1.92713	7.38148	1.17588	0.32329
			3.00496	0.3229	1.8075	2.55592	0.55398	0.11362	1.14222	0.2913	1.2777	3.1427	1.3488	2.05372	0.79525	0.82474	7.2815	3.32589	3.22053	1.27393	0.1233	0.58312	0.73452	1.00728	1.38	2.5288	3.38245	0.4785	1.0358	0.29888	2.12854	1.21733	0.83884
			0.30616	0.87279	0.6325	0.07089	1.1725	0.88902	0.30345	0.3127	1.0747	0.18268	1.95218	0.12054	1.3838	1.88108	1.0232	7.95005	1.37345	0.14328	2.2383	1.30305	5.35047	1.35877	0.5422	1.8458	1.31798	2.0281	2.2182	3.74822	0.24082	0.87287	0.41594
			3.40009	1.26503	8.5329	0.08838	4.80091	3.82825	0.87863	3.2749	1.288	0.18517	0.58047	1.74484	0.81871	1.88433	7.2881	0.38424	1.19857	3.8451	1.1518	0.42887	0.8471	2.30794	1.8495	2.5807	0.88281	0.5402	3.3854	0.38814	0.77307	0.58728	0.34747
			1.57579	1.19486	2.383	1.71081	0.3203	0.08281	0.8394	1.7088	[illegible]	1.47014	0.47184	1.72187	0.81274	0.17545	5.2388	1.04242	4.2421	1.05137	0.1738	0.40521	0.13895	0.19987	2.541	1.429	1.33548	3.3543	0.3848	1.28407	1.08178	0.4881	3.72788
			0.14843	1.45023	3.3088	0.48818	5.80508	2.53821	0.25804	0.9581	4.1235	3.05818	0.80317	1.18558	3.04888	2.28328	0.5178	1.6388	0.40388	2.04759	0.9843	0.4843	0.7875	0.50468	0.8341	1.4211	7.37837	0.3278	0.8205	0.40894	1.17552	0.18188	3.04743
			0.53844	0.1174	0.61	0.58948	0.28779	0.2983	0.4041	0.5287	0.3084	1.80392	2.23754	2.80278	0.83583	0.04875	0.8858	1.10481	0.45087	3.6338	0.8478	0.08821	3.47748	1.53305	0.5398	1.7983	0.823	0.5095	12.837	0.30862	0.70414	2.75843	0.81883
			1.78085	2.26803	0.4838	3.67604	0.89101	0.22574	2.95087	0.0836	1.9023	0.71463	0.42518	0.6028	0.57018	1.04891	0.2045	2.19737	0.51384	2.47871	1.5487	1.48832	1.02383	1.47122	2.5807	0.2781	0.84123	1.2731	1.2381	0.83884	0.88815	1.82997	0.44145
			6.54011	0.21281	0.407	8.29518	2.18785	0.51574	0.18587	0.8911	15.317	0.52244	0.08884	1.3988	2.8185	2.90854	0.5317	6.97783	1.42221	0.30003	4.1804	1.78404	0.24046	1.28887	1.1141	2.5788	2.62137	0.9888	0.4378	0.88732	0.41438	1.24312	1.28219
			3.76175	0.52311	15.4135	0.55438	0.72171	0.54488	0.15087	0.489	0.3213	1.55553	0.1892	0.55058	1.88511	1.50763	3.3387	2.07702	1.83281	1.88885	1.5848	0.80305	0.2982	0.988	2.7278	0.284	0.58876	1.7857	0.252	3.35158	5.57158	1.1755	5.91337
			0.23956	0.34134	0.3242	7.30708	0.58677	2.0863	0.45175	0.1837	0.7522	1.22894	1.80088	0.70458	0.70888	4.1285	0.4831	0.88524	0.83678	0.58288	1.4988	0.43909	0.52045	0.13818	0.1821	1.2372	0.27884	0.202	0.4018	0.88708	1.85045	2.88803	0.53178
Average			1.478649	1.228302	2.029853	1.88883	2.22556	1.311459	1.435085	1.52125	1.878257	2.080889	1.024372	1.854318	1.87833	1.588084	2.054527	1.824989	1.800721	1.844832	2.11882	1.058087	1.021304	1.287915	1.748483	1.549127	1.852358	1.637393	1.902003	1.87441	1.872088	1.287282	2.088833
Moving range average			1.278754	1.479801	2.578858	2.287758	2.578413	1.271989	0.958434	1.458752	2.587282	2.513502	0.882818	2.017392	1.270133	2.050787	2.58800	1.883418	1.5707	2.088805	1.978834	0.882288	1.088176	1.327034	2.082514	1.298855	1.881489	1.900828	2.13281	2.087744	2.055008	0.798878	2.270332
T statistic			2.283498	1.834522	1.538873	1.520771	1.491598	2.48283	2.4984	1.773804	1.378412	1.722287	2.387378	1.723878	3.185943	1.721572	1.808208	2.042294	2.403019	2.07215	2.171788	2.932985	2.715757	2.528318	2.051203	2.220821	1.881057	2.288262	1.92178	2.332488	1.747012	3.088388	2.088137
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.775	0	0	0	0	0	0	0	0	0.814734	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0	0	0.87483	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.878	0	0	0.888228	0.889801	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.935780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	0	0	0	0	0	1.021378	0	0.994589	0	0.995312	0	0.994217	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.007446	0	0
36	1.8	1.035	0	1.052806	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1.9	1.086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.11775	0	1.097328	0	0	0	0
38	2	1.138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.15957	0	1.174796	0	0	0	0	1.184113	0	0	0	0	0	0	0	1.172852
39	2.1	1.189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.225811	0	0	0	0	0	0	0	0	0	0	0	0
40	2.2	1.24	1.287083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.250819	0	1.283994	0	0	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	1.325363	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.307569	0	0	0
42	2.4	1.342	0	0	0	0	0	1.373941	1.392694	0	0	0	0	0	0	0	0	0	1.34354	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2.5	1.393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.406422	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.503036	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.598	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.612912	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.681888	0

49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	1.740871	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3.3	1.799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.756	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.758	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.858	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.958	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.058	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator shape parameter			1.287083	1.052806	0.888226	0.888801	0.87483	1.373941	1.302694	1.021378	0.814734	0.904580	1.325363	0.985312	1.740871	0.904217	0.835780	1.15057	1.34354	1.174700	1.225811	1.812812	1.503036	1.408422	1.164113	1.250818	1.11775	1.283904	1.087328	1.307580	1.007448	1.881888	1.172852
Estimator scale parameter			1.146740	1.168814	2.258824	2.120284	2.544572	0.954523	1.030438	1.480408	2.308588	2.071878	0.772808	1.983522	0.98287	1.505309	2.105502	1.57385	1.340282	1.855283	1.728803	0.858051	0.879484	0.922848	1.501087	1.230808	1.857221	1.275235	1.733308	1.280552	1.858728	0.785389	1.778308
Control chart constant d2			1.02238	0.988128	0.978398	0.977108	0.97474	1.029048	1.030388	0.985344	0.984775	0.991842	1.025398	0.982036	1.049877	0.991804	0.983935	1.010757	1.020782	1.012281	1.01703	1.043788	1.037807	1.031348	1.01121	1.018248	1.008442	1.022078	1.004228	1.023893	0.983583	1.047247	1.012071
Control chart constant d3			0.986747	0.98588	1.003373	1.004478	1.008508	0.981314	0.980218	0.989038	1.015121	0.991892	0.984288	0.991813	0.943864	0.991832	0.998855	0.978258	0.983151	0.975023	0.971115	0.949198	0.954312	0.959438	0.975887	0.988305	0.979814	0.986995	0.981844	0.985432	0.990508	0.94828	0.975178
Control chart constant D4			3.926017	4.065653	4.178561	4.163112	4.195047	3.882331	3.873311	4.088748	4.243952	4.105389	3.908478	4.10488	3.732581	4.105832	4.148004	3.998112	3.897308	3.989082	3.958818	3.778813	3.82346	3.868813	3.895398	3.945952	4.023678	3.927989	4.03655	3.915618	4.098372	3.753233	3.98021
Upper contro limit X			5.231869	5.67098	9.938428	8.810695	10.18128	5.019718	4.225589	5.817878	9.924431	9.682428	3.835908	8.05508	5.30538	7.788725	8.945568	6.782125	6.389889	8.078248	7.950427	3.593815	4.112578	5.158008	7.828768	5.388228	7.898191	7.21612	8.27288	7.790894	7.878865	3.578851	8.818887
Lower control limit X			-2.27857	-3.21438	-5.87712	-5.13743	-5.71014	-2.3988	-1.35542	-2.87548	-6.18582	-5.54108	-1.58718	-4.14844	-1.9527	-4.81856	-5.83851	-3.11215	-2.78843	-4.18898	-3.71079	-1.47774	-2.06987	-2.58218	-4.4288	-2.28798	-3.98447	-3.84133	-4.46888	-4.44207	-4.53288	-1.00408	-4.84283
Upper control limit MR			5.024338	6.015548	10.76882	8.569948	10.81858	4.938283	3.712314	5.981552	10.98022	10.31885	3.488985	8.281111	4.740873	8.418777	10.73541	6.850522	8.121502	8.255783	7.827113	3.334895	4.087852	5.131382	8.320471	5.117329	7.892438	7.485807	8.888388	8.174808	8.418878	3.002122	9.058102
Normal upper control limit X			4.980252	5.163412	8.887788	7.971093	9.08304	4.694408	3.984112	5.408908	8.780273	8.745515	3.398357	7.318721	5.054342	7.040306	8.837744	6.248868	5.978114	7.448801	7.378827	3.404801	3.884857	4.827281	7.287084	4.98821	7.08811	6.882254	7.573838	7.228822	7.137534	3.414613	8.12508
Normal lower control limit X			-1.92895	-2.70681	-4.92848	-4.19783	-4.63182	-2.07149	-1.11384	-2.35841	-6.00178	-4.82418	-1.34861	-3.41108	-1.70188	-3.88814	-4.82888	-2.98888	-2.37887	-3.55884	-3.13719	-1.28843	-1.82225	-2.23143	-3.78012	-1.88888	-3.38430	-3.41747	-3.78883	-3.8781	-3.79336	-0.84005	-3.85118
Normal upper control limit MR			4.182238	4.835337	8.427058	7.476393	8.428253	4.158861	3.132183	4.787201	8.455172	8.214128	2.917077	8.582838	4.180784	6.701873	8.457877	5.438042	5.133048	8.78347	8.458841	2.883321	3.494087	4.338748	8.805855	4.238123	8.410177	8.211251	8.888371	8.822749	8.715787	2.813985	7.418445

OBJECTIVE # 3

Lognormal (0 1*2)

k = 30 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	0.30000	1.08470	0.20248	0.54560	1.28190	1.43632	1.80850	1.46830	0.75230	0.43678	0.57873	2.98142	1.00300	0.28220	1.83230	0.91054	0.29900	3.84874	2.24570	0.38615	0.79740	1.91332	0.22520	0.87802	0.88507	0.68244	1.01500	0.20420	0.48512	2.10021	2.46441
			1.18150	2.48783	4.08795	0.44876	8.41420	2.82895	0.87550	0.51880	0.33021	0.68905	0.49158	2.81067	1.08803	4.53271	0.83340	8.98426	0.88880	2.08736	0.25703	0.13152	0.08282	0.80837	0.89480	1.00382	5.81985	0.80357	1.83340	2.42300	1.34849	0.24736	4.24027
			0.74230	0.18620	1.70084	0.36355	0.40510	1.57082	0.81150	1.63830	0.13880	0.53211	2.07890	0.23570	0.48651	5.88887	0.40270	1.88095	0.45770	3.32838	0.40408	0.82017	0.40105	0.58851	1.15580	0.75283	0.19291	0.39977	1.57560	0.29740	2.05088	4.97338	1.42418
			3.45330	1.67987	3.80530	1.78198	0.38020	0.24828	1.74840	0.29781	1.74894	0.54122	5.54485	2.03860	0.98980	5.68890	3.25780	1.28580	0.43850	1.10478	1.40914	0.42801	0.87803	1.58782	3.83750	0.15089	1.86045	1.24548	1.01490	1.12170	0.55478	3.81198	0.37270
			1.14430	2.87578	0.33234	0.81300	0.22400	1.80332	0.55800	1.20884	0.94824	1.44258	0.48257	1.03812	1.05853	0.85104	1.03840	1.00238	13.12880	0.38518	0.80832	0.92951	0.77152	1.13011	0.97280	0.48388	0.37547	0.45841	4.05890	1.23890	1.72147	0.44394	1.10988
			2.52000	0.44348	5.19482	1.88100	1.80050	3.52914	0.32780	8.44585	8.24530	0.49244	1.42383	2.23118	1.70254	1.93180	0.42030	1.48704	8.08780	1.87080	0.37585	0.20873	3.84580	0.76250	2.43410	5.38370	2.73925	1.10082	1.93840	0.08370	3.74240	0.28038	0.88890
			0.93320	2.86579	0.31873	1.32143	1.88120	3.72984	0.24780	0.13582	0.40540	0.42583	2.20750	8.00411	0.38880	2.02278	1.82020	2.88287	0.32080	2.81217	2.01731	0.82080	4.45121	2.35778	3.15210	1.08785	0.29034	0.42390	0.83810	2.54780	0.94880	2.21127	2.76473
			0.88250	1.07198	1.01885	1.41528	0.27780	2.89288	0.58720	0.45724	2.34893	0.43285	4.13705	3.78408	0.88897	0.87240	0.78520	1.47738	1.27410	1.44158	1.20000	2.72431	2.85329	0.83711	0.32350	1.80894	4.82843	0.71830	0.55850	12.07380	0.44794	0.42421	0.88402
			0.10190	1.81573	0.33277	0.47849	0.26870	0.15003	0.78240	0.42512	0.88325	1.37039	0.23454	1.70030	0.32408	2.92373	0.27020	0.88241	1.15030	4.70178	2.07437	0.80841	5.82899	0.38210	0.21880	0.38088	0.14338	1.98475	1.73230	0.41530	2.07777	0.77805	0.90111
		10	4.38020	0.34997	1.29578	0.34575	0.87790	2.11294	2.14580	2.87414	0.88448	7.79863	0.38924	1.10190	0.78512	1.31875	0.18950	5.40035	0.81790	1.80900	0.38280	2.16882	2.20393	3.00072	0.72900	1.17423	8.34814	0.74887	0.21310	2.13250	2.48891	4.75580	1.83520
			2.77700	3.80985	0.82175	0.40971	0.60080	2.58174	1.07170	0.32538	0.88708	0.55541	0.58787	0.24452	1.33138	0.18894	0.71480	1.48480	0.45580	1.45788	0.43122	0.25278	0.41378	2.23952	3.08840	1.13001	0.28811	1.01735	1.44180	0.80930	3.38244	1.00208	4.04855
			0.50750	0.83893	0.50895	0.47507	0.19070	0.78835	1.10090	1.53310	0.49880	5.80800	1.18740	2.24753	0.39843	0.98150	0.35000	2.88218	0.53870	0.27188	1.71889	1.08030	4.41888	3.83447	8.94000	2.15148	1.97040	0.89029	0.58030	0.30400	0.33484	1.81885	0.81080
			5.81520	0.77978	1.28790	3.07858	3.23180	0.44851	0.99810	5.39878	5.85822	0.35194	4.80850	3.81380	0.88451	0.90530	0.83830	0.58248	0.88850	1.42881	0.84807	2.58772	2.31908	1.19774	3.97450	0.28978	1.27835	4.29885	2.84780	0.48470	0.25518	1.38002	2.98495
			1.02080	0.89804	0.80430	3.21985	1.44400	0.88943	1.05810	0.20131	0.34813	3.77817	8.08735	1.51557	0.08188	0.28233	1.09280	2.27148	4.35550	0.88828	2.80297	0.85583	0.23334	0.28357	11.70710	0.45393	1.43758	0.22724	0.70990	0.88230	0.80883	0.58885	0.19300
New observations k =			0.98800	0.08042	0.70808	0.50854	1.88770	0.81979	8.88810	0.09883	1.53458	0.84725	1.81153	2.48712	0.84941	3.08837	5.80130	0.88439	1.30770	2.03388	8.57588	2.72353	0.78021	0.88488	3.14480	1.85790	1.78715	1.93288	32.81400	0.10780	1.38578	3.52731	0.17851
			2.11100	1.38031	0.14085	0.57897	8.18100	0.82142	0.52780	0.45842	0.50591	0.87838	0.88822	2.20318	0.53188	1.24185	0.52010	0.88102	0.51170	0.05113	0.32883	2.32501	0.98117	1.13183	0.38420	0.53858	1.28043	3.37510	0.38130	0.70980	8.11573	1.47400	0.86985
			0.28870	0.94990	0.74815	1.75523	2.29800	1.23853	1.33830	1.38500	0.22198	0.45448	4.10038	0.44985	0.84780	0.48852	3.79510	2.48892	2.75170	0.25831	1.12580	0.48504	1.54453	3.07238	0.80880	8.88435	0.54739	0.85385	0.25700	0.24980	0.78874	0.83301	1.28289
			1.00790	0.35428	0.45302	3.83553	0.84590	1.97821	0.51830	1.32947	0.62815	0.44232	1.34227	0.88330	0.33383	1.74339	1.58480	0.88903	0.40380	0.70037	2.14288	1.27140	0.18802	0.27518	2.84840	1.85107	2.44039	0.59520	0.85380	1.85870	0.24885	2.10414	0.33885
			1.62820	0.18408	1.17813	0.53997	10.58020	0.34214	1.89080	5.83828	0.55388	6.25322	5.17849	3.74715	1.10338	0.98880	28.58000	0.45588	0.88580	5.88548	0.80849	8.52338	0.88484	0.24383	2.83140	1.47732	0.53484	3.95395	1.53270	0.77210	0.55182	0.78980	0.48012
		20	0.98840	2.17930	0.33351	2.42458	3.01130	1.07517	0.80340	1.24393	0.83405	0.38703	2.57228	1.88988	1.57435	0.89815	0.53900	0.81571	4.75470	1.54244	2.11383	2.82510	1.31998	0.48040	0.48580	1.03247	0.20475	0.78123	0.42880	0.23890	1.11838	0.42494	0.80937
			5.27120	3.01598	0.88741	1.10831	0.31790	0.18179	0.34810	0.88823	0.73850	0.75188	0.51148	2.02818	2.85100	1.58508	1.03070	0.88819	0.54920	2.45838	5.88787	1.17854	0.75328	0.23187	8.98340	0.45217	0.49887	0.58090	0.38190	1.71730	1.07301	0.24781	0.95004
			0.89210	0.48835	0.74434	0.49838	2.02348	0.31877	0.81340	2.08470	1.20110	4.37834	1.08114	0.71707	2.31354	0.88498	0.41400	0.42094	3.10840	1.13880	1.88720	1.00305	0.80237	0.20284	8.43770	0.31981	0.54188	1.03858	0.30850	2.47770	2.62555	7.22984	0.97342
			2.80080	0.83570	0.38837	0.35880	0.88170	0.82734	0.83170	0.12798	1.58488	1.33532	0.47802	0.28055	0.52502	0.81824	0.88310	1.13213	2.79858	2.02420	1.18841	0.31221	0.38012	0.54218	1.81350	0.81453	3.19843	1.20798	0.75480	1.24580	0.28850	0.30194	2.94772
			0.77740	0.28833	0.88862	1.32088	1.28230	0.12575	1.08200	1.75458	0.44002	0.89108	0.98001	0.38319	2.38084	7.01843	4.02850	1.73985	0.52120	2.05122	2.08517	0.24521	0.44028	0.34085	2.49090	0.83433	2.20888	0.88418	0.78590	1.18830	0.30523	0.97512	0.99958
			14.43110	1.88818	0.58318	1.21727	1.78420	0.87241	2.17830	2.10878	1.25355	0.02714	0.58885	1.33238	1.34705	1.81873	7.84050	0.38049	0.28580	0.58783	2.83480	2.27482	2.78244	3.82138	1.01870	1.98220	0.83008	1.40587	1.38290	3.52450	0.18844	0.58587	0.12718
			0.18290	0.30887	0.18558	0.58570	0.44870	0.83195	15.88810	1.30847	0.37071	1.38984	4.24158	0.78931	0.24178	3.45541	0.81300	0.12173	4.42880	1.78000	2.23112	0.12122	0.17747	0.32585	2.38470	1.81081	0.85957	1.54801	0.77880	1.23480	1.48221	0.77718	0.27844
			2.76710	0.73885	0.38987	0.18831	0.37830	2.44858	3.48570	0.28880	1.42882	0.27455	0.74758	0.58572	0.72587	0.45254	2.12480	3.88815	8.10170	0.15204	0.71534	1.43772	0.58803	0.58782	0.49090	0.38284	0.73392	0.68898	0.13480	2.88350	1.33338	1.50305	0.42878
			0.54560	0.15148	0.55482	1.27882	0.41330	0.24842	0.82980	0.79448	3.98823	3.11348	0.84415	0.48288	2.38245	0.17588	2.29000	1.38840	0.24090	1.83448	0.84437	1.81238	3.80128	8.38314	1.33080	4.53127	3.00084	0.47372	3.10240	1.81250	0.86845	0.34185	0.18474
			1.65720	0.85478	0.25857	1.32688	3.87810	2.40938	0.92820	0.84183	0.38821	0.41421	0.81451	2.22890	0.88985	2.15846	1.75730	0.43288	1.14230	1.42505	0.08573	1.89833	0.23611	0.73584	1.58220	0.38583	0.58854	2.78415	0.53880	2.08900	0.87545	2.30828	0.88038
		30	1.13840	2.47143	0.81294	0.18584	1.58590	2.21112	0.88880	3.40833	1.08838	0.31449	1.38338	0.52251	0.41498	0.27480	0.79780	0.48778	0.20880	5.81810	1.48288	3.32828	0.35401	0.83901	0.11830	0.05314	1.18891	0.84841	0.31380	4.82900	0.22780	3.98894	1.79557
Estimator shape parameter			1.207883	1.062806	0.898226	0.888801	0.87483	1.373941	1.382894	1.021378	0.814734	0.884580	1.325383	0.885312	1.740871	0.904217	0.835788	1.15857	1.34354	1.174788	1.225811	1.812812	1.503038	1.408422	1.184113	1.250810	1.11775	1.283894	1.087328	1.307580	1.007448	1.881888	1.172852
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.148749	1.168914	2.258824	2.120284	2.544572	0.954523	1.030438	1.488409	2.308588	2.071878	0.772889	1.883522	0.98287	1.585308	2.195502	1.57385	1.340282	1.855283	1.728803	0.858051	0.878494	0.822848	1.501987	1.238888	1.857221	1.275235	1.733308	1.288552	1.858728	0.785389	1.778388
Control chart constant d2			1.02238	0.899128	0.978398	0.877108	0.87474	1.029048	1.030388	0.985344	0.884775	0.881842	1.025388	0.882038	1.048877	0.881884	0.883835	1.010757	1.028792	1.012281	1.01703	1.043788	1.037807	1.031348	1.01121	1.018248	1.008442	1.022078	1.004228	1.023893	0.883583	1.047247	1.012071
Control chart constant d3			0.968747	0.88580	1.003373	1.004478	1.008508	0.981314	0.980219	0.988038	1.015121	0.881802	0.884288	0.881813	0.843884	0.881832	0.988855	0.978258	0.983151	0.975023	0.871115	0.948198	0.854312	0.858438	0.875887	0.988305	0.878814	0.988895	0.981844	0.985432	0.880508	0.84828	0.875178
Control chart constant D4			3.928017	4.065653	4.178581	4.183112	4.195047	3.882331	3.873311	4.088749	4.243852	4.105388	3.808479	4.10488	3.732581	4.105832	4.148004	3.988112	3.887309	3.988082	3.858818	3.778813	3.82348	3.888813	3.885388	3.945852	4.023878	3.827888	4.03855	3.815818	4.088372	3.753233	3.88021
Upper contro limit X			5.231868	5.87098	8.938428	8.810895	10.18128	5.018716	4.225580	5.817878	8.824431	9.882428	3.835808	8.05508	5.30536	7.788725	8.845588	8.762125	8.388888	8.078248	7.850427	3.583915	4.112578	5.158888	7.828788	5.388228	7.888181	7.21812	8.27288	7.798884	7.878885	3.578851	8.818887
Lower control limit X			-2.27857	-3.21438	-5.87712	-5.13743	-5.71816	-2.3888	-1.35542	-2.87548	-6.18582	-5.54188	-1.58718	-4.14844	-1.8527	-4.81858	-5.83851	-3.11215	-2.78843	-4.18888	-3.71078	-1.47774	-2.08887	-2.58218	-4.4298	-2.28788	-3.88447	-3.84133	-4.48888	-4.44207	-4.53288	-1.00408	-4.84283
Upper control limit MR			5.024338	8.015548	10.78892	9.588848	10.81858	4.838283	3.712314	5.881552	10.88022	10.31885	3.488885	8.281111	4.748873	8.410777	10.73541	8.850522	8.121582	8.255783	7.827113	3.334085	4.887852	5.131382	8.328471	5.117328	7.882438	7.485887	8.888388	8.174888	8.418878	3.002122	8.858182
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	1	1	0	0	1	0	1	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1	1	0	1	1	0	0	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
Total false alarm in X			1	0	0	0	1	0	1	1	0	0	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1	0	0	1	1	1	0	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
Total false alarm in MR			1	0	0	0	0	0	1	1	0	0	1	0	0	1	1	1	1	0	1	1	0	1	1	1	1	0	1	1	0	1	0
Sub-total X control charts with at least one false alarm k 30 =							147																										
Sub-total MR control charts with at least one false alarm k 30 =							130																										
Normal upper control limit X			4.880252	5.183412	8.887788	7.971083	8.08304	4.894408	3.884112	5.400809	8.788273	8.745515	3.388357	7.319721	5.054342	7.040305	8.937744	8.248888	5.878114	7.448801	7.378827	3.404801	3.884857	4.827281	7.287084	4.88821	7.08811	8.882254	7.573838	7.228822	7.137534	3.414813	8.12505
Normal lower control limit X			-1.92895	-2.78881	-4.82848	-4.18783	-4.83182	-2.07148	-1.11384	-2.35841	-5.00178	-4.82418	-1.34881	-3.41108	-1.70188	-3.88814	-4.82888	-2.58888	-2.37887	-3.55884	-3.13718	-1.28843	-1.82225	-2.23143	-3.78012	-1.88888	-3.38438	-3.41747	-3.78883	-3.8781	-3.78336	-0.84005	-3.85118
Normal upper control limit MR			4.182238	4.835337	8.427058	7.478393	8.428253	4.158881	3.132183	4.787201	8.455172	8.214125	2.917077	8.582838	4.150794	8.701873	8.457877	5.438042	5.133048	8.78347	8.458841	2.883321	3.494087	4.338748	8.805855	4.238123	8.410177	8.211251	8.888371	8.822748	8.715787	2.813895	7.418445
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0	0	1	0	0	1	1	0	0	1	0	1	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	1	1	0	0	1	0	0	0	1	0	0	0	1	1	1	0	1	1	0	0	1	0	0	1	0
False alarm in X? (Y=1/N=0)			1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0
Total false alarm in X			1	0	0	0	1	0	1	1	0	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	1	1	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	1	1	0	0	1	0	0	0	1	0	0	0	1	1	1	0	1	1	1	0	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0	1	1	1	0	0	0	0	0	0	1	0
Total false alarm in MR			1	0	0	0	1	0	1	1	0	0	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	1	0
Sub-total normal X control charts with at least one false alarm k 30 =							183																										
Sub-total normal MR control charts with at least one false alarm k 30 =							185																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							7																										
Sub-total MR control charts with at least one false alarm k 1 =							8																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							9																										
Sub-total MR control charts with at least one false alarm k 1 =							13																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	1	1	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							71																										
Sub-total MR control charts with at least one false alarm k 10 =							61																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0	0	1	0	0	1	1	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	1	1	0	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							84																										
Sub-total MR control charts with at least one false alarm k 10 =							80																										

OBJECTIVE # 3

Lognormal (0 1^2)   k = 30 obs   Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	5.38658	2.62009	4.26832	11.18130	14.42360	2.83356	2.44967	2.51873	2.27273	4.20537	7.87645	2.48037	3.96084	2.81320	4.46460	6.69551	5.66850	3.78127	3.33250	3.39201	2.88910	7.84428	8.68600	2.91397	3.38580	2.79820	11.12380	2.83980	2.44740	2.88369	4.88000
			3.34577	3.33981	4.13659	4.18890	3.18710	2.36234	2.81205	2.81844	2.58335	2.38138	4.32818	8.18333	3.43206	8.00680	3.11280	5.51452	3.29050	3.47348	15.77750	5.85221	2.47150	2.27588	5.65980	2.48378	2.88000	3.55000	4.18310	2.79830	4.07380	3.30295	2.68310
			2.84873	2.61194	5.85703	3.84710	2.53900	2.28417	2.80950	8.18908	4.20747	3.48138	2.58300	4.69281	2.81518	2.88130	2.83980	2.48323	2.34480	8.38900	2.30830	2.98442	2.43880	3.13155	8.40580	2.48725	2.54050	8.51860	2.21380	2.75800	3.25880	4.50442	2.81850
			2.54049	3.26921	3.70077	3.00570	2.58480	5.47775	2.58131	2.49778	3.95121	8.14225	2.38601	8.41831	3.70628	2.42310	2.83450	4.80110	2.53810	2.87935	2.87470	2.48053	5.23340	4.08388	3.82820	3.34819	3.16080	5.52130	3.58120	2.55580	3.15300	8.87046	2.57740
			4.02787	2.71213	3.60189	2.91800	4.84180	2.44574	3.22865	3.08579	2.42438	3.13850	3.89383	3.87181	7.55371	3.86970	15.29800	2.45098	4.93010	2.73082	3.01500	2.35934	2.85880	7.38712	2.23290	2.79503	3.88510	5.12240	2.41140	3.80740	3.61880	3.98815	5.60620
			3.04343	2.38378	2.82048	3.09340	2.44840	3.84848	3.85490	3.07131	4.58318	4.05721	4.64501	2.61921	3.88532	7.15610	5.39000	2.57448	4.07700	3.42548	3.63040	4.83190	2.52740	3.87015	2.48450	2.94568	2.74470	3.05820	8.12350	2.85820	2.80520	2.70552	2.64980
			2.90282	3.56598	3.89409	8.35860	3.03800	2.84047	3.77754	2.98074	2.92128	2.24048	2.43502	2.83794	4.10320	2.81730	2.77300	2.58203	20.22340	2.81538	3.02170	2.28325	3.30820	2.96407	2.58290	2.77707	5.58650	4.23870	5.42870	5.58150	2.85830	2.31713	3.08580
			3.63380	2.32277	4.34967	2.45840	5.52780	2.38595	2.78817	3.83775	3.74510	2.88645	4.76972	2.88254	4.34044	4.78580	2.55220	5.12772	2.73800	2.83012	8.43240	5.03834	22.98890	2.88879	2.44450	3.48055	3.84240	3.08830	4.88480	2.42780	20.31280	4.38180	4.79510
			2.78446	4.13507	4.68632	4.80020	3.24800	2.38585	2.49254	4.42828	2.34424	2.86533	3.87995	2.71654	3.11899	2.45580	2.83180	2.35061	2.98800	2.90580	2.98290	8.90813	3.98410	2.72448	2.76480	2.35721	2.54880	3.82140	2.82250	3.28420	2.58170	2.88258	2.32980
		10	3.82089	3.57275	4.14104	3.49480	3.88850	3.58017	5.42503	3.12818	4.02018	2.79738	5.58837	3.01538	8.83523	2.22410	2.72880	4.08529	2.76180	8.33861	4.05880	3.88555	2.88180	2.75381	4.28480	4.84112	3.52320	2.77420	4.74800	3.27370	2.88920	7.88284	3.98080
			3.87481	4.58300	8.72918	3.22530	2.59870	2.77779	4.52590	2.88864	2.23178	4.24988	2.85707	3.80187	2.87423	2.34710	2.82750	2.81512	3.12280	2.43550	3.78500	4.04481	3.80810	3.72202	3.54050	4.77415	2.24080	3.23700	5.28840	2.58290	2.32080	3.91512	2.81180
			3.07923	2.38822	3.36340	2.73070	3.01470	8.82995	2.85677	2.53038	2.83248	4.57585	2.50562	3.98589	6.29583	3.28940	2.45580	2.31801	2.83820	4.23788	8.37830	2.97338	2.85380	2.83538	2.72070	2.54288	2.80470	5.87920	4.12080	8.81480	2.83230	3.43733	3.05580
			3.30022	2.80070	3.64152	2.52180	4.83980	2.59094	2.48604	5.40431	2.50729	3.40183	2.73985	2.56481	2.58528	4.88840	2.71080	4.52751	4.00890	8.58435	2.31100	3.88342	3.50980	2.43008	4.89400	2.70473	2.52880	2.76880	2.45200	3.58970	3.85410	2.27632	2.87880
			2.98149	3.48531	2.94825	3.01200	3.00300	5.30978	2.63208	2.88095	3.84548	3.13608	3.01337	2.44894	8.13838	4.70770	2.72630	3.50399	2.48190	4.13027	2.27830	7.07285	3.08110	7.01391	3.73350	2.31008	2.77800	7.42040	2.19800	7.18580	3.98250	8.87655	3.21820
New observations k =			3.41448	3.32478	2.70649	16.23740	3.99310	8.18515	3.52329	2.55200	2.88242	3.48827	3.20208	2.48739	3.43598	12.73830	2.88280	3.38881	2.51710	4.88822	12.88210	2.73721	5.50310	4.85830	3.93820	8.05867	2.74210	2.58250	2.58930	2.72050	3.50310	8.45828	2.88490
			2.62060	2.74024	2.58254	3.01410	8.78210	3.72682	4.43530	2.84865	7.84842	2.23786	2.38230	2.88137	3.55387	8.77790	2.51540	3.15572	2.87590	2.42380	7.83710	5.05783	3.33520	2.89763	4.54790	2.91814	3.87870	2.92830	3.24970	2.71670	4.04540	3.91118	2.84220
			2.87871	4.43354	3.35803	3.82290	4.48300	8.45248	3.47668	3.15438	2.50883	4.51812	2.57030	3.43016	5.00454	3.35720	4.34210	7.27583	2.88100	3.18283	3.63470	5.38610	5.14720	2.78880	2.70830	3.71151	3.57050	2.38980	5.98120	2.84400	4.88880	3.32503	3.56990
			5.02488	2.49837	2.73532	2.93800	2.50880	2.48245	2.52887	3.33358	2.42788	3.98038	4.00281	3.84112	8.02108	3.20850	4.88220	2.27980	2.78018	4.57118	3.01810	2.38235	3.02140	4.75212	4.88550	2.82888	7.84610	2.98320	5.74870	2.38770	4.38810	3.58948	14.85940
			2.81598	2.79874	5.35411	8.73270	3.80200	2.98859	2.35298	3.87113	3.53780	3.30080	2.52083	2.83271	8.83170	6.54880	2.45810	2.45894	3.27400	5.21840	2.38490	5.55752	2.28480	2.85735	3.98880	8.83098	3.72390	5.12090	3.88450	5.08810	5.83210	3.77559	3.43950
		20	3.91540	3.33738	2.87508	2.83350	3.21120	3.58583	2.78700	2.44212	7.75088	3.33854	3.80172	2.77088	2.40750	2.83550	3.88980	3.15900	12.88570	7.77185	2.58930	2.47855	2.55800	2.88832	4.01840	8.43725	2.42810	3.88570	4.18150	3.18430	2.70880	2.58307	2.85520
			2.51429	3.51215	2.35375	2.98220	4.48210	3.07587	8.72282	2.85045	4.50283	2.28107	3.70808	2.48925	2.43842	3.84590	5.94810	4.88270	3.71820	3.70142	5.37220	2.48443	4.07320	2.79802	3.15480	3.03808	3.84170	2.85720	2.38200	8.10850	2.28880	3.24721	12.82480
			5.84202	2.54109	2.32288	5.52870	5.72880	2.58673	3.08745	2.63782	2.38420	3.87859	4.30418	7.38881	4.38704	3.03570	2.93750	4.73807	2.74130	3.80150	2.54880	4.37770	3.82230	2.70833	3.38420	2.49274	2.38980	2.55520	2.38440	2.78080	2.94400	3.03861	8.71950
			2.44020	2.95978	4.03085	2.72120	8.34740	4.33138	2.78114	2.86580	2.51252	2.37533	8.88019	2.81442	2.58887	2.87590	4.81210	3.20073	2.31840	3.80335	3.02010	3.81323	2.77180	2.48824	2.35440	2.78844	13.58560	3.28830	3.98080	36.70800	2.84080	5.47980	2.81240
			2.87233	8.44771	4.87288	2.25400	2.83050	3.68699	3.23880	4.38183	5.61140	2.84885	2.88727	3.10894	2.73294	7.73750	2.38320	4.04251	3.01030	3.37081	3.02150	2.38252	2.41780	3.49187	2.84810	4.34332	2.74800	3.78400	18.84870	2.78820	3.85880	4.50861	3.18240
			2.40861	3.26868	4.50368	13.01830	3.83150	3.85844	4.15215	4.08832	4.50702	4.80730	2.88877	2.98874	2.31383	10.38810	3.75130	2.89842	3.74410	5.13870	3.23300	4.72448	2.82340	3.03740	14.28290	5.18014	2.88210	2.72400	2.57880	3.70810	4.40570	2.98138	2.58990
			3.05989	3.23283	4.54728	3.01300	2.23530	2.57782	2.88722	5.54858	2.32551	3.98588	2.84211	8.87418	2.45551	5.38250	5.21740	2.45823	2.87890	4.84758	3.13480	2.70388	3.88810	3.17804	3.37520	3.71727	2.58870	2.43300	2.45850	2.88230	3.72100	5.17798	3.20580
			8.13757	3.98517	3.14698	2.52320	2.38340	2.88392	2.38017	5.38383	3.03510	3.33980	2.83777	3.48754	3.23241	3.81730	3.32400	3.53862	3.48730	2.57342	3.08920	5.22057	8.37580	2.88022	8.14820	3.70585	13.30580	2.78480	3.49850	8.09870	2.85480	2.85800	2.78690
			2.22508	3.14417	4.28808	3.17500	2.84230	3.78807	2.38357	3.34844	3.59874	4.84819	3.30840	5.58808	2.88950	2.38240	4.14320	8.28108	2.88710	3.30408	2.88180	3.18151	28.11900	4.42748	2.40510	3.29583	2.87810	10.71420	2.52370	4.48210	4.88290	8.53054	4.49100
			3.00812	8.88138	2.55418	3.85560	2.77820	2.58827	2.78384	4.12151	4.41131	3.44832	2.98908	2.82528	3.83807	3.04700	3.38580	2.74857	2.31140	8.33525	4.10580	5.83241	3.57080	8.58818	3.58080	3.42588	3.09130	2.88880	2.88730	3.05490	2.32780	5.04733	2.90240
		30	3.84382	2.28158	3.01248	3.72380	3.01420	3.85799	3.18878	2.88888	5.24871	3.20185	2.82738	2.94780	3.72858	8.57430	2.42020	2.72031	2.73450	2.49328	8.85520	3.98851	2.58420	3.88543	2.70580	2.33218	3.88380	13.20180	2.41220	20.88300	3.72130	5.77170	3.73450
Estimator shape parameter			1.287683	1.052606	0.898226	0.888801	0.87463	1.373841	1.392604	1.021378	0.814734	0.904580	1.325363	0.885312	1.740871	0.884217	0.835780	1.15957	1.34354	1.174798	1.225611	1.612812	1.503036	1.408422	1.164113	1.250618	1.11775	1.283904	1.097328	1.307588	1.007448	1.881888	1.172852
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.146749	1.160014	2.258824	2.120284	2.544572	0.854523	1.030438	1.480400	2.308580	2.071878	0.772808	1.863522	0.98287	1.585308	2.195502	1.57385	1.340282	1.855293	1.729803	0.858051	0.679494	0.922848	1.501987	1.238888	1.857221	1.275235	1.733308	1.280552	1.859728	0.765388	1.778380
Control chart constant d2			1.02238	0.990128	0.978398	0.977108	0.97474	1.029046	1.030388	0.985344	0.984775	0.991842	1.025388	0.992036	1.048077	0.981804	0.983835	1.010757	1.028782	1.012281	1.01703	1.043788	1.037807	1.031348	1.01121	1.019248	1.008442	1.022078	1.004228	1.023893	0.983583	1.047247	1.012071
Control chart constant d3			0.968747	0.98588	1.003373	1.004478	1.008508	0.981314	0.980219	0.988039	1.015121	0.991892	0.984288	0.991813	0.943984	0.981832	0.988855	0.978258	0.983151	0.975023	0.971115	0.949196	0.954312	0.959438	0.975887	0.989305	0.979814	0.966095	0.981644	0.985432	0.990508	0.94829	0.975179
Control chart constant D4			3.926017	4.085653	4.178561	4.183112	4.195047	3.982331	3.873311	4.086749	4.243952	4.105389	3.906478	4.10486	3.732581	4.105832	4.148004	3.998112	3.997308	3.989082	3.950818	3.778913	3.82348	3.888813	3.985308	3.945852	4.023678	3.927988	4.03855	3.915818	4.096372	3.753233	3.99021
Upper contro limit X			5.231869	5.67098	8.938428	8.910695	10.18128	5.019718	4.225589	5.917878	8.924431	9.682428	3.635806	8.05508	5.30538	7.798725	8.845588	6.762125	6.389869	8.078248	7.950427	3.583915	4.112578	5.158009	7.828769	5.388228	7.888181	7.21612	8.27289	7.788884	7.878685	3.578851	8.818897
Lower control limit X			-2.27857	-3.21438	-5.87712	-5.13743	-5.71014	-2.3968	-1.35542	-2.87548	-6.16582	-5.54108	-1.58716	-4.14844	-1.9527	-4.61856	-5.83851	-3.11215	-2.78843	-4.18888	-3.71078	-1.47774	-2.08887	-2.56218	-4.4298	-2.28798	-3.88447	-3.94133	-4.46888	-4.44207	-4.53288	-1.00408	-4.64283
Upper control limit MR			5.024338	6.015548	10.76892	9.569946	10.81656	4.938283	3.712314	5.981552	10.08822	10.31885	3.486865	8.281111	4.740873	8.418777	10.73541	8.850522	8.121502	9.255783	7.827113	3.334095	4.087852	5.131382	8.320471	5.117328	7.892438	7.465607	8.808388	8.174806	8.418078	3.002122	9.059102
False alarm in X? (Y=1/N=0)			1	0	0	1	1	1	1	1	0	0	1	1	1	1	1	0	1	0	1	1	1	1	1	0	0	0	1	0	1	1	0
False alarm in X? (Y=1/N=0)			0	0	0	1	0	1	1	0	0	0	1	0	1	1	0	1	1	0	1	1	1	1	0	1	1	1	0	1	0	1	1
False alarm in X? (Y=1/N=0)			1	1	0	1	0	0	1	0	0	0	1	0	0	1	0	1	0	1	0	1	1	1	1	0	1	1	1	1	0	1	1
Total false alarm in X			1	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	0	1	0	1	1	1	0	0	0	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	1	1	1	1	1	0	1	1
Total false alarm in MR			1	1	0	1	1	1	1	0	0	0	1	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
Sub-total X control charts with at least one false alarm k 30 =							208																										
Sub-total MR control charts with at least one false alarm k 30 =							150																										
Normal upper control limit X			4.880252	5.183412	8.887788	7.971093	8.08304	4.694409	3.984112	5.400808	8.760273	8.745515	3.398357	7.318721	5.054342	7.040305	8.937744	6.248866	5.878114	7.448801	7.378827	3.404801	3.884857	4.827281	7.287884	4.99821	7.08911	6.892254	7.573838	7.228822	7.137534	3.414613	8.12505
Normal lower control limit X			-1.92695	-2.70881	-4.82848	-4.19783	-4.63192	-2.07148	-1.11394	-2.35841	-5.00178	-4.62418	-1.34981	-3.41109	-1.70168	-3.86814	-4.82869	-2.59899	-2.37887	-3.55984	-3.13718	-1.28843	-1.82225	-2.23143	-3.79012	-1.89998	-3.38438	-3.41747	-3.78983	-3.8781	-3.78336	-0.84005	-3.95118
Normal upper control limit MR			4.182238	4.835337	8.427058	7.478383	8.426253	4.156861	3.132183	4.787201	8.455172	8.214129	2.917077	6.592836	4.150784	6.701873	8.457877	5.438042	5.133046	8.78347	8.450841	2.883321	3.494087	4.338748	8.805855	4.238123	8.410177	8.211251	8.868371	8.822748	8.715787	2.613895	7.419445
False alarm in X? (Y=1/N=0)			1	0	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	1	0	1	1	0
False alarm in X? (Y=1/N=0)			1	0	1	1	0	1	1	1	0	0	1	0	1	1	0	1	1	1	1	1	1	0	1	1	1	0	1	0	1	1	1
False alarm in X? (Y=1/N=0)			1	1	0	1	0	0	1	1	0	0	1	1	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	0	1	0	0	1	0	0	0	1	1	1	0	1	1	1	1	1	0	0	0	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	1	0	0	0	0	0	0	1	1	0	0	1	0	1	1	0	1	0	1	0	0	0	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	1	0	0	0	1	0	0	0	0	1	1	0	0	0	1	1	1	1	1	1	1	1	0	1	1
Total false alarm in MR			1	1	0	1	1	1	1	1	0	0	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
Sub-total normal X control charts with at least one false alarm k 30 =							217																										
Sub-total normal MR control charts with at least one false alarm k 30 =							178																										
False alarm in X? (Y=1/N=0)			1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							38																										
Sub-total MR control charts with at least one false alarm k 1 =							31																										
False alarm in X? (Y=1/N=0)			1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							44																										
Sub-total MR control charts with at least one false alarm k 1 =							39																										
False alarm in X? (Y=1/N=0)			1	0	0	1	1	1	1	1	0	0	1	1	1	1	1	0	1	0	1	1	1	1	1	0	0	0	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	1	0	1	0	1	1	1	0	0	0	1	0	1	1	0
Sub-total X control charts with at least one false alarm k 10 =							140																										
Sub-total MR control charts with at least one false alarm k 10 =							87																										
False alarm in X? (Y=1/N=0)			1	0	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	0	1	0	0	1	0	0	0	1	1	1	0	1	1	1	1	1	0	0	0	1	0	1	1	0
Sub-total X control charts with at least one false alarm k 10 =							155																										
Sub-total MR control charts with at least one false alarm k 10 =							108																										

OBJECTIVE # 3

Lognormal (0 1^2) k = 30 obs Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	5.10877	5.91524	6.30599	4.57569	8.00719	5.54959	4.49909	5.68315	6.27027	9.73033	6.40565	5.53663	4.80179	5.10159	5.00949	4.77214	14.88798	10.17467	6.65196	5.69538	6.03919	4.81348	6.13659	8.64017	4.87254	5.39219	14.36399	4.40819	7.08725	5.14347	4.98730
			4.45779	5.65277	4.85629	4.80909	5.82568	7.53559	5.57119	5.39838	7.69853	4.38288	5.45424	5.45242	7.53267	4.88685	4.72999	5.25090	4.46409	7.30183	7.68861	5.45432	4.77573	6.18060	5.05499	9.28894	4.83823	7.32819	5.81999	4.85870	5.54408	6.84748	5.28329
			4.70742	6.12076	4.77869	4.72089	7.44980	5.74578	4.92089	5.26451	4.73577	8.17188	4.84913	4.51110	5.15783	6.80414	5.04709	4.82447	4.70799	5.17022	7.83435	5.29233	4.80958	4.57705	5.96319	9.22300	5.37338	4.73708	4.98729	5.14585	5.87230	5.43432	5.24429
			4.48558	4.91497	4.52959	5.95579	10.81075	5.49790	4.70869	5.58910	5.37999	4.87725	10.04245	4.89428	5.84253	6.62997	5.51729	4.54705	6.22319	4.83489	4.55961	4.85291	5.48431	6.48820	5.52459	4.48770	6.08343	4.48929	5.08849	5.61701	4.84736	4.59867	5.58559
			4.51265	5.70015	5.83329	4.91939	4.86579	5.16767	7.27339	5.21103	5.86837	6.44440	5.29878	6.30390	4.93664	6.44310	6.69999	4.78316	4.83009	4.84439	4.62523	4.70889	4.41921	4.45302	4.85309	6.55077	5.22257	4.85359	5.32929	4.80555	7.70823	5.19540	5.84299
			5.61828	5.07272	5.18829	5.81919	7.85408	6.41032	6.10029	7.58280	4.55813	6.51117	6.89707	4.81936	4.63709	6.37819	5.52599	4.80695	5.63319	6.05878	7.56189	4.42884	5.18595	6.83301	10.78099	6.58372	4.85507	4.98549	6.98709	4.68338	4.84471	4.88965	6.43969
			8.18752	8.87159	5.40469	7.47849	7.11421	13.87563	5.08529	6.83989	6.12793	6.93874	5.38251	4.82757	5.45389	5.58544	5.21809	4.78087	5.28859	4.70900	5.88232	4.62348	5.15009	4.51879	5.82159	4.57011	4.78884	10.13099	6.30819	4.75425	8.62785	4.89282	4.78339
			8.21229	5.83632	5.02089	5.72829	4.45485	4.78818	4.42899	5.35028	10.38738	4.95894	6.28324	10.10485	8.00234	5.08155	7.11409	4.95084	5.88999	5.31051	6.32491	5.48884	8.22905	5.01789	10.12389	4.91501	5.34942	4.78979	4.43159	5.48385	10.58173	8.81813	4.48059
			5.42947	7.87045	5.47439	4.85789	7.48823	4.82515	5.15879	5.08733	4.78138	5.88334	6.82413	4.53012	4.59173	4.48173	4.48829	5.10275	4.80589	5.67088	6.81164	5.38788	6.38974	4.89738	9.68859	4.55032	5.12852	5.00789	5.11318	6.81889	4.89343	5.09208	4.97059
		10	5.17339	5.81688	9.02439	4.38958	5.95487	4.48503	8.10879	6.87844	5.20489	6.28252	5.48020	5.05812	9.88502	4.73717	5.08589	4.78589	6.88589	4.83472	4.53827	4.93202	7.07278	5.13310	5.21228	5.14033	6.81498	4.51859	4.42599	4.70731	10.82043	4.88578	8.14749
			6.17848	5.99993	5.02519	5.99169	5.07420	4.44533	4.47909	5.25874	4.45248	4.83870	4.82873	5.19029	8.72587	4.81525	5.34119	5.07993	5.82149	7.33045	4.82380	4.48838	5.37282	5.48378	5.20999	5.28172	9.58991	4.84549	4.78739	6.64889	9.08588	5.83165	4.97999
			4.78850	4.99988	4.88899	6.57859	4.53202	5.28994	4.93239	4.72572	5.10848	11.37983	13.58382	8.83708	4.77870	5.04282	5.01349	8.87418	4.75709	5.01558	5.15277	4.85455	5.58157	5.04353	6.53548	4.85549	4.82777	5.88549	4.87879	4.62484	4.88853	5.08870	4.77059
			8.87828	6.99453	6.41479	16.13809	5.17436	6.28941	4.71189	5.05848	7.28807	5.79584	5.55898	4.51924	5.82858	6.38709	4.86258	5.48072	4.83858	4.85785	5.18008	5.24588	6.32701	4.86428	4.78589	6.27387	8.81869	5.45039	5.89679	5.75212	8.44411	5.24283	6.42919
			4.88882	4.77704	6.05889	7.13099	4.45312	5.08887	5.88719	5.01987	4.87785	4.53210	5.24815	4.61178	4.49189	4.83045	5.81449	12.50840	6.88519	5.28707	6.51397	5.00802	9.82580	4.49887	8.77689	5.85883	5.78533	6.88349	6.56349	4.48013	6.28221	5.02774	5.88799
New observations k =			8.77275	4.98587	6.83899	4.87269	4.98778	5.08820	14.42489	8.94248	8.13402	4.85617	5.28038	4.89761	5.85930	5.12310	12.11389	5.31200	5.81419	8.84872	4.59151	9.58989	6.49510	5.18053	6.08428	5.43983	5.05014	5.82729	5.41449	4.83304	8.18495	6.75137	5.47589
			5.48758	5.14514	4.85869	4.88329	5.53888	4.99082	4.89809	4.78838	4.83279	5.11399	4.83032	6.24388	4.81017	5.93774	6.47719	4.82781	4.80759	8.90229	5.01017	4.85844	6.31785	4.87885	5.20899	5.88891	4.48855	4.81539	4.84779	5.06403	6.18904	5.17257	4.58978
			4.83898	4.89002	7.28439	4.78898	8.47453	7.86178	5.47989	4.80489	5.49883	4.85739	4.50849	5.10408	5.87472	5.04858	4.88378	7.57877	4.82099	5.81587	4.86588	5.44876	4.88445	5.30854	6.77529	5.83042	6.30825	12.38839	4.43359	8.21837	6.17843	4.75118	10.57149
			4.75325	6.50311	4.80839	5.28709	5.10340	5.31328	4.55139	5.25872	4.57581	4.73029	5.22145	4.49304	4.47481	5.40311	5.52289	8.90489	4.88078	5.07735	5.04363	6.48132	4.99381	6.94741	4.78749	4.82238	7.31878	4.88749	5.34899	5.48288	5.85723	4.88443	5.08589
			8.30259	6.25722	6.40709	8.11829	4.51007	5.48291	4.80789	5.18501	6.44187	7.53881	4.51988	4.88857	5.74278	4.40175	4.89249	4.98330	4.88819	7.58885	10.14838	4.57885	4.52733	5.48822	6.84479	8.42885	5.34204	4.75999	8.15849	4.78748	4.78813	5.18912	8.40919
		20	5.03037	4.88049	4.82309	5.35529	5.85308	7.03131	9.72839	8.11888	4.72545	4.80082	4.58890	6.72888	4.47528	4.88884	4.42919	5.81819	4.58709	5.13885	8.00118	6.28701	8.28233	5.84778	4.52099	5.18832	4.89519	6.37709	4.78319	4.58835	4.85898	4.78025	4.53289
			4.74807	4.81832	21.24029	7.17739	5.14405	8.39315	8.57858	5.10388	5.10309	4.51027	13.80345	5.70011	5.47795	5.77141	6.34738	4.87419	4.38709	4.82158	5.43221	6.85989	6.52353	8.37355	4.71539	8.71223	5.01195	14.82989	5.57459	5.22813	4.45220	5.33282	5.11819
			4.93302	5.38195	10.58459	5.24849	4.72576	8.81539	20.84919	7.53475	4.81495	4.98384	4.54487	7.01550	5.85274	5.80735	4.80899	7.01000	7.19878	5.19378	4.50199	5.40949	8.32572	5.33972	7.87419	5.50388	8.82532	7.30739	7.14889	5.44535	4.59818	4.84839	4.88318
			8.03201	4.83289	4.89848	6.30739	8.75428	7.07283	9.15579	5.38877	8.45117	4.81248	4.81878	4.78357	5.88838	8.46098	7.53189	7.88871	5.54789	9.87500	5.47433	6.25884	4.89493	5.80851	4.85089	5.88737	8.79477	6.42109	5.18939	5.28375	5.05854	4.88083	5.48349
			4.82471	4.80841	6.87579	4.85189	4.57123	5.13831	5.84299	5.08395	5.32989	5.70788	5.11083	7.27745	5.94038	5.08305	5.02389	4.74849	6.83159	5.19523	6.78253	5.88054	7.28867	4.83811	4.57859	5.05294	11.85491	6.27529	6.50049	5.82353	5.11719	5.88821	5.00459
			5.48135	4.83390	4.59509	6.80359	4.41489	4.88453	4.82329	4.80787	5.20489	8.17858	9.23573	7.88099	7.53811	5.34803	4.50459	6.22471	5.88878	7.41734	10.81789	5.51149	8.18897	4.77878	7.55539	5.71573	4.58152	5.10719	4.80029	4.81815	6.24881	4.49857	4.88149
			7.19889	4.83545	5.33029	10.08789	10.30279	5.13799	5.59529	4.85887	7.02188	5.97887	5.37153	5.32862	13.82858	5.78031	9.45309	7.54313	5.35849	5.74848	7.30844	5.81223	4.48018	4.71574	6.83989	4.73514	5.00828	6.71809	4.72489	4.81585	4.51885	4.88904	5.11329
			6.41181	5.93141	4.80409	5.84429	4.70156	4.83871	4.47559	7.81935	5.81988	4.82239	5.07817	5.04562	5.01580	5.05887	10.86388	5.93893	4.80049	5.22789	4.77020	5.54529	5.58507	4.81988	7.08789	4.87050	6.77798	5.35149	7.85439	5.21484	5.32004	5.38858	8.38839
			4.89988	5.19838	5.41829	5.88219	4.88598	4.79818	6.27879	4.58828	4.77184	5.23244	4.88342	5.18772	4.82224	5.03781	13.20589	6.77144	4.88889	5.57488	4.50279	7.80233	4.64593	4.85131	7.38719	4.58289	6.30844	4.98549	8.83989	5.41310	5.04448	4.52031	14.79489
			4.79817	5.72734	4.47139	8.89479	5.85987	5.18445	5.07789	4.83419	4.87381	6.88810	4.80384	6.00810	12.80184	4.84758	4.58829	4.93889	5.58399	6.11298	13.29244	7.17828	5.41363	4.82052	5.34409	5.41778	5.58785	6.85219	4.58829	4.97458	5.88985	7.34730	4.85159
		30	4.40507	10.70107	4.48089	5.13539	4.53805	4.52893	8.51819	4.84532	4.73830	4.53820	4.72384	5.59824	5.92888	12.84585	4.77589	5.07833	4.88779	5.43178	7.12597	5.28738	8.28008	5.87587	4.57789	11.79758	5.43648	6.89489	8.17518	4.88373	4.80089	5.33988	7.92388
Estimator shape parameter			1.287883	1.052808	0.898228	0.888801	0.87483	1.373841	1.392894	1.021378	0.814734	0.894588	1.325363	0.895312	1.740971	0.894217	0.835789	1.15857	1.34354	1.174798	1.225811	1.812812	1.503838	1.408422	1.164113	1.250818	1.11775	1.283984	1.087328	1.307588	1.007448	1.881888	1.172852
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.146748	1.188914	2.258824	2.120284	2.544572	0.854523	1.030438	1.489409	2.308588	2.071879	0.772888	1.863522	0.98287	1.595308	2.195502	1.67385	1.340282	1.655293	1.728803	0.858051	0.878494	0.922848	1.501887	1.238888	1.857221	1.275235	1.733308	1.288552	1.858728	0.785389	1.779388
Control chart constant d2			1.02238	0.889128	0.878388	0.977109	0.97474	1.028848	1.030388	0.995344	0.984775	0.881842	1.025388	0.892838	1.049877	0.881884	0.983835	1.010757	1.028782	1.012281	1.01703	1.043788	1.037887	1.031348	1.01121	1.018248	1.008442	1.022878	1.004228	1.023883	0.883583	1.047247	1.012071
Control chart constant d3			0.988747	0.88588	1.003373	1.004478	1.008509	0.881314	0.980219	0.989038	1.015121	0.881882	0.884289	0.881813	0.843884	0.881932	0.898855	0.878258	0.883151	0.875023	0.871115	0.948188	0.854312	0.858438	0.875887	0.888385	0.878814	0.888985	0.881844	0.885432	0.888588	0.84828	0.975178
Control chart constant D4			3.928017	4.085853	4.178581	4.183112	4.195047	3.882331	3.873311	4.088748	4.243852	4.105389	3.888478	4.10488	3.732581	4.105632	4.148004	3.898112	3.887308	3.888082	3.858818	3.778813	3.82348	3.888813	3.895388	3.845852	4.023878	3.827988	4.03855	3.815818	4.008372	3.753233	3.88021
Upper contro limit X			5.231868	6.67098	8.938428	8.810895	10.18128	5.018718	4.225589	5.817878	8.824431	8.862429	3.835808	8.05508	5.30538	7.788725	8.845588	6.782125	6.388888	8.078248	7.850427	3.583815	4.112578	5.158888	7.828788	5.388228	7.888181	7.21612	8.27289	7.798884	7.878885	3.578851	8.818887
Lower control limit X			-2.27857	-3.21438	-5.87712	-5.13743	-5.71014	-2.3868	-1.35542	-2.87548	-6.16592	-5.54108	-1.58716	-4.14644	-1.9527	-4.81858	-5.83851	-3.11215	-2.78843	-4.18898	-3.71079	-1.47774	-2.08887	-2.58218	-4.4288	-2.28798	-3.98447	-3.94133	-4.48888	-4.44207	-4.53288	-1.00408	-4.84283
Upper control limit MR			5.024338	6.015548	10.78882	9.588848	10.81858	4.838283	3.712314	5.881552	10.88022	10.31885	3.488895	6.281111	4.740873	8.418777	10.73541	6.850522	6.121502	8.255783	7.827113	3.334095	4.087852	5.131382	8.320471	5.117328	7.882438	7.465607	6.888388	8.174888	8.418878	3.002122	9.050102
False alarm in X? (Y=1/N=0)			1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	1	0	1	1	0
False alarm in X? (Y=1/N=0)			1	1	0	1	0	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	1	1	0	1	1	0	1	1	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1
Total false alarm in MR			0	0	1	0	0	1	1	0	0	0	1	0	1	0	0	1	1	1	1	1	1	0	1	1	0	1	1	0	0	0	1
Sub-total X control charts with at least one false alarm k 30 =							232																										
Sub-total MR control charts with at least one false alarm k 30 =							148																										
Normal upper control limit X			4.880252	5.163412	8.887788	7.871093	9.08304	4.694409	3.984112	5.400909	8.760273	6.745515	3.308357	7.319721	6.054342	7.040305	8.037744	6.248966	5.978114	7.448001	7.370827	3.404001	3.884857	4.827261	7.287084	4.88821	7.08811	6.882254	7.573839	7.228922	7.137534	3.414613	8.12505
Normal lower control limit X			-1.92895	-2.70691	-4.82848	-4.10783	-4.63192	-2.07149	-1.11394	-2.35841	-5.00176	-4.82418	-1.34961	-3.41109	-1.70168	-3.88814	-4.82889	-2.58899	-2.37887	-3.55984	-3.13719	-1.28843	-1.82225	-2.23143	-3.78012	-1.88898	-3.38439	-3.41747	-3.78983	-3.8781	-3.78338	-0.84005	-3.85118
Normal upper control limit MR			4.182238	4.835337	8.427058	7.478393	8.428253	4.158861	3.132183	4.787201	8.455172	8.214125	2.817077	6.582838	4.150794	6.701873	8.457877	5.438042	5.133048	6.78347	6.458841	2.883321	3.494087	4.338748	8.805855	4.238123	6.410177	6.211251	6.888371	6.822749	6.715767	2.813895	7.418445
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			1	1	0	1	0	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			1	1	0	0	0	1	1	1	0	1	1	0	1	0	0	0	1	1	0	1	1	1	1	1	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	1	0	0	0	1	0	0	0	1	0	1	1	1	0	0	0	1	0	1	0	0	1	1	1	0	0	0	1	1
Total false alarm in MR			1	1	1	1	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1
Sub-total normal X control charts with at least one false alarm k 30 =							239																										
Sub-total normal MR control charts with at least one false alarm k 30 =							184																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	1	0	0	1	1	0	0	0	0	0	1	1	0	1	1	0	0	1	0	0	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0	1	1	0	0	1	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							97																										
Sub-total MR control charts with at least one false alarm k 1 =							65																										
False alarm in X? (Y=1/N=0)			1	1	0	0	0	1	1	1	0	1	1	0	0	0	0	0	1	1	0	1	1	0	0	1	0	0	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			1	1	0	0	0	0	1	1	0	1	1	0	0	0	0	0	1	1	0	1	1	1	0	1	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							115																										
Sub-total MR control charts with at least one false alarm k 1 =							95																										
False alarm in X? (Y=1/N=0)			1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	1	1	0	1	1	0	1	1	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							199																										
Sub-total MR control charts with at least one false alarm k 10 =							92																										
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			1	1	0	0	0	1	1	1	0	1	1	0	1	0	0	0	1	1	0	1	1	1	1	1	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							215																										
Sub-total MR control charts with at least one false alarm k 10 =							133																										

OBJECTIVE # 3

LOGNORMAL (0 1^2)   n = 50 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			3.03447	1.861	0.28027	0.88366	1.38011	1.08438	0.81674	0.88838	1.0434	3.2246	0.33162	1.18344	1.1679	1.88825	2.48102	0.24378	1.15248	3.48888	1.85106	2.84678	0.81588	0.3898	2.71088	4.71861	0.6042	0.8481	0.2788	0.8294	7.74508	0.48672	1.1273
			0.88881	0.3613	0.88788	0.14871	0.22329	0.38811	0.27261	0.36048	0.1888	8.3486	6.888	1.8788	3.882	0.12143	0.4878	0.42888	0.31817	1.23144	2.84867	0.26464	0.78821	0.4388	0.38334	0.13378	0.4741	0.6758	1.7672	3.5538	2.03238	0.20688	1.48124
			0.22882	3.4861	0.38373	1.42853	0.38282	0.37218	0.23878	2.37888	0.8247	1.0388	1.16888	1.20486	8.8412	0.88616	0.38651	1.35702	1.28863	0.14404	1.18464	0.31863	1.10836	6.2888	1.48888	0.88131	3.078	0.4766	0.2867	1.308	0.78834	0.63081	3.81882
			1.66827	0.7124	0.87432	1.88177	0.30442	2.81815	0.82718	1.59828	0.6342	0.3858	0.88627	0.36874	1.0227	0.56838	0.26818	0.3822	1.02671	2.10142	1.42882	0.48264	2.63032	1.1731	1.48087	4.88053	0.7726	0.6028	2.4188	0.3638	0.80585	0.35737	2.48438
			1.0663	0.2198	4.74343	1.04408	3.02181	0.80158	8.88112	0.46548	1.8204	0.1361	1.84147	0.48422	1.348	1.683	0.82818	2.53837	1.8318	0.54866	0.26824	0.76148	0.48361	1.0841	2.65148	0.66387	2.2417	0.4888	1.0848	0.7448	7.40382	0.86333	2.48863
			7.81442	0.2838	2.04314	1.0158	1.57824	2.28871	1.81825	0.38177	1.8033	1.7154	0.9928	2.84244	1.1888	1.22881	5.93822	0.78818	2.38742	1.48406	1.86883	0.22238	0.28041	0.3028	1.88842	3.34878	20.3881	2.6388	0.8401	0.3758	1.32881	0.88784	0.47646
			1.72234	8.8658	0.8348	1.88861	0.30861	1.90818	1.19018	0.37402	2.8206	0.6887	7.36311	1.61378	1.3652	0.93882	0.82026	4.47388	2.64888	0.64966	1.88342	1.16836	1.0888	2.3782	0.87187	0.48313	0.2083	2.343	0.218	2.1728	0.83864	2.88272	2.28848
			1.41681	1.82	3.86875	0.28672	0.32883	1.2814	2.03387	1.05328	0.832	0.6181	0.84371	4.42847	2.8882	0.84788	1.22848	2.88866	0.62617	4.88188	0.38817	1.18882	0.34816	0.1084	0.48638	3.38348	0.6688	0.782	0.7458	1.4838	2.12618	3.66138	0.78462
			0.6848	0.8843	0.48357	0.1033	1.64221	1.3881	0.63988	0.27327	0.8888	3.7856	1.23214	1.12677	0.783	0.28054	0.7183	1.68888	0.23788	1.82542	7.88857	1.86263	6.27348	2.3688	2.68414	0.78688	1.3618	0.4388	0.8238	0.5458	0.37138	3.47688	1.52681
			1.08232	0.0852	2.88288	1.38124	0.78878	0.83813	1.80308	1.88048	0.2237	0.6728	0.71443	2.88388	1.1081	1.73262	1.86367	0.62386	1.32888	0.29428	1.7868	0.41101	0.88674	1.3128	0.8486	3.14887	2.823	0.2867	0.788	1.8834	6.0856	0.4038	3.83817
			1.02884	0.8883	3.65172	2.30067	0.15058	2.31631	0.10411	1.06231	1.1241	0.7117	0.27226	0.5347	1.6878	0.18878	0.48783	1.04271	0.78677	1.41234	2.17088	0.78887	3.84721	0.281	0.88887	0.62483	0.8836	3.787	3.2327	0.6458	0.48336	0.68288	1.34886
			0.83863	0.7888	1.81914	1.72626	4.87817	0.64343	1.03841	0.84542	1.0798	0.3342	1.62444	1.23388	0.2438	0.38788	2.38888	0.84686	0.88888	0.99076	0.80648	1.4643	3.17588	0.2017	0.44711	0.3363	0.8126	2.0243	0.6202	0.8732	1.30801	0.78166	0.80843
			1.20856	0.6488	0.85888	0.1061	0.49321	2.82188	2.86083	1.8328	3.3183	0.3048	2.88883	0.52881	1.888	0.21848	2.77173	0.84628	0.88318	1.82206	0.37058	0.8886	0.65023	3.48	0.74086	0.28182	1.7844	0.6888	2.1778	4.8678	0.64248	2.88123	0.42542
			0.73028	0.6601	0.49678	2.18823	0.44821	0.15867	0.17118	1.10782	0.3324	1.1141	0.88117	0.23885	0.5847	9.78818	0.32604	1.03807	0.73446	3.44302	2.18078	0.88676	6.44824	1.8828	1.74307	0.43711	3.8838	0.6686	1.6738	0.6092	0.41463	1.77377	2.23686
			2.17784	0.8287	0.60984	1.18018	0.4041	0.19358	0.27835	0.38061	0.8883	2.8631	0.57736	0.76442	0.8143	0.87738	0.60882	2.88488	2.48378	2.41888	0.88036	0.3376	0.83863	1.221	0.77806	0.72842	0.6138	2.8881	0.8106	2.3844	0.68877	0.63074	0.13877
			0.38804	1.4061	3.39644	0.43848	0.65784	0.47523	0.88447	6.33224	0.6825	0.8862	0.22601	0.2887	0.1788	2.88708	1.03843	0.2281	2.12678	3.64816	1.83236	6.888	1.24262	0.0878	2.48338	2.08864	1.636	3.8878	0.6748	2.6348	1.38288	0.60682	0.64001
			0.40017	1.5868	0.6478	1.31262	2.84835	2.41882	0.28467	0.4826	1.0188	0.3806	1.81827	0.47588	0.2886	0.43086	0.26307	0.78698	1.41377	0.14283	8.33888	0.81278	0.0787	18.9234	0.42026	1.16681	0.882	1.4227	1.2863	1.8811	1.28688	2.34883	0.14682
			0.71188	1.2128	0.4867	2.4884	2.80122	8.83588	2.34821	0.43232	2.8488	0.1721	0.26381	3.88481	1.8826	0.71083	1.18834	0.73718	7.18828	0.66796	1.18731	0.48288	1.20446	0.3471	1.3344	0.10863	1.0826	0.6806	0.378	0.8607	1.06886	1.8878	0.78822
			2.33123	7.7038	0.74321	1.83778	0.58458	0.57102	0.37817	3.49738	0.8282	6.8314	0.2841	2.84878	1.8882	0.48118	2.07842	1.18383	2.73501	0.82974	2.22784	0.68088	0.38702	0.2888	6.23863	0.16821	0.1821	0.4813	0.4861	2.6116	6.88454	1.22006	2.88826
			0.87873	0.8882	1.0338	4.57884	0.19885	3.88982	1.18838	0.72844	1.4887	0.6336	1.88087	0.84063	0.3874	6.84163	1.1887	1.81748	2.24888	0.63888	2.74288	1.88354	1.07141	0.7411	0.88287	2.12868	0.6384	0.4284	0.3146	2.0423	0.53433	0.88878	1.17848
			1.28888	0.8593	3.18247	2.63737	0.84172	0.36128	1.88023	0.3848	1.471	0.2602	1.55988	1.26833	0.8871	0.26573	0.40318	0.98376	0.88872	1.6886	0.88841	2.61168	1.88412	0.6828	0.70154	0.84061	2.8818	2.6081	0.364	1.1486	0.08822	0.35174	3.20837
			2.01881	2.1026	0.18588	1.47187	2.12838	3.18266	4.21873	0.8814	1.7013	8.3083	0.17142	3.17783	0.4288	0.88848	0.47878	0.73188	6.60778	1.4881	2.28411	0.86072	0.86216	1.0408	1.88072	0.86123	2.4288	0.6382	0.4828	0.1748	0.30622	2.14134	0.23226
			0.74318	0.7257	3.23488	0.71282	2.15766	0.88338	1.28888	0.84161	0.0838	2.6818	0.84084	1.73888	0.7788	0.28088	0.82418	2.2866	8.88381	2.17812	0.28887	4.25191	1.81887	0.1468	0.88434	0.16411	0.3871	1.2121	2.2188	3.8718	3.33811	3.18688	0.08138
			1.47582	3.2258	0.85881	0.81314	2.48831	1.12881	0.67361	0.34243	1.0247	0.2807	4.68858	0.24281	3.8883	0.27861	9.7848	3.77886	1.7131	2.6654	0.32007	2.50222	0.30146	0.1844	0.84823	1.88886	8.6286	1.1428	0.8237	0.303	0.84085	0.21802	0.03603
			0.84431	0.4348	1.28798	4.72858	0.81386	1.63802	0.30217	1.27082	0.4114	0.4243	0.81713	1.0234	0.7884	0.20143	0.46256	0.72346	0.1648	1.88267	0.86886	0.18418	0.20621	0.6488	2.44328	7.2188	2.3836	1.0244	10.8388	0.386	0.48686	0.46786	0.64787
			1.62438	2.4328	3.3788	3.2883	0.77886	1.83718	2.50324	8.87786	2.6474	1.3388	1.03343	0.88348	0.288	0.78838	0.43888	8.64001	0.34174	0.17112	0.20383	0.88828	2.17863	2.8316	0.88888	0.84646	0.6616	1.0017	1.8874	0.7036	0.78114	0.34674	0.28837
			0.84283	8.6842	4.88726	1.62888	0.6886	2.18186	0.32082	0.22228	0.8888	0.3104	0.88328	0.32177	2.0747	1.33877	1.8438	0.32436	0.86801	1.20884	3.3152	0.19126	2.76498	1.2881	2.31802	1.02738	0.3048	2.8623	1.3861	0.2468	6.78081	2.27118	3.48581
			0.38488	0.8842	0.13817	2.82424	0.48138	1.63324	0.3278	4.88313	1.8378	8.7742	1.88482	8.66886	0.636	2.88178	0.87164	0.27812	0.88888	0.21646	2.03748	1.62863	3.13843	0.4488	0.18887	0.10841	1.0136	0.3888	0.6367	1.2648	2.2878	2.2214	0.83641
			4.92736	4.5031	2.82836	0.34724	6.18262	0.68776	0.12763	1.12672	1.281	0.6532	1.34333	1.00006	2.776	0.47207	2.78788	1.67467	1.41168	6.23072	0.66748	1.82824	0.24087	1.6788	1.8258	0.8184	0.3211	0.4178	2.4427	3.4784	0.83288	0.38876	4.38787
			0.12886	1.0841	0.7478	0.88417	0.6836	6.81688	1.87627	2.12888	1.8318	10.0478	0.28383	2.34886	0.1038	1.08124	0.66888	2.88338	0.688	1.16888	0.18874	1.48028	0.88738	0.7636	1.84786	1.68786	0.883	10.6488	0.3476	0.4873	0.21848	0.41683	0.48037
			0.40028	0.6243	0.88488	1.68286	1.03013	0.24368	1.82202	2.84888	2.8232	0.7636	0.21482	2.83738	1.4764	7.88141	1.13868	4.21202	1.88468	1.20802	1.07688	1.78381	0.47768	0.8834	0.2336	0.78478	1.6404	0.8878	0.7831	0.3148	2.37888	0.04148	0.84012
			0.36681	0.6818	2.80872	0.76121	0.68287	8.85871	2.62888	0.20334	1.1308	1.4684	0.1384	0.64912	1.0408	0.4841	0.2886	3.18338	0.46102	0.48341	0.44611	1.18812	2.12388	0.1816	1.02823	2.26677	4.8864	0.8888	2.3412	0.8388	0.68328	4.03828	0.86877
			0.70078	0.7212	0.43124	0.83436	0.66368	0.68802	0.19878	1.18681	3.0013	0.4727	0.28818	3.37017	3.6886	0.48647	0.38884	0.88872	0.44241	0.24672	0.48488	1.63471	1.63768	1.1688	0.40483	0.47872	0.8867	3.3781	1.7411	13.7373	1.38861	1.4132	0.81377
			0.76734	0.1832	2.06202	0.34842	1.00416	1.22486	0.85336	0.48431	1.0484	0.5188	4.85178	0.36856	1.8804	0.32144	0.88164	0.60484	0.88188	2.2878	4.47814	0.38852	0.34137	0.7871	1.81836	0.26887	0.6388	2.8347	0.3746	1.8233	0.38683	1.18271	0.40001
			0.71818	22.3906	1.08118	1.36362	0.28861	1.38836	0.23648	0.83406	0.428	10.1843	1.88818	0.78888	18.8883	1.66182	2.78432	0.88682	0.88883	0.86774	1.12082	0.28838	0.37036	1.337	0.78881	0.17681	0.8813	2.448	2.4768	0.3347	1.68726	4.88222	0.28134
			7.41876	2.4876	0.19636	7.02872	0.88834	0.11668	0.56164	1.07888	1.1678	0.8686	0.84348	1.44846	6.8828	0.16838	3.12848	0.68884	0.13312	2.38774	0.66024	1.28107	1.8038	3.4888	0.32387	2.81782	0.6826	0.8168	0.864	0.2026	0.76601	1.4877	2.40883
			0.20483	0.8288	0.20711	0.47166	0.48833	1.14702	0.38888	0.74422	8.2827	0.3484	2.23605	6.18063	1.0363	0.88862	0.07842	1.64178	0.88186	0.24643	0.4643	3.78882	8.2003	1.287	0.84446	3.40617	2.2488	0.4107	0.8367	0.1382	3.5883	2.28784	7.78882
			0.2388	0.1626	1.1484	2.127	0.62878	0.88776	1.68653	1.18672	0.6886	0.6641	1.18812	3.20107	2.3403	4.37741	0.38864	1.2618	0.38684	1.26108	0.26872	0.88682	0.83108	1.0383	3.68438	2.68386	0.2886	6.0041	0.2386	6.036	0.38868	0.16701	4.38184
			0.43816	4.078	0.88171	1.84887	3.41408	1.88122	0.68383	3.46246	3.7848	2.6867	0.6888	0.13816	0.8288	0.38183	1.10466	1.31683	0.76388	0.87768	3.62882	1.78286	0.33172	1.2428	0.42787	0.33881	0.8184	1.1218	0.7417	0.1137	8.40146	0.18886	0.3721
			0.28163	1.3117	2.78614	1.32186	0.27317	1.88131	0.28871	6.0288	1.2028	0.1331	1.6287	0.18847	0.7272	1.00881	0.16113	0.87071	1.48882	0.3847	0.78833	0.348	1.18386	6.7788	0.41628	0.78476	2.1181	1.4438	2.7662	2.1132	0.18888	1.84718	4.61417
			0.47373	0.1287	0.61888	2.87117	1.47827	0.41484	1.72864	0.35846	0.8888	3.3321	0.41111	0.83767	1.6888	0.888	1.18083	0.18846	0.11468	1.02384	4.18288	1.83818	0.42882	0.2644	0.86481	1.84882	3.1686	1.3107	0.1871	2.2088	0.31762	0.84388	1.21484
			0.28881	1.6681	0.88231	2.41333	0.84428	0.68288	2.14216	0.88826	0.6741	1.3367	0.41081	2.27444	0.8383	2.86888	0.38887	0.23888	0.42388	0.87234	4.28878	0.44814	0.76888	0.8477	0.08788	1.81168	0.3436	0.8848	2.0623	0.3077	0.63888	1.61884	3.78884
			0.41624	8.1181	0.82876	0.27488	3.18833	1.08874	0.88886	2.88118	0.6143	4.4381	3.22888	1.70478	0.4883	0.42632	0.88848	1.0813	1.28883	0.83168	0.38882	0.82802	3.38377	2.0848	0.70322	0.81881	0.8233	0.886	4.1818	0.4878	0.88078	0.84684	0.82387
			0.26824	0.6066	0.81412	0.73371	0.21213	1.82188	0.85884	0.22722	1.0643	2.4881	0.81886	1.24881	1.8748	0.71883	0.83266	0.48886	1.18888	3.41884	1.107	2.76803	0.76122	0.0426	0.86886	1.13684	0.8882	1.4748	0.4881	0.8311	0.10146	0.48861	0.86388
			0.62287	1.6883	2.82172	0.6377	2.88324	0.64822	0.38748	0.88886	1.1023	0.8662	1.48382	0.78888	0.1886	8.14282	1.08884	0.63886	0.88816	0.48411	0.86168	1.88283	4.86388	0.3888	0.84876	0.77441	0.2888	0.8867	0.4846	0.7342	2.232	0.8637	0.48883
			0.22683	0.8882	1.71	0.48864	1.66012	0.63884	0.83818	0.28882	41.8318	0.8841	0.63361	1.07882	2.2817	5.83331	1.63887	1.16814	0.38884	0.87636	1.48763	2.88298	0.23481	1.283	0.86788	2.80638	0.1886	1.1063	0.4868	0.268	0.78328	0.81011	4.33036
			0.88673	0.3014	1.61718	0.78446	2.8818	1.03724	0.43881	4.88648	1.1748	0.2881	0.4123	8.18886	0.8638	1.8667	0.16464	1.28872	0.81882	8.68282	0.84768	0.46236	7.81748	2.8044	1.48868	1.87264	2.8288	1.287	2.8882	1.2888	1.42166	3.11188	1.88878
			6.28723	2.0067	1.84128	0.18118	2.34641	0.4619	2.72428	0.78829	0.1073	1.8203	0.83432	0.83618	0.3448	1.88848	1.1481	0.86718	0.86478	0.31888	0.38238	1.14883	1.04824	1.2666	2.88888	1.32271	0.2861	1.681	0.2887	1.347	0.88011	0.88646	4.34318
			1.13366	1.1888	0.36882	2.43788	0.24288	0.72863	0.8611	1.83673	1.8038	0.1166	1.31638	1.18888	1.0437	1.88688	2.88188	0.84813	0.87837	0.84488	3.88323	1.32386	0.13783	0.827	0.78148	0.87021	1.8888	1.7818	0.3388	0.4682	1.728	0.27887	1.02226
			2.41431	0.4173	1.44848	0.12724	2.18862	1.12281	5.41737	1.08476	0.3778	0.8283	0.33883	1.13784	1.1488	1.83288	0.82184	0.83481	0.18624	0.2831	0.48211	3.12388	1.48888	4.1144	1.28188	0.81114	1.8227	0.7873	0.2028	1.8706	2.81288	0.0684	1.83631
Average			1.36763	2.18881	1.48727	1.48341	1.28728	1.49884	1.28494	1.48717	2.17436	1.83513	1.38228	1.7814	1.78815	1.82288	1.48442	1.32648	1.38786	1.88374	1.8464	1.36441	1.78882	1.86983	1.24888	1.48867	1.7841	1.78446	1.33162	1.86867	1.78348	1.42388	1.78886
Moving range average			1.4221	3.00072	1.49083	1.28221	1.28123	1.49833	1.29832	1.88388	2.82781	2.83478	1.48382	1.82881	1.74832	1.82472	1.82886	1.08412	0.86288	1.80628	1.82182	1.16818	2.18731	2.88461	1.13877	1.48733	2.14882	1.82861	1.48842	1.88888	2.18833	1.24828	1.7788
T statistic			2.06762	1.42027	2.48858	2.90242	2.4288	2.88102	2.18296	2.28888	1.4128	1.38838	2.23826	2.24283	2.08683	1.68487	1.81884	2.88888	2.21688	1.81818	1.82188	2.08874	1.81877	1.48881	3.4656	2.08276	1.78843	2.37882	2.19488	1.86734	1.82078	2.04611	1.84314
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.099	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.776	0	0	0	0	0	0	0	0	0	0.82618	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0.83754	0	0	0	0	0	0	0.83366	0	0	0	0	0	0	0	0	0	0	0	0	0.8833	0	0	0	0	0	0	0	0	0
33	1.5	0.879	0	0	0	0	0	0	0	0	0	0	0	0	0	0.88158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.01338	0	0	0	0	0	0	0
36	1.8	1.035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.04366	0	0	0	0	0	0	1.08424	1.04658	0	0
37	1.9	1.086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.0868	0	0	1.08546	1.08741	0	0	0	0	0	0	0	0	0	0	0	1.10843
38	2	1.138	1.18733	0	0	0	0	0	0	0	0	0	0	0	1.17116	0	0	0	0	0	0	0	0	0	1.1802	0	0	0	0	0	0	1.181	0

39	2.1	1.189	0	0	0	0	0	0	1.2211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.23887	0	0	0	0
40	2.2	1.24	0	0	0	0	0	0	0	1.27417	0	0	1.26951	1.28104	0	0	0	0	1.24798	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.33018	0	0	0	0	0
42	2.4	1.342	0	0	1.36788	0	1.35888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2.5	1.393	0	0	0	1.38424	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	1.48632	0	0	0	0	0	0	0	0	0	1.4904	0	0	0	1.47447	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3.3	1.799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.07736	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator shape parameter			1.16733	0.83764	1.36788	1.38424	1.35888	1.48632	1.2211	1.27417	0.83366	0.82816	1.26951	1.28104	1.17116	0.88159	1.0868	1.4904	1.24798	1.09645	1.09741	1.47447	1.04366	0.8633	1.07736	1.1802	1.01336	1.33018	1.23887	1.08424	1.04559	1.181	1.10843
Estimator scale parameter			1.16302	2.611	1.07896	1.08396	0.95821	1.00358	1.06227	1.18717	2.80855	2.34231	1.0816	1.39589	1.50974	1.94088	1.36386	0.88936	1.04797	1.54616	1.49836	0.91867	1.72183	1.92172	0.88481	1.1836	1.77041	1.28137	1.07843	1.46543	1.71528	1.22848	1.63815
Control chart constant d2			1.01153	0.88869	1.03003	1.0306	1.02778	1.03852	1.01862	1.02128	0.98801	0.98878	1.02001	1.02021	1.01181	0.97583	1.00407	1.03684	1.01902	1.00402	1.00424	1.03684	0.99806	0.97293	1.06558	1.01278	0.99434	1.02677	1.01806	1.00048	0.99829	1.0108	1.00644
Control chart constant d3			0.87562	1.01173	0.98061	0.98013	0.96236	0.9652	0.97145	0.96786	1.01231	1.0134	0.96868	0.96861	0.97532	1.00557	0.98177	0.95496	0.96949	0.98181	0.98164	0.95578	0.98678	1.00806	0.83907	0.87458	0.98888	0.96388	0.97028	0.98475	0.98857	0.97814	0.98884
Control chart constant D4			3.99348	4.22499	3.8767	3.87268	3.89078	3.83111	3.96236	3.9332	4.22828	4.2344	3.94111	3.93984	3.99121	4.18855	4.03748	3.8288	3.9474	4.03774	4.0368	3.83688	4.0717	4.20408	3.88821	3.88588	4.08228	3.90403	3.95348	4.06798	4.07034	3.98725	4.02952
Upper contro limit X			5.57532	11.48	5.63836	5.15798	4.87871	5.82146	5.11622	6.4313	10.9381	10.1112	5.75621	7.13091	6.94846	7.54013	6.36145	4.4823	4.14291	7.08781	7.09811	4.73762	8.40182	8.02488	4.48461	5.75498	8.27882	6.48725	5.89406	6.87514	8.12829	5.13132	7.01367
Lower control limit X			-2.96006	-7.10835	-2.84482	-2.10117	-2.38418	-2.84017	-2.64634	-3.45896	-6.58038	-6.24086	-3.03086	-3.80811	-3.40818	-4.29418	-3.3728	-1.91131	-1.82721	-3.70043	-3.7073	-2.0288	-4.80787	-4.7088	-1.88834	-2.93786	-4.88842	-3.05834	-3.03103	-3.864	-4.54231	-2.7834	-3.80147
Upper control limit MR			5.67913	12.678	5.77802	4.88802	4.80718	5.73258	5.14441	6.81898	11.9568	11.1586	5.8986	7.1842	6.98991	8.0837	6.6788	4.16088	3.90131	7.28828	7.36418	4.48088	8.84678	8.87934	4.20116	5.84861	8.7827	6.36776	5.85282	7.32898	8.58181	4.9838	7.18771
Normal upper control limit X			5.13982	10.1876	5.46225	4.84036	4.85182	5.47023	4.73782	5.86344	9.89513	8.94248	5.33486	6.81792	6.41261	6.74191	5.82873	4.20878	3.888	6.49504	6.49086	4.48121	7.84072	7.14874	4.27073	5.31106	7.50861	6.0366	5.28882	6.38298	7.40075	4.74848	6.4388
Normal lower control limit X			-2.42456	-6.79384	-2.48771	-1.87364	-2.06707	-2.48895	-2.16805	-2.98908	-6.34842	-5.0722	-2.8101	-3.08602	-2.87831	-3.49684	-2.83788	-1.6578	-1.25328	-3.10784	-3.20014	-1.7624	-4.04708	-3.83188	-1.78068	-2.49381	-3.92031	-2.62888	-2.80578	-3.24382	3.81377	-1.88863	-3.0248
Normal upper control limit MR			4.64743	8.80637	4.87204	4.12481	4.12171	4.88888	4.24291	5.50029	8.24129	8.61038	4.88113	5.98742	5.70986	6.28887	6.3234	3.64288	3.14706	5.88888	5.96405	3.91764	7.1806	6.74881	3.7215	4.79624	7.07188	5.32197	4.83803	5.90225	6.89002	4.08268	5.81312

OBJECTIVE # 3

Lognormal (0 1 ^2)   k = 50 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	0.39000	1.08479	0.20248	0.54569	1.28190	1.43832	1.60850	1.46830	0.75239	0.43676	0.57873	2.98142	1.09308	0.28226	1.03230	0.91054	0.29000	3.84874	2.24579	0.36815	0.79740	1.01332	0.22520	0.97802	0.98507	0.88244	1.01500	0.20420	0.48512	2.10021	2.48441
			1.16150	2.48763	4.06785	0.44876	0.41420	2.82895	0.87550	0.51088	0.33021	0.88905	0.49158	2.81067	1.08803	4.53271	0.83340	0.96428	0.88880	2.08736	0.25703	0.13152	0.08282	0.80837	0.89480	1.00362	5.61985	0.80357	1.83340	2.42300	1.34849	0.24736	4.24027
			0.74230	0.16628	1.70084	0.38355	0.40510	1.57082	0.91150	1.63838	0.13880	0.53211	2.07898	0.23578	0.48651	5.88887	0.40270	1.88095	0.45770	3.32838	0.40406	0.92017	0.40105	0.58851	1.15580	0.75283	0.19291	0.38877	1.57580	0.28740	2.05088	4.87338	1.42418
			3.45330	1.87867	3.80530	1.78188	0.38020	0.24628	1.74840	0.29781	1.74884	0.54122	5.54485	2.03880	0.98968	5.88889	3.25780	1.28580	0.43850	1.10478	1.40814	0.42881	0.87803	1.58792	3.93750	0.15088	1.88045	1.24548	1.01480	1.12170	0.55478	3.81198	0.37270
			1.14430	2.87578	0.33234	0.81300	0.22400	1.80332	0.55800	1.20884	0.84824	1.44258	0.46257	1.83812	1.05853	0.95104	1.03840	1.00238	13.12880	0.38516	0.80832	0.82851	0.77152	1.13011	0.87280	0.48388	0.37547	0.45841	4.05880	1.23880	1.72147	0.44384	1.10986
			2.52000	0.44348	5.19482	1.88100	1.60050	3.52814	0.32780	0.44505	0.24530	0.48244	1.42383	2.23119	1.70254	1.83180	0.42030	1.48704	0.08780	1.87080	0.37585	0.20873	3.64580	0.78250	2.42410	5.38370	2.73825	1.10082	1.93840	0.08370	3.74240	0.28038	0.88890
			0.93320	2.86579	0.31873	1.32143	1.88120	3.72884	0.24780	0.13582	0.40540	0.42583	2.20758	8.00411	0.38888	2.02278	1.62020	2.98287	0.32080	2.61217	2.01731	0.82080	4.45121	2.35778	3.15210	1.08795	0.28034	0.42380	0.63810	2.54780	0.84880	2.21127	2.78473
			0.88250	1.07198	1.01885	1.41528	0.27780	2.88288	0.58720	0.45724	2.34883	0.43285	4.13705	3.78408	0.88887	0.87240	0.78520	1.47738	1.27410	1.44158	1.20000	2.72431	2.85328	0.63711	0.32350	1.88884	4.82843	0.71830	0.55850	12.07380	0.44784	0.42421	0.88402
			0.10180	1.81573	0.33277	0.47849	0.28870	0.15003	0.78240	0.42512	0.88325	1.37038	0.23454	1.70030	0.32408	2.92373	0.27020	0.88241	1.15030	4.70178	2.07437	0.80841	5.82898	0.38210	0.21880	0.38088	0.14338	1.88475	1.73230	0.41530	2.07777	0.77905	0.80111
		10	4.38020	0.34897	1.29578	0.34575	0.87780	2.11284	2.14580	2.87414	0.88448	7.78883	0.38824	1.10180	0.78512	1.31875	0.18850	5.40935	0.81780	1.88800	0.38280	2.18882	2.20383	3.00072	0.72800	1.17423	0.34814	0.74887	0.21310	2.13250	2.48881	4.75580	1.83520
			2.77700	3.80885	0.82175	0.40871	0.60080	2.58174	1.07170	0.32538	0.88708	0.55541	0.58787	0.24452	1.33138	0.18894	0.71480	1.48480	0.45580	1.45788	0.43122	0.25278	0.41378	2.23852	3.08840	1.13001	0.28811	1.01735	1.44180	0.80830	3.38244	1.00208	4.04855
			0.50750	0.93893	0.50895	0.47507	0.18078	0.78835	1.10080	1.53310	0.49880	5.80609	1.19740	2.24753	0.38843	0.88150	0.35000	2.88218	0.53870	0.27188	1.71888	1.08030	4.41888	3.83447	8.84000	2.15148	1.87040	0.88029	0.58030	0.30400	0.33484	1.81885	0.81080
			5.81520	0.77878	1.28790	3.07858	3.23188	0.44851	0.98810	5.39878	5.85822	0.35184	4.80850	3.81380	0.88451	0.80530	0.83830	0.58249	0.88850	1.42881	0.84807	2.58772	2.31888	1.19774	3.87450	0.28878	1.27635	4.28885	2.84780	0.48470	0.25518	1.38002	2.88485
			1.02080	0.89604	0.80430	3.21895	1.44400	0.88843	1.05810	0.20131	0.34813	3.77817	8.08735	1.51557	0.08188	0.28233	1.08280	2.27148	4.35550	0.88828	2.80287	0.85563	0.23334	0.28357	11.70710	0.45383	1.43758	0.22724	0.70880	0.88230	0.80883	0.58885	0.18300
New observations k =			0.98800	0.08042	0.70808	0.50654	1.88770	0.81879	8.88810	0.08883	1.53458	0.84725	1.81153	2.48712	0.84841	3.08837	5.80130	0.89438	1.30770	2.03388	8.57588	2.72353	0.78021	0.88488	3.14480	1.85780	1.78715	1.83288	32.81400	0.10780	1.38578	3.52731	0.17851
			2.11100	1.38031	0.14885	0.57887	8.18100	0.82142	0.52780	0.45842	0.50581	0.87838	0.88822	2.28318	0.53188	1.24185	0.52010	0.88102	0.51170	0.05113	0.32883	2.32581	0.88117	1.13183	0.38420	0.53858	1.28043	3.37510	0.38130	0.70880	8.11573	1.47468	0.88885
			0.28870	0.84890	0.74815	1.75523	2.28800	1.23853	1.33838	1.38500	0.22188	0.45448	4.10038	0.44885	0.84780	0.48852	3.78510	2.48882	2.75170	0.25831	1.12580	0.48504	1.54453	3.07238	0.88880	8.88435	0.54738	0.85385	0.25700	0.24880	0.78874	0.83301	1.28288
			1.00780	0.35428	0.45302	3.83553	0.84580	1.87821	0.51830	1.32847	0.82815	0.44232	1.34227	0.88330	0.33383	1.74338	1.58480	0.88903	0.40380	0.70837	2.14288	1.27140	0.18802	0.27518	2.84840	1.85107	2.44038	0.58520	0.85380	1.85870	0.24885	2.18414	0.33885
			1.82820	0.18408	1.17813	0.53887	10.58020	0.34214	1.88080	8.83828	0.55388	6.25322	5.17848	3.74715	1.10338	0.88880	28.58080	0.45588	0.88540	5.88548	0.88849	8.52338	0.88484	0.24383	2.83140	1.47732	0.53484	3.85385	1.53270	0.77210	0.55182	0.78880	0.48012
		20	0.98840	2.17830	0.33351	2.42458	3.01130	1.07517	0.80340	1.24383	0.83405	0.38703	2.57228	1.88888	1.57435	0.88815	0.53800	0.81571	4.75470	1.54244	2.11383	2.82510	1.31888	0.48040	0.48580	1.03247	0.20475	0.78123	0.42888	0.23880	1.11838	0.42484	0.88837
			5.27120	3.01588	0.88741	1.10831	0.31780	0.18178	0.34810	0.88023	0.73850	0.75188	0.51148	2.02818	2.85100	1.58508	1.03070	0.88818	0.54820	2.45838	5.88787	1.17854	0.75328	0.23187	8.98340	0.45217	0.49887	0.58088	0.38190	1.71730	1.07301	0.24781	0.85004
			0.88210	0.48835	0.74434	0.48838	2.02340	0.31877	0.81340	2.08470	1.20110	4.37834	1.08114	0.71707	2.31354	0.88488	0.41400	0.42084	3.10840	1.13880	1.88720	1.00305	0.80237	0.20284	8.43770	0.31881	0.54188	1.03858	0.30850	2.47770	2.82555	7.22884	0.87342
			2.80080	0.83570	0.38837	0.35880	0.88170	0.82734	0.83170	0.12788	1.58488	1.33532	0.47802	0.28055	0.52502	0.81824	0.88310	1.13213	2.78850	2.02420	1.18841	0.31221	0.38012	0.54218	1.81350	0.81453	3.18843	1.20788	0.75488	1.24580	0.28850	0.30184	2.84772
			0.77740	0.28833	0.88862	1.32888	1.28230	0.12575	1.08200	1.75458	0.44002	0.88108	0.88001	0.38318	2.38884	7.01843	4.02850	1.73885	0.52120	2.05122	2.88517	0.24521	0.44028	0.34085	2.48080	0.83433	2.20888	0.88418	0.78580	1.18830	0.30523	0.87512	0.88858
			14.43110	1.88018	0.58318	1.21727	1.78420	0.87241	2.17830	2.10078	1.25355	0.02714	0.58885	1.33238	1.34705	1.81873	7.84050	0.38048	0.28580	0.56783	2.83480	2.27482	2.78244	3.82138	1.01870	1.88220	0.83008	1.40587	1.38280	3.52450	0.18844	0.59587	0.12718
			0.16280	0.30887	0.10558	0.58570	0.44878	0.83195	15.88810	1.30847	0.37071	1.38884	4.24158	0.78831	0.24178	3.45541	0.81300	0.12173	4.42880	1.78000	2.23112	0.12122	0.17747	0.32585	2.38470	1.81081	0.85857	1.54801	0.77880	1.23480	1.48221	0.77718	0.27844
			2.78710	0.73885	0.38887	0.18831	0.37830	2.44858	3.48570	0.28880	1.42882	0.27455	0.74758	0.58572	0.72587	0.45254	2.12480	3.88815	8.10170	0.15204	0.71534	1.43772	0.58803	0.56782	0.48080	0.38284	0.73382	0.88888	0.13480	2.88350	1.33338	1.50305	0.42878
			0.54580	0.15148	0.55482	1.27882	0.41330	0.24842	0.92880	0.78448	3.88823	3.11348	0.84415	0.48288	2.38245	8.17588	2.28880	1.38840	0.24080	1.93448	0.84437	1.81238	3.80128	8.38314	1.33080	4.53127	3.00084	0.47372	3.10240	1.81250	0.88845	0.34185	0.18474
			1.85720	0.85478	0.25857	1.32888	3.87810	2.40838	0.82820	0.84183	0.38821	0.41421	0.81451	2.22880	0.88865	2.15848	1.76730	0.43288	1.14230	1.42585	0.88573	1.88833	0.23811	0.73584	1.58220	0.38583	0.58854	2.78415	0.53880	2.08800	0.87545	2.30828	0.88836
		30	1.13840	2.47143	0.81284	0.18584	1.58580	2.21112	0.88880	3.40833	1.00838	0.31448	1.38338	0.52251	0.41480	0.27480	0.78780	0.48778	0.20880	5.81818	1.48288	3.32828	0.35401	0.83801	0.11830	0.05314	1.18881	0.84841	0.31380	4.82800	0.22780	3.88884	1.78557
Estimator shape parameter			1.167335	0.837539	1.387803	1.394236	1.356889	1.485321	1.221104	1.274185	0.83355	0.820162	1.258508	1.281844	1.171184	0.881565	1.095901	1.490402	1.247886	1.085454	1.087412	1.474487	1.043554	0.883304	1.877356	1.180203	1.013381	1.33018	1.238972	1.084241	1.045587	1.181004	1.108432
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.183021	2.810896	1.078864	1.083957	0.856207	1.003582	1.052274	1.167174	2.808547	2.342311	1.081801	1.395882	1.508738	1.848888	1.383848	0.889353	1.04787	1.548153	1.49835	0.910574	1.721831	1.821722	0.88481	1.1835	1.770408	1.281371	1.078432	1.485428	1.715284	1.228481	1.538154
Control chart constant d2			1.011528	0.988888	1.030034	1.030487	1.027778	1.038521	1.018822	1.021257	0.988815	0.988755	1.020013	1.020213	1.011806	0.975833	1.004072	1.038835	1.018018	1.004023	1.004238	1.035843	0.98805	0.972832	1.055581	1.012788	0.984344	1.025788	1.018047	1.00048	0.988284	1.010901	1.005441
Control chart constant d3			0.975825	1.011728	0.980508	0.98013	0.982347	0.855204	0.971448	0.987883	1.01231	1.013402	0.988878	0.988515	0.975315	1.00557	0.981774	0.954846	0.989492	0.981815	0.981838	0.955781	0.988778	1.008083	0.938088	0.874582	0.988878	0.983884	0.870284	0.984748	0.988575	0.978141	0.980841
Control chart constant D4			3.98348	4.224891	3.875781	3.872577	3.890778	3.831107	3.982354	3.833204	4.228277	4.234387	3.841108	3.938838	3.981208	4.188553	4.037457	3.8288	3.947388	4.037743	4.038485	3.835857	4.071702	4.204075	3.888205	3.985881	4.002258	3.804033	3.853477	4.057858	4.070338	3.987254	4.029518
Upper contro limit X			6.575317	11.47887	6.83836	5.157885	4.878712	5.82145	5.116218	6.431303	10.0321	10.11121	5.755213	7.130905	6.94548	7.540134	6.381448	4.482288	4.142811	7.087908	7.088188	4.737818	8.401818	8.024881	4.48451	5.754884	8.278821	6.467251	5.884058	6.875141	8.129287	5.131323	7.013588
Lower control limit X			-2.88005	-7.10835	-2.84482	-2.18117	-2.38418	-2.84017	-2.54834	-3.45888	-6.58838	-6.24085	-3.03085	-3.60811	-3.40818	-4.28418	-3.3728	-1.81131	-1.52721	-3.70043	-3.7873	-2.0288	-4.80787	-4.7088	-1.88834	-2.83785	-4.88842	-3.05834	-3.03103	-3.858	-4.54231	-2.2834	-3.60147
Upper control limit MR			5.878135	12.87803	5.778022	4.88802	4.807178	5.732581	5.144407	6.618883	11.85877	11.1588	5.888497	7.184203	6.988813	8.083702	6.578804	4.150876	3.881305	7.288203	7.354188	4.488888	8.848776	8.678338	4.281155	5.848888	8.782887	6.357758	5.852824	7.328879	8.581613	4.883881	7.187786
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	1	0	1	1	0	0	1	1	0	0	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0
Total false alarm in X			1	0	0	0	1	0	1	1	0	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	0	1	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	1	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0
Total false alarm in MR			1	0	0	0	1	0	1	1	0	0	0	0	0	1	1	1	1	0	1	1	0	1	1	1	0	0	1	1	0	1	0
Sub-total X control charts with at least one false alarm k 30 =							146																										
Sub-total MR control charts with at least one false alarm k 30 =							132																										
Normal upper control limit X			5.13082	10.18748	5.482252	4.840358	4.851821	5.47023	4.737917	5.863438	8.895131	8.842455	5.334865	6.61782	6.412808	6.741913	5.82873	4.208783	3.888887	6.495038	6.480849	4.481208	7.640724	7.148738	4.278728	5.311049	7.508508	6.035598	5.288815	6.362882	7.400748	4.748456	6.438888
Normal lower control limit X			-2.42455	-5.79384	-2.46771	-1.87354	-2.05707	-2.48895	-2.16805	-2.88908	-5.34842	-5.0722	-2.6101	-3.09502	-2.87831	-3.49594	-2.83788	-1.5578	-1.25328	-3.10756	-3.20014	-1.7524	-4.04708	-3.83188	-1.78056	-2.48381	-3.92031	-2.62889	-2.80578	-3.24382	-3.81377	-1.89853	-3.0248
Normal upper control limit MR			4.647428	9.808368	4.872042	4.124814	4.121713	4.88898	4.242813	5.500293	9.24128	8.61038	4.881135	5.987416	5.708882	6.288874	5.323388	3.542895	3.147063	5.888884	5.854049	3.81754	7.180787	6.748808	3.721488	4.78524	7.021885	5.321871	4.838027	5.802255	6.890018	4.082575	5.813118
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	1	0	1	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	1	0	1	1	0	0	1	1	0	0	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0
Total false alarm in X			1	0	0	0	1	0	1	1	0	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	0	1	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	1	0	1	1	0	0	1	1	1	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0
Total false alarm in MR			1	0	1	0	1	0	1	1	0	0	1	0	0	1	1	1	1	0	1	1	0	1	1	1	1	0	1	1	0	1	0
Sub-total normal X control charts with at least one false alarm k 30 =							181																										
Sub-total normal MR control charts with at least one false alarm k 30 =							182																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							7																										
Sub-total MR control charts with at least one false alarm k 1 =							10																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							8																										
Sub-total MR control charts with at least one false alarm k 1 =							17																										
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							66																										
Sub-total MR control charts with at least one false alarm k 10 =							56																										
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							81																										
Sub-total MR control charts with at least one false alarm k 10 =							88																										

OBJECTIVE # 3

Lognormal (0 1 ^2)   k = 50 obs   Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	5 30058	2 62009	4 20832	11 16130	14 42360	2 83356	2 44907	2 51873	2 27273	4 20537	7 87945	2 40837	3 90084	2 81320	4 46480	8 80551	5 86850	3 78127	3.33250	3 39291	2 68910	7 84428	8 88800	2 81307	3 38580	2 79820	11 12380	2.83880	2 44740	2 88388	4 88000
			3 34577	3 33901	4 13059	4 10090	3 18710	2 38234	2 81205	2 81044	2 58335	2 36139	4 32818	8 18333	3 43208	8 00880	3 11280	5 51452	3 28050	3 47348	15 77750	5 85221	2 47150	2.27588	5 85980	2.48378	2.88000	3 55000	4 18310	2 78830	4 07390	3.30295	2 88310
			2 84873	2 81194	5 85703	3 84710	2 53900	2 28417	2 80959	8 10908	4 20747	3 48139	2 59308	4 89281	2 81518	2 88130	2.63980	2 48323	2 34480	8 38808	2 30930	2.88442	2 43800	3 13155	8.40580	2 48725	2 54050	8 51880	2 21380	2 75880	3 25880	4 50442	2 81850
			2 54049	3 28921	3 70077	3 00570	2 58480	5 47775	2 58131	2 49776	3 05121	8 14225	2 38801	8 41831	3 70828	2 42310	2 83450	4 90110	2 53810	2 97835	2.87470	2 48053	5.23340	4 08388	3.82820	3 34818	3 18080	5 52130	3 58120	2.55580	3 15300	8 87048	2 57740
			4 02787	2 71213	3 80109	2 81800	4 84100	2 44574	3 22985	3 08579	2 42438	3 13850	3 88383	3 87181	7 55371	3 88870	15 28800	2 45098	4.93010	2.73082	3 01500	2.35834	2 85880	7 38712	2 23290	2.78503	3 88510	5 12240	2 41140	3 80740	3 81880	3 98815	5 80820
			3 04343	2 38378	2 82048	3 09340	2 44840	3 84848	3 85480	3 07131	4 58318	4 05721	4 84501	2.81821	3 88532	7 15810	5.38000	2 57448	4 07700	3 42548	3 83040	4 83190	2 52740	3 87015	2 48450	2.84589	2 74470	3 05820	8 12350	2 85820	2.80520	2 70552	2 84980
			2 90282	3 56598	3 89409	8 35880	3 03800	2 84047	3 77754	2 88074	2 92128	2 24048	2 43502	2 83784	4 10320	2.81730	2 77300	2 58203	20 22340	2 91538	3 82170	2 28325	3.30820	2 98407	2 58290	2 77707	5 58850	4 23870	5 42870	5 58150	2 85830	2 31713	3 08580
			3 83388	2 32277	4 34987	2 45840	5 52780	2 38595	2 78817	3 83775	3 74510	2 98845	4 78872	2.98254	4 34044	4 78580	2 55228	5 12772	2 73800	2 93012	8 43240	5 03834	22 88880	2 88878	2.44450	3 49855	3.84240	3 08830	4 88480	2 42780	20 31280	4 38180	4 78510
			2 76446	4 13507	4 88832	4 80020	3 24800	2 38585	2 48254	4 42828	2 34424	2 98533	3 87995	2 71854	3 11889	2 45580	2 83180	2 35081	2.98800	2 90580	2 88280	8 88813	3.88410	2 72448	2 78480	2 35721	2.54890	3 82140	2.82250	3 28420	2 58170	2 89258	2 32980
		10	3 82069	3 57275	4 14104	3 49480	3 88850	3 58017	5 42503	3 12818	4 02018	2.78730	5 58837	3 01538	8 93523	2.22410	2 72880	4 08529	2.78180	8 33881	4.05880	3.88555	2.88180	2 75381	4.28480	4 84112	3 52320	2 77420	4 74800	3 27370	2 88820	7 88284	3 88880
			3 87481	4 58300	9 72818	3 22530	2 59870	2 77778	4 52580	2 88884	2 23178	4 24988	2 85707	3 80187	2 97423	2.34710	2.82750	2 81512	3 12290	2.43550	3 78500	4 04481	3 80810	3.72202	3.54050	4 77415	2.24080	3.23700	5 28840	2.58290	2.32080	3 91512	2 81180
			3 07923	2 38922	3 38340	2 73070	3 01470	8 82985	2 85877	2 53038	2 83246	4 57585	2 50582	3.88598	8 28583	3.28840	2.45580	2 31801	2 83820	4 23788	8.37830	2 87338	2 85380	2 83538	2 72070	2.54288	2 80470	5 87920	4 12080	8 81480	2.83230	3 43733	3 05590
			3 30022	2 80070	3 84152	2 52180	4 83980	2 59894	2 48804	8 40431	2 50728	3 40183	2 73985	2.58481	2.58528	4 88840	2.71080	4 52751	4 00890	8.59435	2 31180	3 88342	3.50980	2 43008	4 88400	2 70473	2 52880	2 78880	2 45200	3 58870	3 85410	2 27832	2 87880
			2 98149	3 48531	2 84825	3 01200	3 00300	5 30978	2 83208	2 88095	3 84548	3 13888	3 01337	2 44894	8 13838	4.70770	2.72830	3 50399	2 48190	4 13027	2.27830	7 07285	3 08110	7 01381	3 73350	2 31008	2 77800	7 42040	2 18800	7 18580	3 98250	8 87855	3 21820
New observations k =			3 41446	3 32478	2 70849	18 23740	3 88310	9 10515	3 52328	2 55200	2 88242	3 48827	3 20209	2 48738	3 43598	12 73830	2 88280	3 38881	2 51710	4 88822	12 80210	2 73721	5 50310	4 85830	3 83820	8 05087	2 74210	2 58250	2 58830	2 72050	3 50310	9 45028	2 88490
			2 82080	2 74024	2 58254	3 01410	8 78210	3 72882	4 43530	2 84985	7 84842	2 23788	2 38230	2 88137	3 55387	8 77790	2 51540	3 15572	2 87580	2.42388	7 83710	5.05793	3 33520	2 88783	4.54790	2 81814	3.87870	2 92830	3 24870	2 71870	4 04540	3 81118	2 84220
			2 87871	4 43354	3 35883	3 82290	4 48300	8 45248	3 47888	3 15438	2 50883	4 51812	2 57030	3 43018	5 00454	3.35720	4 34210	7 27583	2.88100	3 18283	3.83470	5 38810	5 14720	2 78880	2 70830	3 71151	3.57050	2 38880	5.88120	2 84400	4 88880	3 32503	3 58980
			5 02488	2 49837	2 73532	2 93800	2 50880	2 48245	2 52987	3 33358	2 42788	3 98039	4.00281	3 84112	9 02108	3 20850	4 88220	2 27080	2 78010	4 57118	3.01810	2 38235	3.02140	4 75212	4 80550	2.82088	7 94810	2 98320	5 74870	2 38770	4 38810	3 59849	14 95840
			2 81598	2 79874	5 35411	8 73270	3 00200	2 99059	2 35289	3.87113	3 53788	3 30090	2.52083	2.83271	8 83170	8.54980	2.45810	2 45084	3 27400	5 21840	2.38490	5.55752	2.28480	2.85735	3 88880	8 83098	3 72390	5 12080	3 88450	5 08810	5 83210	3 77558	3 43850
		20	3 81540	3 33736	2 97508	2 83350	3 21120	3 58563	2 78700	2 44212	7 75088	3 33854	3 80172	2.77088	2.40750	2.83550	3.88880	3 15900	12.88570	7 77195	2.58830	2.47855	2.55800	2 88832	4 01840	8 43725	2 42810	3 80570	4 18150	3 18430	2 70880	2 58307	2 85520
			2 51429	3 51215	2 35375	2 98220	4 46210	3 07587	8 72292	2 85045	4 50283	2.28107	3.70809	2.48925	2.43842	3 84590	5.94810	4 88270	3 71820	3.70142	5.37220	2 48443	4.07320	2 78802	3 15480	3 03808	3 94170	2.85720	2 38200	8 10850	2.28980	3 24721	12 82480
			5 84202	2 54109	2.32298	5.52870	5 72880	2.58873	3 08745	2 83782	2 38420	3 87858	4 30418	7 38881	4 38704	3.03570	2.93750	4 73807	2.74130	3 08159	2.54880	4 37770	3.82230	2.70833	3.38420	2 48274	2 38880	2.55520	2.38440	2 78080	2 84400	3 03081	8 71850
			2 44020	2 95878	4 03085	2 72120	8 34740	4 33138	2.78114	2 88588	2.81252	2 37533	8.88818	2 81442	2 58887	2.87580	4.81210	3 20073	2.31840	3.80335	3.82010	3.91323	2 77180	2.48824	2 35440	2 78844	13.58580	3 28830	3.88080	38 70800	2 84080	5.47880	2 81240
			2 87233	8 44771	4 97288	2.25400	2 83050	3.88890	3.23880	4 38183	5 81140	2.94885	2.98727	3.10894	2 73284	7 73750	2.38320	4 04251	3.01830	3.37081	3.02150	2.38252	2 41780	3.48187	2.84810	4 34332	2.74800	3 79400	18.84870	2 78820	3 85880	4 50881	3 18240
			2 40881	3 28888	4 50388	13.01830	3.83150	3.85944	4 15215	4 08832	4 50702	4 90730	2.88877	2 98874	2 31383	10.38810	3.75130	2.89842	3.74410	5.13870	3 23300	4.72448	2.92340	3.03740	14 28290	5 18014	2.88210	2 72400	2.57880	3 78810	4.40570	2 99138	2 58990
			3 05988	3 23283	4 54728	3 01300	2 23530	2.57782	2 88722	8 54858	2 32551	3 98598	2 84211	8.87418	2 45551	5 38250	5.21740	2.45823	2 87880	4.84758	3.13480	2 70388	3 98810	3 17804	3 37520	3.71727	2.58870	2 43300	2.45850	2 88230	3 72100	5 17798	3 20580
			8 13757	3 99517	3 14898	2 52320	2.38340	2 88382	2 38017	5.38383	3 03518	3 33880	2 83777	3 48754	3.23241	3.81730	3.32400	3 53862	3 49730	2 57342	3 08820	5 22057	8.37580	2 88022	8 14820	3 70585	13 30580	2 78480	3 48850	5 08870	2 85480	2 85808	2 78890
			2 22508	3 14417	4 28808	3 17500	2 84230	3.78807	2 38357	3.34844	3 58874	4 84818	3.30840	5 58808	2 88850	2.39240	4 14320	8.28108	2.88710	3.30408	2.88180	3 18151	28 11800	4 42748	2 40510	3.28583	2 87810	10 71420	2 52370	4 48210	4.86290	8.53054	4 49100
			3 08812	8 88139	2 55418	3 85580	2.77620	2 58827	2.78384	4 12151	4.41131	3.44932	2.90808	2.82528	3 93807	3 04700	3.38580	2 74857	2.31140	8 33525	4 10580	5.83241	3.57080	8.58818	3 58080	3 42508	3 09130	2 88880	2.88730	3 05480	2.32780	5.04733	2 90240
		30	3 84382	2 28158	3.01248	3 72380	3.01420	3.85798	3 18878	2 88888	5 24871	3.20185	2.82738	2.84780	3.72858	8.57430	2.42020	2 72031	2.73450	2.48328	8.85520	3.98861	2.58420	3.88543	2.70580	2.33218	3.89380	13.20180	2.41220	20.88300	3.72130	5 77170	3 73450
Estimator shape parameter			1 107335	0.837530	1 307083	1.304236	1.350880	1.485321	1.221104	1.274165	0.83365	0.828102	1.258508	1.261844	1.171164	0.881585	1.095801	1.490402	1.247088	1.085454	1.087412	1.474467	1.043554	0.883304	1.077356	1.180203	1 013381	1.33018	1 238872	1.084241	1.045587	1 161004	1 108432
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1 163021	2 610998	1.078884	1 063957	0 958207	1.003582	1 052274	1 167174	2.808547	2.342311	1.081801	1.395802	1.508736	1.840988	1.383848	0.889353	1.04797	1.548153	1.49835	0.910574	1.721831	1.021722	0.88481	1.1835	1 770408	1.281371	1.078432	1 485428	1 715284	1.228481	1 538154
Control chart constant d2			1 011528	0 988688	1.030034	1.030497	1 027778	1 038521	1 018822	1.021257	0 988015	0 988755	1.020013	1.020213	1.011805	0.875833	1.004072	1.036835	1.018010	1.004023	1 004238	1.035843	0 88805	0.872932	1.055581	1 012788	0 884344	1 025788	1 018047	1.00048	0.888284	1 010881	1 005441
Control chart constant d3			0 875625	1 011728	0 880508	0 98013	0 882347	0 955204	0.871448	0.987083	1.01231	1.013402	0.988878	0.988515	0.875315	1.00557	0 881774	0.954848	0 988492	0.881815	0 881838	0 955761	0.888778	1.008083	0.838088	0 874582	0.888878	0 883884	0 870284	0 884748	0 888575	0 878141	0 888841
Control chart constant D4			3 98348	4 224981	3.875701	3.872577	3 880778	3.831107	3 862354	3.933204	4.228277	4.234307	3 841108	3.838838	3.881208	4.188553	4.037457	3.8288	3.847388	4.037743	4.038485	3 835857	4 071782	4.204075	3.888205	3 885881	4 882258	3 884033	3.853477	4 057858	4.070338	3.887254	4.028818
Upper contro limit X			5 575317	11.47987	5.83838	5.157985	4.970712	5 82145	5 118218	6.431303	10.8381	10 11121	5 755213	7.130805	8.94548	7 540134	8.381448	4.482288	4 142811	7 087808	7 088108	4 737818	8.401819	8.024861	4 48451	6.754884	8 278821	6 487251	5 884858	8 875141	8.128287	5 131323	7 013588
Lower control limit X			-2 88005	-7 10835	-2.84482	-2 19117	-2.38418	-2.84017	-2.54834	-3.45888	-8.58838	-6.24085	-3.03085	-3.80811	-3.40818	-4.28418	-3.3728	-1.81131	-1.52721	-3.70043	-3.7973	-2.0288	-4.80787	-4.7068	-1 88834	-2.83785	-4.88842	-3 05834	-3.03183	-3.858	-4.54231	-2 2834	-3.80147
Upper control limit MR			5.878135	12 87803	5.778022	4.88802	4.907178	5.732581	5 144407	8.819883	11.85877	11.1588	5.888487	7 184283	8.988813	8.083782	8.578804	4 150878	3.801308	7 288283	7 354188	4 488888	8.948778	8.878338	4.281155	5.848888	8 782887	8 357758	5 852824	7 328878	8.581813	4.883801	7 187708
False alarm in X? (Y=1/N=0)			0	0	0	1	1	0	1	1	0	0	1	1	1	1	1	1	1	0	1	1	1	0	1	0	0	1	1	0	1	1	0
False alarm in X? (Y=1/N=0)			0	0	1	1	1	1	0	0	0	0	0	0	1	1	0	1	1	1	1	1	0	0	1	1	0	1	1	1	0	1	1
False alarm in X? (Y=1/N=0)			1	0	0	1	1	0	1	0	0	0	1	1	0	1	0	1	0	1	0	1	1	1	1	0	1	1	1	1	0	1	1
Total false alarm in X			1	0	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	1	1	0	1	0	1	0	1	0	0	0	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	1	1	1	1	1	0	0	1
Total false alarm in MR			0	0	1	1	1	1	0	0	0	0	1	0	0	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	0	1
Sub-total X control charts with at least one false alarm k 30 =							205																										
Sub-total MR control charts with at least one false alarm k 30 =							137																										
Normal upper control limit X			5 13882	10 16748	5.482252	4.840358	4.651821	5.47023	4.737817	5 863438	8.685131	8.942455	5.334665	6.61782	6.412606	6.741913	5.82673	4.208783	3.908907	6.495036	6.490949	4.461209	7.840724	7.149738	4.278728	5.311049	7.508508	6.035598	5.288815	6.302062	7.400748	4.748456	6.430808
Normal lower control limit X			-2.42455	-5 78384	-2.48771	-1 87354	-2.05707	-2 48895	-2 18805	-2.88909	-5.34842	-5.0722	-2.6101	-3.09502	-2.87831	-3.49504	-2.83708	-1.5578	-1.25329	-3.10758	-3.20014	-1.7524	-4.04708	-3.83108	-1.78056	-2.48301	-3.92031	-2.62808	-2.80578	-3.24382	-3.81377	-1.89853	-3.0248
Normal upper control limit MR			4 847428	8 808368	4.872042	4 124914	4.121713	4.88909	4.242813	5.500283	9.24128	8.81038	4.881135	5.987418	5.708802	6.288874	5.323308	3.542805	3.147053	5.888804	5.854048	3.81754	7 180787	6.748808	3.721498	4.78524	7.021085	5.321871	4.838027	5.802255	6.890019	4.082575	5.613118
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	1	1	0	1	1	0
False alarm in X? (Y=1/N=0)			0	0	1	1	1	1	0	0	0	0	0	0	1	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	1
False alarm in X? (Y=1/N=0)			1	0	0	1	1	0	1	0	0	0	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	0	1	1
Total false alarm in X			1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	0	1	0	0	1	0	0	0	1	1	1	0	1	0	1	0	1	0	0	0	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	1	0	1	0	0	0	0	0	0	1	1	0	1	1	0	1	1	0	0	0	1	0	0	0	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	1	1	1	1	1	1	0	0	1
Total false alarm in MR			0	0	1	1	1	1	0	1	0	0	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1
Sub-total normal X control charts with at least one false alarm k 30 =							228																										
Sub-total normal MR control charts with at least one false alarm k 30 =							171																										
False alarm in X? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							33																										
Sub-total MR control charts with at least one false alarm k 1 =							30																										
False alarm in X? (Y=1/N=0)			1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							38																										
Sub-total MR control charts with at least one false alarm k 1 =							39																										
False alarm in X? (Y=1/N=0)			0	0	0	1	1	0	1	1	0	0	1	1	1	1	1	1	1	0	1	1	1	0	1	0	0	1	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	1	1	0	1	0	1	0	1	0	0	0	1	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							134																										
Sub-total MR control charts with at least one false alarm k 10 =							76																										
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	1	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	0	1	0	0	1	0	0	0	1	1	1	0	1	0	1	0	1	0	0	0	1	0	1	1	0
Sub-total X control charts with at least one false alarm k 10 =							160																										
Sub-total MR control charts with at least one false alarm k 10 =							96																										

OBJECTIVE # 3

Lognormal (0 1 ^2) k = 50 obs Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	5.10877	5.91524	6.38590	4.57509	8.00719	5.54059	4.49900	5.88315	6.27027	8.73933	6.40585	5.53083	4.80179	5.18158	5.08948	4.77214	14.88798	10.17487	8.85180	5.89538	8.03818	4.81348	8.13850	8.84017	4.87254	5.38218	14.38388	4.40818	7.08725	5.14347	4.98739
			4.45770	5.95277	4.85020	4.80900	5.92568	7.53559	5.57119	5.39036	7.09853	4.38208	5.45424	5.45242	7.53287	4.88885	4.72980	5.25090	4.48480	7.30183	7.98881	5.45432	4.77573	8.10080	5.05490	6.28894	4.83823	7.32818	5.81898	4.85870	5.54408	8.94748	5.28329
			4.70742	8.12070	4.77089	4.72089	7.44080	5.74578	4.92089	5.28451	4.73577	8.17100	4.84913	4.51110	5.15703	8.80414	5.04700	4.82447	4.70790	5.17022	7.63435	5.28233	4.80858	4.57705	5.96319	8.22300	5.37338	4.73708	4.98728	5.14585	5.87230	5.43432	5.24428
			4.40554	4.91497	4.52950	5.85570	10.81075	5.49790	4.70869	5.58810	5.37909	4.97725	10.04245	4.80420	5.84253	8.82907	5.51720	4.54706	8.22318	4.63480	4.55881	4.85281	5.48431	6.48820	5.52450	4.49770	6.08343	4.49928	5.08849	5.81701	4.84736	4.59087	5.56558
			4.51205	5.70015	5.83320	4.91930	4.88579	5.10787	7.27339	5.21103	5.08837	6.44440	5.29078	8.30390	4.93884	8.44310	8.89080	4.78318	4.63008	4.64430	4.62523	4.78880	4.41821	4.45302	4.65309	8.55077	5.22257	4.85358	5.32828	4.80555	7.70823	5.19540	5.84289
			5.61928	6.07272	5.18828	5.81919	7.85400	6.41032	8.10029	7.58280	4.55813	5.51117	6.80707	4.91930	4.63708	8.37818	5.52580	4.60695	5.83318	6.05870	7.56180	4.42884	5.18595	8.83301	10.78090	8.58372	4.85507	4.88549	8.88708	4.88338	4.84471	4.88985	8.43989
			8.10752	6.67158	5.49480	7.47640	7.11421	13.67563	5.08529	8.83080	6.12703	6.93874	5.38251	4.82757	5.45388	5.58544	5.21800	4.78887	5.28850	4.70800	5.88232	4.82348	5.15008	4.51879	5.82150	4.57011	4.78884	10.13088	8.30818	4.75425	8.62795	4.88282	4.78338
			8.21220	5.63632	5.02089	5.72920	4.45405	4.76816	4.42090	5.35028	10.30738	4.95894	8.20324	10.10485	8.00734	5.08155	7.11408	4.95084	5.88989	5.31051	6.32491	5.48884	8.22805	5.01789	10.12380	4.91501	5.34842	4.78878	4.43158	5.49385	10.58173	8.81813	4.48858
			5.42947	7.97045	5.47438	4.65790	7.40823	4.82515	5.15870	5.00733	4.78136	5.80334	8.82413	4.53012	4.58173	4.48173	4.48929	5.10275	4.80590	5.57086	8.81184	5.38708	6.38874	4.88736	8.88858	4.55032	5.12852	5.00788	5.11318	8.61880	4.88343	5.09208	4.87058
		10	5.17330	5.81680	9.02438	4.38950	5.95407	4.48503	8.10870	8.07644	5.20480	5.28252	5.48020	5.05812	9.86502	4.73717	5.08580	4.78588	6.88580	4.83472	4.53827	4.83202	7.07278	5.13310	5.21228	5.14033	8.81480	4.51858	4.42588	4.70731	10.82043	4.88578	8.14748
			6.17846	5.99993	5.02519	5.90189	5.07420	4.44533	4.47900	5.25874	4.45248	4.83870	4.82873	5.19020	8.72567	4.81525	5.34119	5.07993	5.82149	7.33045	4.82380	4.48838	5.37282	5.48378	5.20898	5.28172	8.58881	4.84548	4.78738	8.84888	8.08588	5.83185	4.87898
			4.78850	4.99680	4.80890	8.57059	4.53202	5.29994	4.93230	4.72572	5.10848	11.37983	13.58302	8.83700	4.77870	5.04282	5.01349	8.87418	4.75780	5.01558	5.15277	4.85455	6.58157	5.04353	8.53548	4.85548	4.82777	5.88548	4.87878	4.82484	4.98853	5.08870	4.77058
			8.87820	6.99453	6.41478	16.13009	5.17438	6.28941	4.71180	5.05848	7.28807	5.79504	5.55800	4.51924	5.82858	6.38700	4.98258	5.48072	4.83858	4.85785	5.18008	5.24580	6.32701	4.88428	4.78598	8.27387	8.81888	5.45038	5.88878	5.75212	8.44411	5.24283	8.42818
			4.86882	4.77704	6.05880	7.13009	4.45312	5.06897	5.88710	5.01867	4.97795	4.53210	5.24915	4.81179	4.49180	4.83045	5.61449	12.50840	8.86518	5.28707	8.51387	5.00802	9.82580	4.48897	6.77080	5.85883	5.78533	8.88348	8.58348	4.48013	8.28221	5.02774	5.88788
New observations k =			6.77275	4.98507	6.83890	4.67209	4.98770	5.06820	14.42490	8.94248	8.13402	4.85617	5.28038	4.89781	5.85930	5.12310	12.11389	5.31280	5.81419	9.84872	4.58151	8.58988	6.48510	5.18053	8.08429	5.43883	5.05014	5.82728	5.41448	4.83304	8.18485	8.75137	5.47588
			5.48758	5.14514	4.65880	4.88320	5.53886	4.90062	4.89800	4.78830	4.83270	5.11390	4.83032	6.24380	4.81817	5.83774	6.47718	4.82781	4.80758	8.90228	5.81817	4.85644	5.31795	4.87985	5.28809	5.88881	4.48855	4.81538	4.84778	5.08403	8.18804	5.17257	4.58878
			4.83890	4.89002	7.28436	4.78809	6.47453	7.86170	5.47989	4.80480	5.49883	4.85730	4.50849	5.18400	5.87472	5.04856	4.88379	7.57877	4.82990	5.81587	4.88588	5.44876	4.89445	5.30854	8.77528	5.83042	8.30825	12.38838	4.43358	8.21637	8.17843	4.75118	10.57148
			4.75325	8.50311	4.80830	5.26700	5.19340	5.31328	4.55130	5.25872	4.57581	4.73029	5.22145	4.48304	4.47491	5.40311	5.52289	8.90488	4.98878	5.07735	5.04383	8.48132	4.98381	6.94741	4.78748	4.82238	7.31878	4.88748	5.34808	5.49288	5.85723	4.88443	5.08508
			9.30259	6.25722	6.40780	6.11929	4.51007	5.40201	4.80700	5.18501	6.44187	7.53801	4.51980	4.88057	5.74278	4.40175	4.89249	4.98330	4.88818	7.58885	10.14838	4.57805	4.52733	5.48822	8.84479	8.42885	5.34204	4.75808	8.15848	4.79748	4.78813	5.18812	8.40818
		20	5.03037	4.88040	4.82300	5.35528	5.85308	7.03131	9.72838	9.11886	4.72545	4.80082	4.58890	8.72886	4.47528	4.88884	4.42918	5.81918	4.58788	5.13885	8.00118	6.28701	8.28233	5.84778	4.52080	5.18832	4.88518	8.37708	4.78319	4.58835	4.85898	4.78825	4.53288
			4.74807	4.61632	21.24028	7.17738	5.14405	6.38315	8.57858	5.10388	5.18308	4.51027	13.80345	5.70011	5.47785	5.77141	8.34738	4.87418	4.38708	4.82158	5.43221	8.85988	8.52353	8.37355	4.71538	8.71223	5.01185	14.92889	5.57458	5.22813	4.45220	5.33292	5.11818
			4.83302	5.38185	10.58458	5.24840	4.72575	6.61530	20.84818	7.53475	4.61495	4.98384	4.54487	7.01550	5.85274	6.80735	4.88890	7.01080	7.19878	5.18378	4.50190	5.40848	8.32572	5.33872	7.87418	5.50388	8.82532	7.30738	7.14889	5.44535	4.59818	4.84838	4.88318
			8.03201	4.83289	4.88849	5.30738	8.75428	7.07283	8.15578	5.38877	8.45117	4.81248	4.81878	4.78357	5.88838	8.48890	7.53180	7.88871	5.54780	8.97580	5.47433	5.25884	4.88493	5.00851	4.85080	5.88737	8.78477	8.42108	5.18838	5.28375	5.05854	4.88083	5.48348
			4.62471	4.80841	8.87579	4.85180	4.57123	5.13831	5.84298	5.08395	5.32080	5.70788	5.11083	7.27745	5.94038	5.08305	5.02380	4.74849	8.93158	5.19523	8.78253	5.88054	7.20887	4.83811	4.57850	5.05284	11.85481	8.27528	8.50849	5.82353	5.11718	5.88821	5.00458
			5.48135	4.83380	4.58500	8.80350	4.41490	4.88453	4.82329	4.80787	5.20480	6.17958	9.23573	7.80090	7.53811	5.34803	4.50458	8.22471	5.88878	7.41734	10.81780	5.51148	8.18897	4.77870	7.55538	5.71573	4.58152	5.10718	4.80028	4.81815	8.24881	4.49057	4.98148
			7.18080	4.83545	5.33028	10.06780	10.30279	5.13790	5.58529	4.95897	7.02180	5.97007	5.37153	5.32082	13.82058	5.78031	8.45380	7.54313	5.35849	6.74848	7.30044	5.81223	4.48818	4.71574	6.83888	4.73514	5.00828	5.71880	4.72488	4.81585	4.51085	4.88804	5.11328
			5.41181	5.93141	4.80400	5.84420	4.70158	4.83871	4.47559	7.81935	5.81908	4.82238	5.07817	5.04582	5.01580	5.05887	16.86380	5.93083	4.80849	5.22788	4.77020	5.54528	5.58507	4.81806	7.08780	4.87058	6.77798	5.35148	7.85438	5.21484	5.32004	5.38858	8.38839
			4.89986	5.19838	5.41828	5.88210	4.89598	4.79818	8.27879	4.56920	4.77184	5.23244	4.88342	5.18772	4.82224	5.03781	13.20580	8.77144	4.89898	5.57488	4.50278	7.90233	4.84583	4.85131	7.38718	4.59288	6.30844	4.98549	8.83988	5.41310	5.04448	4.52031	14.78489
			4.79917	5.72734	4.47138	6.89478	5.85887	5.18445	5.07780	4.83418	4.87381	8.08810	4.80384	5.00810	12.80184	4.94758	4.58828	4.93888	5.58380	8.11288	13.28244	7.17829	5.41383	4.82052	5.34408	5.41778	5.58785	5.85218	4.58828	4.87456	5.89985	7.34730	4.85158
		30	4.40507	10.70187	4.40080	5.13538	4.53805	4.52883	8.51818	4.84532	4.73838	4.53820	4.72384	5.90824	5.92888	12.84585	4.77588	5.07833	4.88778	5.43178	7.12587	5.28738	8.28008	6.87587	4.57788	11.78758	5.43848	8.09488	8.17518	4.88373	4.90089	5.33988	7.92388
Estimator shape parameter			1.167335	0.837530	1.307693	1.304238	1.358880	1.485321	1.221104	1.274105	0.83355	0.826182	1.258508	1.261844	1.171184	0.881585	1.085901	1.480402	1.247888	1.095454	1.087412	1.474487	1.043554	0.863304	1.877358	1.180203	1.013361	1.33018	1.238872	1.064241	1.045587	1.181004	1.108432
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.183021	2.610998	1.078984	1.083957	0.856207	1.003582	1.052274	1.187174	2.808547	2.342311	1.081601	1.385892	1.808738	1.840880	1.383849	0.889353	1.04797	1.548153	1.40935	0.818574	1.721831	1.821722	0.86481	1.1835	1.770408	1.281371	1.078432	1.485428	1.715284	1.228491	1.530154
Control chart constant d2			1.011528	0.988880	1.030034	1.030497	1.027779	1.038521	1.018622	1.021257	0.988015	0.988755	1.020013	1.020213	1.011805	0.975833	1.004072	1.038835	1.019018	1.004023	1.004238	1.035843	0.99805	0.872932	1.055581	1.012788	0.984344	1.025788	1.018047	1.00049	0.998284	1.010901	1.005441
Control chart constant d3			0.975825	1.011728	0.980508	0.98013	0.962347	0.955204	0.971448	0.987863	1.01231	1.013402	0.988878	0.988515	0.975318	1.00557	0.981774	0.954848	0.989492	0.981815	0.981838	0.955781	0.988778	1.008083	0.938088	0.974582	0.988878	0.983984	0.970284	0.984748	0.988575	0.976141	0.980841
Control chart constant D4			3.99348	4.224891	3.875701	3.872577	3.890778	3.831107	3.982354	3.933204	4.228277	4.234387	3.941108	3.938838	3.981208	4.189553	4.037457	3.8289	3.947398	4.037743	4.038485	3.835857	4.071702	4.204075	3.889205	3.985881	4.082258	3.904033	3.953477	4.057958	4.070339	3.997254	4.029518
Upper contro limit X			5.575317	11.47997	5.83936	5.157985	4.979712	5.82145	5.116218	8.431303	10.9381	10.11121	5.755213	7.130805	8.94548	7.540134	8.381448	4.482289	4.142911	7.087808	7.088108	4.737618	8.401818	8.024861	4.48451	5.754884	8.278821	8.487251	5.884058	8.975141	8.128287	5.131323	7.013568
Lower control limit X			-2.98005	-7.10835	-2.84482	-2.19117	-2.38418	-2.84017	-2.54834	-3.45898	-8.58939	-8.24085	-3.03085	-3.60811	-3.40918	-4.28418	-3.3728	-1.81131	-1.52721	-3.70043	-3.7073	-2.0288	-4.80797	-4.7088	-1.98834	-2.83785	-4.88842	-3.05834	-3.03103	-3.858	-4.54231	-2.2834	-3.60147
Upper control limit MR			5.878135	12.87803	5.778022	4.88802	4.907179	5.732581	5.144407	8.619883	11.95877	11.1566	5.886487	7.184203	8.888913	8.083702	8.576804	4.150978	3.801305	7.288293	7.354189	4.488880	8.848778	8.679339	4.201155	5.849808	8.782887	8.357758	5.852824	7.328979	8.581813	4.993801	7.187708
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	0	0	1	1	0	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	1
Total false alarm in X			1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	1	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	1
Total false alarm in MR			0	0	1	1	1	1	1	0	0	0	1	0	1	0	1	1	1	1	1	1	0	0	1	1	0	1	1	0	0	1	1
Sub-total X control charts with at least one false alarm k 30 =							234																										
Sub-total MR control charts with at least one false alarm k 30 =							149																										
Normal upper control limit X			5.13982	10.18748	5.482252	4.840358	4.851621	5.47023	4.737817	5.963439	9.895131	8.942455	5.334885	8.61782	8.412808	8.741813	5.82673	4.208783	3.888997	8.495038	8.480848	4.481209	7.840724	7.149738	4.278728	5.311048	7.508508	8.035598	5.288815	8.362982	7.400748	4.748458	8.438890
Normal lower control limit X			-2.42455	-5.79384	-2.48771	-1.87354	-2.05707	-2.48885	-2.18805	-2.98909	-5.34842	-5.0722	-2.6101	-3.09502	-2.87631	-3.49594	-2.83788	-1.5578	-1.25328	-3.10758	-3.20014	-1.7524	-4.04708	-3.83108	-1.78058	-2.48381	-3.92031	-2.82889	-2.80578	-3.24382	-3.81377	-1.89853	-3.0248
Normal upper control limit MR			4.647428	9.806368	4.872042	4.124914	4.121713	4.89909	4.242813	5.500293	8.24128	8.61038	4.881135	5.967418	5.708982	6.289874	5.323389	3.542895	3.147053	5.898884	5.954049	3.81754	7.180797	8.748808	3.721489	4.79524	7.021885	5.321971	4.838027	5.902255	8.890018	4.082575	5.813118
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	1	1	1	1	0	0	0	1	1	0	0	0	0	1	1	1	1	0	0	0	1	1	0	1	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	1	1	1	0	1	0	0	0	1	0	1	1	1	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	1
Total false alarm in MR			0	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	0	1	1	1
Sub-total normal X control charts with at least one false alarm k 30 =							242																										
Sub-total normal MR control charts with at least one false alarm k 30 =							181																										
False alarm in X? (Y=1/N=0)			0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	1	1	1	0	1	0	0	1	1	0	0	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0	1	0
Sub-total X control charts with at least one false alarm k 1 =							72																										
Sub-total MR control charts with at least one false alarm k 1 =							48																										
False alarm in X? (Y=1/N=0)			1	0	1	0	1	1	0	0	0	1	1	0	0	0	0	1	1	1	1	1	0	0	1	1	0	0	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	1	1	0	0	0	0	1	1	0	0	0	0	1	1	1	1	0	0	0	1	1	0	0	1	0	0	1	0
Sub-total X control charts with at least one false alarm k 1 =							103																										
Sub-total MR control charts with at least one false alarm k 1 =							79																										
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	0	0	1	1	0	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							195																										
Sub-total MR control charts with at least one false alarm k 10 =							82																										
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	1	1	1	1	0	0	0	1	1	0	0	0	0	1	1	1	1	0	0	0	1	1	0	1	1	0	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							208																										
Sub-total MR control charts with at least one false alarm k 10 =							115																										

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
NORMAL (40 10^2)		k = 10 obs																															
			46 4558	41 9471	35 5827	48 1845	35 6365	40 615	43 3682	38 0378	48 2986	36 9014	16 1084	40 3102	34 5063	47 6708	23 0254	58 5312	49 4093	43 9997	61 6929	32 9509	64 2688	58 7387	38 546	46.0835	32 0537	41 6943	35 4284	46 902	27 3267	37 0348	51 4127
			37 6569	57 1255	47 3255	39 4135	38 0808	55 5874	27 4579	42 8832	52 42	50 2557	38 4031	38 7304	27 9982	42 9769	47 4558	32 8678	48 4411	43 781	34.3017	43 8038	32 6531	20 3665	56 1719	54.633	47 1154	38 6256	35 2993	54 1489	53 5875	31 0153	48 5731
			22 8178	58 4418	26 574	53 0663	49 8578	38 2448	38 5845	37 7863	40 7859	33 4801	45 2104	42 0263	25 2297	48 7828	34 3063	22 7572	55 0687	57 389	25 6709	53 2038	44 2061	51 905	46 5138	51 9326	37 6801	42 4898	42 0463	40.204	37 1814	45 7707	19 0542
			13 2412	24 3549	36 4558	52 256	32 5738	52 9128	54 5933	50 7543	24 6054	31 4058	39 5704	35 2017	38 0009	21 3592	18 8188	29 9261	47 1128	35 6975	56 698	16 5055	51 7019	43 0227	30 0438	48.2933	34 9663	38 061	55 9535	37 5899	49 0328	32 7953	18 7487
			50 0817	20 8952	44 1833	33 0823	41 5337	41 8377	32 2149	55 9198	26 2397	48 0884	41 6931	35 3021	41 6534	32 903	47 9403	25 1444	48 6645	33 7158	29 5658	51 6643	41 7821	60.615	52 5845	39 1743	39 7663	58 421	44 481	46 6711	42 8192	41 4611	51 8342
			23 2825	28 1402	35 3043	43 9457	29 012	45 3278	56 6681	48 067	50 8771	39 1003	50 6378	54 8883	41 5586	24 1727	37 0681	31 8401	50 8688	32 8559	48 7768	45 2022	61 761	42 2678	15 4618	26.098	34 3109	38 4478	27 5354	36 0545	38 6371	23 498	30 9298
			27 575	31 6537	39 8622	28 06	34 8668	44 1768	48 9097	37 8315	39 0551	35.22	29 5684	24 0234	32 2368	45.9201	45 4559	37 1948	38.907	37 0453	35 6773	49 4318	41 3245	52 9816	51 8498	51 8409	47 6934	47 4541	31 0593	44 1124	24 6039	38 03	35 8944
			49 4672	55 2092	37 8971	21 5439	61 5348	35 7698	37 1215	42 8896	43 7907	27 0288	40 1737	55 7049	37 4817	44 1718	52 3738	31 8021	47 3182	34 8068	35 5197	62.6997	46 1139	46 964	32 8925	25 9719	36 7223	46 2875	31 3065	62 3069	26 0318	20 957	32 9395
			42 8289	40 8987	52 3588	47 281	36 2351	42 6438	26 8194	23 218	34 4244	23 4831	52 949	25 2115	26.2068	35.0884	38.8829	37 9167	37 2983	57 0143	52 1542	45 1475	41 3149	27 03	54 3808	35 9678	52 7964	47 1363	28 9907	41 7413	30 1438	47 3734	50 8836
			50 5609	23 2817	30 4688	48 1039	34 8588	39 897	37 1573	34 8497	50 515	45 6138	40 0423	37 2435	34 8687	32 8077	43 1073	35.5491	41 2939	34 2917	35 6892	49 4132	36 0973	48 4735	31 3799	50 0484	40 5209	30 7053	60 8329	52 1689	46 9048	46 1061	35 1311
Average			38 3988	38 1748	38 6013	41 2937	39 6207	43 6813	40 2895	41 2235	41 1012	37 0675	39 4356	38 8642	33.7739	37 5853	38 443	34 3529	46.2383	41.0597	41 5748	45 0023	46 1424	45 2585	40 9844	43 2062	40 4026	42 9323	39 2933	46.39	37 8249	36 4044	37 5401
Moving range average			15 2699	13 3648	11 3175	11 137	12 4653	8 99189	14 4515	9 16994	11 1358	10 6248	11 4629	15 1821	6.69989	10 3398	14.8989	8 18328	6.06809	9 96869	17 7499	15.3208	12.6229	19.2448	22 5791	12 0663	10 0633	8 79413	9 68117	10 9721	11 2542	13 2962	14.2522
T statistic			12 39	14 6463	55 4244	28 0277	44 0815	114 584	32 5031	40 0137	32 231	37 4113	22.957	29 8501	70 9073	26 5726	19 6685	31.8631	150.381	47 237	25 8452	19 6251	47 1509	21 0246	16.0411	33 7283	82 6412	74 3974	26 5295	73 7291	30 1936	29 8461	16 418
1	0 01	0 01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0 02	0 019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0 03	0 027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0 04	0 036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0 05	0 044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0 06	0 052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0 07	0 06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0 08	0 068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0 076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0 1	0 083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0 11	0 09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0 12	0 098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0 13	0 105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0 14	0 112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0 15	0 119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0 16	0 126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0 17	0 133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0 18	0 14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0 19	0 147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0 153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0 3	0 218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0 4	0 279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0 5	0 338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0 6	0 396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0 7	0 452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0 8	0 507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0 9	0 562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0 616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1 1	0 669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0 722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1 3	0 775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1 4	0 827	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1 5	0 879	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1 6	0 931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1 7	0 983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1 8	1 035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1 9	1 086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1 138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	2 1	1 189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	2 2	1.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2 3	1 291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2 4	1 342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2 5	1.393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2 6	1 444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2 7	1 495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2 9	1 596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1 647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	3 1	1 698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3 2	1 748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3 3	1 799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3 4	1 849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3 5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3 6	1 95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	3 7	2 001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3 8	2 051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2 101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2 152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	6.35702	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	7.48617	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.18354	0	0	0	0	0	0	0	8.37202
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.99624	0	0	0	0	9.97656	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.6763	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	11.6425	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	14.1785	0	0	0	0	0	0	0	15.09	0	14.451	0	0	0	0	13.0668	0	0	0	0	0	0	0	14.4295	0	0	15.088	0
119	30	15.165	0	0	0	0	0	0	16.4165	0	18.2805	0	0	0	0	0	0	16.0965	0	0	0	0	0	0	0	17.0291	0	0	0	0	15.2618	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	18.8707	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	22.2057	0	0	20.1719	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23.784	0	0	23.7409	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	27.9689	0	0	57.7071	0	0	0	0	0	0	35.7518	0	0	0	75.7013	0	0	0	0	0	0	0	41.6501	37.5062	0	37.1702	0	0	0
			#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######
Estimator shape parameter			6.35702	7.48617	27.9689	14.1785	22.2057	57.7071	16.4165	20.1719	18.2805	18.8707	11.6425	15.09	35.7518	14.451	9.99624	16.0965	75.7013	23.784	13.0668	9.97656	23.7409	10.6763	8.18354	17.0291	41.6501	37.5062	14.4295	37.1702	15.2618	15.088	8.37202
Estimator scale parameter			6.72578	5.09938	1.38015	2.91243	1.78425	0.75695	2.4542	2.04381	2.52457	1.98376	3.38722	2.57549	0.94468	2.60087	3.84498	2.13418	0.6108	1.72636	3.17684	4.5108	1.94358	4.23915	5.00815	2.53719	0.97005	1.14467	2.72313	1.24804	2.4784	2.4128	4.484
Control chart constant d2			1.10554	1.1087	1.12125	1.11666	1.12006	1.12268	1.11792	1.11945	1.11788	1.11899	1.11472	1.11722	1.12206	1.11684	1.11298	1.11776	1.12275	1.12046	1.11591	1.11294	1.12045	1.11375	1.11017	1.11822	1.12237	1.12218	1.11682	1.12216	1.11732	1.11722	1.11052
Control chart constant d3			0.87106	0.86618	0.85946	0.8597	0.85946	0.85946	0.85954	0.85947	0.85954	0.85948	0.86032	0.85961	0.85946	0.85967	0.86141	0.85955	0.85946	0.85946	0.85968	0.86143	0.85946	0.86085	0.86424	0.85952	0.85946	0.85946	0.85967	0.85946	0.8596	0.85961	0.86381
Control chart constant D4			3.36536	3.35544	3.29809	3.32266	3.30459	3.29019	3.31822	3.30794	3.31658	3.31046	3.33243	3.31997	3.29359	3.32197	3.34012	3.31708	3.28983	3.30243	3.32068	3.34023	3.30248	3.33678	3.35056	3.31465	3.29186	3.29297	3.32204	3.29308	3.31046	3.31998	3.34934
Upper contro limit X			77.8354	74.3381	68.8823	71.2141	73.0079	67.7091	79.0706	65.7979	70.9864	65.5425	70.2852	79.5781	51.687	65.3592	78.603	56.3163	62.447	67.7506	89.2931	86.3006	80.4756	97.0958	102	75.8319	67.3007	66.4423	65.2988	75.7232	68.0426	72.108	76.0416
Lower control limit X			-5.03781	2.01148	8.32025	11.3733	6.23344	19.6534	1.50813	16.6492	11.216	8.57253	6.56611	-1.84962	15.8606	9.81139	-1.71687	12.3896	30.0298	14.3687	-6.14393	3.70391	11.8081	-6.67868	-20.0307	10.7805	13.5044	19.4222	13.2879	17.0568	7.60716	0.70078	-0.96121
Upper control limit MR			61.3688	44.8446	37.3261	37.0087	41.1926	29.585	47.9245	30.3336	36.9328	35.173	38.1991	50.3377	22.0667	34.3479	49.7639	27.1446	19.9564	32.9209	59.0481	51.1751	42.3472	64.215	75.6526	40.0819	33.1271	28.9588	32.1612	36.1322	37.358	44.1431	47.7358
Normal upper control limit X			77.0103	73.7194	68.7009	70.9134	72.773	67.5956	78.7244	65.6117	70.7177	65.3149	69.922	79.1869	51.5927	65.0643	78.0677	56.117	62.3716	67.5722	88.7817	85.7492	80.2457	96.4409	101.035	75.3506	67.1666	66.3209	65.0411	75.5712	67.7563	71.7666	75.446
Normal lower control limit X			-4.21271	2.63024	8.50158	11.674	6.46836	19.7667	1.85452	16.8354	11.4847	8.80005	8.94932	-1.46044	15.955	10.0663	-1.16158	12.5689	30.1051	14.5472	-5.63251	4.25537	12.039	-5.92307	-19.0664	11.0617	13.6386	19.5436	13.5455	17.2088	7.89339	1.04211	-0.36472
Normal upper control limit MR			49.9021	43.676	36.9855	36.3957	40.7365	29.3855	47.2276	29.9674	36.3918	34.7218	37.4606	49.5497	21.8952	33.7899	48.6895	26.743	19.824	32.5777	58.0066	50.0685	41.9051	62.8914	73.7885	39.4981	32.8868	28.7392	31.6381	35.857	36.7768	43.452	46.5763

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Normal (40 10^2)		k = 10 obs																															
		1	42 0364	48 914	58 531	25 649	25 4256	27 9735	44 0138	18 7824	36 2823	33 8276	35 5232	30 7289	38 3858	48 3808	48.7671	27 3456	41 5114	13.3758	34.373	44 2584	30 9204	24 5300	48 4342	25 4014	42 8485	14 7445	43 2128	43 8418	48 5877	58 1158	52 3458
			48 062	41 8802	42 2355	46 0229	40 8525	28 9182	40 383	40 7347	38 9344	50 5784	45 2274	34 344	44 5878	32 8015	38 7052	30 0788	42 5171	35 542	41.2541	37 7788	31 2013	54 4084	38 1016	38 8873	34 3452	35 3123	44 5835	28 1141	28 8148	48 7898	30 9281
			31 8634	31 3381	33 0819	47 791	31 1747	32 9058	36 735	33 884	35 5516	38 2458	38 2084	48 3852	33 8541	40 7264	38 0258	38 8224	29 7808	37 8503	42.338	34 2128	28 8828	54 0487	53 4237	37 7058	45 1854	23.388	48 3828	30 5448	38.124	38 5428	41 105
			45 23	35 5531	34 4388	38 6035	33 4803	45 8337	33 6115	47 5256	58 1815	34 8828	52.2478	48 7149	42 8861	29 8882	48 0815	47 2335	32 0728	8 9188	48 4558	23 1713	48 2877	32 9818	42.8783	35 8131	28 9582	58 9039	53 0887	35 4058	40 8249	38 4442	37 8322
			48 6149	37 468	40 878	24 0086	26 8153	24 2501	56 3401	43 754	33 6208	48 4471	52 0590	48 8678	23.821	47 8873	45 4983	62 8302	40 0845	21.588	49 0297	30 9385	32 8838	42 7442	82 1529	34 3203	32 888	37 8472	45 8213	37 0005	32 8881	35 8721	40 3898
			23 1533	41 4012	28 2768	70 887	32 7013	52 29	41 1898	38 8851	58 5203	41.818	23 9843	40 2223	23 2005	48 8734	48 7708	38.8831	44 8317	48 0559	33 2703	24 8725	38 1247	53 3488	51 1303	30 8384	22 8875	44 158	42 284	32 7748	28 3727	73 5804	54 7528
			32 0448	33 9764	33 9238	38 4617	48 0046	46 3833	58 9533	32 4338	28 548	29 0728	51 4347	47 7084	18 7027	48 7771	40 4487	37 5763	47 8828	30 8852	32 7304	48 7318	34 4098	45.3721	32 1804	48 0783	35 58	45 8774	83 5155	40 4884	43 7781	43 7557	53 8417
			51 8302	34 2747	45 4259	41 3418	31 738	44 7819	29 2887	33 4293	42 332	50 8862	38 7502	51 8488	50 4322	35.4045	43 1788	51 2211	48 8488	45 8802	24 5038	49 1747	33 7763	22.5735	41 8188	37 0824	45 4504	54 7251	48 211	31 2888	38 1033	47 3008	28 1132
			38 2482	33 1956	55 3862	32 7818	38 5018	30 9773	28 2885	33 4078	56 8157	43 8892	44 8486	21 4747	34 3208	51 9211	58.1048	35 3819	33.852	38 8887	25 5328	41 5881	38 5484	28 385	51 3868	21 887	33 8707	28 8818	53 0341	41 4887	42 5524	32 4882	52 4078
		10	28 9131	51 9305	38 7545	37 9954	48 0213	35 3731	35 4822	31 2322	38 6489	48.818	22 5229	38.8878	17 1184	34 8887	48.0495	38 8047	33 5581	38 2702	41.2551	22 7581	41 3873	42 5588	48 5858	38 3188	37 4178	21 7582	52 8482	48 2554	41 5735	42.854	40 5471
			33 4188	55 0908	32 2304	37 0147	25 0182	38 323	33 8087	44 8783	47 8382	30 5643	37 9055	40 7888	38.1027	47 9832	30.579	41 1848	27 2304	38 3041	88.8075	48 2575	35 8482	30 4078	47 0551	18 8581	53 8874	51 5732	47 4501	48 1201	32 1814	38.8082	32 0222
			38 4245	34 8575	35 3288	48 8803	48 8875	40 2118	38 4378	45 8303	45 9285	47 3471	48 0288	37 7349	54 5492	31 8484	34 0237	38 3287	37 7115	48 5242	38 0053	31 8178	35.185	34 3475	48 8027	38 9183	44 3018	27 3858	38 29	43 9105	38 4219	27 527	40 7817
			51 0022	42 0858	45 5887	43 2558	49 7145	43 0728	51 8842	38 7202	50 855	34 5771	44 7858	32 8381	38.3238	48 5813	32.034	54 882	48.2281	41 8858	57 3583	48 8782	42 8183	44 2138	38 8013	38 1871	38 5827	30 3185	48 0352	34 2548	41 5483	51 3813	38 4222
			35 3648	40 29	39 8118	30 8387	42 0708	19 1241	32 2781	45 3491	38 338	55 8842	43 4728	85 2298	48.5898	37 5898	48.8424	52.7094	22 8882	38 5174	57 8569	38 8508	51.8841	45.433	28 572	18 8834	40 7878	41 4272	32 0488	54 81	32 3212	48 8807	38 8417
New observations k =			41 7398	29 7041	51 7098	37 5183	30 3311	55 9838	45 0518	42 2381	51.8805	28 4188	25 9285	41.884	42 4881	58 1752	52.3485	44 2758	38 8455	41 8208	33.3888	37 8341	58 341	55 8421	44 0517	42 1857	38 5131	34 3882	38 8524	33 8174	33 4224	45 8531	50 7522
			59 8861	18 8018	32 3927	58 8334	38 7257	20 1788	37 0808	55 0772	25 1957	48 839	38 5098	45 7484	28.3851	42.4878	32 3303	32 8788	49 2148	32.8334	28 2747	40.587	28 4853	27 8804	47 8147	41 3313	28 7852	53 3884	28 837	35 8718	37 0358	48 4892	31 888
			43 2483	47 1522	38 5395	32 758	57 8554	30 5788	41 851	42.552	85 9504	25 9125	37 5871	48.9238	49 9812	34 1858	55.7818	40 8378	40.5232	47 9284	47 9022	45 8792	33 5731	42 8383	38 8808	41 2118	48 3714	47 4731	43 5188	52 5888	53 1173	52 0293	38 8748
			37 2534	37 4228	40 0348	47 8614	57 4184	38 5898	32 1401	38 2288	35 7271	37 1053	40 2803	34 1088	40.5822	45.8808	22.827	32 4328	38.3888	43 1734	48 2888	22.4738	38 1835	37.823	38 8713	35 184	45 1401	34.487	20.2327	31 58	44 2881	58 4434	41 1851
			40 5811	47 2082	33 8868	38 8224	37 9823	43 4049	23 7272	38 9827	34 7888	83 1833	44 8483	40 8825	53.8745	83.5858	47 0814	42 8828	28 8728	88.882	35 5838	24.738	38 4073	33 378	27 0871	38 2204	27 0178	38 8878	88.977	33 8151	42 7808	48 8503	30 8378
		20	35 8881	52 4038	48 3851	34 8188	44 1808	40 1389	43 1581	34 8804	25 862	24.5818	48 8889	47 1228	44 5324	40.2418	37 0112	28 7257	50 7528	35.2484	21 7304	34.8225	57 8723	41 158	37 8822	52 7428	34 1895	42 8288	42 1443	31 8213	44 8218	38	43 8881
			32 3832	37 378	29 2103	30 5988	32 1183	53 2851	36 7174	22.5881	42 4042	42 7749	44 0873	43 1481	85 0737	28 5804	81 8033	34 8778	48 8871	30 9103	47 7384	20 4523	88 9428	32 888	25 1888	28 1388	27 3374	47 1751	23 5837	41 4185	28 8118	28 2874	35 4758
			24 0243	81 3314	38 0718	34.802	32.083	38 4253	48 5835	38.0158	36 1713	41 8027	43 8842	54 5495	35 7488	85.8777	34.8588	34.33	44 1813	22 0488	53.2814	41 2138	38 3888	28 1488	47 8808	38 7505	52 5873	31 527	48 2074	42 3821	24 3777	45 8927	34 8888
			51 8745	40 4558	88 8244	33 3771	27 3588	47 5027	51 2518	38.3258	43 3887	41 2447	84 1888	35 8804	30.5428	30.3704	31.5258	83.2718	40.8871	24 8418	48 0838	54.7803	51 8353	54 4183	35 7878	44 1882	22 3854	41 3188	28 3448	31 8721	25 4247	31 7731	32 0724
			48 2753	38 0344	47 1541	44.8302	44 8258	28.5093	38 0777	43 3837	48 1487	27 5348	53.8784	38 1187	24 7438	58.775	38.8445	40 5481	53 1437	45.2285	44 1588	37 7283	34 5183	41 7119	28 8888	24 1881	42 0842	41 0575	50 1748	38.3881	28 8328	38 8251	22 2987
			32 7241	38 5418	47 0254	31.287	40 8858	59 851	48 0483	44.818	42 877	40 3085	45 8877	27 4788	24.4814	41.0788	51 8578	28 4782	37 0804	83 2858	40 8182	31 7882	28 9307	38.881	45 3371	50 3074	20 1773	23 2083	44 4178	55 3574	48.3044	33 312	38 7247
			18 2978	38 5128	23 8582	40 2084	43.2232	18 4908	48 8742	37 4811	41 2553	50 1988	39 5548	51.8	40.0003	42.8552	37 1845	48 0485	18 7805	25 4142	25 3088	55.7537	28 3078	41.4523	25.742	28 7205	32 8077	31 1384	51 2388	32.8817	40 488	35 1301	48 5804
			41 4098	38 3059	38 8522	48 5188	34 4574	45 4422	47 3798	34 8858	41 8385	48 0258	30 8332	87 2885	87 4528	81.3082	44 8858	88 1882	32 3812	28.758	44.7884	42 1283	44 8787	38 4888	48 7711	52 8383	51.3775	58 8221	40 7827	33 888	37 1801	84 5257	37 7218
			44 5945	43 3279	15 5719	40 0701	70 498	41 0875	38 0473	53.8851	38 2508	45 3099	28.8557	49 2704	41.0574	41.3388	54 7882	43 8438	33.7805	32.3371	51.084	18 8485	43 8807	53 1554	43.538	34 4729	33 2788	34 1803	38.2827	35.8852	30 1827	27 0804	28 8548
			28 8858	18 8107	47 7258	88 5271	30 5828	35 2401	37 014	41 8172	41 4581	40 8842	35.8823	38 8092	33.5315	87.1408	18.5582	27.1522	38 582	81 4818	53 8888	40.5211	48 4158	48 8884	24 0325	31 2518	37 8078	35 3184	84 8187	30 7388	42.2731	50 4147	52 3058
		30	44 7098	45 7392	35 9387	47 0847	27 4738	42.7955	37 4975	31 8893	38.9216	32 8547	34.8728	32.8890	38.9438	33.2037	28.9877	45 8243	40.282	47 4872	43.7078	45 884	43 7845	33 8487	48 5298	42 2078	88 4003	37 3808	53.0117	42 8857	36.7081	35 0778	33 783
Estimator shape parameter			0.357023	7 488167	27 88893	14 17848	22.20575	57 70707	18.41853	20 17187	18 2805	18.87087	11 84248	15.08804	35.75179	14.45103	8.808242	16.08853	75.70127	23.78387	13 08878	8 076564	23 74080	10.6763	8 18354	17 02913	41 65008	37 50815	14 42947	37 1702	15 28181	15 08804	8.372017
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			5 72578	6 098379	1 388148	2.812425	1 784254	0 758948	2 464202	2.043814	2.524585	1 883761	3.38722	2.575488	0.944877	2.808873	3.84488	2.134182	0.8108	1.728358	3 178838	4 510788	1 843582	4 238153	6 008153	2 537191	0 870048	1 144872	2 723131	1 248042	2 4784	2 412797	4 484
Control chart constant d2			1 105538	1 1087	1 121245	1 118884	1 120083	1 122683	1 117825	1 118453	1 117857	1 11888	1.114718	1 117218	1.122084	1 118838	1 112985	1.117784	1 122747	1 120458	1 115811	1 112838	1 120448	1 113753	1 110173	1 118218	1 122374	1 122178	1 118822	1 122158	1 117315	1 117217	1 110524
Control chart constant d3			0.871083	0 866182	0 859457	0 859899	0 859481	0.859457	0.859536	0.859488	0.859542	0.85948	0.888317	0.859811	0.859457	0.859888	0.881408	0.85955	0 859457	0 859458	0 859875	0 881427	0 859458	0.880848	0.884237	0 858518	0 859457	0 859457	0 859871	0 859457	0 859598	0.859811	0 863814
Control chart constant D4			3 385359	3.355438	3.298894	3 322858	3.304581	3 298188	3.31822	3.307938	3.318582	3.310482	3.332428	3 318874	3.293587	3.321988	3.340117	3.31788	3 28883	3.302425	3.328878	3.340228	3 30248	3.33878	3 350558	3 314848	3.291882	3.292871	3 322037	3 293881	3 318458	3 31888	3 349342
Upper contro limit X			77 83538	74 33812	88 88225	71.21409	73.00784	87 70912	79.07883	85 78788	70.88841	85.54247	70.28517	79.57808	51.887	85.35821	78.80295	58 31628	82 44783	87 75082	89.28315	88 30083	88 47557	87 08564	101 0895	75 83185	87 30072	88 44228	85.29881	75.72318	88 04258	72 10795	78 04147
Lower control limit X			-5 03781	2 011485	8 320248	11 37333	8.23344	18 85338	1.50813	18 84918	11.21587	8.572528	8.588113	-1.84982	15.88878	8.81139	-1 71887	12.38958	30.02885	14 38874	-8 14383	3.703812	11.88815	-8 57888	-20 8307	10.78849	13 50442	18 42222	13 28785	17 0588	7 807182	0.788788	-0 88121
Upper control limit MR			51 38877	44 84481	37 32811	37 00887	41 19284	28 58498	47 8245	30.33358	38.8328	35 17288	38 19812	50.3377	22.08887	34 34783	48.78382	27 14458	19.9584	32.82085	58 04813	51 17508	42 34723	84.21488	78 65258	40 0818	33 12788	28 95883	32 1812	38 13218	37 35787	44 14315	47 73557
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in X			0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							72																										
Sub-total MR control charts with at least one false alarm k 30 =							82																										
Normal upper control limit X			77 01029	73 71938	88.70092	70 81338	72.77302	87 59585	78.72444	85 81167	70.71788	85.31495	88.92198	79.1889	51 59274	85.08432	78 08788	56.11897	62 37158	87 57215	88 78173	85 74917	80.2457	98 44083	101 0352	75 35084	87 10858	88 3208	85 04111	75.57123	87 75833	71 78883	75 44498
Normal lower control limit X			-4 21271	2 830237	8.501575	11 87403	8.488355	18 78885	1.854521	18.83537	11.4847	8.800063	8.848322	-1.48044	15.85504	10.08828	-1 18158	12.58889	30 10512	14.54721	-5.83251	4.255373	12 03802	-6 82387	-19 0884	11 0817	13 83858	18 5438	13 54555	17 20875	7 883388	1 042108	-0 38472
Normal upper control limit MR			48 80211	43.87802	38.88552	36.38572	40 73853	29.38548	47.22785	28 88738	36.38178	34.72185	37 48081	48.54887	21 88524	33.78892	48.88948	28.74295	18 82398	32.87788	58.0068	50 08848	41 90508	82 88135	73 7885	38 4981	32 88878	28 73823	31 83805	35 85887	38 77883	43 45202	48 57828
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in X			0	0	1	1	0	1	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							75																										
Sub-total MR control charts with at least one false alarm k 30 =							83																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							4																										
Sub-total MR control charts with at least one false alarm k 1 =							6																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							4																										
Sub-total MR control charts with at least one false alarm k 1 =							7																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							33																										
Sub-total MR control charts with at least one false alarm k 10 =							41																										
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							34																										
Sub-total MR control charts with at least one false alarm k 10 =							41																										

OBJECTIVE # 3

Normal (40, 10^2)   k = 10 obs   Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	53.036	51.6301	70.5203	54.411	40.0871	44.581	77.1963	85.0899	50.0403	33.175	58.6782	39.0318	50.0281	35.7478	60.783	49.9035	53.8754	42.5502	50.4902	59.1454	39.1857	45.5837	31.6036	51.3125	54.9182	51.2517	47.0401	47.2428	48.3041	43.8521	61.5778
			47.7828	54.8301	68.7159	60.2766	49.2199	49.6446	54.5515	50.8622	45.5295	65.5277	60.0193	67.0639	55.8123	51.3888	39.7818	62.1752	68.4175	67.4648	38.317	62.7867	54.4751	40.1838	55.2932	20.327	42.1902	47.6992	48.6983	52.6411	34.048	51.0645	54.3681
			53.1074	53.946	49.7632	54.6082	47.1297	52.9	40.1082	28.2803	23.5147	63.0148	52.0702	52.2689	29.0176	38.5898	41.6288	54.2774	67.8238	53.2817	53.0582	44.0044	52.511	48.753	58.6678	55.0803	42.7851	48.2198	48.673	45.591	47.1831	43.185	64.1393
			51.8019	51.9145	50.5517	20.3092	57.4428	55.417	51.7368	44.7411	58.3545	53.1903	39.5601	60.1666	53.2417	65.0821	38.2782	48.5824	38.5641	45.3857	68.4568	50.3341	44.8858	57.548	60.5418	57.6572	54.7221	61.4832	66.5082	44.8098	43.7883	48.7798	50.6342
			31.9092	43.2424	60.4581	50.9423	47.7415	57.9447	35.728	51.8387	43.2906	38.9778	64.9375	54.8276	41.1515	38.0174	44.6869	33.1424	41.8521	55.8094	49.9845	51.3524	33.8177	68.7758	40.118	18.6835	52.2821	61.1686	64.1115	41.7709	74.7798	33.8733	38.1887
			68.0817	34.8393	64.0381	49.5874	48.7102	37.1086	51.7592	48.8169	69.4807	67.0855	44.614	32.5259	48.5313	60.4803	41.0183	43.2105	42.2752	53.7862	31.5515	48.7521	48.5238	47.8829	55.3578	61.881	60.2325	22.1841	43.8648	71.3511	33.5898	42.1999	60.9098
			60.5444	29.7958	42.1858	62.6718	53.9257	48.2419	47.7028	28.3028	58.212	51.2232	58.9885	48.1831	53.4863	49.378	42.8807	55.0838	55.6074	49.8422	50.9074	38.1428	48.5188	45.5028	63.1783	50.5031	30.8347	28.83	53.1807	49.0774	31.8124	41.3328	73.7748
			60.3468	58.0813	48.2903	47.0828	48.4348	53.2924	54.9581	32.8841	72.3178	45.8158	55.2868	58.3418	42.3788	50.0568	58.0874	48.8251	53.6813	49.4582	48.2837	48.442	57.6728	52.1257	31.3055	42.6647	48.1866	41.0433	67.7233	54.0758	48.8818	44.9618	59.0227
			62.7062	38.1045	48.6361	51.4428	50.7283	47.9872	44.5904	52.1958	38.4038	58.118	54.0508	40.6825	61.4153	72.173	53.0028	60.6894	43.3778	65.4598	68.1283	58.1432	53.6693	67.9474	55.1001	64.3121	58.8107	58.7538	44.5114	51.1833	52.6833	40.9854	62.4203
		10	61.0648	42.0992	60.684	48.5302	58.0306	38.0864	42.754	45.9558	57.2023	58.8763	63.8237	50.232	45.6408	31.2451	42.2797	43.0145	49.6848	43.9148	54.308	58.0283	48.3875	53.1844	21.6031	54.2185	51.552	51.6682	56.1475	31.8023	46.6312	52.3491	60.1575
			58.8668	62.579	53.0172	47.9258	51.864	47.8082	52.9058	48.8072	60.3843	43.9252	52.0418	43.9802	38.6801	58.9511	45.6456	41.7903	51.0881	38.7875	38.588	53.6032	37.0045	58.218	33.0802	43.8053	35.4598	63.4458	58.7301	47.8288	48.2282	40.4364	38.7535
			51.2085	35.3814	50.0783	42.6668	48.6835	42.2498	42.3035	28.5587	48.5787	60.1734	41.9138	38.0502	38.5408	31.8243	63.5898	45.1201	51.505	62.4412	54.7817	58.684	35.284	43.6857	51.5888	42.858	52.9868	69.4415	32.6828	58.9741	53.0549	58.2382	42.657
			57.5867	55.708	38.8024	34.8105	55.5857	42.0877	45.9947	62.3984	48.3458	42.1131	34.3451	68.9272	67.0852	41.3418	54.0421	44.1144	38.3895	72.1288	42.4851	50.9128	58.1811	55.122	45.1088	60.4071	58.2315	49.9502	62.7482	51.848	52.4485	38.2402	40.1519
			38.4083	64.9646	52.5834	64.4472	60.2385	44.1823	43.8488	52.9178	48.0344	43.181	61.8841	63.5285	67.068	73.4415	28.6824	57.2828	47.5655	48.6388	58.8651	38.3908	64.6295	40.6785	81.141	48.7888	34.2483	63.0098	51.57	40.7783	49.3525	53.5553	58.6484
New observations k =			33.0008	42.1138	45.8384	50.6958	42.8558	46.03	48.5573	50.9805	54.287	38.8183	50.1822	57.0132	51.4837	57.5058	53.0388	75.6987	38.1011	52.9132	49.5388	50.1103	45.3098	49.1962	63.0014	53.4141	40.3197	38.6029	49.7877	45.824	60.7972	58.5741	28.5778
			52.7738	55.4774	48.4754	52.4822	57.6288	67.3173	53.9016	37.5778	42.7328	48.7444	52.0562	71.0572	61.5783	38.2827	43.5051	58.9825	54.8916	50.4281	60.0344	41.0408	51.2155	43.6942	34.3803	78.4773	44.4717	42.9867	72.9847	53.1184	37.8143	45.6528	53.388
			43.1483	51.8384	43.3188	48.188	54.6668	48.3122	58.5548	47.8314	53.8688	42.1848	48.8703	54.6083	58.3458	44.3463	43.7317	52.2873	54.8384	58.3283	51.5677	49.8778	40.3847	53.3297	40.7844	58.3748	53.8572	57.4154	58.3718	48.3812	71.1895	51.4867	33.2114
			63.3921	50.4953	80.401	44.9198	58.3591	52.0788	58.7051	38.2838	40.2288	47.5721	47.6828	64.5024	31.9137	34.8275	53.6808	40.9245	45.8578	50.5288	43.2074	68.6335	38.8834	30.827	32.6273	51.9808	35.4712	32.4271	38.9828	41.2783	52.595	51.7887	58.7483
			48.1927	55.6548	42.1538	51.2463	60.5088	53.4158	58.5084	38.7251	63.2254	53.3578	49.4814	54.8008	45.6853	53.5518	52.616	52.0513	42.4434	47.0072	34.1054	62.5488	58.1718	58.0828	38.6077	38.6858	39.8242	35.3125	43.6438	50.5883	48.8034	52.718	38.1933
		20	48.1888	58.0842	37.1825	38.4411	45.7098	63.2533	62.3751	55.8783	53.8783	42.1552	49.3783	40.5863	38.6564	50.9381	40.9125	58.3831	61.2851	55.1785	47.8228	41.4881	58.781	35.5273	43.0254	33.1204	52.2117	29.884	46.3851	45.0073	71.738	24.9852	51.6833
			75.1854	37.5087	67.5514	41.3458	68.401	42.484	78.4883	64.08	48.1437	63.3538	54.5072	61.8508	64.5867	57.6448	43.9874	53.1838	38.0952	67.0388	48.4078	38.6472	58.0886	64.7388	50.928	48.3817	58.2741	40.0838	52.0885	45.3101	45.3102	50.1834	38.3114
			38.2707	52.7127	40.6472	23.3367	58.8574	41.2738	48.3878	41.5138	45.5203	52.0071	49.2008	45.5872	38.4027	43.6883	37.2841	68.1438	48.9011	44.9821	48.1313	53.2384	44.7734	43.7228	43.2887	48.6588	48.1353	47.2444	42.4203	40.9047	49.0818	51.2112	45.08
			55.8025	51.4262	61.8351	62.0581	37.1187	50.589	62.9451	56.2418	71.7273	54.8708	44.1888	38.5202	64.4482	33.2818	68.1878	28.6705	53.7028	48.0214	48.2278	33.688	64.7987	58.3411	57.1028	40.3254	53.3815	52.4867	35.4884	44.5041	53.3547	43.1457	54.1432
			58.7708	53.2818	33.0927	58.6866	38.0894	68.6805	50.7284	38.1802	38.4882	48.8495	43.1358	58.4485	46.2785	65.7822	49.9488	50.2184	38.0838	51.5241	52.8588	58.7428	48.8281	47.6888	33.4082	41.1832	49.8802	43.9807	53.7523	57.0233	48.7881	51.4902	48.8583
			40.4308	58.7964	55.6802	51.4208	47.9583	44.0988	65.2484	58.9088	29.4838	52.3114	55.5724	42.7638	48.6178	34.4243	30.9161	58.7213	63.0845	50.6147	47.5616	41.0388	73.5733	33.1871	38.5438	42.5281	44.0187	47.0137	54.6832	28.9879	38.6015	61.7644	49.7628
			48.9453	60.659	64.3238	41.6087	47.0612	54.4284	57.658	28.7454	44.8074	52.3802	67.4957	30.4775	58.8048	41.6274	54.282	63.3581	43.7728	43.2448	55.2855	64.9834	58.5782	38.0114	54.8775	58.0448	52.9502	48.4618	33.4415	54.4525	55.4208	43.4977	55.6828
			68.9281	48.3041	57.0758	60.1013	43.4028	52.1805	57.2984	44.4308	47.3905	45.4093	63.2542	61.6825	61.2535	54.0948	62.31	54.7884	51.5283	50.8238	44.7007	71.6733	44.2881	53.1351	60.8501	48.8888	60.9448	58.2004	35.0888	44.2788	43.1832	28.8281	53.2883
			52.9289	51.1778	51.7077	37.0188	38.1245	40.281	58.7555	48.7186	47.4575	47.1837	48.8252	43.6183	45.8272	38.4824	53.3032	70.5477	62.6174	50.7438	48.4834	61.3576	48.3824	52.5744	48.7188	68.4888	48.118	44.8263	45.9881	48.5218	62.8637	52.1585	57.018
			34.9101	47.2837	47.9883	49.6868	70.5851	44.0635	60.9445	49.2183	50.0118	44.3815	29.7788	50.2843	35.4048	45.7887	13.2882	48.6885	52.3535	40.1325	48.7083	58.4817	60.6454	64.0548	58.3888	58.5485	67.3871	55.3137	42.8785	31.2422	44.3888	34.0388	42.8301
		30	55.6528	37.788	45.1985	43.1883	51.3823	43.4535	68.0888	58.8863	32.8098	38.9885	67.0755	58.2187	73.8808	41.7058	48.4071	62.3255	51.28	75.3233	38.953	48.9325	49.0881	42.7814	61.2783	50.9818	47.4828	58.8137	43.2857	50.551	35.5781	53.702	48.6375
Estimator shape parameter			6.357023	7.486187	27.98893	14.17846	22.20575	57.70707	16.41853	20.17187	18.2805	18.87887	11.84248	15.08004	35.75178	14.45103	9.998242	16.09853	75.70127	23.78387	13.08678	8.978564	23.74089	10.6763	6.18354	17.02813	41.65008	37.50815	14.42847	37.1782	15.28181	15.08804	6.372017
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			5.72578	5.099378	1.380148	2.912425	1.784254	0.758948	2.454202	2.043614	2.524585	1.863781	3.38722	2.575488	0.944877	2.800873	3.84498	2.134182	0.8108	1.728358	3.178838	4.510798	1.943582	4.238153	6.008153	2.537181	0.970048	1.144672	2.723131	1.248042	2.4784	2.412787	4.484
Control chart constant d2			1.105538	1.1087	1.121245	1.118864	1.120083	1.122083	1.117825	1.118453	1.117857	1.11898	1.114718	1.117218	1.122084	1.118836	1.112985	1.117784	1.122747	1.120458	1.115811	1.112838	1.120448	1.113753	1.110173	1.118218	1.122374	1.122178	1.118822	1.122158	1.117315	1.117217	1.110524
Control chart constant d3			0.871083	0.886182	0.858457	0.858889	0.858481	0.858457	0.858538	0.858488	0.858542	0.85848	0.880317	0.858811	0.858457	0.858888	0.881408	0.85855	0.858457	0.858458	0.858875	0.861427	0.858458	0.888848	0.884237	0.858515	0.858457	0.858457	0.858871	0.858457	0.858568	0.858811	0.863814
Control chart constant D4			3.385358	3.355438	3.298884	3.322858	3.304581	3.298188	3.31822	3.307838	3.318582	3.318482	3.332428	3.318874	3.283587	3.321988	3.340117	3.31788	3.28983	3.302425	3.328878	3.340228	3.30248	3.33878	3.350558	3.314848	3.281882	3.282871	3.322037	3.283081	3.318458	3.31898	3.348342
Upper contro limit X			77.83538	74.33812	68.98225	71.21408	73.00784	67.70812	78.07083	65.78788	70.98841	65.54247	70.28517	78.57808	51.887	65.35821	78.80295	58.31628	62.44703	87.75862	88.28315	96.30063	80.47557	87.08564	101.0895	75.63185	67.30072	68.44228	65.29881	75.72318	68.04256	72.10795	78.04147
Lower control limit X			-5.03781	2.011485	8.320248	11.37333	8.23344	19.65338	1.50813	18.84816	11.21587	8.572528	8.588113	-1.84862	15.88078	8.81138	-1.71687	12.38958	30.02985	14.38874	-8.14383	3.703912	11.88815	-8.57868	-20.0307	10.78048	13.50442	18.42222	13.28785	17.0588	7.607182	0.700786	-0.98121
Upper control limit MR			61.38877	44.84481	37.32811	37.00887	41.18284	28.58489	47.9245	38.33358	36.8328	35.17298	38.19812	50.3377	22.08887	34.34783	48.78382	27.14458	19.9584	32.82085	58.04813	51.17508	42.34723	64.21498	75.65258	40.0818	33.12708	28.95883	32.1812	38.13218	37.35787	44.14315	47.73557
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	1	1	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0
Total false alarm in X			0	0	1	0	0	1	0	0	1	1	0	0	1	1	0	1	1	1	0	0	0	0	0	1	1	1	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	1	1	0	0	0	1	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 30 =							137																										
Sub-total MR control charts with at least one false alarm k 30 =							91																										
Normal upper control limit X			77.01028	73.71836	68.70082	70.91338	72.77302	67.59585	78.72444	65.61167	70.71788	65.31495	68.92186	79.1888	51.58274	65.08432	78.08786	56.11887	62.37156	67.57216	88.78173	95.74917	80.2457	98.44083	101.0352	76.35084	67.18858	68.3208	65.04111	75.57123	67.75833	71.78083	75.44408
Normal lower control limit X			-4.21271	2.630237	8.501575	11.67403	8.468355	19.78885	1.854521	18.83537	11.4847	8.800053	8.949322	-1.46044	15.85504	10.08828	-1.18158	12.58888	30.10812	14.54721	-5.63251	4.255373	12.03802	-5.92387	-18.0864	11.0817	13.63858	18.5436	13.54555	17.20875	7.893388	1.042108	-0.38472
Normal upper control limit MR			48.90211	43.67802	36.88552	36.38672	40.73853	28.38548	47.22785	29.88738	36.38178	34.72185	37.48881	48.54867	21.88524	33.78892	48.88948	26.74295	18.82398	32.57788	58.0068	50.08848	41.90508	62.88135	73.7885	38.4881	32.88878	28.73823	31.83805	35.85887	38.77883	43.45202	48.57828
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	1	1	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0
Total false alarm in X			0	0	1	0	0	1	0	0	1	1	0	0	1	1	0	1	1	1	0	0	0	0	0	1	1	1	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	1	1	0	0	0	1	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 30 =							141																										
Sub-total MR control charts with at least one false alarm k 30 =							93																										
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							13																										
Sub-total MR control charts with at least one false alarm k 1 =							9																										
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							13																										
Sub-total MR control charts with at least one false alarm k 1 =							11																										
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							81																										
Sub-total MR control charts with at least one false alarm k 10 =							48																										
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							83																										
Sub-total MR control charts with at least one false alarm k 10 =							52																										

OBJECTIVE # 3

Normal (40, 10^2)   k = 10 obs   Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	48 0091	77 9293	53 7989	58 6784	43 0324	88 8001	84 1113	88 5223	85 1822	57 7238	75 7582	83 1872	88 2158	88 4478	82 0488	87 1418	77 204	70 8149	55 1028	88 6788	48 1317	48 3122	85 1023	61.0884	57 8337	88 2043	57 1854	55 8077	72 0778	88 5858	58 3822
			44 4178	54 8018	58 5403	53 4858	61 3324	45 9842	87 7438	85 1474	84 8214	71 2778	54 8781	74 1458	83 3047	70 538	84 2784	45 5844	57 1272	81 8518	82 8134	48 2773	70 348	53 8883	72 2058	74.955	51 5717	88 3553	53 4713	37 081	72 8234	83 4508	71 5331
			84 0828	49 0393	40 8798	77 0443	78 358	48 082	70 887	50 78	80 408	53 4208	83 8688	58 7372	73 8348	83 7818	51 4283	85.5282	85 8827	88 5884	71 0778	82 0414	77.035	43 5527	80 5841	50 3893	81 8188	58 8083	83 5378	84 2405	38 3038	88 1408	70 1478
			88 1368	80 8547	57 8574	43 848	54 3045	83 814	61 1812	58 1883	81 2283	87 0002	58 8888	70.8958	85 0217	87 7308	58 2111	80 8881	52 8434	88 3433	88 8028	87 198	75 7403	71 0848	45 5877	72 0438	35.833	54 0882	87 8188	82 4872	55 2081	58 0831	58 7301
			61 4858	48 8772	87 3378	77 18	88 5327	87 8443	81 4543	81 8158	83 1877	84 2185	57 2854	61 8553	50 8888	58 0384	78 2342	57 8311	84 1835	55 8448	88 3583	77 7301	54 5015	57 148	84.874	58 5788	55 7878	54 8521	77 4818	87 8747	87 7432	88 8803	80 8471
			54 8188	52 803	81 5254	57 1807	83 5888	57 0802	85 2833	58 3755	88 0182	81 8385	88 1355	45 0988	50 8872	85 8137	82 2487	77 8428	58 8848	85.1831	42.8245	75 0157	41 8183	87 038	48 0533	61.888	84 8448	74 7508	84 7838	58 5588	54 3825	38 2843	58 4454
			53 4728	52 8888	88 4883	38 2823	88 8138	55 488	82 8548	75 2837	33 1377	58 0282	58.1187	82.888	47 1351	52 7088	88.4741	57 7081	88 1201	75 8257	44 0804	88.378	75 8808	50.88	73 7054	85 8588	85.8008	57 8572	58.3885	88 0887	88 7301	48 235	58.488
			87 8435	54 0873	44 1888	81 8707	84 2488	80 0777	88 3849	54 8388	55 5888	50 2802	73.2788	71 1887	58 8783	47 8077	87 1802	58 2898	57 4227	85 4284	88 7808	81 1851	88 0272	88 9881	54 5588	81 0758	48 7753	87 11	58 7251	58 4442	88 3488	48 1888	58 5811
			84 1344	45 0057	88 5784	84 3487	83 2238	82 0724	75 315	52 8832	48 2777	51.522	74 4188	57 287	88 2808	43 8711	47 2288	47 7515	87 3882	80.5181	82.488	54 1308	48 2288	74 0358	81 5772	55 7088	51 458	41 8873	87 888	33 4111	57 5815	82 8828	42 2383
		10	48 8108	58 5077	88 8158	50 2583	70 5892	78 8885	58 8182	81 8008	57 8154	80 0748	88 2887	58 7888	72 1574	88.7888	58 3547	48.3827	82 8541	53.0358	82 3802	73 7754	50 8182	72 0401	84 7352	45 8235	57 8078	61 3221	84 1808	48 8745	53 5825	58 8878	84 5885
			70 8258	55 448	83 5457	57 2084	47 1512	81 842	70 7188	83 4238	53 7138	71 8811	83 5853	83 8808	40 2858	87 8418	40 8722	82 7852	58 0885	88.281	82 8018	84 1834	52 0547	88.8427	78 7205	82 8833	55 7594	53 3887	58 0858	88 1888	88 7848	40 4808	48 2614
			57 1208	72 8718	88 8715	74 0718	51 4878	80 057	88 9888	54 7844	48 1573	83 1848	75 4888	81 8848	83 3274	57 0157	78 2782	58.2442	58 7038	58 1033	58 8333	80 8204	52.008	50.378	40 9727	58 8187	42 8174	85 4333	88 0888	53 7828	77 1808	55 2885	53 8818
			51 5884	88 8255	80 4888	81 1848	85 8831	85 008	72 7031	75 4278	58 1274	88 7887	83 4908	88 8185	82 7187	58 7885	82.8182	55 8145	52 3172	45.7141	70.1584	87 7321	58 7732	58 2808	45 1575	88 1002	58.7088	58 3184	52 8807	88 8311	73 8351	58 7158	51 9821
			57 2811	72 5855	80 8753	83 2155	78 8098	71 4248	58 0223	51 7505	82 8881	83 8515	48 3225	81 9208	48 1758	83 8781	88 8078	84.8773	84 1288	88.0783	70.587	52 2038	81 2758	58 8522	43 1721	88 8087	57 2555	51 8488	57 412	83 7588	54 385	81 7418	58 8187
New observations k =			88 4133	58 7788	81 7401	85 4211	48 2244	55 9381	50 4821	57 7318	53 0055	70 5248	85 8258	82.3384	82 0548	58.8772	58 8315	81 4074	57 5884	70.271	47 8274	57 8748	70 4851	84 7478	88 3884	74 9538	87 8783	88 5887	85 2838	85 7813	80 0188	77 7131	55 3818
			58 5853	81 5578	55 8534	43 3334	53 8881	84 804	73 7824	75 5808	53.278	88 8884	53 1108	80.528	32.2844	74 4954	42 383	87 4814	80.577	88 5583	55.2188	37 3872	58.041	82 2382	48 3284	83 8148	83 8818	48 8151	75 1888	41 8818	81 8555	72 7405	83 4298
			70 3283	84 5081	38 7018	43 8223	58 8447	55 232	73 7854	83 7898	58 5151	38.448	84.8148	81 7787	57 5188	48 028	84 882	57 8514	84 102	48 1748	73 4288	48 4881	71 0003	58 4588	58 1783	73 7154	38.5444	88 5438	42 2132	52 0887	77 5818	73 7023	48 438
			85 2488	48 5829	51 4788	83 1718	58 0834	43 8844	61 9341	51 5501	38 1831	48 5824	72 4154	52.25	48 8884	53.3011	58.4828	85 4731	71 1887	45.844	78 2352	52.3341	88 7024	83 4457	48 3848	54 5282	85 858	88 0815	88 7528	85 8143	82 7572	88 8884	78 8825
			85 3177	52 7208	55 3805	85 7471	50 112	72 2728	88.3078	40 8474	84 5548	58 0284	88 8878	57 3088	57 3088	83.2534	81.3114	58 1815	84 3185	54 2882	87 8147	87 22	45 3141	57 8853	84 4708	88 8884	51 8447	88 3745	88 1213	54 8827	48 042	50 4483	58 4348
		20	47 8342	84 8898	88 8818	48 4877	58.3885	61 2378	52 8457	70.8518	51 8875	80.4841	38 1883	88.8345	85 1123	81.0407	55.5181	85.088	70 8374	78 7012	54 4082	80 7188	58.8725	47 7438	55 0814	54 3088	38 7428	71 8424	58 8883	50 1871	48 1001	54 2888	53.8822
			53 4238	82 5728	82 7324	48 8037	84 4504	43 7485	88.4108	48 7788	87 8355	80.8774	72.2881	88 8808	50 7855	71.2411	44.7028	80.5181	87 4808	35.0788	52 4318	55 2007	82 7075	57 5885	82 0884	84 7814	88 8428	88 2003	48 5481	80 8533	40 2102	50 2857	87 757
			41 3582	45 1782	74 8037	54 9087	54 8824	55 4578	88 8418	47 8528	81 8787	81.4978	58 3107	82 3512	58.1878	71 4288	84 1272	70 3328	58 1048	58 3473	45 838	40 2508	51 4803	88 0778	82 8457	88 0883	53 4538	58 5124	58 1378	82 8104	85 7827	54 8188	54 82
			88 5488	85 4848	87 8781	72 1503	58 8188	78 724	73 4234	43 8785	83 8888	45.7208	58 8833	57 8053	53.7178	53.9224	78 8585	78 7872	82 4723	47.384	80.2851	83 0358	42 2532	84 4158	84 5823	53 5318	48 1037	88 2388	88.771	82 8824	48.7488	47 0851	71 888
			80 2308	78 3858	55 9091	88 7017	50.832	55 7785	81 1018	58 7578	54 2427	38.812	57 8458	52.8851	58 4805	84 8011	40 7505	88.3128	84 5877	51.488	51.2722	42.4801	53.8884	84.728	82 5585	47 1827	48 2157	85 5824	87 8818	88 833	54 8847	85 8484	51 2078
			50 8813	53 9788	49 014	72 5475	70 9348	88 8884	58.4818	50 2577	61 1185	48 7074	58.3504	58.8887	88 5107	84 4378	72.8532	83 7201	58 3531	88.7134	48.4517	71.3828	53.872	52.8011	85 7888	57 4508	61 8318	80 2408	43 1248	52.2285	80 5714	81 8882	71 1858
			75 4581	85 5383	50 8135	57 4053	54 0803	83 0885	38 8088	81 5373	87 1534	45 8448	48 3218	48.4384	73 5884	47 3843	48 5808	58.2785	47 4457	52.0187	71.2078	58 8448	58 4121	58 1318	83 8858	58 7448	52 8358	81.883	55.858	61 4171	48 8857	53 7137	88 7387
			58 3358	57 872	72 8774	52.2305	71 8423	78 3708	82 9082	54 8514	57 8187	47.82	58 8357	78.7881	42.8888	81 5428	88.0217	83 1478	85.1337	47 4881	81 5473	75 8178	55 5144	82 1027	54 4183	88.344	70.3818	61 8557	58.88	88 2858	88 1402	61 4228	50 8252
			85 8974	58 8142	58 3882	78 0237	53 2088	88 3404	51 8802	58 3874	53 1278	41.855	84 5288	75.3424	78.5721	48.2818	70.1111	58 1283	38 0287	50 2888	38 0778	53 8101	70 801	57 1105	74 4144	73 4437	85 182	61 8087	58 2871	72 5833	48.3513	58 7388	87 3834
			54 1022	88 4813	48 0583	88 8282	84.2542	82 7242	44 3828	28 8084	50.1287	70 9884	58.0731	53.8452	71.8038	53 7245	85.1883	88 9087	48.3187	83.8384	48 5288	50 8803	47 7888	70.2315	77 8538	88 9715	83 185	85 8084	58 8808	87 3833	38 1008	85 0238	44 0838
		30	48 5272	83 2108	78.8088	85.4838	45 4388	52 8531	58 7878	53.5878	41.0338	80.8078	71.5218	58.1408	54.2823	38.7887	37.4438	48.3838	77.5852	51.0553	81.7802	48.3058	58.8088	72 7888	54 0532	88 4035	84 5887	61.8382	81 1781	80.8512	58 1702	48 8278	84 5874
Estimator shape parameter			8.357023	7 488187	27 88883	14 17848	22.20578	87 70707	18.41853	20 17187	16 2805	18.87087	11.64248	15.08004	35.75179	14.45103	8.898242	18.08853	75.70127	23.78387	13.08879	8 878584	23 74089	10.8783	8 18354	17 02813	41.85008	37 50815	14 42847	37 1702	15 28181	15 08804	8 372017
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			5 72578	5 089378	1 380148	2 912425	1 784254	0 758848	2 454202	2 043814	2 524585	1.983781	3.38722	2.875488	0.944877	2.800873	3.84498	2.134182	0 8108	1 728358	3 178838	4 518788	1.943582	4 238153	6 008153	2.537181	0 878848	1 144872	2 723131	1 248842	2.4784	2 412787	4.484
Control chart constant d2			1 105538	1 1087	1 121245	1 118884	1 120083	1 122883	1 117825	1 118453	1 117857	1 11888	1 114718	1 117218	1 122084	1 118838	1 112885	1 117784	1 122747	1 120458	1 115011	1 112838	1 120448	1 113753	1 110173	1 118218	1 122374	1 122178	1 118822	1 122158	1 117315	1 117217	1 110524
Control chart constant d3			0 871083	0 888182	0 858457	0 858888	0.858481	0 858457	0 858538	0 858488	0 858542	0.85848	0.880317	0.858811	0 858457	0 858888	0 881408	0.85855	0.858457	0.858458	0 858875	0.881427	0.858458	0.888848	0.884237	0 858515	0 858457	0.858457	0 858871	0 858457	0 858588	0.858811	0 863814
Control chart constant D4			3 385358	3.355438	3.288084	3 322858	3 304591	3.290188	3 31822	3.307938	3 318582	3.310482	3.332428	3.318874	3.283587	3.321888	3.340117	3 31708	3.28883	3.302425	3.328878	3 340228	3.30248	3 33878	3 350558	3.314848	3 291882	3 292871	3 322037	3.283081	3 318458	3 31888	3 348342
Upper contro limit X			77 83538	74 33812	88.88225	71 21408	73.00784	87 70812	78 07083	85 78788	70.88841	85.54247	70.28517	78.57808	51.887	85.35821	78 80285	58.31828	82 44703	87 75082	88 28315	88.30083	88 47557	97 08584	101 8885	75 83185	87 30072	88 44228	85 28881	75.72318	88.04258	72 10785	78 04147
Lower control limit X			-5 03781	2 011485	8.320248	11.37333	8 23344	18.85338	1.50813	16.84918	11.21587	8.572528	8.588113	-1.84862	15.88078	8 81138	-1 71887	12 38858	30.02885	14.38874	-8 14383	3 703812	11 88815	-8 57888	-20 0307	10.78849	13 50442	19 42222	13.28785	17 0588	7 807182	0.700788	-0 88121
Upper control limit MR			51 38877	44 84481	37 32811	37 00887	41 18284	28 58488	47 8245	30.33358	38.9328	35.17288	38.19812	50.3377	22.08887	34.34783	48 78382	27 14458	18 8584	32 82085	58 04813	51 17508	42.34723	84 21488	78 85258	40 0818	33 12708	28 85883	32 1812	36.13218	37 35787	44 14315	47 73557
False alarm in X? (Y=1/N=0)			0	1	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	0	1	0	0	0	0	0	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	0	0	1	1	1	0	1	0	1	1	0	1	1	0	1	1	1	0	0	0	0	0	0	1	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	1	1	1	0	1	0	1	0	1	1	0	1	1	0	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0
Total false alarm in X			0	1	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	0	1	0	0	0	0	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							212																										
Sub-total MR control charts with at least one false alarm k 30 =							83																										
Normal upper control limit X			77 01029	73 71838	88 70092	70.81338	72.77302	87 58585	78.72444	85 61187	70.71788	85.31485	88.82188	78 1888	51 58274	85.08432	78.08788	56.11887	82 37158	87 57215	88 78173	85.74917	88.2457	88 44083	101 0352	75 35084	87 18858	88 3208	85 04111	75 57123	87 75833	71 78883	75 44498
Normal lower control limit X			-4.21271	2 630237	8 501575	11 87403	8.488355	18 78885	1.854521	16 83537	11.4847	8.800053	8.849322	-1.48044	15 95504	10.08828	-1 18158	12 58889	30 10512	14 54721	-5 83251	4.255373	12 03802	-5 82387	-19 0864	11 0817	13 83858	18 5438	13 54555	17 20875	7 883388	1 042108	-0 38472
Normal upper control limit MR			48 80211	43 67802	38 88552	38.38572	40.73853	28.38548	47 22785	28 88738	38 38178	34.72185	37 48081	48.54887	21 88524	33.78882	48.08848	28 74295	18.82388	32 57788	58.0088	50.08848	41.80508	82 88135	73.7885	38 4881	32.88876	28 73823	31 83805	35 85887	38 77883	43 45202	48 57828
False alarm in X? (Y=1/N=0)			0	1	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	0	1	0	0	0	0	0	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	0	0	1	1	1	0	1	0	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	1	1	1	0	1	0	1	0	1	1	0	1	1	0	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0
Total false alarm in X			0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	0	1	0	0	0	0	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							213																										
Sub-total MR control charts with at least one false alarm k 30 =							98																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	0	1	0	0	1	0	1	1	0	1	1	1	0	0	0	0	0	0	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							85																										
Sub-total MR control charts with at least one false alarm k 1 =							38																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	0	1	0	0	1	0	1	1	0	1	1	1	0	0	0	0	0	0	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							88																										
Sub-total MR control charts with at least one false alarm k 1 =							40																										
False alarm in X? (Y=1/N=0)			0	1	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	0	1	0	0	0	0	0	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							177																										
Sub-total MR control charts with at least one false alarm k 10 =							80																										
False alarm in X? (Y=1/N=0)			0	1	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	0	1	0	0	0	0	0	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							177																										
Sub-total MR control charts with at least one false alarm k 10 =							82																										

OBJECTIVE # 3

NORMAL (40 10^2) k = 30 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			67.5313	22.1292	34.4063	51.7536	34.3058	28.9318	44.4372	60.1896	34.5418	33.8706	37.3985	38.8287	55.7763	38.6058	40.1844	38.0148	32.4848	46.0128	39.1703	53.8843	35.0753	38.5385	45.0081	23.2395	52.2325	27.308	39.3341	31.9332	48.5548	43.3155	47.0881
			36.2841	48.6675	28.8066	44.4833	40.2977	27.335	40.041	36.8026	42.6707	13.2458	38.5819	31.0324	30.0678	35.4603	40.3845	33.1508	22.9807	47.7852	40.4475	38.2888	45.332	52.2711	27.489	40.2408	8.4182	31.1328	37.4384	46.5852	48.6347	37.9027	51.0783
			38.0352	43.9828	58.5155	55.1064	33.9157	28.1457	55.1513	43.3058	45.4648	37.331	48.5031	47.1541	32.187	44.4177	28.7474	50.602	55.1868	38.4784	43.5025	49.4197	31.7821	40.8515	31.8828	33.5334	54.2758	35.3038	34.4018	52.2886	28.3722	25.2811	32.6877
			57.3772	44.5695	38.2548	58.5798	43.4184	37.1687	34.8047	44.1578	54.8348	41.3555	33.5188	50.7675	38.7187	38.9832	53.4854	34.2588	49.7893	38.2884	38.4779	44.0278	50.8881	43.181	40.2528	35.7753	32.4248	50.4074	38.2778	38.4598	55.2428	40.4234	9.4818
			48.2378	42.0345	48.8327	31.7238	31.8441	36.1367	55.4805	41.8217	50.5153	24.8782	38.577	40.4428	48.2728	35.5498	42.0521	42.5058	43.1882	31.3188	25.5208	27.5043	33.8407	47.0141	47.8732	33.0848	44.1323	34.8717	38.8938	48.0018	33.6238	38.7817	25.3884
			34.8572	21.9602	48.2428	42.4881	48.0994	50.7689	53.4878	37.6778	28.2787	26.5552	35.2877	43.6213	35.8422	38.2536	38.5171	33.9748	34.7018	31.2185	25.7813	38.8481	33.8472	44.4632	47.2201	24.1234	31.13	52.8784	12.5853	22.1849	28.9788	31.3527	38.883
			21.8318	44.0002	25.998	41.7184	38.1081	33.358	28.1651	32.3102	38.1428	25.7188	35.898	38.4153	40.5378	51.0512	48.2738	38.4187	47.8827	19.188	50.8312	41.8434	14.0332	24.5814	33.9402	40.3768	33.2489	37.4083	44.7183	38.4848	47.3141	37.244	55.8078
			40.2485	52.7457	40.2825	38.582	34.0787	45.8788	10.8778	44.3241	52.5231	41.3187	52.3821	43.2788	35.9322	45.4818	33.0287	40.5942	43.6117	50.5748	34.7244	23.2448	35.8048	44.5881	82.0527	47.358	28.1677	43.878	37.9405	48.1788	51.8398	38.868	44.4511
			27.9548	15.2218	27.2518	42.2981	35.1418	33.7303	33.8038	38.6384	44.3185	18.3124	30.2387	27.0721	41.7887	43.0787	21.2884	45.3856	28.5084	42.8208	37.1526	43.1388	38.7571	23.7377	42.3797	44.4471	28.4082	41.1187	43.3832	41.3483	25.4891	44.4784	33.5488
			28.3078	50.813	32.936	45.0805	19.428	27.6751	38.4483	29.5521	22.3852	38.9814	45.8214	51.1717	38.2248	34.2503	25.7903	48.2982	43.3508	28.5172	33.5387	42.7085	31.882	38.2017	48.1127	28.824	24.9043	52.8982	29.5483	33.3336	34.3137	32.9877	42.0807
			41.4435	47.7106	32.7543	25.9887	41.3327	14.7092	42.0288	43.4518	42.0905	18.2558	31.4838	29.5543	41.4981	40.123	47.8508	24.0394	47.9741	44.5844	47.4808	38.4438	18.0185	44.8788	44.8314	45.5308	48.7411	45.1928	38.5487	38.5241	25.7381	44.3203	39.6787
			46.2818	30.558	38.1987	30.2805	31.8558	45.295	28.3058	33.2728	37.3088	24.2871	48.1148	53.7358	36.7308	19.8981	45.2828	32.2708	42.5382	34.4437	38.8856	28.8875	38.1013	48.8895	58.8203	54.4895	30.4788	35.1517	58.6251	49.9116	52.2802	18.5874	29.1438
			41.8884	31.9482	42.4581	50.9135	32.7841	43.8131	42.5083	41.8158	35.9007	38.5744	26.3754	55.5862	30.5458	37.123	31.4944	81.3807	52.4185	54.7503	40.4181	53.4808	33.8231	31.8422	40.9903	37.0484	41.4887	27.043	62.0444	42.201	50.1528	43.1958	48.1258
			32.3588	83.7733	35.955	48.43	44.829	37.847	58.3187	41.6581	41.363	43.8935	43.5174	43.3884	48.0282	22.5878	42.8098	49.0502	41.8811	22.0895	58.9818	27.5837	13.7535	45.5317	48.404	37.4222	35.2838	47.563	52.7405	35.0748	42.4363	36.1003	47.1359
			22.8448	34.0211	43.0248	44.8536	38.0991	45.9528	54.1686	44.6073	37.8571	47.5382	48.588	25.6113	34.3863	41.1013	16.8813	43.5548	23.8251	38.9831	41.6314	28.2881	34.7073	48.8591	47.111	32.8218	42.8167	25.5405	30.4428	38.2388	46.887	43.8282	48.8025
			50.5998	38.0848	44.1089	21.9564	49.5011	20.6215	28.2282	52.6833	37.3318	38.518	38.3888	37.487	44.8331	28.4881	52.8536	35.4095	38.375	20.3878	42.7484	55.3458	34.8857	44.8843	38.0584	32.8218	28.7957	53.4348	49.9194	40.5188	28.7148	40.5012	53.0522
			43.894	23.781	31.4884	32.6287	24.6138	34.4338	26.2748	24.998	44.6983	33.2565	28.6225	38.8672	29.381	45.5884	34.1312	38.7838	37.8855	48.0911	32.0833	48.5505	48.8251	50.8857	44.6288	32.838	41.7763	44.4781	28.245	54.3798	51.4724	38.782	32.0584
			38.902	40.2572	38.1958	37.4428	32.6687	41.2719	45.53	44.2815	49.528	34.8551	25.8888	18.5805	48.2518	38.8645	38.1767	36.7208	46.2938	47.4958	40.4798	58.758	34.418	34.3751	53.0854	52.3352	47.4868	51.5072	49.1837	30.11	58.0888	38.3228	53.401
			42.6783	37.8788	38.3032	71.0586	48.3055	31.8395	61.4008	34.1321	48.8281	43.4787	38.8487	57.8834	51.703	35.1285	37.3373	31.5588	38.085	38.4198	58.8825	28.872	45.3054	30.5114	42.9082	50.4785	57.4387	45.7542	82.6121	43.9585	53.6483	47.5188	70.3448
			49.8145	57.3404	52.841	30.5857	41.2343	52.2738	47.5361	34.1955	48.2204	35.7118	43.2358	44.5298	88.8873	44.898	53.7883	73.7855	25.4118	30.8734	43.5895	24.3125	47.0158	27.9005	43.4948	44.4284	30.1282	24.7228	42.3013	51.134	43.5218	27.644	47.2843
			39.991	51.0907	27.8337	47.8787	38.5363	74.0088	38.5815	42.112	38.3182	47.0187	38.8888	14.1581	49.0018	43.1821	48.7288	27.0828	37.4825	52.2522	58.3888	33.8271	37.0031	43.3352	43.4382	42.8855	21.5828	41.8025	28.9549	28.9341	51.6743	88.0546	45.0838
			28.5512	37.207	40.4845	44.6734	38.8841	46.3935	38.3847	31.2232	34.4027	35.0893	28.6743	45.2733	31.0783	38.0403	53.498	38.8321	20.8418	37.2117	28.2188	35.0122	52.3807	45.8848	41.4143	42.2221	47.2585	50.8028	40.7252	37.1303	40.8878	37.4333	42.28
			33.8858	40.0384	38.882	18.1957	44.8511	38.5978	53.3558	31.4333	39.4248	44.8438	48.7598	43.4132	30.374	47.2881	24.0367	30.3028	27.8231	30.7288	15.4898	43.1378	34.8283	25.4421	40.9549	40.8841	42.6242	55.8573	22.6148	41.3309	45.2193	42.9095	35.5108
			38.5425	38.5675	44.4864	42.8888	42.7188	25.1181	23.9142	43.7548	35.8495	50.8165	38.2888	17.9108	42.9785	49.7904	42.3295	41.1768	38.88	47.1514	55.3821	42.6208	54.6318	31.877	43.2234	28.8378	35.788	44.8382	41.0208	45.5898	33.2834	53.6108	43.525
			48.858	28.2981	58.4284	26.3428	38.2934	42.6344	40.8978	41.7008	47.1147	48.234	58.8458	43.2388	80.7877	22.1783	43.0104	28.8732	33.3187	50.2808	38.9887	54.4438	31.2128	37.8961	50.8343	44.2157	32.5377	45.2851	45.2978	34.5188	37.3108	29.2287	9.8812
			80.0302	34.9315	14.497	45.0573	28.6731	53.8206	57.9183	50.7785	45.1722	33.7777	41.8355	28.4188	34.8757	44.5843	34.3485	15.7149	38.1818	58.7708	43.7771	25.872	30.8258	41.8185	51.3823	50.0484	53.2857	33.8868	83.104	42.0858	48.5885	48.8701	37.2448
			47.3793	56.4552	37.3737	32.0261	45.0308	56.7283	50.5271	58.1488	28.5872	58.6248	45.6587	55.832	32.2988	38.1564	41.5484	31.0843	44.3413	37.7838	48.884	38.8802	48.5745	57.2004	52.5822	42.0895	38.3928	47.3897	21.0388	44.2422	58.0881	55.6404	42.8824
			48.0027	48.8363	40.978	38.6184	31.1881	33.8341	20.3581	38.6242	38.2021	42.5022	34.8277	38.7088	38.7083	44.1749	31.184	38.7083	32.5347	37.2408	48.1541	44.588	38.3125	51.8838	18.5227	48.1832	45.8178	38.0204	82.6988	43.6888	43.8852	43.4851	23.8105
			33.2052	41.8877	30.4988	40.7996	37.0888	47.908	48.8288	44.7048	44.4718	36.687	38.352	51.5484	38.0589	51.8033	51.1012	35.2411	38.9808	42.2844	33.8804	38.8825	40.8848	24.1833	32.2108	30.8818	40.4181	35.7387	37.7187	36.7155	17.178	52.7928	38.7481
			42.3083	50.1037	37.1308	28.7958	52.0248	48.1577	32.3491	18.5839	53.9282	32.0253	32.287	37.2819	41.8848	41.2528	38.1681	34.1407	48.0825	35.3727	38.838	37.1388	34.1117	38.7158	35.4844	32.5828	50.3711	51.8849	50.4783	50.143	43.1734	38.0865	32.2498
Average			41.12828	40.6227	38.34837	40.37228	38.05817	39.3783	41.02928	40.23418	41.40828	36.42243	38.10311	38.81228	40.82952	38.31552	38.11135	38.3994	38.2724	38.33862	40.7177	38.48243	38.88038	40.12128	43.08804	39.1978	38.31827	41.7852	41.2802	41.03938	42.51825	40.61114	40.03884
Moving range average			10.58988	13.22118	11.01833	12.78135	8.305531	12.18984	14.88478	8.274728	7.852041	10.78787	10.59711	15.8032	9.472238	8.414672	12.82871	11.82825	10.18482	12.20044	11.0088	11.35028	12.05532	10.41087	8.508803	7.630997	13.81858	11.27895	16.17183	8.757248	12.48866	11.93454	12.78987
T statistic			30.32287	21.98157	31.15865	25.30218	48.90905	20.41584	17.32214	38.73857	53.51747	21.911	51.88745	18.88201	48.27892	41.86181	27.88365	28.7448	33.43554	28.11825	30.23344	31.04028	22.32751	35.38285	38.08724	44.88078	18.56882	38.37585	17.64505	56.47157	27.2401	35.77787	14.02598
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.879	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1.8	1.035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1.9	1.086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1.138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	2.1	1.189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	2.2	1.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2.4	1.342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2.5	1.393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3.3	1.798	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.175965
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	8.824071	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8.985874	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.447458	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	10.00501	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	10.37187	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	11.15478	0	0	0	0	0	0	0	11.1105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.32775	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	12.81514	0	0	0	0	0	0	0	0	0	0	14.00648	13.53665	0	14.22275	0	0	0	0	0	0	0	0	0	0	13.7845	0	0
119	30	15.165	15.32649	0	15.74432	0	0	0	0	0	0	0	0	0	0	0	0	0	18.80277	0	15.28172	15.66513	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	20.03478	0	0	0	0	0	0	0	0	0	0	0	0	0	17.85632	19.20862	0	0	19.85292	0	0	0	18.05398	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	21.09505	0	0	0	0	0	0	0	0	0	22.64538	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	24.82031	0	0	0	0	0	0	0	23.30522	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	27.01036	0	28.18099	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28.4953	0	0	0
Estimator shape parameter			15.32649	11.15478	15.74432	12.81514	24.82031	10.37187	8.824071	20.03478	27.01036	11.1105	28.18099	10.00501	23.30522	21.09505	14.00648	13.53665	18.80277	14.22275	15.28172	15.66513	11.32775	17.85632	19.20862	22.64538	9.447458	19.85292	8.985874	28.4953	13.7845	18.05398	7.175965
Estimator scale parameter			2.083348	3.641729	2.435695	3.150358	1.545723	3.706704	4.649699	2.008217	1.533052	3.275548	1.492998	3.979236	1.751848	1.863052	2.79238	2.836699	2.26695	2.765894	2.684471	2.517828	3.238331	2.248895	2.243682	1.730844	4.05604	2.104738	4.581622	1.440216	3.084353	2.248428	5.579552
Control chart constant d2			1.117352	1.114252	1.11758	1.115708	1.120643	1.113412	1.1113	1.119407	1.121093	1.114217	1.12095	1.112973	1.120345	1.119748	1.118552	1.116234	1.118149	1.118892	1.117327	1.117548	1.114422	1.118583	1.119118	1.12018	1.112238	1.119345	1.111557	1.121323	1.118404	1.118686	1.107942
Control chart constant d3			0.859594	0.860553	0.859568	0.859936	0.859458	0.861078	0.862943	0.85947	0.859457	0.860573	0.858458	0.861388	0.85948	0.859485	0.859721	0.859781	0.85952	0.859894	0.859587	0.859571	0.860483	0.859498	0.859477	0.859481	0.862018	0.859471	0.862675	0.859457	0.859752	0.859492	0.867279
Control chart constant D4			3.318287	3.334588	3.31808	3.327898	3.301409	3.338247	3.348571	3.308187	3.298833	3.334728	3.299718	3.340083	3.303047	3.308331	3.323432	3.325053	3.315014	3.322712	3.3184	3.318228	3.333798	3.312672	3.308774	3.303853	3.343026	3.308525	3.345822	3.297887	3.324188	3.312223	3.357855
Upper contro limit X			69.50558	78.21921	67.92835	74.73983	82.98741	72.22412	81.23838	85.09037	82.42003	85.48786	87.48418	82.40953	66.18378	84.53912	73.5747	69.85158	85.50779	72.11518	70.2781	69.96167	69.11301	68.04288	65.90718	58.83479	75.05211	72.00899	84.80863	87.14404	76.02489	72.61678	74.81813
Lower control limit X			12.747	5.026188	8.788398	8.004754	13.14493	6.534484	0.820178	15.37801	20.30853	7.376807	10.74205	-2.78497	15.48528	14.08192	4.848808	7.147215	10.847	8.56205	11.15828	8.023188	4.207718	12.19873	20.2888	18.761	1.58843	11.58141	-2.38824	14.83474	9.007812	8.80551	5.481552
Upper control limit MR			35.08427	44.08687	36.58278	42.53245	30.72137	40.89303	49.84847	30.88253	25.80338	35.87385	34.98747	52.784	31.28724	31.12803	42.62869	38.88455	33.78219	40.53858	36.5428	37.66282	40.18897	34.48778	28.18185	25.21245	45.5272	37.31006	54.10484	32.17618	41.45148	38.52985	42.87838
Normal upper control limit X			69.23768	75.78537	67.6551	74.38525	82.80482	71.78938	80.84308	84.90102	82.28137	85.11305	87.28892	81.84207	66.02184	84.35454	73.22484	69.3258	85.35818	71.78881	69.98841	69.87835	68.72238	67.80877	65.72755	58.4931	74.53864	71.77708	84.27838	86.98852	75.88023	72.35184	74.88127
Normal lower control limit X			13.0149	5.460035	9.041851	8.378337	13.30742	6.959248	1.415474	15.58738	20.52518	7.731812	10.81928	-2.21751	15.6374	14.2785	4.987771	7.473185	11.18583	8.888825	11.43888	8.305508	4.588348	12.43282	20.46854	18.80288	2.098898	11.78332	-1.75	15.08928	9.352273	8.870351	8.878417
Normal upper control limit MR			34.54238	43.20878	36.01118	41.78848	30.41048	39.83873	48.87817	30.30881	25.66047	35.25411	34.83137	51.84488	30.95527	30.78715	41.81788	38.00113	33.28335	39.87105	35.97875	37.08272	39.39878	34.02271	27.80841	24.9381	44.50545	36.85307	52.84958	31.88889	40.75083	38.00207	41.73184

OBJECTIVE # 3

Normal (40 10^2)

k = 30 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	42.0364	48.914	58.531	25.849	25.4258	27.9735	44.0138	18.7824	38.2823	33.8276	35.5232	30.7288	39.3658	48.3688	48.7871	27.3456	41.5114	13.3758	34.373	44.2584	30.9204	24.5309	48.4342	25.4014	42.9495	14.7445	43.2128	43.8419	49.5877	56.1158	52.3458
			48.082	41.8902	42.2355	48.0229	40.9525	28.9182	40.363	40.7347	38.8344	50.5784	45.2274	34.344	44.5878	32.8015	30.7052	30.0788	42.5171	35.542	41.2541	37.7788	31.2013	54.4084	38.1018	38.9873	34.3452	35.3123	44.5835	28.1141	28.9148	48.7998	30.8281
			31.9634	31.3361	33.0819	47.791	31.1747	32.9056	36.735	33.894	35.5518	39.2458	39.2084	48.3852	33.8541	40.7284	39.0258	38.8224	28.7888	37.8503	42.338	34.2128	28.8828	54.0487	53.4237	37.7056	45.1654	23.388	48.3828	30.5448	39.124	38.5428	41.105
			45.23	35.5531	34.4388	38.8035	33.4603	45.9337	33.6115	47.5258	58.1815	34.8828	52.2478	48.7148	42.8981	28.8882	48.0815	47.2335	32.0728	8.9188	48.4558	23.1713	48.2877	32.8818	42.9783	35.8131	28.9582	58.9039	53.0887	35.4058	40.8249	38.4442	37.8322
			48.6149	37.488	40.878	24.0068	28.8153	24.2501	58.3401	43.754	33.6208	49.4471	52.0598	48.9878	23.821	47.8873	45.4883	52.8302	40.0845	21.588	49.0287	30.8385	32.8839	42.7442	82.1528	34.3203	32.889	37.9472	45.9213	37.0005	32.9881	35.8721	40.3988
			23.1533	41.4012	28.2769	70.967	32.7013	52.29	41.1898	38.6951	58.5203	41.918	23.8843	40.2223	23.2005	48.8734	48.7788	38.8931	44.8317	48.0559	33.2703	24.8725	38.1247	53.3488	51.1303	30.9384	22.9875	44.158	42.284	32.7748	28.3727	73.5804	54.7528
			32.0448	33.9784	33.9238	38.4817	48.0048	48.3633	58.8533	32.4338	28.548	29.0729	51.4347	47.7084	18.7027	48.7771	40.4487	37.5783	47.8828	30.8852	32.7304	48.7318	34.4098	45.3721	32.1804	48.0793	35.58	45.8774	83.5155	40.4894	43.7781	43.7557	53.8417
			51.8302	34.2747	45.4258	41.3418	31.736	44.7818	29.2907	33.4293	42.332	50.8862	38.7502	51.8488	50.4322	35.4045	43.1789	51.2211	48.8488	45.9802	24.5038	49.1747	33.7783	22.5735	41.8188	37.0824	45.4504	54.7251	48.211	31.2988	39.1033	47.3009	29.1132
			39.2482	33.1958	55.3882	32.7818	38.5018	30.8773	28.2085	33.4079	58.9157	43.8982	44.8488	21.4747	34.3288	51.8211	58.1048	35.3818	33.852	38.8887	25.5328	41.5881	39.5494	28.385	51.3888	21.887	33.6707	28.9818	53.0341	41.4887	42.5524	32.4882	52.4078
		10	28.9131	51.9305	39.7545	37.8954	48.0213	35.3731	35.4822	31.2322	38.6498	48.818	22.5228	38.8878	17.1184	34.8967	49.0485	38.8047	33.5581	39.2702	41.2551	22.7581	41.3873	42.5589	48.5858	38.3188	37.4178	21.7582	52.9482	48.2554	41.5735	42.854	40.5471
			33.4186	55.0808	32.2304	37.0147	25.0182	39.323	33.8067	44.8783	47.8382	30.5843	37.8055	40.7888	38.1027	47.9832	30.578	41.1848	27.2304	38.3041	88.8075	49.2575	35.8492	30.4078	47.0551	18.9581	53.8874	51.5732	47.4501	49.1201	32.1814	38.8082	32.0222
			39.4245	34.8575	35.3289	48.8803	48.8875	40.2118	38.4379	45.8303	45.9285	47.3471	48.0268	37.7348	54.5482	31.8484	34.0237	38.3287	37.7115	48.5242	38.0053	31.8178	35.185	34.3475	48.8027	38.9183	44.3019	27.3858	38.28	43.9105	38.4218	27.527	40.7817
			51.0022	42.0858	45.5867	43.2556	49.7145	43.0728	51.8942	38.7202	50.855	34.5771	44.7858	32.8381	38.3238	48.5813	32.034	54.882	48.2281	41.8858	57.3583	49.8792	42.8183	44.2138	38.8013	38.1871	38.5827	30.3185	48.0352	34.2548	41.5483	51.3813	38.4222
			35.3849	40.28	39.8118	30.8387	42.0708	18.1241	32.2781	45.3491	38.338	55.8842	43.4728	85.2298	48.5698	37.5988	48.8424	52.7088	22.8882	39.5174	57.8588	38.8588	51.8841	45.433	29.572	18.8934	40.7678	41.4272	32.0488	54.91	32.3212	48.8807	38.8417
New observations k =			41.7398	29.7041	51.7096	37.5183	30.3311	55.9038	45.0518	42.2381	51.8805	28.4198	25.8285	41.884	42.4881	58.1752	52.3485	44.2758	38.8455	41.8208	33.3898	37.8341	58.341	55.8421	44.0517	42.1957	38.5131	34.3082	38.8524	33.8174	33.4224	45.8531	50.7522
			59.8861	18.8018	32.3827	58.6334	39.7257	20.1788	37.0808	55.0772	25.1957	48.838	38.5098	45.7494	28.3951	42.4879	32.3303	32.8788	48.2148	32.8334	28.2747	40.587	28.4953	27.8804	47.8147	41.3313	29.7952	53.3884	28.837	35.9718	37.0358	48.4882	31.888
			43.2483	47.1522	39.5395	32.758	57.8554	30.5789	41.851	42.552	55.9504	25.9125	37.5871	48.9238	49.8812	34.1858	65.7818	40.8378	40.5232	47.8284	47.8022	45.8782	33.5731	42.8383	38.8888	41.2118	49.3714	47.4731	43.5188	52.5888	53.1173	52.0293	38.8748
			37.2534	37.4228	40.0348	47.8814	57.4184	39.5898	32.1401	38.2288	35.7271	37.1053	40.2803	34.1089	40.5822	45.8808	22.827	32.4328	38.3898	43.1734	48.2898	22.4738	38.1835	37.823	39.8713	35.184	45.1401	34.487	20.2327	31.58	44.2081	58.4434	41.1851
			40.5811	47.2082	33.8888	38.9224	37.9823	43.4048	23.7272	36.8627	34.7888	63.1933	44.8483	40.8825	53.8745	63.5858	47.0814	42.8928	28.8728	80.882	35.5838	24.738	38.4073	33.378	27.0871	38.2204	27.0178	38.8678	88.877	33.8151	42.7808	48.8503	30.8378
		20	35.8981	52.4038	49.3951	34.6188	44.1908	40.1389	43.1581	34.8804	25.862	24.5818	48.8889	47.1228	44.5324	40.2418	37.0112	28.7257	50.7528	35.2484	21.7304	34.8225	57.8723	41.158	37.8922	52.7428	34.1885	42.8288	42.1443	31.8213	44.8218	38	43.8081
			32.3632	37.378	28.2103	30.5988	32.1183	53.2951	38.7174	22.5881	42.4042	42.7749	44.8873	43.1481	55.0737	28.5804	51.8033	34.8778	45.8871	30.8103	47.7384	20.4523	88.8428	32.888	25.1888	28.1388	27.3374	47.1751	23.5837	41.4185	28.8118	29.2874	35.4758
			24.0243	61.3314	38.0718	34.802	32.083	38.4253	48.5835	38.0158	38.1713	41.8027	43.8842	54.5495	35.7488	55.8777	34.8588	34.33	44.1813	22.0488	53.2914	41.2138	38.3889	28.1488	47.8808	39.7505	52.5873	31.527	48.2074	42.3821	24.3777	45.8827	34.9888
			51.8745	40.4558	88.9244	33.3771	27.3568	47.5027	51.2518	38.3258	43.3887	41.2447	84.1898	35.8804	30.5428	30.3704	31.5258	53.2718	40.8871	24.8418	48.0838	54.7803	51.8353	54.4183	35.7878	44.1882	22.3854	41.3188	28.3448	31.8721	25.4247	31.7731	32.0724
			49.2753	38.0344	47.1541	44.8302	44.8258	28.5093	38.0777	43.3837	48.1487	27.5348	53.8784	38.1187	24.7438	58.775	38.8445	40.5481	53.1437	45.2285	44.1588	37.7293	34.5183	41.7119	28.8888	24.1881	42.0842	41.0575	50.1748	38.3881	28.8328	38.8251	22.2887
			32.7241	38.5419	47.0254	31.287	40.8858	59.851	49.0483	44.818	42.677	40.3085	45.8877	27.4788	24.4814	41.0788	51.8578	29.4782	37.0804	63.2858	40.8182	31.7882	29.8307	38.881	45.3371	50.3074	20.1773	23.2083	44.4178	55.3874	48.3044	33.312	38.7247
			18.2876	38.5128	23.9582	40.2084	43.2232	19.4808	48.8742	37.4611	41.2553	50.1888	38.5548	51.8	40.0083	42.8552	37.1845	48.0485	19.7805	25.4142	25.3089	55.7537	29.3078	41.4523	25.742	29.7205	32.8077	31.1384	51.2388	32.9017	40.489	35.1301	49.5804
			41.4098	38.3059	39.8522	48.5188	34.4574	45.4422	47.3788	34.8858	41.8385	48.0258	30.8332	87.2885	57.4528	61.3892	44.8858	88.1882	32.3812	28.758	44.7884	42.1283	44.8787	38.4888	48.7711	52.8383	81.3775	58.8221	40.7827	33.088	37.1881	84.5257	37.7215
			44.5945	43.3279	15.5719	40.0701	70.498	41.0875	38.0473	53.9651	38.2588	45.3098	28.8557	49.2704	41.0574	41.3398	54.7882	43.8436	33.7805	32.3371	51.084	18.8485	43.8807	53.1554	43.538	34.4728	33.2788	34.1803	38.2827	35.9852	30.1827	27.0804	28.8548
			26.8859	18.8107	47.7258	80.5271	30.5828	35.2401	37.014	41.8172	41.4581	40.8842	35.8823	38.8082	33.5315	87.1408	18.5582	27.1522	38.582	51.4818	53.8888	40.5211	48.4158	48.8884	24.0325	31.2518	37.8079	35.3184	84.8197	30.7388	42.2731	50.4147	52.3058
		30	44.7089	45.7392	35.9367	47.0847	27.4738	42.7955	37.4875	31.8883	38.8218	32.8547	34.8728	32.8889	38.8438	33.2037	28.8877	45.8243	40.282	47.4872	43.7078	45.884	43.7845	33.8487	48.5288	42.2075	80.4003	37.3888	53.0117	42.0857	38.7081	35.0778	33.783
Estimator shape parameter			15.32649	11.15478	15.74432	12.81514	24.62031	10.37197	0.824071	20.03478	27.01036	11.1195	26.19099	10.00501	23.30522	21.09595	14.00848	13.53685	16.88277	14.22275	15.20172	15.60513	11.32775	17.85632	19.20862	22.64538	0.447458	19.85292	0.985874	28.4953	13.7845	18.05398	7.175895
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			2.883348	3.641728	2.435895	3.150358	1.545723	3.788704	4.849898	2.008217	1.533052	3.275548	1.492898	3.978238	1.751948	1.863052	2.79238	2.838898	2.28895	2.785884	2.884471	2.517828	3.238331	2.248895	2.243882	1.730844	4.05804	2.104738	4.591822	1.440218	3.084353	2.249428	5.578552
Control chart constant d2			1.117352	1.114252	1.11768	1.115708	1.120843	1.113412	1.1113	1.119407	1.121093	1.114217	1.12085	1.112873	1.120345	1.118748	1.118552	1.118234	1.118149	1.118882	1.117327	1.117548	1.114422	1.118583	1.118118	1.12018	1.112238	1.118345	1.111557	1.121323	1.118404	1.118888	1.107842
Control chart constant d3			0.859594	0.880553	0.858568	0.858936	0.858458	0.861078	0.862943	0.85947	0.858457	0.860573	0.858458	0.861398	0.85848	0.858485	0.859721	0.859781	0.85952	0.858884	0.859587	0.858571	0.860483	0.858488	0.858477	0.858481	0.862018	0.858471	0.862875	0.858457	0.858752	0.858492	0.867278
Control chart constant D4			3.319267	3.334588	3.31808	3.327888	3.301409	3.338247	3.348571	3.308187	3.298833	3.334728	3.298718	3.340883	3.303047	3.308331	3.323432	3.325053	3.315014	3.322712	3.3184	3.318228	3.333788	3.312872	3.308774	3.303953	3.343026	3.308525	3.345822	3.297887	3.324188	3.312223	3.357855
Upper contro limit X			88.50558	78.21821	87.92835	74.73983	82.98741	72.22412	81.23838	85.08037	82.42083	85.48788	87.48418	82.40953	88.19378	84.53812	73.5747	88.65158	85.58778	72.11518	70.2781	88.86187	89.11301	88.04288	85.80718	58.63478	75.05211	72.00888	84.90883	87.14404	78.02488	72.61878	74.81813
Lower control limit X			12.747	5.028188	8.788388	8.004754	13.14483	8.534484	0.820178	15.37881	20.38853	7.378897	10.74206	-2.78497	15.48528	14.08192	4.848008	7.147215	10.947	8.58205	11.15929	8.023188	4.207718	12.18973	20.2889	18.781	1.58843	11.58141	-2.38824	14.93474	9.007812	8.80551	5.481552
Upper control limit MR			35.08427	44.08687	38.58278	42.53245	30.72137	40.88303	48.84647	30.88253	25.80338	35.97385	34.88747	52.784	31.28724	31.12803	42.82888	38.88455	33.76218	40.53854	38.5428	37.88282	40.18897	34.48778	28.18185	25.21245	45.5272	37.31008	54.10484	32.17818	41.45148	38.52885	42.87938
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in X			0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Total false alarm in MR			0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							38																										
Sub-total MR control charts with at least one false alarm k 30 =							63																										
Normal upper control limit X			88.23768	75.78537	87.8551	74.38525	82.80482	71.79936	80.64308	84.90102	82.28137	85.11305	87.28882	81.84207	88.02184	84.35454	73.22494	88.3258	85.35818	71.78881	88.98841	88.87835	88.72238	87.80977	85.72755	58.4931	74.53884	71.77708	84.27038	88.98852	75.88023	72.35184	74.00127
Normal lower control limit X			13.0149	5.460035	9.041851	8.378337	13.30742	8.958248	1.415474	15.56738	20.52518	7.731812	10.81928	-2.21751	15.6374	14.2765	4.987771	7.473185	11.18563	8.890825	11.43888	8.305508	4.598349	12.43282	20.48854	18.80288	2.008898	11.78332	-1.78	15.08928	9.352273	8.870351	6.078417
Normal upper control limit MR			34.54238	43.20878	38.01118	41.78848	30.41048	38.83873	48.67817	30.30981	25.88047	35.25411	34.83137	51.84488	30.85527	30.78715	41.81768	38.00113	33.28335	38.87105	35.87475	37.08272	39.38878	34.02271	27.80841	24.9381	44.50545	38.85307	52.84958	31.88888	40.75083	39.00207	41.73184
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in X			0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	0	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
Sub-total normal X control charts with at least one false alarm k 30 =							41																										
Sub-total normal MR control charts with at least one false alarm k 30 =							72																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							4																										
Sub-total MR control charts with at least one false alarm k 1 =							4																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							4																										
Sub-total MR control charts with at least one false alarm k 1 =							5																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							15																										
Sub-total MR control charts with at least one false alarm k 10 =							26																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							18																										
Sub-total MR control charts with at least one false alarm k 10 =							29																										

OBJECTIVE # 3

Normal (40, 10^2)   k = 30 obs   Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	53 036	51 6301	70 5203	54 411	40 0871	44 581	77 1963	65 0000	50 0403	33.175	58 6782	39 0319	50 0281	35 7478	60 763	49 9035	53 0754	42.5502	50.4082	58 1454	38 1857	45 5037	31 8036	51.3125	54 0182	51 2517	47 0401	47 2428	49 3041	43 8521	61 5778
			47 7028	54 8391	68 7158	60 2786	49 2190	49 6448	54 5515	50 9822	45 5295	65 5277	68 0183	67 0839	55 8123	51 3888	38 7618	62 1752	68 4175	67 4648	38.317	62 7887	54 4751	40 1938	55 2832	20.327	42 1902	47 8892	48 8863	52.6411	34 048	51 0845	54 3881
			53 1074	53 946	49 7632	54 6682	47 1297	52 9	40 1082	28 2803	23 5147	63 0148	52 0702	52.2889	28 0176	38 5088	41 8288	54 2774	67 8238	53 2817	53 0582	44 0044	52 511	48 753	58 6878	55 0803	42 7851	48 2198	48 873	45.581	47 1831	43 185	64 1383
			51 0010	51 9145	50 5517	20 3082	57 4428	55 417	51 7308	44 7411	58 3545	53 1983	38 5801	60 1666	53.2417	65 0821	39 2782	48 5824	38 5841	45 3857	68 4588	50.3341	44 8856	57 548	60 5418	57 6572	54 7221	61 4032	66 5082	44 8098	43 7883	48 7798	50 6342
			31 0002	43 2424	60 4581	50 9423	47 7415	57 9447	35 728	51 9387	43 2998	38 9778	64 9375	54 8278	41 1515	38 0174	44 8888	33 1424	41 9521	55 8084	49 9845	51 3524	33 8177	68 7758	40.118	18 8835	52 2821	61 1866	64 1115	41 7708	74 7788	33 6733	38 1887
			68 0017	34 8303	64 0381	49 5874	48 7102	37 1088	51 7582	48 8189	68 4807	67 0655	44.614	32 5259	49 5313	60.4803	41 0183	43 2105	42.2752	53.7882	31 5515	48 7521	48 5238	47 8828	55 3578	51.881	60 2325	22 1841	43 8648	71 3511	33 5898	42 1998	68 0098
			60 5444	28 7058	42 1858	62 0718	53 0257	48 2419	47 7028	28 3028	58 212	51 2232	58 9865	48 1831	53 4963	49.376	42 8897	55 0839	55 6074	48 8422	50 9874	30 1428	48 5186	45 5028	63 1783	50 5031	30 8347	28 83	53 1907	48 0774	31 8124	41 3326	73 7748
			60 3468	58 0013	48 2983	47 0829	49 4348	53 2924	54 9581	32 8841	72 3178	45 8156	65 2888	58 3418	42.3788	50.0568	58 0874	48 8251	53 6813	48 4582	48.2837	49 442	57 6728	52 1257	31 3055	42.6847	48 1888	41 0433	67 7233	54 0756	48 9818	44.8618	58 0227
			52 7062	38 1045	48 6381	51 4426	50 7283	47 9872	44 5904	52 1056	38 4038	58 119	54 0508	40 8825	61.4153	72.173	53 0028	68 8694	43 3778	65 4588	68 1283	58 1432	53 6683	67 8474	55 1001	64 3121	58 9107	58 7538	44 5114	51 1833	52 8833	40 9854	62 4283
		10	61 0648	42 0992	60 694	48 5382	58 0308	38 0664	42 754	45 8556	57 2023	58 8783	63 8237	50.232	45 8408	31 2451	42 2787	43.0145	49 6848	43 8148	54.308	58.0283	48 3875	53 1844	21 8031	54 2185	51 552	61 6892	55 1475	31.8023	48 8312	52 3491	68 1575
			58 0868	62 579	53 0172	47 9258	51 864	47 8082	52 9058	48 8072	60 3943	43 9252	52 0418	43 9882	38 8881	55.9511	45 6458	41 7903	61.0681	38.7875	38.568	53 8832	37 0045	58.218	33 0802	43.8053	35 4598	63 4458	58.7301	47 9286	48 2282	40 4384	38 7535
			51 2085	35 3814	50 0703	42 6669	48 8835	42 2498	42 3035	28 5587	46 8787	60 1734	41.8138	38.0502	38 5488	31.8243	63 5008	45 1201	51.565	62.4412	54 7817	58.884	35 284	43.8857	51 5868	42.858	52 8868	68 4415	32 8828	58 8741	53 0548	58 2382	42 857
			57 5867	55 708	38 9024	34 9105	55 5857	42 0877	45 9947	62 3984	46 3458	42 1131	34 3451	68 9272	57 0852	41 3418	54 0421	44 1144	38.3885	72 1288	42.4651	50 9128	58 1811	55 122	45 1088	68 4071	58 2315	48 8502	52 7482	51 946	52 4485	38 2402	40 1518
			38 4083	64 9648	52 5934	64 4422	60 2385	44 1823	43 8488	52 8178	48 0344	43 181	61 8841	53 5285	67 088	73 4415	28 6824	67 2826	47 5855	48.8388	58 8851	38 3808	64 6295	40.6785	61 141	46 7888	34 2483	63 0898	51.57	40 7783	49 3525	53 5553	58 8484
New observations k =			33 0008	42 1138	45 8384	50 6958	42 8558	48 03	48 5573	50 9805	54 287	38 9183	50 1822	57 0132	61 4637	57 5058	53 0388	75.6987	38 1011	52 9132	48.5388	50 1103	45 3098	48 1962	63 0014	53 4141	40 3197	38 6029	49 7877	45 824	60 7872	58 5741	28 5778
			52 7738	55 4774	46 4754	52 4822	57 0286	57 3173	53 9018	37 5778	42 7328	48 7444	52 0582	71 0572	61.5703	38 2827	43.5051	58 9025	54 8818	50 4281	60.0344	41 0408	51 2155	43 6942	34 3803	78 4773	44 4717	42 8967	72.8847	53 1184	37 8143	45 8528	53 388
			43 1483	51 8394	43 3188	48 198	54 6666	48 3122	58 5549	47 8314	53 8888	42.1948	48 8703	54 8893	58.3458	44 3483	43 7317	52 2873	54 8384	58.3283	51 5677	48 6778	40 3647	53.3287	40 7844	58 3748	53 8572	57 4154	58 3718	48 3812	71 1895	51 4867	33 2114
			63 3921	50 4953	60 401	44 9198	58 3581	52 0788	58 7851	39 2838	40 2288	47 5721	47 8829	54 5024	31.8137	34 8275	53.8888	40 0245	45.8578	50.5288	43 2074	68 6335	38 8834	30.827	32 6273	51 8808	35 4712	32 4271	38 8829	41 2763	52.595	51 7987	58 7483
			49 1927	55 6549	42 1538	51 2483	60 5088	53 4158	58 5984	38 7251	63 2254	53.3578	48.4814	54 8008	45 8853	53 5518	52.818	52 0513	42 4434	47 0072	34 1054	62 5488	58 1718	58 0828	38 6077	38 8858	38 9242	35.3125	43 6438	50 5883	48 8034	52.718	38 1833
		20	48 1668	59 0842	37 1825	38 4411	45.7098	63 2533	62 3751	55 9783	53.8783	42.1552	49 3783	40 5883	38 6584	58 8381	48 9125	58.3831	61 2851	55.1785	47 8228	41 4881	58.781	35 5273	43 0254	33.1204	52 2117	28 864	46.3651	45 0073	71 738	24 8952	51 6633
			75 1654	37 5087	67 5514	41 3458	68 401	42 484	78 4993	64.08	48 1437	63.3538	64 5072	61 8589	54 5867	67 6448	43.8874	53 1838	38 0852	57.0368	48 4079	38 6472	59 0088	64 7386	50 928	48 3817	58 2741	40 0938	52 8885	45 3101	45 3102	50 1834	38 3114
			38 2707	52 7127	40 5472	23.3387	58 9574	41.2738	49 3678	41.5138	45 5283	52.0071	48 2008	45.5872	38 4027	43 6883	37 2841	66 1438	48 8811	44 8821	48 1313	53.2364	44 7734	43 7228	43.2887	48.8508	48 1353	47 2444	42.4203	40 9047	48 0018	51 2112	45 08
			55 8025	61 4282	61 8351	62 9501	37 1187	50.588	62 9451	58.2418	71 7273	54.8708	44 1808	38.5282	64 4482	33 2818	68 1878	28 6785	53.7829	46.0214	48 2278	33.886	64 7987	58.3411	57 1028	40.3254	53 3815	52 4887	35 4984	44 5841	53 3547	43 1457	54 1432
			58 7708	53 2818	33 0827	58 6666	38 0694	68.6805	50 7284	38 1802	38 4882	48.8495	43.1358	58.4485	46 2785	65 7822	49.0488	50.2104	38 0838	51 5241	52 9568	58 7428	48.8291	47 6888	33 4882	41 1932	49 8802	43 8807	53 7823	57 0233	46 7881	51 4802	48 9583
			40 4308	58 7864	55 6802	51 4208	47 6583	44 0988	65.2484	58.9888	28 4938	52 3114	65.5724	42.7838	46.6178	34 4243	38.6181	58 7213	63 0845	50 8147	47 5418	41 9398	73 5733	33 1871	39 5436	42.5281	44 0197	47 0137	54 6832	28 9878	38 6815	61 7844	48 7628
			49 0453	60 6509	64 3238	41 6087	47 0612	54 4294	57 859	28.7454	44 8074	52.3802	67 4957	38 4775	58 9848	41.8274	54.282	63 3561	43.7728	43 2448	55 2855	54.9834	58 5792	38 0114	54.8775	58 0448	52 8502	48 4818	33 4415	54 4525	55 4288	43 4877	55 6628
			68 8281	46 3041	57 0758	60 1013	43 4028	52.1805	57 2884	44.4308	47 3905	45 4093	63.2542	61 6825	61 2535	64 0848	62.31	54 7984	51.5283	50 8238	44 7007	71 6733	44 2891	53 1351	68 8581	48 8888	60.8448	58 2004	35 0888	44 2788	43 1832	28 8281	53 2883
			52 9288	51 1776	51 7077	37 0198	38 1245	40 281	58 7555	48 7188	47 4575	47 1837	48.8252	43 6183	45.8272	38 4824	53.3832	70 5477	62.6174	50 7438	48 4834	61 3575	48 3824	52 5744	46 7198	68 4888	48 116	44 9283	45 8881	48 5218	62 8637	52 1585	57 018
			34 9101	47 2837	47 9983	49 6069	70 5951	44 0835	60 9445	49 2183	50.0118	44 3815	28.7788	58 2843	35.4048	45.7887	13.2882	46 6885	52.3535	40 1325	48.7093	58 4817	60.6454	64 0548	56 3898	58 5485	67 3871	55 3137	42 8785	31 2422	44 3898	34 0388	42 6301
		30	55 6529	37 788	45 1085	43 1683	51 3823	43 4535	68 0808	58.0883	32.8088	38.8865	67.0755	58.2187	73 9808	41 7058	48.4071	62.3256	51 28	76.3233	38.853	48 6325	49.0801	42.7814	61 2783	58 9818	47 4826	58 6137	43 2857	50 561	35.5781	53 702	48 6375
Estimator shape parameter			15 32849	11 15478	15.74432	12.81514	24 62031	10 37107	8.824071	20.03478	27 01036	11 1195	28.19089	10.00501	23.30522	21.08585	14.00848	13.53665	16.88277	14 22275	15.28172	15.68513	11.32775	17 65032	18 20862	22.04538	9.447458	18 05282	8 985874	28.4953	13 7845	18 05388	7 175886
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			2 683348	3 641728	2 435605	3 150358	1 545723	3 798704	4 649690	2 008217	1 533052	3.275548	1.492808	3.878238	1.751848	1 003052	2.78238	2 836888	2.20895	2 785894	2 684471	2.517828	3.238331	2 248895	2 243882	1 730844	4 05604	2 104738	4 581822	1 440218	3.084353	2 249428	5 578552
Control chart constant d2			1 117352	1 114252	1 11758	1 115708	1 120643	1 113412	1 1113	1.119407	1 121083	1 114217	1.12085	1.112873	1.120345	1 110748	1 118552	1 118234	1 118149	1 116892	1 117327	1 117548	1 114422	1 118583	1 119118	1 12018	1 112238	1 118345	1 111557	1 121323	1 116404	1 118866	1 107942
Control chart constant d3			0 859594	0 860553	0.859568	0.859838	0.859458	0 861076	0 862943	0.85947	0 859457	0 860573	0.859458	0.861398	0.85948	0.859485	0.859721	0 859781	0.85952	0.859894	0.859597	0.859571	0.860483	0.859498	0.859477	0.859481	0 862018	0.859471	0 862875	0 859457	0 859752	0 859492	0 867278
Control chart constant D4			3.319267	3.334568	3.31008	3.327806	3.301408	3.338247	3 348571	3.308187	3.298833	3.334728	3.298716	3.340883	3.303847	3.308331	3.323432	3.325863	3.315014	3.322712	3.3184	3 318228	3.333788	3.312872	3.308774	3.303853	3.343028	3 308525	3 345822	3.287887	3.324188	3.312223	3 357855
Upper contro limit X			88 50558	78 21921	87 82835	74.73883	82.98741	72.22412	81.23838	65.08037	62.42883	85.46798	87 46418	82.40953	88 18378	84.53812	73.5747	89.85158	65.58779	72 11518	70.2781	89.98167	89.11301	88 04286	85.90718	58 63478	75 05211	72 00898	84 90863	87 14404	76.02480	72 61878	74 61813
Lower control limit X			12 747	5 026188	8.768398	6.004754	13 14493	8.534484	0.820178	15 37801	20.38853	7.378887	10.74205	-2.78487	15 46528	14.08182	4.848888	7.147215	10.847	6 56205	11.15828	9.023188	4.207718	12 18873	20.2888	18.781	1.58643	11 58141	-2 38824	14 93474	8.007812	6 60551	5 481552
Upper control limit MR			35.08427	44 08887	38 56278	42 53245	30.72137	40.69303	48.84847	30 68253	25.80338	35.87395	34.86747	52.784	31.28724	31 12883	42.62888	38 88455	33.78218	40.53856	38.5428	37 86282	40 18887	34.48778	28.18185	25.21245	45 5272	37 31088	54 10484	32 17818	41 45148	38 52885	42 87838
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	1	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	0	0	1	0	1	0	1	1	0	1	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0
Total false alarm in X			1	0	1	0	1	0	0	0	1	1	1	0	1	1	0	1	1	1	0	1	1	1	0	1	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			1	0	0	0	1	0	0	1	1	0	1	0	1	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							129																										
Sub-total MR control charts with at least one false alarm k 30 =							74																										
Normal upper control limit X			89.23768	75 76537	87 6551	74.38525	82 80492	71 79838	80.64308	64 90102	62.29137	85.11305	87 28882	81 84207	88.02184	84.35454	73.22484	89 3258	85.35818	71.78881	88 98841	88.67835	88.72238	87 88877	85 72755	58.4931	74.53884	71 77788	84 27838	88 98852	75 88823	72.35184	74 00127
Normal lower control limit X			13.0149	5.480035	8 041851	8.378337	13.30742	8.059248	1.415474	15.58736	20.52518	7.731812	10.91828	-2.21761	15.8374	14.2785	4.887771	7 473186	11 18563	8.898825	11 43898	9.305508	4.588348	12 43282	20 46854	18 80288	2.888898	11 79332	-1 75	15 08928	8.352273	8.878351	8 078417
Normal upper control limit MR			34.54238	43 20876	38.01116	41 78946	30 41048	38 83673	48.87617	30.30981	25.86047	35.25411	34.83137	51.64486	30.95527	30.78718	41.91788	38.00113	33.28335	38.87185	36.07875	37 08272	38 38678	34 02271	27 80841	24.8381	44.50545	38 85307	52.84958	31 88889	40 75083	38 00207	41 73184
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	1	1	1	1	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	0	0	1	0	1	0	1	1	0	1	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0
Total false alarm in X			1	0	1	0	1	0	0	1	1	1	1	0	1	1	0	1	1	1	0	1	1	1	0	1	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	0	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			1	0	0	0	1	0	0	1	1	0	1	0	1	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0
Sub-total normal X control charts with at least one false alarm k 30 =							137																										
Sub-total normal MR control charts with at least one false alarm k 30 =							79																										
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							10																										
Sub-total MR control charts with at least one false alarm k 1 =							5																										
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							11																										
Sub-total MR control charts with at least one false alarm k 1 =							5																										
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	1	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							63																										
Sub-total MR control charts with at least one false alarm k 10 =							35																										
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	1	1	1	1	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							67																										
Sub-total MR control charts with at least one false alarm k 10 =							38																										

OBJECTIVE # 3

Normal (40, 10^2) k = 30 obs Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	48.9981	77.9293	53.7989	58.6784	43.0324	88.8001	64.1113	66.5223	65.1022	57.7238	75.7582	63.1672	69.2156	66.4478	82.0486	67.1418	77.204	70.8149	55.1028	88.8798	48.1317	48.3122	65.1023	61.0984	57.8337	69.2043	57.1054	55.8077	72.0779	69.5858	58.3022
			44.4178	64.8018	58.5403	53.4858	81.3324	45.9842	67.7438	65.1474	64.8214	71.2778	54.9781	74.1458	63.3047	70.538	84.2784	45.5844	57.1272	81.8518	82.6134	48.2773	70.348	53.8883	72.2058	74.855	51.5717	69.3553	53.4713	37.081	72.6234	83.4508	71.5331
			84.0829	49.0393	40.8790	77.0443	78.358	48.062	70.897	50.78	80.408	53.4288	63.6889	58.7372	73.9348	83.7818	51.4283	65.5292	65.8827	68.5864	71.0778	82.0414	77.035	43.5527	80.5841	50.3893	61.8188	58.8093	63.5378	64.2405	38.3038	69.1408	70.1478
			68.1388	80.9547	57.8574	43.848	54.3045	63.614	61.1812	58.1883	81.2283	67.0002	58.6886	70.8959	65.0217	87.7308	58.2111	80.9881	52.6434	68.3433	88.8028	87.198	75.7403	71.0848	45.5877	72.0438	35.933	54.0862	67.8186	62.4872	55.2081	58.0831	58.7301
			81.4858	48.8772	67.3378	77.18	88.5327	67.8443	61.4543	61.8158	83.1677	64.2185	57.2954	81.6553	50.6886	58.0384	78.2342	57.6311	64.1835	55.6448	68.3583	77.7301	54.5015	57.148	64.874	58.5788	55.7978	54.6521	77.4818	87.6747	67.7432	88.8803	80.6471
			54.6188	52.803	61.5254	57.1807	83.5688	57.0802	85.2833	58.3755	88.0192	61.8385	68.1355	45.0988	50.6872	85.8137	52.2487	77.6428	58.8848	65.1831	42.8245	75.0157	41.6193	87.038	48.0533	81.888	64.8448	74.7589	64.7838	58.5588	54.3825	38.2843	58.4454
			53.4728	52.8889	88.4883	39.2823	88.8138	55.488	82.9548	75.2837	33.1377	58.0282	58.1187	82.898	47.1351	52.7089	68.4741	57.7081	88.1201	75.8257	44.0804	88.378	75.8808	50.88	73.7054	65.8588	65.8008	57.9572	58.3985	68.0867	88.7301	48.235	58.498
			87.6435	54.0873	44.1888	81.8707	64.2488	80.0777	88.3849	54.8388	55.5888	50.2882	73.2788	71.1887	58.9783	47.8877	87.1902	58.2888	57.4227	65.4284	89.7888	81.1851	89.0272	88.8881	54.5598	61.0758	48.7753	67.11	58.7251	58.4442	89.3489	48.1888	58.5811
			64.1344	45.0057	88.5784	84.3487	63.2238	82.0724	75.315	52.8832	48.2777	51.522	74.4188	57.287	88.2888	43.8711	47.2288	47.7515	87.3882	88.5181	82.498	54.1388	48.2288	74.0358	81.5772	55.7888	51.458	41.8873	87.888	33.4111	57.5815	82.9829	42.2383
		10	48.8108	58.5077	88.8158	50.2583	70.5882	78.8885	58.8182	81.8008	57.8154	80.0748	88.2887	58.7888	72.1574	88.7888	58.3547	48.3927	82.8541	53.0358	82.3882	73.7754	50.8182	72.0401	84.7352	45.8235	57.8078	81.3221	84.1888	48.8745	53.5828	58.8878	84.5885
			70.8258	55.448	63.5457	57.2884	47.1512	81.842	70.7188	83.4238	53.7138	71.8811	83.5853	83.8888	40.2858	87.8418	40.8722	82.7852	58.0885	88.281	82.8818	84.1934	52.0547	88.8427	78.7285	82.8833	55.7584	53.3887	58.0858	88.1888	88.7848	40.4988	48.2814
			57.1288	72.8718	88.8715	74.0718	51.4878	60.057	88.8888	54.7844	48.1573	83.1848	75.4888	81.8848	83.3274	57.0157	78.2782	58.2442	58.7038	58.1033	58.8333	88.9284	52.008	50.378	40.8727	58.8187	42.8174	85.4333	88.0888	53.7828	77.1888	55.2885	53.8818
			51.5884	88.8255	88.4889	81.1848	85.8831	85.008	72.7031	75.4278	58.1274	88.7887	63.4888	88.8185	82.7187	58.7885	82.8182	55.8145	52.3172	45.7141	70.1584	87.7321	58.7732	58.2888	45.1575	88.1002	58.7888	58.3184	52.8887	88.8311	73.8351	58.7158	51.8821
			57.2811	72.5955	80.8753	83.2155	78.8898	71.4248	58.0223	51.7585	82.8881	83.8515	48.3225	81.8289	48.1758	83.8781	88.8878	84.8773	84.1288	88.0783	70.587	52.2038	81.2758	58.8522	43.1721	88.8887	57.2555	51.8489	57.412	83.7588	54.385	81.7418	58.8187
New observations k =			88.4133	58.7788	81.7401	85.4211	48.2244	55.8381	50.4821	57.7318	53.0055	70.5248	85.8258	82.3384	82.0548	58.8772	58.8315	81.4074	57.5884	70.271	47.8274	57.8748	70.4851	84.7478	88.3884	74.5538	87.8783	88.5887	85.2838	85.7813	80.0188	77.7131	55.3818
			58.5853	81.5578	55.8534	43.3334	53.8881	84.804	73.7824	75.5888	53.278	88.8884	53.1188	80.528	32.2844	74.4954	42.383	87.4814	80.577	88.5583	55.2188	37.3872	58.041	82.2382	48.3284	83.8148	83.8818	48.8151	75.1888	41.8818	81.8555	72.7485	83.4288
			70.3283	84.5081	38.7018	43.8223	58.8447	55.232	73.7854	83.7888	58.5151	38.448	84.8148	81.7787	57.5188	48.028	84.882	57.8514	84.102	48.1748	73.4288	48.4881	71.0003	55.4588	58.1783	73.7154	38.5444	88.5438	42.2132	52.0887	77.5818	73.7023	48.438
			85.2488	48.5828	51.4788	83.1718	58.0834	43.8844	81.8341	51.5501	38.1831	48.5824	72.4154	52.25	48.8884	53.3011	58.4828	85.4731	71.1887	45.844	78.2352	52.3341	88.7024	63.4457	48.3848	54.5282	85.858	88.0815	88.7528	85.8143	82.7572	88.8884	78.8825
			85.3177	52.7288	55.3805	85.7471	50.112	72.2728	88.3078	40.8474	84.5548	58.0284	88.8878	57.3088	57.3888	83.2534	81.3114	58.1815	84.3185	54.2882	87.8147	87.22	45.3141	57.8853	84.4788	88.8884	51.8447	88.3745	88.1213	54.8827	48.042	50.4483	58.4348
		20	47.8342	84.8888	88.8818	48.4877	58.3885	81.2378	52.8457	70.8518	51.8875	80.4841	38.1883	88.8345	85.1123	81.0407	55.5181	85.088	70.8374	78.7012	54.4082	80.7188	58.8725	47.7438	55.0814	54.3088	38.7428	71.8424	50.8883	50.1871	48.1001	54.2888	53.8822
			53.4238	82.5728	52.7324	48.8037	84.4504	43.7485	88.4108	48.7788	87.8355	80.8774	72.2881	80.8808	50.7855	71.2411	44.7028	80.5181	87.4808	35.0788	52.4318	55.2007	82.7075	57.5885	82.0884	84.7814	88.8428	88.2003	48.5481	80.8533	40.2102	50.2857	87.757
			41.3582	45.1782	74.8037	54.8087	54.8824	55.4578	88.8418	47.8528	81.8787	81.4978	58.3107	82.3512	58.1878	71.4288	84.1272	70.3328	58.1048	58.3473	45.938	40.2588	51.4803	88.0778	82.8457	88.0883	53.4538	58.5124	58.1378	82.8104	85.7827	54.8188	54.82
			88.5488	85.4848	87.8781	72.1583	58.8188	78.724	73.4234	43.8785	83.8888	45.7288	58.8833	57.8053	53.7178	53.8224	78.8585	78.7872	82.4723	47.384	80.2851	83.0358	42.2532	84.4158	84.5823	53.5318	48.1037	88.2388	88.771	82.8824	48.7488	47.0851	71.888
			80.2388	78.3858	55.8081	88.7017	50.832	55.7785	81.1018	58.7578	54.2427	38.812	57.8458	52.8851	58.4805	54.8811	40.7585	58.3128	84.5877	51.488	51.2722	42.4801	53.8884	84.728	82.5585	47.1827	48.2157	85.5824	87.8818	88.833	54.8847	85.8484	51.2078
			50.8813	53.8788	48.014	72.5475	70.8348	88.8884	58.4818	50.2577	81.1185	48.7074	58.3504	58.8887	88.5107	84.4378	72.8532	83.7201	58.3531	88.7134	48.4517	71.3828	53.872	52.8011	85.7888	57.4588	81.8318	80.2488	43.1248	52.2285	80.5714	81.8882	71.1858
			75.4581	85.5383	50.8135	57.4053	54.0803	83.0895	38.8088	81.5373	87.1534	45.8448	48.3218	48.4384	73.5884	47.3843	48.5888	58.2785	47.4457	52.0187	71.2078	88.8448	58.4121	58.1318	83.8858	58.7448	52.8358	81.883	55.858	81.4171	48.8857	53.7137	88.7387
			58.3358	67.872	72.8774	52.2305	71.8423	78.3708	82.8082	54.8514	87.8187	47.82	58.8357	78.7881	42.8888	81.5428	88.0217	83.1478	85.1337	47.4881	81.5473	75.8178	55.5144	82.1027	54.4183	88.344	70.3818	81.8557	58.88	88.2858	88.1402	81.4228	50.8252
			85.8874	58.8142	58.3882	75.0237	53.2088	88.3404	51.8802	58.3874	53.1278	41.855	84.5288	75.3424	78.5721	48.2818	70.1111	58.1283	38.0287	50.2888	38.0778	53.8101	70.881	57.1108	74.4144	73.4437	85.182	81.8087	58.2871	72.5833	48.3513	58.7388	87.3834
			54.1022	88.4813	48.0583	88.8282	84.2542	82.7242	44.3828	28.8084	50.1287	70.8884	58.0731	53.8452	71.8038	53.7245	85.1883	88.8087	48.3187	83.8384	48.5288	50.8803	47.7888	70.2315	77.8538	88.8715	83.185	85.8884	58.8800	57.3833	38.1008	85.0238	44.0838
		30	48.5272	53.2108	78.8088	85.4838	45.4388	52.8531	58.7878	63.5878	41.0338	88.8078	71.5218	58.1408	54.2823	38.7887	37.4438	48.3838	77.5852	51.0553	81.7802	48.3058	58.8088	72.7888	54.0532	88.4035	84.5887	61.8382	81.1781	88.8512	58.1702	48.8278	64.5874
Estimator shape parameter			15.32649	11.15478	15.74432	12.81514	24.82031	10.37187	8.824071	20.03478	27.01038	11.1185	28.19099	10.00501	23.30522	21.08585	14.00848	13.53865	18.88277	14.22275	15.28172	15.88513	11.32775	17.85832	18.20862	22.84538	9.447458	19.85292	8.885874	28.4953	13.7845	18.05308	7.175805
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			2.883348	3.841728	2.435895	3.150350	1.545723	3.708704	4.849809	2.008217	1.533052	3.275548	1.492980	3.979238	1.751948	1.863852	2.79238	2.838698	2.20895	2.785894	2.884471	2.817828	3.238331	2.248805	2.243682	1.730944	4.05804	2.104738	4.581622	1.440218	3.084353	2.249428	5.579552
Control chart constant d2			1.117352	1.114252	1.11758	1.115708	1.120843	1.113412	1.1113	1.118407	1.121083	1.114217	1.12095	1.112873	1.120345	1.110748	1.110552	1.118234	1.118149	1.118802	1.117327	1.117548	1.114422	1.118583	1.119118	1.12018	1.112238	1.119345	1.111557	1.121323	1.116404	1.118088	1.107942
Control chart constant d3			0.858594	0.860553	0.858588	0.859838	0.859458	0.861078	0.862843	0.85947	0.858457	0.860573	0.859458	0.861390	0.85948	0.858465	0.858721	0.859781	0.85852	0.858894	0.858597	0.858571	0.860483	0.858498	0.858477	0.858461	0.862018	0.859471	0.862875	0.859457	0.858752	0.859482	0.867278
Control chart constant D4			3.310267	3.334588	3.31808	3.327898	3.301409	3.338247	3.348571	3.308187	3.298833	3.334728	3.298718	3.340083	3.303047	3.308331	3.323432	3.325053	3.315014	3.322712	3.3184	3.318228	3.333798	3.312872	3.308774	3.303853	3.343028	3.308525	3.345822	3.297887	3.324188	3.312223	3.357855
Upper contro limit X			88.50558	78.21921	67.92835	74.73983	82.88741	72.22412	81.23838	65.08037	62.42003	65.46798	67.46418	82.40863	88.18378	84.53812	73.5747	88.85158	85.58778	72.11518	70.2781	88.98187	80.11301	88.04298	85.00718	59.63479	75.05211	72.00898	84.00863	87.14404	78.02469	72.61878	74.61613
Lower control limit X			12.747	5.026189	8.768300	8.004754	13.14493	8.534484	0.820178	15.37801	20.39853	7.376807	10.74205	-2.78407	15.48526	14.09182	4.848008	7.147215	10.947	8.56205	11.15829	8.023188	4.207718	12.19873	20.2888	18.781	1.58843	11.58141	-2.38824	14.93474	9.007812	8.80551	5.461552
Upper control limit MR			35.08427	44.08887	38.58278	42.53245	30.72137	40.89303	48.84847	30.88253	25.80338	35.87385	34.98747	52.784	31.28724	31.12803	42.82889	38.88455	33.78218	40.53858	38.5428	37.88282	40.18897	34.48778	28.18185	25.21245	45.5272	37.31008	54.10484	32.17818	41.45148	38.52985	42.87838
False alarm in X? (Y=1/N=0)			0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1
False alarm in X? (Y=1/N=0)			1	0	0	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0
Total false alarm in X			1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							227																										
Sub-total MR control charts with at least one false alarm k 30 =							85																										
Normal upper control limit X			69.23768	75.78537	67.6551	74.38525	82.80492	71.79938	80.64308	84.90102	62.29137	65.11305	67.28882	81.84207	66.02184	64.35454	73.22484	69.3258	65.35918	71.78881	89.99841	88.67835	88.72238	67.80977	85.72755	59.4931	74.53884	71.77708	84.27039	68.98852	75.68023	72.35184	74.00127
Normal lower control limit X			13.0149	5.460035	9.041651	8.379337	13.30742	8.959246	1.415474	15.56738	20.52519	7.731812	10.91929	-2.21751	15.8374	14.2785	4.807771	7.473185	11.18583	8.800825	11.43898	8.305508	4.598349	12.43282	20.48854	18.80289	2.080899	11.79332	-1.75	15.08928	9.352273	8.870351	6.076417
Normal upper control limit MR			34.54238	43.20878	36.01116	41.78946	30.41048	39.83673	48.67817	30.30881	25.68047	35.25411	34.83137	51.84488	30.95527	30.78715	41.91788	38.00113	33.28335	39.87105	35.97875	37.09272	39.39878	34.02271	27.80841	24.8381	44.50545	38.85307	52.84958	31.88889	40.75083	39.00207	41.73184
False alarm in X? (Y=1/N=0)			0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1
False alarm in X? (Y=1/N=0)			1	0	0	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0
Total false alarm in X			1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1
Sub-total normal X control charts with at least one false alarm k 30 =							229																										
Sub-total normal MR control charts with at least one false alarm k 30 =							81																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	0	1	1	0	1	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							42																										
Sub-total MR control charts with at least one false alarm k 1 =							34																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	0	1	1	0	1	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							43																										
Sub-total MR control charts with at least one false alarm k 1 =							34																										
False alarm in X? (Y=1/N=0)			0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							186																										
Sub-total MR control charts with at least one false alarm k 10 =							58																										
False alarm in X? (Y=1/N=0)			0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							188																										
Sub-total MR control charts with at least one false alarm k 10 =							60																										

OBJECTIVE # 3

NORMAL (40 10^2)   h = 60 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			40.8071	48.8107	62.7778	37.788	60.1618	29.8048	40.2161	63.2281	18.8774	38.7804	61.1528	46.8083	46.8784	38.4002	38.8011	41.8278	22.3024	24.8018	38.7426	44.8488	43.8886	33.8288	34.4883	28.3788	28.0868	47.8687	63.3874	36.1383	24.2828	40.0078	37.28
			48.21	27.081	49.7193	20.8887	8.2808	40.8944	42.3583	33.8882	41.6408	27.588	47.2864	46.2588	38.8814	37.7033	48.7387	38.6342	42.4818	40.5842	62.2201	47.4836	32.8664	38.6296	30.4078	38.8881	27.8682	42.8662	43.1888	48.3283	64.6333	51.5242	48.1842
			49.7831	38.2706	44.7177	48.3318	40.7311	24.7721	40.4329	31.0842	26.8283	28.4103	30.7717	45.1888	29.1082	33.2037	62.4146	38.7844	64.8078	30.8171	43.0814	61.3716	37.814	30.3366	28.0656	28.2784	41.6828	40.6263	23.8327	38.0336	30.2726	36.8323	44.8866
			49.0628	41.0834	35.3838	60.6317	24.8817	68.0032	19.2092	47.3787	34.7288	60.8398	38.8178	63.3698	49.1348	35.8681	38.1881	64.2387	46.1978	60.5288	30.2673	29.1131	31.2621	66.8321	38.1284	37.7628	60.0424	49.8413	40.0733	48.7828	43.3324	36.8682	44.7082
			36.3208	27.418	46.4254	27.1814	38.3868	64.7142	65.4062	26.8877	44.4966	44.3587	37.8378	48.0653	38.8246	41.8877	30.8297	27.0162	38.5378	34.8807	18.044	24.8137	46.8788	44.6836	38.3782	63.6884	44.0468	61.0047	37.0638	33.3382	44.2872	65.606	68.3788
			47.6803	38.876	38.1078	28.1007	32.3484	60.6388	27.8114	70.6028	42.1108	31.6238	42.2801	40.6848	32.1686	46.3841	46.8013	48.703	36.005	60.3183	33.8867	36.8438	34.6876	62.7704	37.8868	33.217	28.8812	41.6881	40.1426	30.6277	30.3448	80.808	34.1201
			37.81	32.0208	44.9884	32.7842	36.8453	41.7321	37.3281	42.2638	36.8087	44.2047	33.0818	33.818	34.8384	62.8788	63.8028	38.0286	45.6688	43.8606	38.8817	62.8463	24.8807	28.8843	43.6466	63.0383	47.272	40.6242	67.3603	22.8386	37.878	46.8788	34.8748
			36.6488	44.1633	60.0218	33.4708	28.8824	28.7617	28.76	46.4021	38.7741	30.4666	69.4408	7.1836	36.6848	34.4888	44.8186	38.8444	34.8827	40.8181	42.1886	64.8266	47.8108	43.6886	37.2383	42.3867	33.3088	63.8643	33.1271	43.2147	32.6388	62.178	27.2618
			46.6782	68.1184	42.8894	34.7288	38.1384	31.8481	28.2248	34.3603	48.0183	29.4822	37.0276	26.4884	88.0256	44.8837	67.4833	38.36	44.2184	38.4838	48.2384	32.8218	21.0644	22.8888	33.4382	30.0271	37.8824	33.612	38.4874	43.4078	48.8748	63.2648	40.1282
			37.1606	37.6888	26.3488	47.073	48.1634	47.3889	32.7633	18.8031	44.318	36.2886	47.8588	36.2247	47.2456	49.7046	67.0147	38.5216	33.8813	42.1822	38.6186	23.8238	80.8034	38.3187	67.2362	30.8266	60.6874	81.6872	48.6836	26.7228	50.08	24.8823	38.1844
			38.6631	31.5054	47.8828	38.3854	36.407	38.1884	28.0216	68.3863	36.6312	68.6438	27.8427	38.1088	48.2617	26.6223	28.9848	32.0363	47.0703	43.8384	27.8883	62.8882	38.8347	62.3141	27.7284	20.2123	61.8288	43.0327	67.5121	81.0481	42.877	38.8488	43.8286
			67.028	38.2703	41.3835	47.4928	31.1421	64.6548	48.1166	63.7833	38.8348	62.3138	30.3826	46.3374	47.8326	62.3722	18.1834	38.4164	28.4378	66.7687	46.8818	46.8701	28.3482	62.202	63.1287	40.7861	26.8848	34.88	30.7612	67.0377	47.4782	43.0237	21.3784
			43.8033	40.1213	41.0682	41.1841	36.6226	40.8818	41.1308	30.1778	44.3882	30.1126	60.3418	43.8634	42.2766	37.8481	48.8107	42.8874	38.7704	81.8344	38.722	21.2074	40.16	47.4873	38.6688	34.3851	22.8658	34.4378	38.4877	47.433	30.8178	38.6788	47.7887
			62.9808	26.6784	48.4872	67.0843	35.7287	38.6877	46.3828	43.6277	42.8848	43.4853	48.8874	48.3084	61.6661	45.2604	28.018	38.8318	38.8838	40.2451	61.8873	48.1867	33.8081	40.708	48.8684	36.1843	24.3862	42.6108	42.8884	31.428	48.7834	44.136	48.8018
			48.8118	39.6178	62.3311	42.1924	45.2848	46.314	62.7884	46.864	49.881	64.3831	40.8044	46.2384	46.3688	32.8988	37.0137	38.8988	47.2222	29.0814	32.8117	64.8888	38.8327	38.033	41.4336	28.8878	33.847	44.0233	18.8544	38.7488	48.7684	43.8863	47.4542
			41.4832	46.8842	37.6384	48.0608	34.8843	32.1882	67.8344	24.2088	43.7068	34.8257	43.8748	46.2477	31.6014	34.877	46.8338	48.1837	32.0838	48.6888	68.6678	43.376	44.8888	67.8834	48.6848	47.2248	31.2234	37.8688	34.0486	28.4636	37.8788	42.0166	28.3178
			61.9484	29.2854	34.3384	38.4301	45.4428	68.888	38.3088	43.8183	60.6138	40.1728	41.1016	40.8303	60.3884	42.6826	46.4861	67.8178	22.8688	48.6834	38.1172	47.6788	30.1323	34.6818	42.2364	64.6238	48.2673	67.7868	43.2181	63.4258	43.6188	53.818	48.6618
			63.6227	28.721	48.8368	42.4004	48.6738	38.647	28.0828	37.4088	38.3228	48.4224	41.7788	37.8388	39.161	38.0812	37.4287	32.3243	38.4368	38.8381	61.8812	42.8228	60.6283	47.7342	21.288	38.2872	41.8038	30.0444	68.8132	63.7828	35.6247	33.8738	38.2277
			32.7338	33.8216	42.6161	48.4011	44.8481	38.6544	47.6144	31.8388	83.386	38.1783	42.6282	26.716	63.0447	48.8264	68.2761	47.3678	45.6228	40.703	68.7678	17.8438	10.661	38.3803	33.8167	29.8408	34.8867	28.2883	38.3807	41.0627	36.637	43.0487	32.7862
			60.788	43.3805	39.0888	49.7618	61.481	20.2244	26.1496	20.4358	40.6238	40.9108	48.8191	41.6642	46.614	38.7482	60.0823	45.6888	47.8133	42.3446	47.6601	38.6834	41.1704	28.1747	32.0768	46.4204	62.2131	66.0021	60.747	48.8288	37.3618	46.2278	30.8852
			42.6107	38.3384	37.8898	37.6278	66.8014	24.8778	32.2064	28.3206	46.1442	46.0928	38.8888	66.7888	34.8888	42.1786	48.4241	33.7886	68.8344	38.0161	41.3806	22.8128	28.8864	32.0248	67.8804	42.1166	43.2648	30.6388	68.4158	38.7638	38.0684	68.704	46.4681
			46.8811	42.6688	23.878	43.0083	41.3281	42.0338	41.7863	32.2802	61.6128	49.0886	40.8818	61.1428	28.2888	30.0366	43.2831	80.3284	29.2867	37.8367	41.8028	43.2743	42.7248	38.2452	41.2676	40.2618	48.7786	48.708	43.0818	34.7431	34.764	33.6862	60.6843
			28.8511	41.3428	60.0384	40.7868	34.863	28.1831	80.247	34.1808	48.6178	28.9458	21.6777	44.9148	40.1122	38.7718	28.3358	24.8886	40.866	81.2063	28.142	48.0436	38.1136	38.8824	30.748	48.746	47.0264	66.806	43.3016	37.6388	62.8108	17.8631	28.2238
			38.2406	60.8458	32.0821	28.8017	60.6787	40.6607	8.6368	48.0782	31.8678	27.8326	40.0178	60.8488	31.2188	64.4462	40.08	34.8282	48.3328	17.6448	42.8677	38.4888	34.1187	34.6283	41.8118	37.8408	38.7738	43.0116	44.2988	60.7121	18.6422	44.8231	36.1768
			38.8278	68.1208	40.6593	17.4308	18.2788	42.6288	46.2803	37.8882	30.2883	36.783	61.7283	34.8834	41.648	29.4218	34.9028	44.0422	38.3283	32.3376	46.8284	41.8477	42.4711	67.3181	68.0386	48.8288	18.4201	68.3171	38.3081	61.8828	43.2071	62.6027	49.6614
			38.2841	43.3031	63.6868	40.2138	86.9111	44.6748	32.3018	60.3474	41.1816	47.8867	36.981	64.7868	47.1888	27.882	33.8458	40.2626	46.8488	38.7888	34.8862	44.8888	64.6824	38.8282	38.3886	33.8883	44.7126	28.8386	47.3241	34.7828	32.6101	61.1264	28.1814
			38.8173	30.4836	44.4818	60.3761	28.4876	68.2868	38.2388	44.2	22.8834	38.6424	32.1878	22.0626	42.2873	61.3888	66.6613	33.8778	33.3113	29.8588	38.8317	24.0188	28.8876	36.6778	66.2432	68.1461	43.8786	66.7288	32.0848	31.1106	68.8207	32.882	43.884
			43.6363	49.2863	42.6844	38.3821	43.6868	27.4487	46.0788	43.8881	30.8886	42.7884	38.1881	28.8863	30.8453	40.3434	62.884	38.1618	34.2338	33.1147	32.8113	68.7202	88.3368	43.6816	38.0207	36.8373	38.8084	38.7047	48.8088	41.2818	26.8293	38.8878	46.8134
			18.3098	67.8146	6.2402	40.0744	30.8634	66.2188	47.168	32.0278	38.6608	20.3381	46.4764	48.8888	38.4888	63.388	60.7722	48.8888	68.1388	26.4787	60.4867	61.0332	40.4384	40.4388	46.8823	62.716	34.2788	31.1367	11.8333	30.1686	49.8686	62.2884	27.7237
			68.0642	47.068	38.0608	38.7703	28.9168	46.2888	62.2618	37.2738	41.0424	38.0886	36.0613	22.8886	41.871	47.9362	46.8277	33.1686	48.1113	41.8881	36.2722	42.8888	38.1883	34.1438	48.1248	38.4667	49.4236	68.4401	37.8336	42.3148	38.7787	30.8483	37.6388
			27.8304	41.7828	66.482	46.2686	42.78	46.8273	33.7188	42.4884	38.2881	44.8888	16.6188	32.8847	40.8864	27.8782	38.2328	33.9877	48.6486	60.8127	30.0388	60.0118	28.6838	30.3883	36.383	48.3883	46.1841	38.7864	38.8886	44.1678	49.8443	37.781	48.0632
			46.8828	38.2641	66.4781	28.8228	46.9304	42.2837	41.0888	42.0408	28.43	62.2188	34.3888	30.2318	37.3728	62.4686	80.4888	44.2728	68.4083	46.847	17.0314	38.0223	28.7078	29.7888	47.8886	42.8488	42.8238	49.8331	68.3642	84.6288	67.0881	40.0838	38.2461
			48.1033	37.4438	82.1682	60.8071	27.8688	41.1272	32.6818	29.8364	28.4188	33.2878	68.1366	60.2771	38.4384	46.0871	44.7072	38.6181	42.3181	37.8617	33.6824	46.6824	26.4082	26.8834	36.4603	41.1187	47.6868	38.2888	38.4823	44.3381	22.3678	40.8884	68.7387
			42.1421	23.0798	29.7861	36.727	19.3771	18.8818	38.7832	38.6833	37.8314	28.0673	42.0008	26.6367	30.2887	48.8036	68.8182	31.1083	30.1863	38.372	60.1308	32.3131	36.86	68.2827	38.0327	48.8878	18.3024	44.1782	37.0288	46.4888	34.1812	44.4032	34.8372
			62.2078	66.517	20.6886	28.8778	38.2664	38.4468	48.1643	40.7674	18.7481	36.8864	38.386	18.4788	41.0281	27.8743	47.0158	34.1688	68.6786	46.6768	34.3231	33.2678	43.8814	48.7818	47.2168	36.0638	68.218	42.1448	20.3744	40.4088	37.1832	23.8043	42.8072
			47.718	46.8878	43.1188	34.922	44.018	38.4012	42.7282	61.4877	42.4712	48.634	36.2313	31.7868	43.384	43.6288	38.4848	41.408	63.6781	47.2021	43.8667	48.1884	31.7883	34.8313	31.6076	40.4107	33.8842	40.2268	32.0318	43.0083	38.4481	46.48	64.8428
			27.6884	46.2886	67.7281	28.6283	46.4107	44.831	33.1218	38.7026	61.2872	18.1734	43.0028	38.4688	44.7866	42.7482	22.0107	28.3486	27.3888	27.2414	24.4888	8.6448	37.6716	40.3641	62.0888	36.4847	62.1608	81.3678	37.7181	38.4306	28.0418	34.1314	60.6228
			17.4106	24.2701	41.2047	40.642	37.3884	40.7482	62.2803	38.8288	44.2768	32.7121	41.6084	42.4078	40.8878	22.6084	48.11	37.4886	38.0018	33.6488	44.8074	36.3634	48.6878	37.8828	36.7678	26.8886	37.8888	31.6288	32.6162	34.3868	32.208	43.3444	40.7818
			41.0184	88.3884	28.8031	37.1361	38.8888	30.0148	64.1787	68.868	42.7748	47.378	61.868	28.6146	49.1822	46.8728	48.8438	13.0128	61.2467	27.3201	36.6388	32.4138	32.4887	62.8842	43.0777	28.1628	48.0031	32.0748	32.6113	70.6008	46.7444	60.1133	36.8888
			37.6613	33.0284	44.8678	67.0278	37.6777	42.82	37.7311	28.7724	38.1884	37.8663	61.8874	38.8467	43.8688	38.0183	38.0812	37.4338	46.4166	61.1338	61.2888	41.8331	37.8284	18.7187	28.0413	60.8218	47.8888	33.1896	36.641	27.3388	44.9683	37.1884	40.9687
			60.4682	42.8224	38.181	28.1618	66.3087	26.0868	49.8844	49.0781	48.9741	28.6288	38.2786	38.8888	46.1486	27.2373	32.1688	48.4581	44.2407	38.4257	30.4842	41.384	37.2277	68.0282	61.8862	28.4424	33.8688	41.211	37.8282	62.0388	43.7117	34.2771	41.7327
			40.3867	29.8473	46.018	42.4011	43.6848	64.4288	43.0281	44.8728	64.3888	49.1846	44.6607	44.1888	47.7887	38.6781	48.0212	63.6262	46.1742	44.3876	32.1786	41.8818	27.3317	36.3176	47.4028	30.2008	24.8288	44.3388	28.4733	33.4033	60.0642	48.7811	63.6888
			36.188	47.8733	66.1972	40.7184	63.4888	33.3017	38.3888	47.2248	48.1172	28.7848	62.8841	28.881	44.0688	68.6486	48.4786	42.3768	28.6888	38.8818	36.1048	32.0663	33.6284	60.2106	22.281	47.3861	49.0888	38.0643	37.8811	37.672	43.408	26.2031	43.4858
			48.2643	38.8282	65.382	41.8347	66.6833	36.9872	88.0123	43.0873	68.1718	38.1884	32.7887	46.688	44.6284	41.8488	46.2248	30.2286	33.4288	38.6187	44.8172	37.3822	86.8298	46.7881	33.0214	46.2886	37.3878	43.2447	42.8187	60.8008	48.4888	48.0278	60.86
			48.6327	33.8888	64.9688	67.4048	38.3076	66.6638	68.7638	47.927	42.3037	44.464	18.6788	66.6272	63.3283	44.0848	48.8888	48.8883	48.0883	38.4888	38.0314	23.6816	61.3681	38.723	11.7761	41.7838	38.0863	41.4087	14.862	60.4684	27.2682	46.1863	41.0278
			28.6111	40.2861	40.0672	68.872	38.684	37.3087	30.2274	19.0132	38.7121	42.3638	38.6886	34.2888	48.8886	26.1326	34.6173	68.4883	34.7847	44.0611	28.2767	82.8488	64.4118	60.0636	37.633	38.2887	43.3231	46.8018	33.9483	36.0288	20.2788	18.8824	41.818
			41.4134	38.8833	62.8212	42.8147	14.638	18.7233	86.847	49.6828	27.7328	68.4861	38.2482	47.2887	14.6482	28.4742	31.8484	38.1102	38.8362	44.0333	26.8388	28.8831	31.8267	27.6788	30.7278	30.3736	22.8271	61.8481	48.617	68.2738	68.4848	36.868	21.8873
			44.6822	43.7612	48.1168	33.0644	46.0663	22.6728	62.8282	32.6788	43.8688	37.2642	34.367	17.3688	40.8848	22.8488	47.7038	64.1883	28.184	42.0413	43.8874	32.8172	27.4787	44.881	38.8804	18.081	37.641	47.3388	41.0868	26.0638	47.1283	42.8311	62.7826
			41.5288	38.667	38.023	16.8824	66.0047	36.0003	21.237	28.8688	27.2823	32.1788	37.2864	48.086	36.0447	38.06	36.3328	36.761	32.9178	37.8266	46.886	62.1867	26.4366	28.1428	43.0146	46.7231	48.8188	30.8843	60.7281	68.2482	28.7321	33.2037	8.6888
			68.0434	21.8083	46.0332	28.6414	30.2164	38.2314	41.4078	43.0018	44.0888	28.4122	41.2188	31.8043	63.7646	42.6278	38.3487	33.378	62.4827	38.7648	38.6086	43.2286	38.6016	38.9827	38.8883	38.2784	12.8688	18.3883	48.1787	62.1626	48.1874	43.8818	41.8833
Average			42.477	38.7882	43.003	38.2722	39.682	38.2824	40.8928	39.8351	38.8768	38.7628	40.2028	38.8818	41.6488	40.187	43.2348	38.8242	41.4738	40.4032	38.8873	38.7248	38.2388	40.7238	38.6783	38.8188	38.787	42.4341	38.7368	42.3282	40.1288	41.4811	40.8381
Moving range average			10.4298	11.278	10.8016	10.2864	13.3481	12.3881	13.4862	12.4987	8.38331	11.4884	8.6178	11.7384	8.76181	12.287	11.2887	10.8822	11.3788	8.4684	11.2781	12.8628	13.3201	12.8367	12.4343	11.0888	11.8811	11.007	11.8182	12.888	12.6888	11.4421	12.8337
T statistic			36.741	32.4298	21.866	27.8608	17.8027	23.7322	20.748	26.6822	28.0778	28.9288	34.2073	18.7822	42.2374	32.4344	30.7612	34.8667	33.8206	37.8131	30.0606	19.8848	21.8408	30.388	27.8792	33.8372	21.8428	38.7783	21.8881	31.6384	27.8787	30.8882	23.6882
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.278	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.878	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1.8	1.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1.9	1.088	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1.138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

39	2.1	1.190	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	2.2	1.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2.4	1.342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2.5	1.393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3.3	1.799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	9.11436	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	9.58009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.0114	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	10.538	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	11.0915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.8343	0	0	0	11.0954	0	11.1091	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	12.0301	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.8199
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	13.9999	0	0	0	12.9652	14.7037	15.1293	0	0	0	0	0	0	0	0	0	0	0	0	14.0042	0	0	0	0	0	14.1029	0	0
119	30	15.165	0	16.3799	0	0	0	0	0	0	0	0	17.2987	0	0	18.3822	15.5406	17.4933	17.0752	0	15.1802	0	0	15.349	0	17.0938	0	0	0	15.9942	0	15.8451	0
120	35	17.665	18.5365	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19.9716	0	0	0	0	0	0	0	20.0632	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	21.2837	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator shape parameter			18.5365	16.3799	11.0915	13.9999	9.11436	12.0301	10.538	12.9652	14.7037	15.1293	17.2987	9.58009	21.2837	18.3822	15.5406	17.4933	17.0752	19.9716	15.1802	10.0114	10.8343	15.349	14.0042	17.0938	11.0954	20.0632	11.1091	15.9942	14.1029	15.8451	11.8199
Estimator scale parameter			2.29186	2.42878	3.87712	2.80719	4.34282	3.29818	3.90152	3.07484	2.71186	2.68225	2.32907	4.03674	1.86983	2.45308	2.78208	2.28226	2.42989	2.12987	2.5868	3.86792	3.49726	2.85318	2.92818	2.27813	3.49982	2.11808	3.67889	2.848	2.84548	2.8601	3.40947
Control chart constant d2			1.11899	1.11791	1.11419	1.11654	1.11176	1.11507	1.1136	1.11581	1.11689	1.11724	1.11833	1.11239	1.1199	1.11781	1.11747	1.11843	1.1102	1.11803	1.11727	1.11299	1.11403	1.11736	1.11856	1.11824	1.11418	1.11941	1.11421	1.11771	1.11862	1.11763	1.11497
Control chart constant d3			0.85948	0.85954	0.86059	0.85972	0.86248	0.86017	0.86095	0.8599	0.85984	0.85961	0.85951	0.86108	0.85948	0.85954	0.85959	0.8595	0.85961	0.85948	0.8599	0.86138	0.86068	0.85959	0.85972	0.85951	0.86068	0.85947	0.86058	0.85954	0.85971	0.85967	0.86021
Control chart constant D4			3.31117	3.31832	3.33485	3.32349	3.34498	3.3308	3.33744	3.32717	3.32118	3.31898	3.31408	3.34242	3.30802	3.31631	3.31884	3.31362	3.31463	3.31026	3.31887	3.34006	3.33567	3.3182	3.32344	3.31461	3.33498	3.30816	3.33477	3.31738	3.32311	3.31834	3.33128
Upper contro limit X			70.4423	70.0673	72.3568	68.8345	75.8009	72.6464	77.0611	73.4398	65.0237	69.811	65.7361	68.8849	65.0964	73.1088	73.49	69.1138	72.0029	65.7802	68.2848	74.6377	74.1101	75.4546	72.8872	68.8844	70.7776	71.8328	71.5691	76.1898	73.9466	72.1773	74.6292
Lower control limit X			14.5117	9.63118	13.6501	11.8098	3.5631	8.03844	4.33444	8.23088	14.7279	7.91408	14.6701	9.20836	18.2018	7.26744	12.9787	10.7348	10.8447	15.0482	9.70988	4.91144	2.38977	5.98293	6.10832	9.14273	9.79649	12.9358	7.91288	8.48287	6.31257	10.7448	8.64298
Upper control limit MR			34.6347	37.4048	36.356	34.2168	44.6477	41.1891	46.0429	41.5864	31.0871	38.1398	31.5429	37.5687	28.834	40.6812	37.4002	38.0582	37.7181	31.3087	37.4331	43.2822	44.4302	42.8381	41.3245	38.7874	38.622	38.4128	38.4144	41.929	41.8275	37.9887	42.0863
Normal upper control limit X			70.2158	69.7986	71.9984	68.8636	75.8822	72.186	76.587	73.0786	64.7782	69.3168	65.5162	68.4767	64.926	72.912	73.2878	68.8861	71.7387	65.5585	68.877	74.1728	73.9858	75.1271	72.6481	68.4388	70.3858	71.7081	71.1898	75.8808	73.6062	71.8821	74.2386
Normal lower control limit X			14.7382	9.80202	14.0086	11.9809	4.08188	8.41877	4.79858	8.60377	14.9734	8.20836	14.888	9.70758	18.3723	7.58197	13.2821	10.9823	11.2088	15.2479	9.99756	5.2763	2.81409	6.3204	6.50842	9.4003	7.19837	13.1601	8.30184	8.79153	8.65389	11.0301	7.03873
Normal upper control limit MR			34.0845	36.8686	35.8282	33.8453	43.8215	40.3828	44.1058	40.8458	30.5883	37.644	31.1046	36.7206	28.8012	40.0988	36.8286	35.5829	37.1988	30.81	36.8504	42.3289	43.6301	42.2737	40.6362	36.2711	38.8274	36.9709	38.6251	41.2083	41.1338	37.3826	41.2871

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Normal (40, 10^2)		k = 50 obs																															
		1	42.0364	48.914	58.531	25.849	25.4256	27.8735	44.0138	19.7824	38.2823	33.6278	35.5232	30.7289	39.3858	49.3808	46.7871	27.3458	41.5114	13.3758	34.373	44.2584	30.9204	24.5309	48.4342	25.4014	42.8485	14.7445	43.2128	43.8418	49.5877	58.1158	52.3458
			48.082	41.8902	42.2355	48.0228	40.9525	28.9182	40.363	40.7347	38.8344	50.5784	45.2274	34.344	44.5878	32.6015	30.7052	30.0788	42.5171	35.542	41.2541	37.7768	31.2013	54.4084	38.1016	36.9873	34.3452	35.3123	44.5835	28.1141	28.9148	48.7898	30.9281
			31.8834	31.3361	33.0919	47.791	31.1747	32.9056	36.735	33.684	35.5518	39.2458	38.2084	48.3852	33.8541	40.7284	39.0259	39.8224	29.7808	37.6503	42.338	34.2128	28.8828	64.0467	53.4237	37.7058	45.1854	23.389	48.3928	30.5448	39.124	39.5428	41.105
			45.23	35.5531	34.4388	38.6035	33.4803	45.9337	33.6115	47.5258	58.1815	34.8828	52.2479	46.7148	42.8981	29.8882	48.0815	47.2335	32.0728	9.9188	46.4556	23.1713	46.2877	32.9818	42.9783	35.8131	28.9582	58.9038	53.0887	35.4058	40.8248	38.4442	37.8322
			48.8148	37.488	40.878	24.0086	28.8153	24.2501	58.3401	43.754	33.8208	48.4471	62.0589	48.9878	23.821	47.8873	45.4863	52.8302	40.0845	21.588	49.0287	30.8385	32.6838	42.7442	62.1528	34.3283	32.888	37.9472	45.9213	37.0005	32.9861	35.8721	40.3898
			23.1533	41.4012	28.2789	70.887	32.7013	52.28	41.1888	38.8951	58.5203	41.818	23.9843	40.2223	23.2005	48.8734	46.7788	38.8831	44.8317	48.0558	33.2703	24.8725	38.1247	53.3488	51.1303	30.9384	22.9875	44.158	42.284	32.7748	28.3727	73.5804	54.7529
			32.0448	33.8764	33.8238	38.4817	48.0048	48.3833	58.8533	32.4338	28.548	28.0728	51.4347	47.7084	19.7027	48.7771	40.4487	37.5783	47.8828	30.8852	32.7304	48.7318	34.4088	45.3721	32.1904	48.0793	35.58	45.8774	63.5155	40.4884	43.7781	43.7557	53.8417
			51.8302	34.2747	45.4258	41.3418	31.736	44.7818	28.2887	33.4283	42.332	50.8882	36.7502	51.8488	50.4322	35.4045	43.1788	51.2211	48.8488	45.8802	24.5038	48.1747	33.7783	22.5735	41.8188	37.0824	45.4504	54.7251	48.211	31.2988	38.1033	47.3088	28.1132
			38.2482	33.1956	55.3882	32.7818	38.5018	30.9773	28.2085	33.4078	58.9157	43.8882	44.8488	21.4747	34.3288	51.8211	58.1048	35.3818	33.852	38.8887	25.5328	41.5881	38.5484	26.385	51.3888	21.887	33.8707	28.8819	53.0341	41.4887	42.5524	32.4882	52.4078
		10	28.9131	51.8305	38.7545	37.9854	48.0213	35.3731	35.4822	31.2322	38.8488	48.816	22.5228	38.8878	17.1184	34.8887	48.0485	38.8047	33.5581	38.2702	41.2551	22.7581	41.3873	42.5588	48.5858	38.3188	37.4178	21.7582	52.8482	48.2554	41.5735	42.854	40.5471
			33.4188	55.0808	32.2304	37.0147	25.0182	38.323	33.8887	44.8783	47.8302	30.5843	37.8055	40.7868	38.1027	47.8832	30.578	41.1848	27.2304	38.3041	60.6075	48.2575	35.8482	30.4078	47.0551	18.9581	53.8874	51.5732	47.4501	48.1201	32.1814	38.8082	32.0222
			38.4245	34.6575	35.3269	48.8803	48.8875	40.2118	38.4379	45.8303	45.8265	47.3471	48.0288	37.7348	54.5482	31.6484	34.0237	39.3287	37.7115	48.5242	39.0053	31.8178	35.185	34.3475	48.6027	38.9183	44.3018	27.3858	38.28	43.8105	39.4218	27.527	40.7817
			51.0022	42.0858	45.5867	43.2558	49.7145	43.0728	51.8842	38.7202	50.855	34.5771	44.7858	32.6361	38.3238	48.5813	32.034	54.862	46.2281	41.6858	57.3563	48.6782	42.6183	44.2138	38.8013	38.1971	39.5827	30.3185	46.0352	34.2548	41.5483	51.3813	38.4222
			35.3848	40.28	38.8118	30.8387	42.0708	18.1241	32.2781	45.3481	38.338	55.8842	43.4728	65.2288	48.5888	37.5888	48.6424	52.7088	22.8082	38.5174	67.8568	38.8588	51.9841	45.433	29.572	18.8834	40.7878	41.4272	32.0498	54.81	32.3212	48.6807	38.6417
New observations k =			41.7398	29.7041	51.7088	37.5183	30.3311	55.8838	45.0518	42.2381	61.8805	28.4198	25.9285	41.884	42.4881	58.1752	52.3485	44.2758	38.8455	41.6208	33.3886	37.6341	58.341	55.8421	44.0517	42.1957	38.5131	34.3082	38.6524	33.8174	33.4224	45.8531	50.7522
			58.8861	18.8016	32.3827	58.8334	38.7257	20.1788	37.0808	55.0772	25.1857	48.838	38.5088	45.7484	28.3851	42.4878	32.3303	32.8788	48.2146	32.8334	26.2747	40.587	28.4853	27.8804	47.8147	41.3313	29.7852	53.3884	29.637	35.8718	37.0358	48.4892	31.866
			43.2463	47.1522	38.5385	32.758	57.6554	30.5788	41.651	42.552	55.9504	25.8125	37.5871	48.9238	48.9812	34.1858	55.7818	40.6378	40.5232	47.9284	47.8022	45.8782	33.5731	42.8363	38.8806	41.2118	48.3714	47.4731	43.5188	52.5888	53.1173	52.0293	38.8748
			37.2534	37.4228	40.0348	47.8814	57.4184	38.5898	32.1401	38.2288	35.7271	37.1053	40.2803	34.1088	40.5622	45.8808	22.827	32.4328	38.3888	43.1734	48.2886	22.4736	38.1835	37.823	38.8713	35.184	45.1401	34.487	20.2327	31.58	44.2081	58.4434	41.1851
			40.5811	47.2082	33.8988	38.9224	37.8823	43.4048	23.7272	38.8827	34.7888	63.1933	44.8483	40.8629	53.9745	63.5858	47.0814	42.8828	28.8728	60.882	35.5838	24.738	38.4073	33.378	27.0871	38.2204	27.0178	38.8878	60.877	33.8151	42.7808	48.8503	30.8378
		20	35.8861	52.4038	48.3851	34.8108	44.1808	40.1388	43.1581	34.8804	25.862	24.5818	48.8889	47.1228	44.5324	40.2419	37.0112	28.7257	50.7528	35.2484	21.7304	34.8225	57.6723	41.158	37.8822	52.7428	34.1885	42.9288	42.1443	31.8213	44.8218	36	43.8081
			32.3832	37.378	28.2103	30.5888	32.1183	53.2851	38.7174	22.5881	42.4042	42.7748	44.0873	43.1481	55.0737	28.5804	51.8033	34.8778	45.8871	38.9183	47.7384	20.4523	60.8428	32.888	25.1888	28.1388	27.3374	47.1751	23.5837	41.4185	28.8118	28.2874	35.4758
			24.0243	61.3314	38.0718	34.807	32.083	38.4253	48.5835	38.0158	38.1713	41.8027	43.8842	54.5485	35.7488	55.8777	34.8588	34.33	44.1813	22.0488	53.2814	41.2138	38.3888	28.1488	47.8008	38.7505	52.5873	31.527	48.2074	42.3821	24.3777	45.8927	34.8888
			51.6745	40.4558	60.8244	33.3771	27.3588	47.5027	61.2518	38.3258	43.3887	41.2447	64.1888	35.8804	38.5428	30.3704	31.5258	63.2718	40.8871	24.8418	48.0838	54.7803	51.6353	54.4183	35.7878	44.1882	22.3854	41.3108	28.3448	31.8721	25.4247	31.7731	32.0724
			48.2753	38.0344	47.1541	44.8302	44.8258	28.5083	38.0777	43.3837	48.1487	27.5348	53.8784	38.1187	24.7438	58.775	38.8445	40.5481	53.1437	45.2285	44.1588	37.7283	34.5183	41.7118	28.8888	24.1881	42.0842	41.0575	50.1748	38.3881	28.8328	38.8251	22.2887
			32.7241	38.5418	47.0254	31.287	40.8856	58.851	48.0483	44.818	42.877	40.3085	45.8877	27.4788	24.4814	41.0788	61.8579	28.4782	37.0804	63.2958	40.9182	31.7882	28.8307	38.881	45.3371	50.3074	20.1773	23.2083	44.4178	55.3574	48.3044	33.312	38.7247
			18.2978	38.5128	23.9582	40.2084	43.2232	19.4908	48.8742	37.4811	41.2553	50.1888	30.5548	51.8	40.0083	42.8552	37.1845	48.0485	18.7805	25.4142	25.3088	55.7537	28.3078	41.4523	25.742	28.7205	32.6077	31.1384	51.2388	32.8817	40.488	35.1301	48.5604
			41.4098	38.3058	38.8522	48.5188	34.4574	45.4422	47.3798	34.8858	41.6385	48.0258	30.0332	57.2885	57.4528	61.3882	44.6858	66.1882	32.3812	26.758	44.7884	42.1283	44.6787	38.4888	48.7711	62.8383	51.3778	58.6221	40.7927	33.088	37.1801	64.5257	37.7215
			44.5845	43.3278	15.6718	40.0701	70.488	41.0875	38.0473	53.8851	38.2588	45.3088	28.8557	49.2704	41.0574	41.3388	54.7882	43.8438	33.7805	32.3371	51.084	18.6485	43.8807	53.1554	43.538	34.4728	33.2768	34.1803	38.2827	35.8852	30.1827	27.0804	28.8548
			28.8858	18.8107	47.7258	60.5271	30.5828	35.2401	37.014	41.9172	41.4581	40.8842	35.8823	38.8092	33.5315	57.1408	18.5582	27.1522	38.582	51.4818	53.8888	40.5211	48.4158	48.8884	24.0325	31.2518	37.8079	35.3184	64.8197	30.7388	42.2731	50.4147	52.3058
		30	44.7088	45.7382	35.8387	47.0847	27.4736	42.7855	37.4875	31.8883	38.9218	32.8547	34.8728	32.8888	38.9438	33.2037	28.8877	45.6243	40.282	47.4872	43.7078	45.884	43.7845	33.8487	48.5298	42.2075	60.4003	37.3808	53.0117	42.0857	38.7081	35.0778	33.783
Estimator shape parameter			18.53548	18.37988	11.08148	13.98984	9.114364	12.03008	10.53802	12.9552	14.70373	15.1283	17.20886	8.560094	21.28369	16.38219	15.54058	17.49334	17.07523	10.87157	15.18025	10.01143	10.83428	15.34901	14.00418	17.08358	11.08542	20.05317	11.10908	15.98418	14.10291	15.84511	11.91858
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			2.291858	2.429764	3.877117	2.807185	4.342817	3.266178	3.881517	3.074837	2.711853	2.562255	2.328088	4.036741	1.958833	2.453081	2.782081	2.282253	2.428887	2.128871	2.508588	3.08792	3.497251	2.853185	2.82818	2.278128	3.48882	2.11808	3.578888	2.848083	2.845481	2.850097	3.409473
Control chart constant d2			1.11888	1.117907	1.114188	1.118541	1.111754	1.115085	1.113801	1.115812	1.11888	1.11724	1.118327	1.112384	1.119802	1.117808	1.11747	1.118427	1.118238	1.119828	1.117275	1.112881	1.114027	1.117364	1.118551	1.118243	1.114182	1.119413	1.114208	1.117708	1.118815	1.117527	1.114988
Control chart constant d3			0.859484	0.859538	0.868588	0.858723	0.862477	0.860188	0.860947	0.859804	0.858644	0.859808	0.858508	0.861878	0.859484	0.859538	0.85958	0.859503	0.858514	0.859478	0.859803	0.861383	0.860881	0.859582	0.858722	0.858514	0.860582	0.85947	0.860578	0.859555	0.858789	0.859574	0.860208
Control chart constant D4			3.311187	3.316317	3.334855	3.323488	3.344884	3.3308	3.33744	3.327188	3.321184	3.318858	3.314058	3.342418	3.308023	3.316311	3.318842	3.313518	3.314533	3.310254	3.318872	3.34005	3.335573	3.318201	3.32344	3.314512	3.334882	3.308153	3.334775	3.317389	3.323108	3.318342	3.331261
Upper contro limit X			70.44235	70.0873	72.35578	68.93452	75.60092	72.54837	77.05108	73.43858	65.02368	68.81103	65.73514	68.8849	65.09538	73.10858	73.48	68.11388	72.00292	65.78018	68.28488	74.6377	74.11008	75.45458	72.88724	68.69442	70.7775	71.93282	71.55908	76.18984	73.94854	72.17727	74.82818
Lower control limit X			14.51185	9.531178	13.65014	11.80081	3.583104	8.038441	4.334438	8.230884	14.72783	7.814082	14.67008	8.288345	18.20188	7.287437	12.87871	10.73457	10.84488	15.0482	8.708875	4.811441	2.388765	5.882834	8.188318	9.14273	6.788485	12.83558	7.812885	8.482871	6.312588	10.74488	6.842885
Upper control limit MR			34.53472	37.40458	38.35501	34.21853	44.6477	41.18986	45.04283	41.58543	31.08788	38.13878	31.54288	37.55871	28.83481	40.88123	37.40023	38.05824	37.71811	31.3887	37.43387	43.28217	44.43822	42.83807	41.32454	36.78735	38.62281	36.41287	38.41438	41.82883	41.82748	37.88887	42.08828
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in X			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							40																										
Sub-total MR control charts with at least one false alarm k 30 =							55																										
Normal upper control limit X			70.21578	68.79848	71.98838	68.85351	75.08217	72.18504	78.58897	73.07848	64.77824	68.31878	65.51818	68.47588	64.82498	72.81203	73.20757	68.88813	71.73874	65.55851	68.977	74.17284	73.88578	75.12712	72.84813	68.43888	70.38582	71.70808	71.18881	75.88078	73.80522	71.89207	74.23848
Normal lower control limit X			14.73824	8.802017	14.00855	11.88092	4.081882	6.419787	4.788563	8.583788	14.87338	8.208357	14.88803	8.787582	18.37228	7.581967	13.28215	10.9823	11.20887	15.24788	8.987558	5.276298	2.814088	6.320484	8.508423	9.400295	7.188388	13.18014	8.301837	8.791525	6.853888	11.03008	7.035728
Normal upper control limit MR			34.0845	38.85883	35.82818	33.84528	43.82145	40.39285	44.10585	40.84591	30.5993	37.54402	31.10451	36.72054	28.80124	40.0888	38.82851	35.5828	37.18858	30.81004	38.85041	42.32884	43.53013	42.27375	40.83518	36.27112	38.82738	35.9708	38.82514	41.20828	41.13383	37.39285	41.28705
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in X			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
Total false alarm in MR			0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0
Sub-total normal X control charts with at least one false alarm k 30 =							40																										
Sub-total normal MR control charts with at least one false alarm k 30 =							62																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							3																										
Sub-total MR control charts with at least one false alarm k 1 =							2																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							3																										
Sub-total MR control charts with at least one false alarm k 1 =							3																										
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							20																										
Sub-total MR control charts with at least one false alarm k 10 =							21																										
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							20																										
Sub-total MR control charts with at least one false alarm k 10 =							28																										

OBJECTIVE # 3

Normal (40 10^2)   k = 50 obs   Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	53 036	51 6301	70 5203	54 411	40 0971	44 561	77 1963	65 0899	50 0403	33 175	56 0782	39 0318	50 0281	35 7478	60.783	48 9035	53 8754	42 5502	50 4962	59 1454	39 1057	45 5937	31 8036	51.3125	54 8182	51 2517	47 0401	47 2428	49 3041	43 8521	61 5778
			47 7820	54 8381	68 7150	60 2786	49 2199	49 8446	54 5515	50 8022	45 5295	65 5277	68 0183	67 0630	55 8123	51 3880	39 7810	62 1752	68 4175	67 4840	38.317	62 7087	54.4751	40 1938	55 2932	20.327	42 1902	47 8992	48 8963	52 6411	34 048	51 0845	54 3881
			53 1074	53 948	48 7632	54 6682	47 1297	52 9	40 1082	28 2803	23 5147	63 0148	52 0702	52 2689	29 0176	38 5696	41 6288	54 2774	67 8238	53 2817	53 0582	44 0044	52 511	48 753	58 8678	56 0603	42 7851	48 2198	48 873	45 581	47 1831	43 185	64 1383
			51 9010	51 9145	50 5517	20 3092	57 4428	55 417	51 7368	44 7411	59 3545	53 1903	39 5901	60 1666	53 2417	65 0821	39 2782	48 5924	39 5641	45 3857	69 4566	50 3341	44 8858	57 548	60.5419	57 6572	54 7221	61 4932	66 5982	44 8099	43 7893	48 7798	50 6342
			31 9092	43 2424	60 4501	50 9423	47 7415	57 9447	35 726	51 9367	43 2996	36 9776	64 9375	54 8276	41 1515	38 0174	44 6698	33 1424	41 9521	55.8084	49 8645	51 3524	33 8177	68 7758	40 119	18 8835	52 2821	61 1686	64 1115	41 7709	74 7798	33 8733	39 1887
			69 0917	34 8393	64 0381	49 5874	46 7102	37 1086	51 7582	48 8189	69 4807	67 0655	44 614	32 5259	48 5313	60.4803	41 0183	43 2105	42 2752	53 7882	31 5515	48 7521	48 5238	47 8828	55 3578	51 881	60 2325	22 1941	43 8848	71 3511	33 5896	42 1989	60 9899
			60 5444	29 7958	42 1856	62 6718	53 9257	48 2418	47 7028	28 3028	59 212	51 2232	56 9885	48 1931	53 4963	49 376	42 8097	55 0639	55 6074	49 8422	50 9974	30 1429	48 5168	45 5028	63 1783	50 5031	30 8347	28 83	53 1907	49 0774	31 8124	41 3328	73 7748
			60 3486	59 0913	48 2893	47 0828	49 4348	53 2924	54 9581	32 8941	72 3179	45 6156	55 2868	59 3416	42 3786	50 0569	56 0874	46 8251	53 6813	49 4582	48 2837	49 442	57 8728	52 1257	31 3055	42 6847	46 1986	41 0433	67 7233	54 0756	48 9918	44 6618	59 0227
			62 7082	36 1045	48 6361	51 4428	50 7283	47 9872	44 5994	52 1958	36 4036	59 119	54 0508	40 9825	61 4153	72 173	53 0028	60 8894	43.3778	65 4588	69 1283	59 1432	53 6893	67 9474	55 1001	64 3121	58 9107	58 7538	44 5114	51 1633	52 6633	40 8854	62 4203
		10	61 0848	42 0892	60 694	48 5392	56 0306	36 0864	42 754	45 9558	57 2023	59 6783	63 8237	50 232	45 6400	31 2451	42 2797	43.0145	49 6048	43 8148	54 308	56 0283	48 3975	53 1844	21.6031	54 2185	51 552	51 6692	55 1475	31 6023	48 8312	52 3481	69 1575
			56 8668	62 579	53 0172	47 9258	51 864	47 8082	52 9058	48 9072	60 3843	43 9252	52 0418	43.9902	38 6801	55 9511	45 6456	41 7903	51 0801	38 7875	38.568	53.6032	37 0045	56.219	33 0902	43.8053	35 4598	63 4458	56 7301	47 9288	46 2282	40 4364	36 7535
			61 2085	35 3814	50 0783	42 6669	48 8835	42 2498	42 3935	29 5587	46 9787	60 1734	41 9138	38 0502	39 5408	31 8243	63 5098	45 1201	51.585	62 4412	54 7817	56 604	35 284	43 8857	51.5868	42.858	52 8668	69 4415	32 6626	58 9741	53 0549	56 2382	42 857
			57 5867	55 708	38 9024	34 8105	55 5957	42 0877	45 9947	62 3864	48 3458	42 1131	34 3451	66 9272	57 0852	41.3418	54 0421	44 1144	38.3895	72.1289	42 4851	50.9128	58 1811	55 122	45 1088	68 4071	58 2315	49 9502	52 7482	51 048	52 4485	39 2402	40 1519
			36 4083	64 9646	52 5934	64 4422	60 2385	44 1823	43 8486	52 8178	48 0344	43 181	61 8841	53.5265	67 068	73 4415	29 6824	57 2828	47 5855	46.8388	58 8651	38.3988	84 8295	40 6785	61 141	48 7868	34 2493	63 0098	51 57	40 7783	49 3525	53 5553	56 8484
New observations k =			33 0008	42 1138	45 8384	50 6958	42 8558	48 03	46 5573	50 9805	54 267	38 9163	50 1822	57 0132	51 4837	57 5058	53 0369	75 6987	38 1011	52 8132	49 5388	50 1103	45 3098	49 1982	63 0014	53 4141	40 3197	38 6029	49 7877	45 924	60 7972	59 5741	29 5778
			52 7738	55 4774	48 4754	52 4822	57 6286	57 3173	53 9016	37 5778	42 7328	46 7444	52 0562	71 0572	61 5703	36.2827	43.5051	59 9025	54 8918	50 4281	60 0344	41 0409	51.2155	43 6942	34 3903	79 4773	44 4717	42 9987	72 6847	53 1184	37 8143	45 6528	53 388
			43 1483	61 8394	43 3188	46 188	54 6666	46 3122	59 5549	47 8314	53 8698	42 1940	46 8703	54 8093	56 3458	44 3483	43.7317	52 2873	54 8364	58 3283	51 5677	49 8776	40 3647	53.3297	40 7844	59 3748	53.8572	57 4154	58 3718	46 3812	71 1895	51 4867	33 2114
			63 3921	50 4953	60.401	44 9198	59 3581	52 0789	56 7851	39 2839	40 2288	47 5721	47 8829	54 5024	31 9137	34 8275	53 6909	40 8245	45 9578	50 5288	43 2074	68 6335	38 8834	30 827	32 6273	51 9808	35 4712	32 4271	38.9829	41 2783	52.585	51 7987	59 7483
			48 1927	55 6549	42 1538	51 2463	60 5088	53 4158	56 5984	38 7251	63 2254	53 3578	49 4814	54 8008	45 8853	53 5518	52.918	52.0513	42 4434	47 0072	34 1054	62 5488	58 1718	58.0828	38 6077	38 6958	39 8242	35 3125	43 6438	50 5083	48 8034	52 718	38 1833
		20	49 1868	58 0842	37 1825	38 4411	45 7098	63 2533	62 3751	55.9783	53 9783	42 1552	49 3783	40 5983	38 6584	50 9381	40.9125	58 3831	61 2851	55.1785	47 8228	41 4881	58 781	35 5273	43 0254	33 1204	52 2117	29.864	46.3851	45.0073	71.738	24 9952	51 6833
			75 1854	37 5087	67 5514	41 3458	68 401	42 484	78 4983	64.08	48 1437	63 3538	54 5072	61 8509	54.5867	57 8446	43 9874	53 1038	38.0852	57 0368	48 4078	38 6472	58.0088	64 7386	50.928	48 3617	58 2741	40 0939	52 0885	45 3101	45.3102	50 1834	38 3114
			38 2707	52 7127	40 5472	23 3367	58 9574	41 2739	49 3878	41 5138	45 5203	52.0071	49 2008	45.5072	39 4027	43 8083	37 2841	58 1438	48 8811	44.8821	48.1313	53 2364	44 7734	43.7228	43.2887	48.8508	48 1363	47 2444	42 4203	40 9047	48 0018	51 2112	45 08
			55 8025	51 4262	61 8351	62.8501	37 1197	50 589	62 9451	56.2419	71 7273	54 8708	44 1608	38.6202	64 4482	33.2819	68 1979	29 6705	53.7028	48.0214	48 2278	33.886	64 7987	58 3411	57 1028	40 3254	53 3815	52 4867	35 4984	44 5941	53 3547	43 1457	64 1432
			58 7708	53 2818	33 0827	59 8666	36 0684	68 6805	50 7284	38 1902	36 4882	48.8485	43 1358	56 4485	48.2785	65 7822	49.8488	50 2184	38.0838	51 5241	62 8568	58 7428	46.8291	47 6888	33 4082	41 1932	49 6802	43 9807	53 7523	57 0233	48 7881	51 4902	48 9583
			40 4308	58 7984	55 8802	51 4288	47 8583	44 0988	65.2484	56 9898	29 4838	52 3114	55 5724	42 7638	48 6178	34.4243	30.8181	58 7213	63.0845	50 6147	47 5818	41 8398	73 5733	33 1871	38 5438	42 5281	44 0197	47 0137	54 6832	28 9878	38 6815	61 7644	49 7626
			49 8453	60 6598	64 3238	41 8087	47 0812	54 4294	57.858	28 7454	44 8074	52 3802	67 4957	30 4776	56 9848	41 6274	54 282	63 3581	43 7729	43 2448	55 2855	54 8634	58 5782	38 0114	54 8775	58 0449	52 9502	46 4818	33 4415	54 4525	55 4208	43 4877	55 8828
			69 9281	46 3041	57 0758	60 1013	43 4028	52 1805	57 2984	44 4308	47 3905	45 4093	63 2542	61.8825	61 2535	54 0848	62.31	54 7984	51 5283	50 8238	44 7007	71 6733	44 2881	53 1351	60.8501	48 9898	60.8448	58 2004	35 0888	44 2789	43 1832	28 8281	53 2893
			52 9288	51 1778	61 7077	37 0188	38 1245	40 281	58 7555	48 7186	47 4575	47 1837	48 8252	43 8183	45 9272	38 4824	53 3032	70 5477	62.6174	50 7438	48 4834	61 3575	48 3824	52.5744	48 7188	66 4886	48 118	44 9263	45 9861	49 5218	62 8837	52 1585	57 018
			34 9101	47 2837	47 9883	49 6889	70.5051	44 0835	80 9445	48.2183	50 0118	44.3816	29 7789	50 2843	35.4049	45 7887	13 2892	46 6685	52.3536	40 1325	46.7083	58.4817	60 6454	64 0546	56 3889	58 5465	67 3871	55 3137	42 6785	31.2422	44 3898	34 0388	42 6301
		30	55 8528	37 798	46 1985	43 1883	51 3823	43.4535	88.0808	58.8863	32.8088	38.9865	67 0755	58.2187	73.8808	41.7058	48 4071	62 3255	51.26	75.3233	38.853	48.8325	48.0801	42.7814	61 2703	50 9818	47 4828	58 6137	43 2857	50.551	35 5781	53 702	49 8375
Estimator shape parameter			18 53540	16 37988	11.09148	13.98984	9 114364	12.03008	10 53802	12 9552	14 70373	15 1283	17 28888	9.660094	21.28388	16.38218	15.54050	17 48334	17.07523	18.87157	15 19025	10.01143	10.03428	15 34801	14 00418	17 08358	11 08542	20 05317	11 10908	15 98418	14 10281	15 64511	11 81858
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			2 291858	2 428784	3 877117	2 807195	4.342817	3.288178	3 861517	3.074837	2.711853	2.562256	2.328868	4 038741	1.858833	2 453001	2.782061	2.282253	2 428887	2.128871	2 588590	3.98782	3.487251	2.853185	2.82818	2 278128	3 49892	2.11608	3 576888	2 648003	2.845481	2 850097	3 409473
Control chart constant d2			1 11808	1 117907	1 114188	1 116541	1 111754	1 115065	1 113601	1 115812	1 11898	1.11724	1 118327	1 112394	1 118802	1.117808	1 11747	1 118427	1 118238	1 118028	1 117275	1 112981	1 114027	1 117384	1 118551	1 118243	1 114182	1 118413	1 114208	1 117706	1 118815	1 117527	1 114988
Control chart constant d3			0 859484	0 859538	0 860588	0.859723	0 862477	0.860166	0.860947	0 859904	0 859844	0.859808	0 858509	0.861878	0.859464	0 859538	0.85958	0.859503	0.859514	0.859479	0 859803	0 861393	0.860681	0 859592	0 859722	0.859514	0 860592	0 85947	0.860578	0 859555	0 859709	0 859574	0 860206
Control chart constant D4			3.311187	3 318317	3.334855	3.323486	3.344884	3.3308	3.33744	3.327188	3.321184	3.319858	3.314058	3.342418	3 308023	3.318311	3.318842	3 313518	3.314533	3.318254	3.319872	3 34005	3.335573	3.318201	3.32344	3 314512	3 334882	3 308153	3.334775	3.317389	3.323108	3 318342	3 331281
Upper contro limit X			70 44235	70 0873	72 35578	68 93452	76.80092	72.54837	77 05109	73.43958	65 02389	68.61103	65.73514	68.8948	65 08538	73.10858	73 49	68 11388	72.00292	65 78018	69.28489	74 6377	74.11008	75 45458	72.88724	68 68442	70.7775	71 83282	71.55008	76.16864	73.84854	72 17727	74 62819
Lower control limit X			14 51185	8 531178	13 85014	11 80991	3 563104	8.038441	4.334438	8 230684	14 72793	7.014082	14.87008	8.298345	18 28188	7 287437	12.87871	10 73457	10 84488	15 0482	8 709675	4.811441	2.308785	5 882834	6 188318	9 14273	6 786495	12 83558	7 812885	8 482871	6.312588	10 74488	6 842895
Upper control limit MR			34 53472	37 40458	38 35581	34.21853	44 8477	41 16908	45.04283	41 58543	31.08709	38.13978	31.54288	37.55871	28 83481	40.88123	37 40023	38.05824	37 71811	31 3087	37 43307	43.26217	44 43022	42 93607	41.32454	38 78735	38 62281	38 41287	38.41438	41 82903	41 82748	37 98867	42 08628
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in X			1	0	0	0	0	0	1	0	1	0	1	1	1	1	0	1	0	1	1	0	0	0	0	1	0	0	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	0	0	0	0	1	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			1	0	0	1	0	0	0	0	1	0	1	0	1	1	1	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							120																										
Sub-total MR control charts with at least one false alarm k 30 =							60																										
Normal upper control limit X			70 21576	68 79846	71.99839	66 85351	76.08217	72 18504	76.58897	73 07648	64 77824	69.31878	65.51818	68.47568	64 92488	72.81203	73.20757	68.86613	71.73874	65 55851	68.877	74 17284	73 66578	75 12712	72 64813	68.43886	70 38582	71 70806	71 16981	75 86078	73 60522	71 89207	74 23848
Normal lower control limit X			14 73824	8 802017	14 00855	11 89092	4 081862	8.419787	4 798563	8.583768	14 97339	8.208357	14.86903	8.707592	18 37228	7.661887	13.28215	10.9823	11 20887	15 24788	8 987556	5.278296	2 814088	8 320404	6 508423	8 400295	7 188380	13 18014	8 301837	8 781525	6 853888	11 03006	7 035728
Normal upper control limit MR			34 0845	38.85983	35.62819	33 84528	43.82145	40 39285	44 10585	40.84591	30.5893	37.54402	31 10451	38 72054	28 60124	40.0888	38 82951	35 5829	37 18858	30 91004	38.85841	42 32894	43.53013	42 27375	40.83518	38 27112	38 82738	35 9709	38.62514	41 20828	41 13383	37 38285	41 28705
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in X			1	0	0	0	0	0	1	0	1	0	1	1	1	1	0	1	0	1	1	0	0	0	0	1	0	0	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	0	0	0	0	1	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			1	0	0	1	0	0	0	0	1	0	1	0	1	1	1	0	0	1	0	0	0	0	0	1	1	1	0	0	1	0	0
Sub-total normal X control charts with at least one false alarm k 30 =							133																										
Sub-total normal MR control charts with at least one false alarm k 30 =							64																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							8																										
Sub-total MR control charts with at least one false alarm k 1 =							6																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							7																										
Sub-total MR control charts with at least one false alarm k 1 =							8																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							54																										
Sub-total MR control charts with at least one false alarm k 10 =							31																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							58																										
Sub-total MR control charts with at least one false alarm k 10 =							34																										

OBJECTIVE # 3

Normal (40, 10^2) k = 50 obs Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13
		1	48 9001	77 9293	53 7969	58 6784	43 0324	66 6001	64 1113	66 5223	65 1822	57 7239
			44 4170	54 9016	58 5403	53 4656	61 3324	45 9842	67 7439	65 1474	64 9214	71 2778
			64 6629	49 0393	40 6799	77 0443	78 356	48 062	70 897	50 78	60 406	53 4209
			60 1300	60 9547	57 6574	43 646	54 3045	63 614	61 1612	56 1683	61 2283	67 0002
			61 4050	48 6772	67 3370	77 19	66 5327	67 6443	61 4543	61 9159	63 1677	64 2105
			54 6100	52 803	61 5254	57 1607	63 5666	57 0602	65 2833	59 3755	60 0192	61 9395
			63 4720	52 6669	68 4663	39 2623	69 6136	55 468	62 9546	75 2637	33 1377	59 0262
			67 6435	54 0073	44 1066	61 6707	64 2468	60 0777	66 3849	54 9369	55 5666	50 2002
			64 1344	45 0057	66 5764	64 3487	63 2239	62 0724	75 315	52 6632	48.2777	51 522
		10	48 6100	58 5077	69 6150	50 2593	70 5992	78 6665	59 6162	61 9006	57 6154	60 0749
			70 9250	55 449	63 5457	57 2094	47 1512	61 642	70 7168	63 4236	53 7136	71 6611
			57 1200	72 9710	66 8715	74 0719	51 4676	60 057	66 9668	54 7644	48 1573	63 1649
			61 5004	66 6255	60 4969	61 1049	65 6031	65 006	72 7031	75 4279	59 1274	69 7007
			57 2011	72 5055	60 6753	63 2155	70 6098	71 4246	58 0223	51 7505	62 9661	63 6515
New observations k =			68 4133	58 7760	61 7401	65 4211	49 2244	55 9361	50 4621	67 7319	53 0055	70 5249
			59 5953	61 5570	55 8534	43 3334	53 6661	64 604	73 7624	75 5606	53 276	69 6964
			70 3263	64 5061	38 7019	43 9223	56 6447	55 232	73 7654	63.7966	59 5151	39.448
			65 2409	49 5929	51 4790	63 1719	50 0834	43 9944	61 6341	51 5501	39 1831	48 5924
			65 3177	52 7209	55 3905	65 7471	50 112	72.2729	69 3079	40 6474	64 5549	59 0284
		20	47 8342	64 6898	66 6616	49 4877	56 3685	61 2379	52 9457	70 9519	51 9675	60 4641
			53 4236	62 5728	52 7324	46 8037	64 4504	43 7495	66 4106	49 7799	67 6355	60 6774
			41 3592	45 1762	74 6037	54 9097	54 6624	55.4579	66 8419	47 6529	61 9797	61 4979
			60 5460	65 4940	67 6701	72 1503	50 6196	78 724	73 4234	43 9795	63 6669	45.7209
			60 2300	76 3850	55 9001	66 7017	50.632	55 7795	61 1019	59 7576	54 2427	39 612
			50 9813	53 9780	49 014	72 5475	70 6348	66 6664	59 4919	50 2577	61 1106	46 7074
			75 4581	65 5383	50 6135	57 4053	64 0803	63 0805	39 9066	61 5373	67 1534	45.6449
			50 3356	57 872	72 6774	52 2305	71 9423	78 3709	62 9092	64 6514	57 6167	47 62
			65 8974	58 8142	56 3062	75 0237	53 2069	66 3404	51 9902	58 3874	53 1279	41 655
			54 1022	69 4913	48 0563	66 8262	64.2542	62 7242	44 3629	28 9064	50 1287	70.9964
		30	48 5272	53 2109	76 6099	65 4830	45 4366	62 6531	56 7679	53.5870	41.0339	60.9079
Estimator shape parameter			18 53549	18 37966	11 09149	13.96964	9 114364	12 03006	10 53602	12 0552	14 70373	15 1263
			0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			2 291658	2 429764	3 877117	2 807105	4 342817	3 266178	3 861517	3.074837	2.711953	2.582255
Control chart constant d2			1 11886	1 117907	1 114188	1 116541	1 111754	1 115085	1 113801	1 115812	1 11698	1 11724
Control chart constant d3			0.859484	0 859538	0 860589	0.859723	0.862477	0 860188	0 860947	0 859804	0.859844	0 859808
Control chart constant D4			3 311187	3 318317	3.334855	3 323488	3 344884	3.3308	3.33744	3 327188	3.321184	3 319858
Upper contro limit X			70 44235	70 0873	72.35578	68.93452	75 60092	72.54837	77 05108	73 43956	65 02368	69 61103
Lower control limit X			14 51185	9.531178	13 65014	11 60801	3.583104	8 038441	4.334438	6.230684	14 72783	7 914082
Upper control limit MR			34 53472	37 40450	38 35501	34 21053	44 6477	41 16906	45.04283	41.58543	31.08708	38 13878
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			1	1	0	1	1	1	0	1	0	1
False alarm in X? (Y=1/N=0)			1	1	1	1	0	1	0	1	1	1
Total false alarm in X			1	1	1	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	1	0	0	0	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 30 =							239					
Sub-total MR control charts with at least one false alarm k 30 =							77					
Normal upper control limit X			70 21678	69 79648	71 89638	68.65351	75.08217	72 16504	76 58607	73.07848	64 77824	68.31876
Normal lower control limit X			14 73824	9 802017	14 00955	11.89092	4 081862	8.419787	4.798583	6.583768	14.97339	8.208357
Normal upper control limit MR			34 0845	38 85983	35 82818	33 84526	43.82145	40.39285	44 10585	40.84581	30 5883	37 54402
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			1	1	0	1	1	1	0	1	0	1
False alarm in X? (Y=1/N=0)			1	1	1	1	0	1	0	1	1	1
Total false alarm in X			1	1	1	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	1	0	0	0	0	0	0	1	0
Sub-total normal X control charts with at least one false alarm k 30 =							240					
Sub-total normal MR control charts with at least one false alarm k 30 =							85					
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							40					
Sub-total MR control charts with at least one false alarm k 1 =							25					
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							42					
Sub-total MR control charts with at least one false alarm k 1 =							26					
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							199					
Sub-total MR control charts with at least one false alarm k 10 =							44					
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							200					
Sub-total MR control charts with at least one false alarm k 10 =							48					

1	2	3	14	15	16	17	18	19	20	21	22	23
		1	75 7582	63 1672	69 2156	66 4479	62 0499	67 1419	77 204	70.6149	55 1029	68 6799
			54 9761	74 1456	63 3047	70 539	64 2794	45 5644	57 1272	61.9519	62 6134	48 2773
			63 6669	59 7372	73 6348	63 7619	51 4263	65 5292	65 6927	66 5664	71 0779	62 0414
			58 6666	70 6959	65 0217	67 7309	54.2111	60 9691	52 6434	66 3433	66 6029	67 199
			57 2954	61 6553	50 9666	59 0364	76.2342	57 6311	64 1635	55 6449	66 3563	77 7301
			66 1355	45 6666	50 6672	65 6137	52 2467	77 6429	59 6646	65 1631	42.6245	75 0157
			59 1197	62 666	47 1351	62 7069	66 4741	57 7061	66 1201	75 6257	44 0604	66 379
			73 2769	71 1997	56 9763	47 6077	67 1902	58 2996	67 4227	65 4264	69 7606	61 1651
			74 4199	57 297	66 2606	43.0711	47 2299	47 7515	67 3662	60.5191	62 499	54 1309
		10	66 2667	59 7666	72 1574	66 7699	59 3547	49 3927	62 6541	53 0356	62 3602	73 7754
			63 5653	63 6606	40 2659	67 6419	40 6722	62 7652	56 0665	66 281	62 6019	64 1934
			75 4669	61 9649	63.3274	57 0157	76 2762	56 2442	56 7039	56.1033	59 6333	60 9204
			63 4906	66 6165	62 7167	56 7665	62.6162	55 6145	52.3172	45.7141	70 1594	67 7321
			48 3225	61 9209	49 1759	63 9781	69 6078	64 6773	64 1299	66.0793	70 567	52 2039
New observations k =			65 6259	62 3364	62 0548	59 6772	56 6315	61 4074	57 5664	70 271	47 6274	57 6749
			53 1109	60.529	32 2644	74 4954	42 363	67 4614	60 577	69.5563	55 2169	37 3972
			64 9149	61.7797	57 5199	46.029	64.962	57 6514	64 102	49 1749	73 4266	46 4661
			72 4154	52 25	46 6664	53.3011	56 4829	65 4731	71 1667	45.644	76 2352	52.3341
			66 6679	57 3069	57 3069	63.2534	61 3114	59 1615	64.3165	54 2692	67 6147	67 22
		20	38.1963	66 6345	65 1123	61.0407	55 5161	65 099	70.6374	76 7012	54 4082	60 7169
			72.2991	60 6606	50.7955	71 2411	44 7029	60 5161	67 4666	35 0799	52 4316	55 2007
			59.3107	62.3512	59 1679	71 4299	64 1272	70 3329	59 1049	56 3473	45.939	40 2506
			59 6933	67 9053	53 7179	53.6224	74.6565	76 7672	62 4723	47 364	60 2651	63 0356
			57 9459	52.6951	58 4605	54 6611	40 7505	56 3129	64 5977	51.468	51 2722	42 4661
			59 3504	59 9097	69.5107	64.4379	72.6532	63 7201	58.3531	66 7134	49.4517	71 3629
			48 3219	49 4364	73.5664	47 3643	48.5606	58 2795	47 4457	52 0167	71 2079	59 6449
			59.6357	78 7661	42 9666	61.5429	69 0217	63 1479	65 1337	47 4661	61 5473	75 6179
			64 5299	75.3424	76 5721	49 2019	70.1111	59 1263	38 0267	50 2666	39 0779	53 6101
			59.0731	53 6452	71 6039	53 7245	65 1963	66 9067	46 3167	63.6394	46.5299	50.6603
		30	71.5215	56 1409	54 2923	39.7667	37 4436	48 3939	77 5852	51.0553	61 7602	46.3059
Estimator shape parameter			17 26666	0.560094	21.26369	16.36219	15.54059	17 49334	17 07523	16.67157	15 19025	10.01143
			0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			2.328068	4 030741	1.858833	2 453081	2.782081	2 282253	2 428887	2.128871	2 588588	3.98782
Control chart constant d2			1 118327	1 112394	1 118802	1 117908	1 11747	1 118427	1 118238	1 119028	1 117275	1 112981
Control chart constant d3			0 859500	0.861878	0 859484	0.859538	0 85958	0 859503	0 859514	0 859478	0.859803	0.861383
Control chart constant D4			3.314058	3.342418	3.308023	3.316311	3.318842	3 313519	3.314533	3.310254	3.319872	3.34005
Upper contro limit X			65.73514	68.8848	65 08538	73 10656	73.48	69 11368	72.00282	65.78019	69 26488	74 8377
Lower control limit X			14 67008	8.288345	18 20188	7 287437	12.97971	10 73457	10.84488	15 0482	8 708675	4 811441
Upper control limit MR			31.54288	37 55671	28.93401	40.68123	37 40023	38.05824	37 71611	31.3087	37 43307	43 28217
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	0	1	1	0
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	1	0	0	0	0	1	0	0
Total false alarm in MR			1	0	1	0	0	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 30 =												
Sub-total MR control charts with at least one false alarm k 30 =												
Normal upper control limit X			65 51818	68.47586	64.92498	72 81203	73.20757	68 66613	71 73874	65.55851	68 977	74 17284
Normal lower control limit X			14 88903	8.707582	18 37228	7.561887	13 28215	10 9823	11 20807	16 24788	8.997558	5.276298
Normal upper control limit MR			31 10451	36.72054	28.80124	40.0888	38.82951	35 5628	37 18858	30.81004	38.85041	42.32894
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	0	1	1	0
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	1	0	0	0	0	1	0	0
Total false alarm in MR			1	0	1	0	1	0	0	1	0	0
Sub-total normal X control charts with at least one false alarm k 30 =												
Sub-total normal MR control charts with at least one false alarm k 30 =												
False alarm in X? (Y=1/N=0)			1	0	1	0	0	0	1	1	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 1 =												
Sub-total MR control charts with at least one false alarm k 1 =												
False alarm in X? (Y=1/N=0)			1	0	1	0	0	0	1	1	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 1 =												
Sub-total MR control charts with at least one false alarm k 1 =												
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =												
Sub-total MR control charts with at least one false alarm k 10 =												
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =												
Sub-total MR control charts with at least one false alarm k 10 =												

1	2	3	24	25	26	27	28	29	30	31	32	33	34
		1	49 1317	46 3122	65 1023	61 0964	57 6337	66 2043	57 1654	55 6077	72 0779	69 5658	58 3922
			70 349	53 6663	72.2059	74.955	51 5717	69 3553	53 4713	37 061	72 6234	63 4509	71 5331
			77 035	43 5527	60 5641	50 3693	61 6166	58 6093	63 5379	64 2405	38 3039	69 1409	70 1479
			75 7403	71.0949	45 5677	72.0439	35 933	54 0662	67 6199	62 4972	55 2061	59 0631	56 7301
			54 5015	57 149	64.974	59 5769	55 7679	54 6521	77 4919	67 6747	67 7432	66 6603	60 6471
			41 6193	67 036	48.0533	61 696	64 6449	74 7509	64 7639	56 5566	54 3625	36 2643	58 4454
			75 6909	50 69	73 7054	65 6569	65 6669	57 9572	59 3665	66 0667	66 7301	48 235	56 499
			69 0272	69 6691	54 5569	61 0759	46 7753	67 11	56 7251	56 4442	69 3469	46 1666	58 5611
			46 2269	74 0359	61 5772	55 7699	51.459	41 6673	67 666	33 4111	57 5615	62 9629	42 2363
		10	50 6192	72 0401	64 7352	45 6235	57 6079	61 3221	64 1966	46 6745	53 5625	59 6976	64 5965
			52.0547	69 9427	76 7205	62 6633	55 7594	53 3667	56 0956	69 1699	66 7946	40 4906	46 2614
			52.006	50 376	40 9727	58 6167	42 6174	65 4333	69 0699	53 7626	77 1609	55 2695	53 6616
			58 7732	58 2908	45 1575	66 1002	56 7099	56 3194	52 6607	66 9311	73 9351	56 7159	51 9621
			61 2759	58 6522	43 1721	66 9067	57 2555	51 6499	57 412	63 7569	54 365	61 7419	58 6167
New observations k =			70 4651	64 7479	66 3664	74 5539	67 6793	66 5967	65 2639	65 7613	60 0196	77 7131	55 3616
			59 041	62 2362	48 3264	63 9149	63 6619	49 6151	75 1699	41 6919	61 6555	72 7405	63 4299
			71 0003	55 4569	59 1763	73 7154	36 5444	66 5436	42 2132	52 0697	77 5619	73 7023	49 439
			66 7024	63 4457	49 3649	54 5262	65 059	66 0615	66 7526	65 6143	62 7572	66 6664	76 6625
			45 3141	57 9653	64 4706	66 6964	51.9447	66 3745	66 1213	54 6627	46 042	50 4463	58 4349
		20	59 9725	47 7436	55 0614	54 3069	39 7429	71 0424	50 6663	50 1671	46 1001	54 2696	53 6922
			62 7075	57 5665	62 0664	64 7614	66 6429	66 2003	48 5491	60 6533	40 2102	50 2657	67 757
			51 4803	66 0779	62 6457	66 0663	53 4539	56 5124	59 1379	62 6104	65 7627	54 6166	54 92
			42 2532	64 4159	64 5623	53.5319	48 1037	69 2369	66 771	62 6924	48.7469	47 0651	71 666
			53 9694	64 729	62 5565	47 1627	48 2157	65 5624	67 6619	66 633	54 6847	65 0464	51 2079
			53.972	52 9011	65 7669	57 4569	61 6319	60 2409	43 1249	52 2265	60 5714	61 6662	71 1959
			59 4121	59 1916	63 6659	58 7449	52 6356	61 663	55.956	61 4171	48 9657	53 7137	69 7367
			55 5144	62 1027	54 4163	66.344	70 3619	61 6557	56 96	66 2659	66 1402	61 4229	50 6252
			70 601	57 1105	74 4144	73 4437	65 192	61 9067	56 2971	72 5633	48 3513	59 7369	67 3934
			47.7966	70.2315	77 6539	66.6715	63 195	65 6064	56 6669	57 3633	39 1006	65 0239	44 0939
		30	56 9099	72.7969	54 0532	66 4035	64 5967	61 9392	61 1761	60 6512	59 1702	49 6279	64 5874
Estimator shape parameter			10 93429	15 34901	14.00416	17 06356	11 06542	20 05317	11 10606	15 96419	14 10291	15 64511	11 61656
			0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			3.497251	2 953185	2 82618	2 278128	3 49892	2 11808	3 578888	2 648003	2 845481	2 650097	3 409473
Control chart constant d2			1 114027	1 117384	1 116551	1 118243	1 114182	1 119413	1 114208	1 117706	1 118815	1 117527	1 114868
Control chart constant d3			0 860881	0.859592	0 859722	0 859514	0 860592	0 85947	0 860579	0 859555	0 859709	0 859574	0 860208
Control chart constant D4			3 335573	3.319201	3 32344	3.314512	3.334882	3 308153	3 334775	3 317389	3 323108	3 318342	3 331281
Upper contro limit X			74 11008	75 45459	72.98724	68 60442	70 7775	71 83262	71 55908	76 16964	73 94854	72 17727	74 62918
Lower control limit X			2 309705	5 982934	6 169318	8 14273	6 798485	12 83559	7 812685	8 482871	8.312569	10 74486	6 642985
Upper control limit MR			44.43022	42 93607	41 32454	38 78735	38 62201	36 41287	39.41436	41 82903	41.82748	37 96867	42 06828
False alarm in X? (Y=1/N=0)			1	0	1	1	0	1	1	0	0	1	1
False alarm in X? (Y=1/N=0)			0	0	1	1	0	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	0	1	1	1	0	0	1	0	0	0
Total false alarm in X			1	0	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	0	0	1	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 30 =													
Sub-total MR control charts with at least one false alarm k 30 =													
Normal upper control limit X			73 68576	75 12712	72.64813	68 43686	70 38562	71 70808	71 16001	75 86078	73 60522	71 89207	74 23648
Normal lower control limit X			2.814088	8 320404	8 508423	9 400295	7 188388	13 16014	8 301837	8 791525	6 653888	11 03008	7 035728
Normal upper control limit MR			43.53013	42 27375	40 83518	38.27112	38 82738	35 9708	38 62514	41 20828	41 13383	37 39265	41 28705
False alarm in X? (Y=1/N=0)			1	0	1	1	0	1	1	0	0	1	1
False alarm in X? (Y=1/N=0)			0	0	1	1	0	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	0	1	1	1	0	0	1	0	0	0
Total false alarm in X			1	0	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	0	0	1	1	0	0	0	0	1
Sub-total normal X control charts with at least one false alarm k 30 =													
Sub-total normal MR control charts with at least one false alarm k 30 =													
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =													
Sub-total MR control charts with at least one false alarm k 1 =													
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =													
Sub-total MR control charts with at least one false alarm k 1 =													
False alarm in X? (Y=1/N=0)			1	0	1	1	0	1	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =													
Sub-total MR control charts with at least one false alarm k 10 =													
False alarm in X? (Y=1/N=0)			1	0	1	1	0	1	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =													
Sub-total MR control charts with at least one false alarm k 10 =													

OBJECTIVE # 3

EXPONENTIAL (Mean = 1)   k = 10 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			2.39572	0.60274	1.31179	4.8851	0.22898	0.43918	0.23767	0.03218	1.78173	0.13108	0.65618	1.28623	1.38363	0.12062	0.03117	0.92388	0.78952	0.47289	1.8659	0.19999	0.49054	0.21649	0.34351	2.63674	1.8521	0.69467	2.08318	0.13635	0.8723	0.18977	2.18032
			0.69498	2.94982	1.85648	0.37673	2.06269	0.8748	1.83387	0.79261	0.37666	1.41511	0.34844	0.7665	0.94729	0.24456	2.09155	0.66985	1.02253	2.90923	0.03616	2.23341	0.67469	0.09969	0.51033	0.23106	0.73522	0.34969	0.80957	1.51228	0.50271	0.4127	0.21925
			2.51085	2.73601	0.11226	0.37679	0.21264	0.09144	0.94572	0.12573	1.99704	0.88522	1.27987	0.38599	1.7024	3.46999	0.59562	1.04046	2.60588	0.11352	0.52777	0.06433	0.34509	1.31478	0.57192	0.2473	0.16784	1.66209	0.04835	1.51755	2.86494	1.68435	1.88584
			0.3414	0.01543	0.68776	1.61365	1.07277	1.16921	0.58293	2.23966	1.48722	0.56006	0.40806	6.50908	0.15601	0.23635	0.82051	1.94235	0.28812	0.57948	0.12078	1.28292	0.92958	0.6205	0.593	0.08414	0.20965	0.65743	0.87811	1.32005	0.29635	1.77062	0.98425
			0.16443	0.61034	1.81618	0.42705	1.10831	0.55846	0.33945	0.17422	0.46705	0.27587	1.83214	3.23531	2.86862	0.40694	2.31714	0.45038	0.13495	0.29551	1.05992	3.49359	2.03554	2.25003	0.13332	0.04554	0.4044	0.88112	0.1517	0.05368	1.49334	0.0952	0.15985
			1.05134	0.10384	1.15502	0.37862	1.27627	1.52725	1.45229	0.11806	0.5198	0.53777	0.03448	2.60435	0.2689	0.6783	0.02792	0.19973	0.2065	0.49339	0.46093	0.67052	0.39425	0.27033	1.10097	0.42144	1.65231	0.17955	0.93157	4.63037	0.60138	2.54979	1.0782
			0.81906	0.17064	0.29122	4.85583	0.83775	0.62278	0.59622	0.06998	3.68471	0.67048	1.84406	0.00767	0.2491	0.67117	0.32459	0.03531	0.26381	2.35545	0.3403	1.58376	0.33042	0.08244	0.48331	5.18688	1.26027	1.32867	0.23915	2.432	0.83236	0.95536	0.95258
			0.08142	1.23614	0.21428	1.35747	1.14104	1.27461	0.3692	0.45177	1.8705	1.88514	1.16326	0.24922	0.9474	0.66957	0.14936	0.93519	0.5981	0.09278	0.43991	0.56449	0.30034	0.12347	0.91715	0.45465	1.34745	0.50253	1.42594	0.47146	0.14894	1.72577	1.52152
			0.59658	0.02058	0.02927	0.96563	0.85484	3.37117	1.56207	1.08726	0.15009	0.75751	2.67043	0.75931	0.04369	2.81766	0.47687	0.93699	1.05752	1.0941	0.66227	0.66596	0.13917	0.4231	1.53645	0.47699	0.96691	0.86439	0.13767	0.29329	0.4523	0.89901	1.21132
			2.05288	0.16374	1.28311	0.04363	0.48637	0.468	1.67731	0.55305	1.68098	0.82892	0.50889	0.21378	0.89937	0.94126	3.18041	1.38685	0.78507	0.3215	0.66195	4.02294	3.26174	0.0018	1.40148	1.38076	0.08549	0.10329	4.06933	1.41463	2.52355	0.34939	1.91342
Average			1.07087	0.66093	0.89373	1.52805	0.92817	1.03969	0.95967	0.56447	1.40176	0.79472	1.07458	1.62174	0.94664	1.02584	1.00151	0.87208	0.7952	0.87278	0.64159	1.48019	0.91014	0.53826	0.75914	1.11675	0.89016	0.72236	1.07746	1.39817	1.05882	1.0632	1.18865
Moving range average			1.07681	0.98599	0.77928	1.80775	0.68265	1.15914	0.73274	0.80696	1.42607	0.58129	1.27687	1.64687	1.16974	1.22824	1.23	0.48721	0.65359	1.34206	0.57215	1.76064	0.84702	0.73614	0.38695	1.49148	0.58999	0.74279	1.27445	1.47558	1.18649	1.05023	0.8421
T statistic			2.17904	0.90092	1.77827	1.38298	4.85787	2.84447	4.40394	1.4156	2.82068	4.48848	2.20435	1.02034	1.83584	1.96845	1.13512	2.70007	2.6681	1.80732	2.42622	1.82683	2.29277	0.96265	4.92052	1.11347	2.43502	3.6533	1.42966	1.58016	2.76052	2.41496	3.95736
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0.5625	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.59583	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0.62678	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.66761	0	0	0	0	0	0	0	0	0.67614	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.775	0	0	0	0.81815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0	0	0	0	0	0.83511	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.84243	0	0	0	0
33	1.5	0.879	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.92068	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	1.0237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1.8	1.035	0	0	0	0	0	0	0	0	0	0	0	0	1.05328	0	0	0	0	1.03873	0	1.0497	0	0	0	0	0	0	0	0	0	0	0
37	1.9	1.086	0	0	0	0	0	0	0	0	0	0	0	0	0	1.12159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1.138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	2.1	1.189	1.22931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	2.2	1.24	0	0	0	0	0	0	0	0	0	0	1.24222	0	0	0	0	0	0	0	0	0	1.28731	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2.4	1.342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.35537	0	0	0	0	0	1.35986	0	0	0	0	1.34963	0
43	2.5	1.393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.47873	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.49504	0	0	0	0	0	0	0	0	0	0	0	0	1.52586	0	0
46	2.8	1.546	0	0	0	0	0	1.56823	0	0	1.55644	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3.3	1.799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.97718	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.13028
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	2.35499	0	0	2.39768	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	2.58322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.61486	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######
Estimator shape parameter			1.22931	0.5625	1.0237	0.81815	2.58322	1.56823	2.35499	0.83511	1.55644	2.39768	1.24222	0.62678	1.05328	1.12159	0.68761	1.49504	1.47873	1.03873	1.35537	1.0497	1.28731	0.59583	2.61486	0.67614	1.35986	1.97718	0.84243	0.92066	1.52588	1.34963	2.13028
Estimator scale parameter			0.67111	1.53055	0.67304	1.8677	0.35931	0.66297	0.40759	0.67593	0.90062	0.33145	0.86505	2.58742	0.89878	0.91463	1.45851	0.58331	0.53776	0.84024	0.47337	1.41011	0.707	0.90338	0.29032	1.65166	0.6546	0.36535	1.27899	1.51862	0.69391	0.78777	0.55799
Control chart constant d2			1.01736	0.90948	0.99563	0.96537	1.07468	1.04139	1.06981	0.96828	1.04073	1.07079	1.01851	0.92596	0.99921	1.00685	0.93993	1.03712	1.03611	0.99747	1.02768	0.99678	1.02235	0.91826	1.07529	0.93741	1.02801	1.05916	0.96951	0.98175	1.03897	1.02725	1.08398
Control chart constant d3			0.97084	1.06469	0.9688	1.0146	0.91976	0.95119	0.92525	1.01208	0.95174	0.92419	0.96991	1.04963	0.98581	0.97946	1.03704	0.95471	0.95554	0.98726	0.98243	0.98617	0.96677	1.05664	0.91903	1.0393	0.98215	0.93582	1.01102	1.00051	0.95319	0.98278	0.93126
Control chart constant D4			3.95775	4.4848	4.08516	4.24109	3.53658	3.79643	3.57524	4.22699	3.80119	3.56738	3.95057	4.41781	4.06521	4.02128	4.35784	3.8269	3.83398	4.07495	3.89143	4.06759	3.92621	4.44942	3.53184	4.36884	3.88921	3.86089	4.22098	4.15936	3.8138	3.89427	3.82242
Upper contro limit X			4.24617	4.11329	3.24184	7.14583	2.83381	4.37892	3.01465	3.08472	5.51254	2.42328	4.83557	8.95739	4.45864	4.6855	4.92732	2.28139	2.88783	4.90918	2.31182	6.76855	3.39563	2.94325	1.83873	6.88995	2.6119	2.82627	5.02104	5.90719	4.48477	4.13031	3.58309
Lower control limit X			-2.10444	-2.38143	-1.45437	-4.08973	-0.97748	-2.29953	-1.0949	-1.93578	-2.70902	-0.83365	-2.6864	-3.71391	-2.56536	-2.83382	-2.92429	-0.53724	-1.09723	-3.16361	-1.02864	-3.80817	-1.57536	-1.86673	-0.32044	-3.65645	-0.83157	-1.38154	-2.86613	-3.11085	-2.38714	-2.00391	-1.18679
Upper control limit MR			4.26175	4.42196	3.16349	7.66682	2.41425	4.4006	2.61972	3.41109	5.42076	2.07366	5.04436	7.27524	4.75523	4.93911	5.38014	1.8645	2.50565	5.46883	2.2265	7.16157	3.32556	3.27639	1.36666	6.51605	2.2946	2.71028	5.37941	6.13745	4.52502	4.08989	3.05044
Normal upper control limit X			3.93473	3.48324	2.98629	6.33589	2.74373	4.12252	2.90885	2.71069	5.19449	2.34069	4.47051	6.00173	4.05785	4.29244	4.27279	2.16785	2.53347	4.44209	2.16328	6.16276	3.16284	2.49608	1.78828	5.08346	2.45929	2.69787	4.40094	5.32257	4.21436	3.85636	3.42828
Normal lower control limit X			-1.793	-1.76138	-1.17683	-3.27979	-0.6874	-2.04313	-0.9889	-1.58175	-2.39098	-0.75128	-2.32134	-2.75824	-2.16437	-2.24076	-2.26976	-0.42369	-0.94307	-2.69653	-0.8801	-3.20237	-1.34256	-1.41955	-0.26999	-2.84996	-0.67896	-1.25315	-2.31203	-2.52624	-2.09673	-1.72997	-1.06097
Normal upper control limit MR			3.51903	3.22221	2.54669	5.90772	2.23091	3.78807	2.39459	2.63721	4.66039	1.89984	4.1728	5.38199	3.82271	4.0139	4.01964	1.5922	2.13593	4.38586	1.8698	5.75378	2.76805	2.4057	1.26457	4.87417	1.92809	2.42744	4.16489	4.82218	3.87743	3.43216	2.75198

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Exponential (Mean=1)		k = 10 obs																															
		1	0.03862	0.17089	0.5208	1.08754	0.2883	0.08332	1.48244	0.13186	0.05831	0.15644	0.75867	0.08479	1.01287	0.78828	1.02318	1.22734	1.03824	1.20815	0.61225	0.1857	0.64418	0.03678	0.28857	1.38288	2.71838	0.12838	0.08222	0.00108	0.36218	1.17518	0.00573
			0.27508	3.11145	1.02362	1.43057	4.12308	1.78437	0.65297	0.2273	0.4135	0.19495	0.13088	0.164	1.15528	0.53777	0.26903	0.14168	0.82318	0.3498	2.80308	3.3032	1.19848	0.75251	0.24038	0.38328	2.88051	0.35401	0.48038	0.18508	3.87481	0.88751	0.218
			1.08773	1.11712	1.07096	0.78151	0.8856	0.39328	0.78378	0.94374	0.43585	0.58875	0.17456	0.55378	1.73419	2.18751	1.80208	2.3867	1.18295	0.28815	0.54793	3.0348	0.44485	1.0888	0.53324	0.53831	0.53475	4.14798	1.28888	0.64482	0.8848	0.3881	0.50481
			0.81517	0.78877	1.82064	0.23113	0.82726	0.88891	2.02404	0.29826	1.06097	0.01753	1.15771	2.04088	2.49582	1.98845	2.83389	0.19572	0.68182	0.30848	1.01778	0.4583	0.11105	0.78448	0.26207	1.03487	0.13882	0.58889	0.8718	0.08898	0.52825	0.63818	0.04858
			0.83085	0.1482	0.29203	0.0851	0.33818	0.25825	1.37827	0.13512	0.1285	0.53028	0.37078	1.70877	0.49531	0.4102	0.28798	0.487	1.75471	0.85707	2.9382	0.1888	1.12138	1.34983	0.07327	1.427	0.19787	0.47824	0.40882	1.94064	0.81185	0.45378	0.70854
			2.73382	0.52598	1.75838	0.73507	1.00337	2.47018	1.28282	3.96277	1.57542	2.40148	1.86002	3.05417	0.55108	0.37558	1.38738	0.88588	1.28457	0.12317	0.07188	1.8444	0.73048	0.08888	0.21832	0.38883	1.482	0.28918	0.48831	0.72821	2.43854	0.82744	0.71224
			0.78368	0.10856	2.28418	3.07625	0.8528	1.3348	1.82782	1.0337	1.25501	1.00074	0.52174	0.58758	0.87738	1.73514	0.24108	2.8554	1.13827	0.88522	2.12883	0.106	1.81318	0.4278	0.1175	3.50288	0.48371	0.81835	0.18558	2.55888	2.58222	0.88032	0.88252
			0.05858	0.83018	2.79031	0.70744	1.85724	1.41235	0.28723	0.22328	1.16075	1.78902	1.83785	0.13247	0.07027	0.34116	0.98478	0.5153	0.45484	2.18828	0.7005	0.5037	0.32888	1.05878	0.31057	0.28715	2.85841	1.98104	1.48358	0.28335	1.81834	2.10841	2.28798
			1.37634	0.25833	1.90862	0.58518	0.51811	0.88148	1.58716	2.8243	0.6458	0.36888	0.52835	0.77865	2.82372	1.11172	3.30374	0.14521	0.85778	0.83788	0.24243	1.5898	0.53341	0.0701	0.77885	0.43228	3.87845	0.2048	0.52891	0.42072	0.03181	2.87893	0.29707
		10	0.88308	0.07814	0.89567	0.81988	0.57135	0.09034	0.21029	1.75897	2.85372	0.2533	0.00853	0.90574	1.81228	1.8278	2.82342	0.4078	0.38528	1.62449	1.04258	0.4194	0.14788	0.2981	0.01078	0.42821	1.13734	0.28428	0.18818	0.07873	2.88571	0.24877	5.65029
			0.05558	0.38153	0.38981	1.37798	0.4538	0.53433	0.45088	0.23088	0.10851	0.04988	0.88377	0.58945	0.11411	0.35827	1.05284	2.22818	2.05177	1.42823	1.28037	0.8737	0.2585	2.70358	2.8823	1.88785	0.5734	0.0828	1.07705	0.57144	1.05838	0.33823	0.64234
			1.14855	0.78588	0.25478	1.28448	0.84815	2.8493	0.88988	1.0274	0.25832	0.45934	0.78549	0.3028	3.13637	0.34708	1.57973	1.72271	0.18737	0.85823	0.95308	3.202	0.79035	1.08538	1.0703	1.80877	0.18748	0.02335	3.08182	2.84208	1.18432	1.19013	2.84848
			0.20844	0.73701	0.78853	0.0213	3.88048	0.43074	0.28118	2.47872	0.86538	4.08577	0.71283	0.81288	0.84793	0.88188	0.40038	1.88116	0.77045	0.34137	0.00318	0.1885	0.51888	0.3084	0.05221	0.242	3.4823	0.5731	0.73258	2.25828	0.18378	2.10327	1.08528
			1.5092	0.88618	1.10438	0.344	0.27044	0.27345	1.75049	2.03877	1.42875	0.28225	0.58338	0.41084	4.52865	3.7478	0.38803	0.19803	0.42085	0.08348	0.41123	0.4557	1.3508	0.28445	1.51158	0.12185	0.22071	1.88481	0.2582	0.70888	0.35777	0.51225	0.77023
New observations k =			1.80332	0.30969	0.00115	1.72058	0.20889	0.54443	0.18848	0.84784	0.88508	0.43508	0.42118	0.43738	3.88888	1.12882	0.22001	0.20084	0.14907	1.10347	0.42771	1.5284	1.01287	0.27838	0.10018	0.88718	0.24178	0.81831	0.7201	0.00448	0.85558	0.02103	2.3718
			1.86318	0.19798	0.15181	2.14802	1.50183	0.70898	0.5353	0.43875	1.83882	0.17218	2.28231	0.83818	4.08588	2.38892	0.18301	0.17888	3.12188	2.18125	0.24988	1.811	0.4183	2.1278	1.58787	1.85098	4.25883	0.43311	0.83288	1.29845	0.08748	0.59438	0.20849
			0.19972	0.72112	0.34523	0.46319	2.83855	0.25257	1.77108	1.28892	0.03198	0.48102	1.87848	0.03351	0.54155	0.52704	0.22478	1.51149	0.44413	5.32588	2.29808	0.1088	0.01481	0.87388	0.88404	0.00048	0.4548	2.01831	0.48883	2.57978	0.71132	3.87515	0.22388
			2.84895	0.30392	0.58165	1.34448	0.78011	2.36397	1.81838	0.55574	0.30753	0.88582	0.5458	0.5411	0.88888	0.81507	0.88323	0.61331	0.84887	1.88834	1.61818	2.9882	0.29588	0.78333	0.28852	1.45483	0.71098	0.42241	0.47038	2.8817	0.54078	0.85717	0.88042
			2.30252	0.29362	0.2558	2.04744	0.15174	3.25873	0.15138	1.58888	3.07887	0.19282	2.28882	0.0835	5.28731	2.13542	1.31828	0.9381	2.47343	1.21874	0.85815	1.1672	1.18228	3.11888	0.98875	0.53375	0.43571	0.08548	1.18874	0.22022	0.01848	0.48141	3.32953
		20	0.18407	2.05798	0.88811	0.37984	0.80138	0.82878	0.98302	0.8481	1.52482	1.42886	0.25871	0.10504	0.28823	2.07052	0.01885	0.9381	8.33156	2.08885	0.15727	0.5288	2.02583	0.8188	1.21706	1.00224	2.88772	0.12511	4.08918	0.43538	1.18559	1.11133	0.88834
			0.17453	0.18823	3.11125	1.18217	0.47873	0.25208	0.45598	0.78311	1.38898	2.85877	0.73188	0.47081	0.1885	0.31154	0.31388	0.88707	0.18434	0.48323	0.52345	0.3013	0.41183	0.48895	0.23488	0.85083	0.08053	0.87017	0.45028	1.5843	1.08897	0.27785	0.3102
			0.88517	0.09254	0.20523	0.2057	0.80223	0.28904	2.82232	0.85358	2.5857	0.23428	0.72195	0.80803	1.26123	0.08824	0.22858	1.56485	0.87988	0.16887	1.01585	0.0835	4.2833	1.5558	0.02838	0.29883	2.00739	0.48803	0.41443	0.53443	0.4113	1.43772	0.38103
			0.79283	0.85034	0.83847	1.07827	0.28864	0.37028	0.78817	2.89018	0.88086	3.88344	1.84438	0.01812	0.80544	1.75751	4.05125	0.58575	1.83824	2.81283	0.00272	11.7303	0.80778	4.6802	0.83423	1.27757	0.53836	0.59532	0.45433	0.48878	2.18584	0.27855	0.14172
			0.19838	2.15572	0.48958	0.00858	0.08481	4.48314	0.53571	1.35738	0.18508	0.15332	1.05234	1.10882	1.28222	1.43388	1.84881	1.88215	0.20507	1.35057	0.71343	0.0845	0.80818	1.6	1.35888	0.61008	0.43534	1.18878	0.1845	0.42888	2.01387	0.42854	0.37894
			0.1824	0.24555	0.41342	1.30998	0.08103	1.82285	4.08196	0.13883	1.57588	0.21013	0.88574	1.78254	3.32204	3.00318	1.45888	0.45428	0.88821	0.80745	2.77758	1.4418	0.44242	0.3412	1.01584	0.52818	1.51878	1.98128	0.32554	0.2753	0.78515	0.31552	0.28843
			0.96889	1.35488	1.34087	0.83093	2.78121	0.08061	0.214	0.10434	0.08708	0.58758	0.58014	0.31784	1.82233	0.21514	1.18111	0.72473	0.80522	0.21111	1.88848	2.0574	1.48785	1.75484	0.08837	3.82388	0.10851	2.15717	1.87788	2.18422	1.53488	0.34238	0.47825
			0.88521	0.57482	1.77147	2.11238	0.2865	0.35705	0.00225	0.81836	0.08885	0.5563	0.84353	0.81238	0.4343	0.0042	0.57818	0.65334	1.32528	0.48803	2.85105	2.5488	1.19985	1.20285	1.75572	0.11828	1.27388	0.02308	0.2235	0.2183	5.81177	1.18058	1.78452
			0.12321	0.51883	0.8698	0.04875	0.63131	0.03506	1.10848	2.0227	0.84855	1.08478	0.3331	3.0575	0.88888	0.10438	1.4108	2.78154	0.78353	0.94888	0.71818	0.1708	0.30548	2.0277	0.84403	4.08048	3.47318	1.19518	0.58881	0.05875	0.17327	1.43298	0.43377
			1.14774	0.04833	1.47879	0.52785	0.08407	1.23071	1.2281	1.98438	0.17431	1.03875	1.05881	2.06338	1.18052	1.80748	0.13	0.98382	0.37458	0.89905	0.85288	2.4827	0.7651	2.85458	0.88028	0.25836	0.08232	0.01388	0.55051	0.38114	1.10552	0.84384	2.84455
		30	0.21932	2.10738	0.18485	0.08478	1.13589	2.82873	1.78884	0.05781	1.03449	3.03583	1.08258	0.20758	1.81881	1.82047	0.00088	0.01543	2.25037	0.57503	0.80844	0.8806	0.18031	2.58112	2.40883	0.58828	1.24311	0.5051	0.57021	0.42781	3.13742	1.88527	1.95245
Estimator shape parameter			1.22931	0.562496	1.023698	0.818147	2.583222	1.588233	2.354088	0.835108	1.558442	2.387083	1.24222	0.826778	1.053278	1.121583	0.887812	1.495037	1.478733	1.038732	1.355372	1.049702	1.287314	0.585832	2.814883	0.876137	1.358861	1.877183	0.842428	0.828882	1.525883	1.348832	2.130255
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.871112	1.530548	0.873042	1.887898	0.358308	0.862071	0.407581	0.675828	0.888817	0.331452	0.885048	2.587422	0.888757	0.814828	1.456511	0.683315	0.537758	0.840238	0.473388	1.410108	0.707004	0.80338	0.290319	1.851862	0.854588	0.36535	1.278894	1.51882	0.883813	0.787787	0.557888
Control chart constant d2			1.017363	0.908484	0.995832	0.885371	1.07488	1.041387	1.06981	0.988279	1.040727	1.070783	1.018511	0.925885	0.988207	1.00885	0.838034	1.03712	1.036111	0.88747	1.027881	0.898784	1.02235	0.918284	1.075287	0.837412	1.028014	1.059181	0.989507	0.981749	1.038868	1.027251	1.003957
Control chart constant d3			0.970843	1.084895	0.988798	1.014804	0.918758	0.951194	0.925254	1.012081	[illegible]	0.824186	0.889805	1.048828	0.885814	0.979477	1.03704	0.954713	0.855541	0.987282	0.982427	0.988188	0.988772	1.058838	0.819032	1.038298	0.982155	0.935817	1.011018	1.000513	0.953182	0.982777	0.931258
Control chart constant D4			3.857748	4.484707	4.085158	4.241087	3.538578	3.788431	3.575238	4.228881	3.801183	3.587358	3.950571	4.417807	4.085207	4.021284	4.357838	3.828898	3.833884	4.074848	3.881427	4.087588	3.926212	4.44942	3.531844	4.388838	3.889212	3.888889	4.220883	4.159382	3.813801	3.894272	3.822424
Upper contro limit X			4.248173	4.113288	3.241837	7.145834	2.83381	4.378817	3.014849	3.08472	5.612541	2.423285	4.835585	8.95738	4.458845	4.885488	4.827321	2.281383	2.887833	4.988178	2.311818	6.788552	3.385832	2.843253	1.838728	5.88895	2.811881	2.828288	5.021844	5.887185	4.48477	4.130388	3.583881
Lower control limit X			-2.10444	-2.38143	-1.45437	-4.08873	-0.97748	-2.29853	-1.0848	-1.83578	-2.70802	-0.83385	-2.8884	-3.71381	-2.58538	-2.83382	-2.92428	-0.53724	-1.08723	-3.18381	-1.02884	-3.88817	-1.57538	-1.88873	-0.32044	-3.85845	-0.83157	-1.38154	-2.88813	-3.11085	-2.38714	-2.00381	-1.18578
Upper control limit MR			4.281753	4.42198	3.183481	7.888818	2.414253	4.400588	2.81872	3.411082	5.420758	2.073858	5.044357	7.275244	4.755235	4.838111	5.380141	1.884502	2.505853	6.488827	2.228487	7.181572	3.325563	3.275381	1.388883	6.518856	2.284588	2.718278	5.379413	6.137453	4.525018	4.088885	3.050443
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1
False alarm in X? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	1	0	0	1	1	1	1	1	0	1	0	0	0	1	0	0
Total false alarm in X			0	1	0	0	1	1	1	1	0	1	0	0	1	0	0	1	1	1	1	1	1	1	1	0	1	1	0	0	1	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	1	1	0	0	1	1	0	1	0	1	0	0	0	1	0	0
Total false alarm in MR			0	1	0	0	1	0	1	1	0	1	0	0	1	0	0	1	1	0	1	1	1	0	1	0	1	1	0	0	1	0	1
Sub-total X control charts with at least one false alarm k 30 =							133																										
Sub-total MR control charts with at least one false alarm k 30 =							111																										
Normal upper control limit X			3.934731	3.403239	2.906282	6.33588	2.74373	4.122515	2.90865	2.710892	5.194481	2.340881	4.470508	6.001727	4.057652	4.292444	4.272791	2.187848	2.533471	4.442094	2.163276	6.102753	3.182837	2.496078	1.788278	5.083464	2.450286	2.807871	4.48804	5.322589	4.214384	3.856364	3.428281
Normal lower control limit X			-1.783	-1.76138	-1.17883	-3.27979	-0.8874	-2.04313	-0.8889	-1.58175	-2.39098	-0.75128	-2.32134	-2.75824	-2.18437	-2.24078	-2.28978	-0.42389	-0.94307	-2.88853	-0.8801	-3.20237	-1.34258	-1.41955	-0.28898	-2.84998	-0.87898	-1.25315	-2.31203	-2.52824	-2.08873	-1.72997	-1.05087
Normal upper control limit MR			3.518028	3.222212	2.548894	5.80772	2.230807	3.788073	2.394584	2.837207	4.880388	1.899645	4.172884	5.381988	3.82271	4.013898	4.01984	1.592202	2.135832	4.385856	1.889801	5.753782	2.788847	2.405702	1.264567	4.874171	1.928887	2.427441	4.164888	4.822181	3.877435	3.432155	2.751883
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1
False alarm in X? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	1	1	0	0	1	1	0	1	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	1	1	1	0	0	1	0	0	0	0	0	1	0	0	1	1	1	1	1	0	1	0	0	0	1	0	0
Total false alarm in X			0	1	1	0	1	1	1	1	0	1	0	0	1	0	0	1	1	1	1	1	1	1	1	0	1	1	0	0	1	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	0	1	0	0	0	1	0	1	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	1	0	1	1	1	0	0	1	0	0	0	0	0	1	1	0	1	1	1	1	1	0	1	0	0	0	1	0	0
Total false alarm in MR			0	1	1	0	1	1	1	1	0	1	0	0	1	0	0	1	1	0	1	1	1	1	1	0	1	1	0	0	1	0	1
Sub-total X control charts with at least one false alarm k 30 =							153																										
Sub-total MR control charts with at least one false alarm k 30 =							151																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							10																										
Sub-total MR control charts with at least one false alarm k 1 =							10																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							13																										
Sub-total MR control charts with at least one false alarm k 1 =							18																										
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							86																										
Sub-total MR control charts with at least one false alarm k 10 =							83																										
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							77																										
Sub-total MR control charts with at least one false alarm k 10 =							85																										

OBJECTIVE # 3

Exponential (Mean=1) k = 10 obs Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	1.4003	1.37003	3.23374	1.20039	1.50646	1.23082	0.55041	1.00047	1.00832	1.82512	1.00123	3.0476	4.07156	1.01071	1.13052	1.00087	1.00331	4.10075	1.34811	4.29705	3.45476	1.2429	1.01367	4.00486	1.04368	1.17282	1.49001	1.66350	1.30832	1.00402	1.82511
			1.32052	1.00210	3.25404	1.82431	1.40266	1.30026	1.30083	1.51374	2.14046	1.00225	1.34776	1.17547	3.20715	2.95255	1.10050	2.43083	1.05024	4.20051	1.00507	1.20327	3.05192	1.00704	1.07325	1.20130	1.24500	2.15000	1.40030	2.7553	1.10294	2.00490	1.21003
			1.13485	1.03130	2.09110	1.39003	1.87624	2.20124	1.64313	1.20504	1.00182	3.67290	1.01547	1.00208	1.49092	1.60323	3.05214	1.4823	1.04400	1.00743	2.40481	1.32618	1.44757	1.50725	1.12214	1.02071	2.20011	2.27645	2.55384	1.52051	1.57301	2.1900	2.04271
			1.4552	1.00573	1.01307	2.20257	3.08294	5.87051	2.83648	1.79247	2.08728	1.32851	1.58729	1.56770	1.60173	2.48083	1.72030	3.08843	1.46283	2.53726	1.75626	1.30530	3.30185	1.74100	2.44360	3.08432	1.22265	1.43482	2.08708	1.49782	2.23135	1.57800	1.61084
			1.80015	1.35458	1.0923	1.69387	2.43390	2.44851	1.40492	1.817	1.62254	1.04448	2.31299	1.52017	1.14880	1.84403	2.14340	1.65105	1.00917	3.21915	2.23051	2.60500	1.27160	1.54551	1.05087	2.51140	4.24865	1.0879	1.10743	2.02863	1.22341	2.3230	1.03419
			5.35305	2.12163	2.35037	1.36291	1.61374	1.28500	1.00870	4.70101	1.44243	1.52008	2.10784	2.38338	3.00087	1.10585	3.01848	2.08548	1.32226	1.00422	1.15050	1.81034	2.10700	1.4665	3.44083	1.82400	1.14103	1.01070	3.90822	1.45024	4.00058	1.35707	1.103
			2.085	2.52640	2.84505	1.10802	1.15557	2.23114	1.82379	1.23582	2.20437	1.31201	1.10323	1.4537	1.04718	1.32007	1.9090	1.31372	1.07425	1.10284	1.00552	2.50094	2.29456	2.27742	2.37400	1.14251	2.40801	1.60042	1.67874	2.50254	4.2858	1.38405	1.46602
			1.20404	1.47900	1.32402	1.52900	1.60347	1.35123	2.81004	3.3300	1.17232	2.58027	2.2023	1.80070	1.3040	1.54211	2.84201	1.15123	1.10102	1.60010	1.31702	1.31347	2.10104	1.37435	3.30000	1.3340	2.50226	2.4001	4.05183	1.7500	2.0575	1.33111	1.71053
			3.81730	4.21843	2.00570	1.13260	2.04150	1.14404	1.16702	2.02580	1.17942	1.00381	2.5553	2.71290	2.12001	2.0024	1.00504	1.64094	2.00432	1.40550	1.72007	1.72217	1.45704	1.3051	2.30041	2.0031	1.04253	2.05510	2.4040	1.13500	4.53451	1.23508	2.01010
		10	1.05737	1.36090	3.00357	1.7455	2.0193	1.58157	1.50144	1.22741	1.33022	2.53402	1.05620	1.0200	1.06723	2.02310	1.01180	2.00767	2.11000	2.29257	4.34720	1.27425	1.30202	1.54026	2.3403	1.20000	1.52221	1.46720	1.50031	1.00022	1.25240	1.65514	2.25170
			1.77060	4.02994	1.0903	3.01097	1.50163	2.10548	1.25000	1.01038	1.15275	7.10031	1.60043	1.05002	1.05004	1.03166	1.45942	1.32320	2.50022	3.21005	1.11383	1.14452	1.72400	1.71020	1.00010	2.50082	1.24367	1.12483	3.57087	1.55504	2.70290	1.0350	1.00400
			1.71332	1.57785	1.30501	2.22083	1.12380	3.50400	2.00070	1.10665	1.17740	2.15611	1.07905	1.55090	1.00007	1.03600	2.00130	2.0795	1.53450	1.50043	3.27014	1.22171	1.27490	1.07371	1.10701	2.17315	1.25455	2.02087	1.2477	2.20750	2.94277	2.32852	1.70737
			1.05211	1.17201	2.37084	2.72090	1.48390	2.10050	1.19036	1.51482	2.70035	1.00730	1.65063	2.01057	2.00260	2.10004	1.74064	3.70700	1.00444	3.73145	1.02894	1.00942	1.0220	1.30212	1.30319	3.40665	2.77923	1.17782	2.00006	1.35001	1.76217	1.20011	1.35055
			1.21827	3.25756	1.46701	4.91590	3.32120	1.00380	1.07114	1.14835	3.50587	3.70075	1.17971	1.10064	1.33348	1.05553	3.02081	1.82070	1.63840	1.57204	4.40087	1.07757	2.40790	1.63470	2.00205	3.40221	4.94583	1.48131	3.80090	1.05704	1.63113	1.03163	1.47082
New observations k =			1.40650	1.24603	2.72482	1.24597	1.10303	1.46650	1.56530	2.00000	2.91019	1.48533	1.10200	1.44272	1.17005	3.03341	1.206	1.91394	1.42225	2.32200	0.56481	2.33276	2.00071	4.24604	1.43337	2.0201	2.06200	1.31550	5.10032	3.00013	1.45002	2.05010	1.0095
			1.50225	1.57071	1.03753	1.04085	3.30220	2.5200	2.76200	1.40310	2.58747	1.20711	1.00543	1.44062	2.40523	1.11640	1.45231	1.81173	1.51447	2.04017	1.00547	1.40006	1.00060	1.46082	1.0318	2.04052	3.07242	1.72030	1.45037	3.01762	1.5003	1.07102	2.30001
			1.20152	1.71471	1.26761	1.81127	1.41135	1.41562	1.43130	1.00550	1.04106	5.67000	1.00842	2.04035	1.40421	1.4520	2.70070	3.05000	1.5102	2.02411	2.19024	2.53384	1.00034	1.24003	2.27122	2.29382	1.07014	1.77243	1.00006	3.13203	1.24140	2.41047	2.06212
			1.00000	1.15401	2.30505	1.20441	1.20082	1.72045	2.26303	1.0010	1.42775	0.67007	1.00005	1.50000	1.72410	2.0533	1.03027	2.70215	2.10030	1.29041	1.00010	1.00002	1.27030	1.20014	2.41107	1.12061	4.50503	3.01007	1.33025	1.24001	1.70070	2.00200	1.01000
			2.510	1.54754	2.11025	1.53023	1.11162	1.01567	2.50455	1.20070	2.15100	1.3203	1.50000	1.23403	1.15573	1.00005	2.02246	1.1173	2.32510	1.95313	1.10643	2.53000	2.74007	2.20735	2.92256	2.93010	1.34030	1.10301	1.05014	1.51020	2.4703	2.10042	1.40553
		20	1.30557	1.52207	1.06742	1.12503	1.20305	1.43530	1.0013	1.17074	2.03444	1.42547	2.62455	2.24423	1.37103	1.00053	3.41300	1.03252	1.0070	1.5000	1.00073	1.40067	1.01100	4.12070	1.29758	2.61501	2.04757	4.34083	1.92725	1.50415	1.30725	2.31550	1.51215
			4.25107	1.72100	1.05375	1.07055	1.70055	3.75056	1.14330	1.14690	1.07310	1.02293	3.54544	1.0082	1.04820	1.03132	1.30010	1.47197	2.1205	1.30910	3.27025	1.2441	2.00533	1.4570	2.00072	1.60003	2.70432	1.97524	1.20705	1.9051	1.34210	1.33004	1.67007
			2.64730	1.33433	2.92671	1.33024	1.95202	2.00071	1.40105	2.21524	2.1250	1.00375	1.16294	1.12332	1.57003	1.27520	1.02017	1.54032	1.70214	1.17030	1.05443	1.70343	2.50040	1.54140	1.40443	1.34201	1.62334	1.99472	1.44275	2.03520	1.02487	1.57793	2.35009
			2.01714	2.77930	4.85027	2.50267	1.10001	3.01051	1.26207	1.77000	1.34420	4.04157	1.02057	1.30704	4.24193	1.70306	1.04257	1.03079	5.90050	3.45020	1.09200	3.05524	2.10003	1.07070	1.40055	1.33102	1.37107	1.73017	6.7007	1.05405	1.35072	4.20500	2.55354
			5.10012	2.13443	1.55432	3.040	2.30720	1.52790	1.07000	2.37900	1.43200	3.30533	1.15240	1.10306	2.14013	1.04100	1.17243	6.17002	2.04051	3.02130	1.44051	1.0051	1.29030	1.30572	1.37503	4.00005	4.24007	2.50743	4.75523	1.64272	1.49720	1.60417	1.00422
			2.76375	3.50124	1.5003	1.70005	1.15444	1.01540	1.11722	3.21004	1.0506	1.40015	6.71410	2.0315	2.63200	1.40093	2.33015	1.63300	1.30705	3.50021	2.10030	1.15741	1.13002	1.6464	1.3533	1.74631	1.30750	2.00023	1.4301	1.54403	1.20347	1.10003	1.21090
			1.23092	4.00587	4.90737	2.46177	1.72231	1.10596	2.47504	1.08221	2.44520	2.73011	1.06474	1.67052	1.5703	1.00050	1.2120	1.3900	1.23001	2.33781	3.70027	1.48501	1.25070	2.05552	2.01930	1.70035	2.46503	2.3002	3.90005	3.03042	1.26211	1.00054	1.05015
			1.41451	1.60063	1.16110	1.06271	1.10535	2.04640	1.10221	1.62037	1.77305	1.62250	1.00004	1.95910	1.09354	2.10050	2.0002	1.51143	1.30405	1.30200	1.90040	1.44121	1.30390	1.25002	2.10504	2.20300	1.25051	1.30760	1.10535	1.17084	1.95270	2.05103	2.57073
			1.14024	1.25090	2.33010	1.42632	2.13949	1.57120	1.17048	1.05605	1.45522	1.14000	2.45127	1.70050	1.13000	1.75473	2.53000	1.2020	1.45321	1.04121	2.00050	2.50117	2.20279	1.22004	4.73735	1.00001	1.34472	1.64534	3.27044	1.17550	1.15520	1.14704	2.00044
			1.51051	1.95930	2.10065	2.22727	1.69600	2.14123	1.37042	1.01748	1.00004	1.71700	1.73713	1.81720	1.00041	1.0130	1.10020	1.03131	1.22044	1.41033	1.02326	2.40064	2.21061	1.19710	2.20005	2.30003	1.03415	1.92065	1.79534	1.00092	1.30702	1.02147	1.42444
		30	1.01535	1.04071	1.5704	1.70772	1.0067	3.08140	3.10777	1.24021	2.25261	2.71407	1.2102	2.00732	2.30005	2.04352	2.07045	1.03300	3.63212	1.24410	1.00634	1.24201	1.04400	1.32700	1.04023	1.41175	2.41902	1.0900	1.39404	1.93530	2.45421	1.71031	1.35550
Estimator shape parameter			1.22931	0.562496	1.023000	0.818147	2.563222	1.506233	2.354000	0.835100	1.558442	2.397883	1.24222	0.828779	1.053278	1.121503	0.887612	1.495037	1.478733	1.038732	1.355372	1.049702	1.287314	0.505832	2.614863	0.678137	1.350861	1.977183	0.842425	0.820682	1.525863	1.349632	2.130255
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.871112	1.530549	0.873042	1.807696	0.369306	0.662071	0.407591	0.675026	0.900817	0.331452	0.905040	2.587422	0.890757	0.914820	1.456511	0.583315	0.537758	0.840238	0.473368	1.410108	0.707004	0.90338	0.290318	1.651062	0.654500	0.38535	1.270004	1.51062	0.603913	0.787767	0.557806
Control chart constant d2			1.017363	0.909484	0.905632	0.985371	1.07480	1.041387	1.00001	0.968279	1.040727	1.070793	1.018511	0.825905	0.890207	1.00005	0.830934	1.03712	1.036111	0.99747	1.027801	0.990704	1.02235	0.910284	1.075287	0.837412	1.028014	1.050181	0.980507	0.981749	1.038000	1.027251	1.083857
Control chart constant d3			0.970843	1.084695	0.900798	1.014804	0.918750	0.951184	0.925254	1.012081	0.95174	0.824180	0.800905	1.048826	0.885814	0.870477	1.03704	0.954713	0.955541	0.987262	0.882427	0.986100	0.900772	1.050038	0.819032	1.039290	0.982155	0.835817	1.011010	1.000513	0.953102	0.882777	0.831258
Control chart constant D4			3.957740	4.404787	4.085150	4.241087	3.530570	3.790431	3.575238	4.220001	3.801103	3.567350	3.850571	4.417807	4.085207	4.021204	4.357830	3.820090	3.833804	4.074040	3.881427	4.087580	3.920212	4.44042	3.531044	4.380030	3.800212	3.860809	4.220083	4.150362	3.813001	3.894272	3.822424
Upper contro limit X			4.240173	4.113200	3.241037	7.145034	2.03301	4.370017	3.014040	3.00472	5.512541	2.423205	4.035505	6.95730	4.450646	4.005400	4.027321	2.281303	2.007033	4.900170	2.311019	6.700552	3.305032	2.943253	1.030729	5.00005	2.611001	2.026200	5.021044	5.007105	4.40477	4.130300	3.503001
Lower control limit X			-2.10444	-2.30143	-1.45437	-4.00973	-0.07748	-2.20053	-1.0040	-1.93578	-2.70002	-0.83305	-2.0004	-3.71301	-2.50530	-2.03302	-2.02420	-0.53724	-1.00723	-3.10301	-1.02004	-3.00017	-1.57530	-1.00673	-0.32044	-3.05045	-0.03157	-1.30154	-2.00013	-3.11085	-2.30714	-2.00391	-1.10570
Upper control limit MR			4.261753	4.42190	3.103401	7.600010	2.414253	4.400500	2.61972	3.411092	5.420750	2.073050	5.044357	7.275244	4.755235	4.030111	5.300141	1.004502	2.505053	5.400027	2.220407	7.101572	3.325503	3.275301	1.300063	6.510055	2.204500	2.710270	5.379413	6.137453	4.525010	4.000005	3.050443
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	0	1	0	0	0	0	0	1	1	0	1	0	1	0	1	0	1	0	0	0	1	0	0
False alarm in X? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	1	1	0	1	1	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	1	0	0	0	1	1	0	1	1	0	0	0	0	1	1	0	1	0	0	0	1	0	1	0	1	0	0	1	0
Total false alarm in X			1	1	1	0	1	1	1	1	0	1	1	0	0	0	0	1	1	0	1	0	1	1	1	0	1	1	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0
Total false alarm in MR			0	0	1	0	0	0	1	1	0	1	0	0	0	0	0	1	1	0	1	0	0	0	1	0	1	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							109																										
Sub-total MR control charts with at least one false alarm k 30 =							108																										
Normal upper control limit X			3.934731	3.483230	2.966292	6.33500	2.74373	4.122515	2.80005	2.710692	5.104481	2.340091	4.470500	6.001727	4.057652	4.292444	4.272781	2.187848	2.533471	4.442094	2.163278	6.182753	3.182837	2.498079	1.798278	5.083484	2.459288	2.697871	4.46894	5.322580	4.214384	3.850364	3.428281
Normal lower control limit X			-1.783	-1.76130	-1.17883	-3.27970	-0.8874	-2.04313	-0.0000	-1.58175	-2.39008	-0.75126	-2.32134	-2.75824	-2.18437	-2.24078	-2.26876	-0.42369	-0.94307	-2.89053	-0.8801	-3.20237	-1.34258	-1.41855	-0.26808	-2.84998	-0.87808	-1.25315	-2.31203	-2.52824	-2.09873	-1.72097	-1.05087
Normal upper control limit MR			3.519028	3.222212	2.548894	5.80772	2.230907	3.780073	2.394584	2.637207	4.660380	1.899845	4.172804	5.381988	3.82271	4.013898	4.01084	1.502202	2.135932	4.385856	1.800801	5.753782	2.768047	2.405702	1.284567	4.874171	1.828087	2.427441	4.184088	4.822181	3.877435	3.432155	2.751983
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	0	1	0	0	1	0	0	1	1	0	1	0	1	0	1	0	1	0	0	0	1	0	0
False alarm in X? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	1	1	0	0	0	1	1	0	1	1	0	1	0	0	1	1	0	1	0	0	0	1	0	1	0	1	0	0	1	0
Total false alarm in X			1	1	1	0	1	1	1	1	0	1	1	0	1	0	0	1	1	0	1	0	1	1	1	0	1	1	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	1	1	0	1	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	1	0	0	1	1	0	1	0	1	0	0	0	0
Total false alarm in MR			0	1	1	0	0	0	1	1	0	1	1	0	0	0	0	1	1	0	1	0	0	1	1	0	1	1	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							204																										
Sub-total MR control charts with at least one false alarm k 30 =							154																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							21																										
Sub-total MR control charts with at least one false alarm k 1 =							11																										
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							28																										
Sub-total MR control charts with at least one false alarm k 1 =							22																										
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	0	1	0	0	0	0	0	1	1	0	1	0	1	0	1	0	1	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							138																										
Sub-total MR control charts with at least one false alarm k 10 =							62																										
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	0	1	0	0	1	0	0	1	1	0	1	0	1	0	1	0	1	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							152																										
Sub-total MR control charts with at least one false alarm k 10 =							82																										

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Exponential (Mean=1)			k = 10 obs		Shift 2 process standard deviation																												
		1	3.75108	4.5844	2.38253	2.0658	2.30683	4.10735	3.78655	2.93696	2.99198	2.88368	3.78106	2.23131	2.11547	3.08035	2.23197	7.36649	2.43331	2.70449	2.47087	2.00202	3.4852	6.08887	2.68511	2.27723	3.38911	4.86896	2.85961	3.17758	3.19483	3.01569	3.12764
			6.41182	3.10967	2.80509	2.3877	4.62489	2.2461	2.5034	3.10577	2.07587	2.56481	2.25057	2.00079	2.67128	3.28134	2.26615	2.90551	2.89315	2.34654	2.56606	2.10778	4.14412	2.50817	2.78072	2.56723	2.0755	4.08814	2.37412	2.03454	2.81717	2.13242	2.21408
			2.25637	2.69227	2.51878	3.4027	2.51187	2.2858	2.16458	2.34185	2.04687	2.55628	2.74811	2.40664	2.21525	2.31401	2.5855	4.19696	2.1866	3.20788	2.64298	4.65277	2.26699	2.16314	2.00388	2.25365	2.41989	2.27782	2.3084	3.78327	2.60878	2.45392	2.29429
			2.15423	2.38373	3.21426	2.7199	2.48939	2.01448	2.31057	2.33075	2.05877	3.66497	2.58718	4.17741	3.45368	2.02718	2.20598	2.30072	2.43099	4.23311	4.65198	4.62061	4.95336	3.49283	2.38006	2.57376	2.48541	3.56107	2.23183	2.17055	4.82837	3.56489	2.32227
			3.34005	2.48585	2.38728	2.0971	2.04084	3.31135	2.40637	2.57424	5.91333	2.29573	3.08852	2.13095	2.98741	2.1124	3.06581	4.71917	2.15578	2.39384	2.89077	2.1843	2.178	2.0894	4.87351	2.35189	2.04839	3.17475	3.05303	2.69131	2.00189	3.33764	2.18483
			3.02988	2.27889	3.89827	3.3687	3.00127	2.21909	2.02748	2.81261	2.0798	3.27715	2.59063	2.81829	2.83389	3.91128	2.66821	2.82708	3.19178	2.38387	2.00811	2.78378	2.2352	2.00575	2.04711	3.62421	2.39955	2.14727	4.86831	3.03482	3.84368	5.38872	3.71089
			3.32398	2.12474	2.44665	2.5198	2.4173	2.50771	2.47898	3.66371	2.03473	2.2191	3.72928	2.84687	2.283	3.72153	2.78792	2.21901	4.1822	3.08873	3.87273	2.43758	5.58557	2.04478	2.44221	3.15522	2.99054	2.03438	2.5138	2.80187	2.78151	2.01628	3.07718
			3.17581	3.48358	8.5248	2.3973	2.7738	2.01355	3.60103	2.81273	2.05517	2.04827	2.31937	2.1145	3.27213	2.82782	2.25098	2.3372	2.72777	2.491	2.83852	2.48145	2.29282	2.7718	2.45523	4.84578	2.32087	3.02962	2.23364	2.38287	2.77713	3.38174	5.90668
			2.48418	2.02821	2.89807	5.7518	2.04352	5.60009	3.48775	3.02483	2.20585	2.60832	5.02173	2.35383	2.92833	2.28743	3.37495	2.04405	2.04198	2.72809	3.75948	2.08092	2.98443	3.3448	2.38308	4.87742	2.2248	2.26901	6.02833	2.81784	2.70528	3.44858	2.67218
		10	2.28308	2.61838	2.95958	2.1427	2.64217	4.49321	2.1074	3.53037	2.03711	3.71686	3.82453	4.52025	3.47342	5.34875	2.32898	2.5873	3.18769	3.87863	2.74812	3.39875	2.41678	2.40035	2.72204	2.45637	2.80637	2.20401	2.15479	3.24088	2.78525	2.41181	2.72015
			3.39605	3.85184	2.83947	2.7008	5.78842	3.47974	2.32549	3.88318	3.51378	2.20664	2.07031	5.84305	2.22753	2.57324	4.24123	5.11938	2.17029	2.81127	2.72798	3.50877	2.30495	2.22878	3.58929	2.48847	2.87551	2.66893	3.7328	2.51412	2.24108	3.01991	2.00376
			2.6881	5.44267	2.51537	2.7865	2.02145	3.40094	3.68	3.1832	2.43147	3.38807	2.01149	2.35408	2.61475	2.28917	2.55427	2.97444	3.01185	3.81248	2.37172	3.00285	2.13871	2.00808	2.10181	2.08871	2.1841	3.68830	2.08918	4.83217	2.43122	2.08949	2.8542
			3.80774	4.25312	3.35315	2.6878	4.40082	2.08953	2.42111	2.01827	4.41847	2.02807	3.41702	2.58551	3.24855	2.02951	5.09912	2.89049	3.28054	2.46885	2.39489	2.04687	2.43028	3.11427	2.13038	4.52778	2.80048	2.08022	3.47115	2.83067	2.74101	2.49382	2.0882
			2.11805	2.58928	3.18072	2.0837	2.34509	2.90168	2.68644	2.27243	4.3438	2.34357	3.63531	4.08427	3.77382	2.33845	2.23553	2.39838	3.63868	2.88104	2.84689	5.20897	2.80238	2.78768	2.48118	8.07753	2.77558	2.83397	2.70312	3.07808	2.67307	2.55543	2.33856
New observations k =			2.18684	3.38059	2.39848	2.9227	2.47603	2.88215	7.51009	3.28178	2.53788	2.17034	2.88031	2.08454	2.23485	2.41182	2.28587	2.31489	3.57798	2.01738	2.17763	2.1708	3.30335	2.10327	2.75318	2.88602	2.48458	2.47215	2.15823	2.68174	2.1068	2.35004	2.07808
			3.08369	3.13609	3.24125	2.8182	2.08071	4.38098	2.48707	4.11487	2.38443	2.25871	6.60573	2.19862	3.40831	2.04151	2.48783	2.16452	6.5158	2.48421	2.90148	3.5826	3.84333	2.9838	2.57522	2.34588	2.71514	2.71702	2.82818	2.28063	2.98712	2.88488	3.78284
			2.90145	4.15995	3.49143	5.1822	2.1838	2.36662	2.0305	2.48152	2.11002	2.18127	2.45878	2.97442	2.66174	2.58122	3.32077	2.27981	3.23734	6.70418	2.83187	5.15318	2.07418	3.08151	2.35878	2.02818	2.20813	4.42676	3.42348	2.68735	2.38058	2.78843	2.48718
			2.40723	2.88554	2.15872	2.4375	2.78111	2.20257	3.80187	2.74088	4.55218	2.30333	2.65892	2.55758	3.1481	2.08127	4.45824	2.41714	2.55348	3.73838	2.29582	2.96521	2.11428	6.71583	2.34487	3.8406	2.53877	2.35133	5.8583	2.40334	2.89304	3.84383	2.46938
			2.88847	2.6981	2.18941	2.8198	3.08352	2.50808	3.6331	2.60832	3.81881	4.17855	2.60877	2.083	2.32551	2.97894	3.07248	2.70307	2.61134	3.71881	3.47957	3.538	2.17888	2.37307	2.52327	5.11377	2.40003	2.87789	3.20438	4.47888	3.48572	2.15098	2.64727
		20	3.12514	2.78787	2.58808	2.8201	6.14014	2.85702	2.23081	3.27858	3.30458	2.87103	2.46105	3.77456	2.18355	5.29881	2.51248	3.518	2.39354	2.25108	2.41274	3.09368	2.19873	6.81988	3.37002	2.88852	2.4851	2.32182	2.05011	2.30368	2.28789	2.86781	2.27258
			2.12758	2.49578	2.41017	2.1758	2.6254	2.30312	2.84114	4.08921	3.5923	8.54114	3.19447	4.27891	2.78832	3.07377	2.35818	4.42715	5.78083	2.27198	2.45891	2.33918	3.72247	2.18187	2.41185	2.00084	3.48178	2.83352	2.58122	2.53838	4.13538	3.03088	2.04703
			2.41531	2.01034	2.46333	2.5451	2.84178	3.88069	2.03283	2.08872	3.45885	2.38127	2.33872	2.0404	3.51787	2.51482	2.73187	2.38637	2.37288	2.11334	2.86407	2.14198	2.22034	2.48821	3.48582	2.5077	2.68369	2.33984	2.28383	2.84817	2.02598	2.53205	3.01832
			2.88727	3.03068	3.08902	3.5984	2.57593	2.85192	2.98711	3.58538	8.18877	3.21831	2.54878	2.47705	2.91858	3.33785	3.83158	2.8105	3.13085	2.21389	4.52795	2.40948	2.18981	2.77152	2.30328	3.78885	4.88287	2.21488	3.79878	2.1819	2.21228	2.52807	3.21351
			2.44428	3.038	2.54088	2.0354	3.82032	2.77082	3.052	3.24198	3.50814	2.47302	2.21855	4.03338	3.44074	2.20583	4.01895	3.17437	2.82842	2.74087	2.04981	2.4888	4.30806	3.53507	5.65353	2.88882	2.45847	4.10876	2.45841	2.6821	3.44184	2.32654	2.62248
			2.39283	3.60944	3.28558	2.9805	3.64687	2.08108	3.15608	2.53412	5.45278	2.0793	2.79895	3.02778	7.42258	2.14889	2.4288	4.01883	3.03308	4.38783	4.43848	3.63878	4.62437	2.62543	2.72483	3.85284	3.154	2.22821	2.4487	2.22923	2.02087	2.98897	5.64072
			6.81584	2.28204	3.15153	4.9375	2.82881	5.57754	4.4118	4.28546	4.07518	2.58877	2.40114	4.0538	2.99278	2.1338	2.27721	4.58968	3.0889	4.82348	3.49805	2.11143	2.40421	2.58307	3.20285	2.28282	2.78308	2.18782	2.98277	2.03282	2.12178	2.95125	2.48695
			4.38053	2.78918	3.45578	2.0437	2.82004	2.70875	2.7898	2.38548	2.69805	3.83915	2.81394	2.55234	2.18295	3.7528	2.79801	3.53595	3.40144	2.04449	2.03148	2.98053	2.18248	2.83048	3.47378	2.05892	2.07185	2.0211	2.25284	2.18584	3.24977	2.78126	3.65344
			2.58517	2.48121	2.58108	2.0038	2.27887	6.60893	2.51858	2.05807	2.78748	3.28048	2.33813	3.40304	2.57498	3.84886	3.82708	2.87107	2.74041	2.82428	2.44243	3.49247	3.75809	2.02085	2.82819	2.82281	2.08874	2.51077	2.53502	4.30386	2.33398	6.39262	2.23287
			2.25844	2.44827	2.37882	2.4302	2.03625	2.39778	2.29401	4.35853	3.25811	2.73828	2.82278	2.38121	2.14405	2.83587	2.40814	2.42581	2.18836	2.85725	2.59553	4.73878	2.70488	2.27784	4.17458	2.10432	2.19415	2.34458	2.19088	4.3988	2.18807	2.45544	2.78324
		30	7.01271	2.88859	2.02001	2.788	2.88481	2.77388	4.8347	3.11101	3.48288	2.20547	2.35349	2.8817	2.12498	2.87883	2.8847	2.84578	3.85862	2.22778	5.37071	3.87567	2.83583	2.44228	3.88028	2.50433	2.40022	5.4833	4.21183	3.81001	2.58014	3.27188	3.81318
Estimator shape parameter			1.22931	0.562496	1.023699	0.818147	2.583222	1.568233	2.354989	0.835109	1.558442	2.387683	1.34222	0.626778	1.053278	1.121593	0.887612	1.495037	1.478733	1.038732	1.355372	1.048702	1.287314	0.585832	2.614883	0.878137	1.358881	1.877183	0.842425	0.920882	1.525863	1.349832	2.130255
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.871112	1.530549	0.873042	1.887898	0.358308	0.862971	0.407591	0.875928	0.900817	0.331452	0.885049	2.587422	0.898757	0.814628	1.458511	0.583315	0.537758	0.840238	0.473368	1.410108	0.707004	0.90338	0.280318	1.851882	0.854598	0.38535	1.278894	1.51862	0.683813	0.787787	0.557886
Control chart constant d2			1.017363	0.909484	0.895432	0.885371	1.07488	1.041387	1.08881	0.988279	1.040727	1.070783	1.018511	0.825865	0.899207	1.00685	0.839934	1.03712	1.038111	0.98747	1.027881	0.988784	1.02235	0.918264	1.075287	0.837412	1.028014	1.058161	0.989507	0.981749	1.038988	1.027251	1.083857
Control chart constant d3			0.970843	1.064695	0.990798	1.014604	0.819756	0.951194	0.925254	1.012081	0.95174	0.824188	0.989905	1.048828	0.985814	0.878477	1.03704	0.954713	0.955541	0.987282	0.982427	0.988166	0.988772	1.058838	0.918832	1.038298	0.982155	0.835817	1.011018	1.000513	0.853182	0.982777	0.831258
Control chart constant D4			3.957748	4.484787	4.085159	4.241087	3.538578	3.786431	3.575238	4.228891	3.881183	3.567358	3.950571	4.417807	4.085207	4.021284	4.357838	3.828896	3.833984	4.074848	3.881427	4.067588	3.828212	4.44942	3.531844	4.398838	3.889212	3.886889	4.220983	4.159382	3.813801	3.894272	3.822424
Upper contro limit X			4.248173	4.113288	3.241837	7.145834	2.83381	4.378817	3.014849	3.08472	5.512541	2.423285	4.835585	6.85738	4.458845	4.885498	4.827321	2.281383	2.887833	4.909178	2.311818	8.788552	3.395632	2.843253	1.838729	5.88995	2.611801	2.826288	5.021044	5.907185	4.48477	4.130308	3.583081
Lower control limit X			-2.10444	-2.38143	-1.45437	-4.08973	-0.87748	-2.29953	-1.0848	-1.83578	-2.70802	-0.83385	-2.8884	-3.71381	-2.58538	-2.83382	-2.92429	-0.53724	-1.08723	-3.16361	-1.02864	-3.80817	-1.57538	-1.88873	-0.32044	-3.05845	-0.83157	-1.38154	-2.88613	-3.11085	-2.38714	-2.00391	-1.18578
Upper control limit MR			4.281753	4.42198	3.183491	7.868816	2.414253	4.400598	2.61872	3.411082	5.420758	2.073858	6.044357	7.275244	4.755235	4.938111	5.380141	1.884502	2.505853	5.488827	2.228487	7.181572	3.325583	3.275381	1.380863	6.518055	2.284588	2.718278	5.378413	8.137453	4.525018	4.088885	3.050443
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1	1	0	0	1	0	1	1	0	1	0	1	1	1	0	1	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	1	1	0	1	0	1	1	0	1	1	0	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	0	1
False alarm in X? (Y=1/N=0)			1	0	1	0	1	1	1	1	1	1	0	0	1	0	0	1	1	0	1	0	1	1	1	0	1	1	0	0	0	1	1
Total false alarm in X			1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	1	1	0	1	0	0	1	1	0	1	1	0	0	0	0	1
Total false alarm in MR			1	0	1	0	1	0	1	0	0	1	0	0	0	0	0	1	1	0	1	0	1	1	1	0	1	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 30 =							219																										
Sub-total MR control charts with at least one false alarm k 30 =							112																										
Normal upper control limit X			3.934731	3.483239	2.988292	6.33569	2.74373	4.122515	2.90865	2.710092	5.104491	2.340891	4.470508	8.001727	4.057852	4.292444	4.272791	2.187848	2.533471	4.442094	2.183276	8.182753	3.182837	2.498078	1.788278	5.083484	2.458288	2.887871	4.48894	5.322568	4.214384	3.858384	3.428281
Normal lower control limit X			-1.793	-1.78138	-1.17983	-3.27978	-0.8874	-2.04313	-0.9889	-1.58175	-2.38098	-0.75128	-2.32134	-2.75824	-2.18437	-2.24078	-2.20978	-0.42368	-0.84307	-2.69853	-0.8801	-3.20237	-1.34258	-1.41955	-0.28988	-2.84998	-0.87898	-1.25315	-2.31203	-2.52824	-2.08873	-1.72897	-1.05087
Normal upper control limit MR			3.519028	3.222212	2.548894	5.90772	2.230907	3.788073	2.394594	2.837207	4.880389	1.899845	4.172804	5.381988	3.82271	4.013898	4.01864	1.592202	2.135932	4.385858	1.868801	5.753782	2.788047	2.405702	1.284567	4.874171	1.828087	2.427441	4.184888	4.822181	3.877435	3.432155	2.751983
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1	1	0	0	1	0	1	1	0	1	0	1	1	1	0	1	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	1	1	0	1	1	1	1	0	1	1	0	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	0	1
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1	0	0	1	0	0	1	1	1	1	0	1	1	1	0	1	1	0	0	0	1	1
Total false alarm in X			1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			1	1	1	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	1	1	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	1	1	0	0	1	0	0	1	0	0	1	1	0	1	0	0	1	1	0	1	1	0	0	0	1	1
Total false alarm in MR			1	1	1	0	1	1	1	0	0	1	0	0	1	0	0	1	1	0	1	0	1	1	1	0	1	1	0	0	0	1	1
Sub-total X control charts with at least one false alarm k 30 =							234																										
Sub-total MR control charts with at least one false alarm k 30 =							151																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	1	0	1	1	1	0	1	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							72																										
Sub-total MR control charts with at least one false alarm k 1 =							48																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0	1	0	1	1	1	0	1	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							84																										
Sub-total MR control charts with at least one false alarm k 1 =							67																										
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1	1	0	0	1	0	1	1	0	1	0	1	1	1	0	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	1	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							186																										
Sub-total MR control charts with at least one false alarm k 10 =							76																										
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1	1	0	0	1	0	1	1	0	1	0	1	1	1	0	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			1	1	1	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	1	1	0	1	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							199																										
Sub-total MR control charts with at least one false alarm k 10 =							110																										

OBJECTIVE # 3

EXPONENTIAL (Mean = 1) k = 30 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			0.30981	3.14082	0.31845	1.92355	0.25008	0.58487	0.50842	1.08776	0.08898	0.048	3.4842	0.51182	2.48185	0.18487	0.55027	0.08584	0.01388	1.52723	0.1542	0.8809	0.38824	0.32456	0.85991	0.3671	0.01545	1.98322	1.15131	0.89088	1.5213	0.09974	1.06332
			1.09912	0.18208	0.25318	0.4031	0.02944	1.35783	0.57873	1.82421	0.17703	0.89323	0.0254	0.06118	6.78488	0.09057	0.12738	0.44287	0.21043	2.42824	1.12202	0.81981	1.18358	1.42642	0.77778	0.15012	0.82863	1.50027	2.59353	2.8779	0.05538	1.80589	0.25271
			1.34095	0.81291	0.48418	0.18391	0.13918	0.75735	0.28256	0.51011	1.00848	0.57957	1.7872	1.11408	1.70708	1.13207	0.5488	1.05886	1.83818	1.78008	0.89298	0.37245	1.24982	1.71438	0.88533	0.59115	0.55843	2.01532	2.11801	0.11021	3.09918	0.4288	0.1128
			0.98843	1.72947	0.83244	1.08008	0.40308	2.19815	0.54728	0.04382	0.11827	0.8111	0.8713	2.87408	0.04889	1.02997	0.78353	0.73717	0.28441	0.51184	0.19401	2.87018	1.22081	0.53411	2.02944	2.28298	1.37424	0.47988	0.81952	1.10744	0.8184	0.89275	0.55827
			1.89942	0.93248	0.3548	0.36355	0.08361	0.88854	0.20288	0.25485	0.14209	0.71288	0.2955	1.38347	3.78912	2.70449	1.09419	0.00334	0.0758	0.14504	2.35828	0.2453	0.78737	0.38375	0.53015	0.53189	0.19217	0.18382	0.03282	3.34533	0.518	0.31035	0.47538
			0.33358	2.03723	0.00741	0.03741	0.87355	0.17134	0.31758	0.48422	0.18857	5.4111	1.9552	1.38564	0.11187	0.38004	0.85881	2.18787	2.22736	2.00878	5.37587	0.44012	0.22207	0.98315	1.83508	0.21458	2.77223	1.00833	1.42745	2.24714	1.28434	0.13073	0.8385
			0.90237	1.33504	2.00023	2.41507	0.80951	0.82132	0.24297	3.98018	0.13828	0.2044	0.4588	0.38003	0.20885	0.44004	0.50428	0.58987	1.33413	1.54323	2.78188	0.37372	1.21257	0.38158	0.5948	0.57192	0.04183	0.33887	0.4101	1.92133	1.58221	0.08528	3.18587
			1.83598	0.12091	0.03307	0.31895	0.3091	0.38837	1.10574	1.00455	1.09205	0.12081	0.2587	0.19025	1.58581	0.74728	0.38188	1.22958	1.11485	1.28204	0.11842	1.32771	1.09478	0.21848	0.48707	0.40036	0.84958	0.44507	1.31784	0.5333	3.00481	0.87302	0.25871
			0.88332	0.38853	0.12438	0.5502	2.9835	1.80883	0.27344	0.31087	1.19884	1.98791	0.9498	0.01191	0.54532	1.48212	1.37358	0.8835	0.8108	1.15545	0.45385	2.77278	0.10013	0.38133	0.84111	1.88438	0.21848	0.85314	2.05704	0.83118	1.0242	0.31932	0.11731
			0.48481	0.78352	0.08348	0.18918	0.07013	1.51891	0.32388	0.0728	0.02404	1.72837	0.2871	2.56342	1.82322	3.87188	0.37577	1.58773	0.77578	0.34382	0.90952	0.17584	3.82584	1.32188	1.3308	0.43285	1.83983	1.90958	2.97648	0.37762	1.04451	1.34811	0.8947
			3.3112	0.37337	0.35188	0.01038	2.41325	2.24328	0.98752	1.81834	0.43088	0.08821	0.8297	2.8569	3.19888	0.35088	0.39275	0.81584	0.8428	0.09428	0.13888	1.88308	0.7819	0.31382	0.68497	1.408	0.04858	3.21885	0.56823	0.88364	0.14584	1.11881	0.71785
			3.57884	0.02534	0.37073	0.50878	0.97418	0.56748	3.05117	2.9088	2.38553	0.08914	0.358	0.05884	0.78158	1.35404	0.70878	1.10383	2.38301	0.18504	4.12322	0.2108	0.82028	1.07507	0.14518	1.27408	0.23878	2.57123	0.84735	0.88783	7.12872	0.45509	0.12778
			0.17524	0.17257	2.98503	1.35118	2.25583	1.12101	0.22083	0.29818	0.01211	2.13807	1.6174	0.80928	0.18258	0.50517	1.08802	2.43489	1.09549	0.19584	1.4078	0.84488	1.38452	2.24313	1.89158	3.712	1.40881	0.21334	3.58102	0.30084	0.18403	0.07222	0.22144
			1.42558	1.00388	0.15588	0.90248	0.87854	0.17481	0.00457	0.08741	2.53828	0.07817	0.0571	0.00701	0.10444	2.33884	0.88528	0.5423	2.1847	0.12344	0.33828	1.79882	0.33818	0.20888	0.40457	2.23982	0.18191	0.02278	1.27489	2.2839	0.29183	1.37817	0.08254
			1.08781	0.31181	0.08187	0.53114	0.09553	1.28797	1.51431	0.32884	0.4213	0.22224	11.4584	0.88718	0.77275	1.3818	0.5738	0.243	1.63081	0.53752	2.88087	1.4388	1.28288	0.04455	1.74857	1.15811	1.0874	2.88585	0.2504	0.57855	2.43083	0.45389	0.10989
			0.3915	1.08848	0.10473	0.12743	1.0738	1.80834	1.83478	0.01157	3.88018	2.20088	1.8457	1.44849	0.77373	0.04578	0.1534	0.88898	0.91844	0.44814	0.28852	0.19057	1.45087	1.35253	0.32188	0.14028	1.28745	0.12307	0.18998	3.47788	0.48384	0.01158	2.01158
			0.16978	0.75717	1.81512	0.14258	0.88758	0.00278	2.28835	0.01348	0.75572	1.38813	0.1771	0.81783	0.04818	0.20282	0.88895	0.81418	0.9153	0.87777	0.97425	0.07881	2.73084	0.75988	0.18858	2.38028	1.80808	1.10878	0.11835	1.47028	0.7705	0.83128	0.0825
			2.80007	0.4082	2.30092	0.48271	2.55851	0.95495	2.08322	0.08033	0.32418	1.54988	0.8882	1.14183	1.01805	0.41282	1.0452	1.40848	0.31888	1.54571	0.84122	0.54838	1.23842	0.80173	0.72581	0.49498	1.52535	0.20584	1.8375	0.50913	0.00012	5.11883	0.02738
			1.43481	1.4208	0.24114	0.12823	0.82158	0.38053	0.43208	0.37521	2.10118	0.38218	0.7544	0.18434	0.14188	1.7038	0.78577	0.18828	0.40083	0.58024	1.18205	0.84108	0.84784	1.05578	0.15875	0.07258	0.55703	0.04542	0.48001	0.8973	0.21472	0.53811	0.25428
			3.00552	0.25128	2.24177	1.02157	1.58543	0.1254	0.54988	0.48145	0.98278	0.24514	0.2015	0.01912	0.88885	1.18828	1.1757	1.42881	0.88834	0.3182	0.79823	0.08553	0.18023	0.45857	1.83283	1.09284	0.5987	0.94287	1.14788	0.8908	1.51087	1.33978	1.23408
			0.85818	1.54821	0.28388	0.44777	1.81813	0.28012	0.50783	0.25878	0.38788	0.90488	2.8218	4.34785	3.07042	0.01321	0.84748	2.02282	0.35377	1.3588	0.38825	0.38328	0.0082	0.1138	0.30838	2.87871	0.10841	0.48874	0.32821	0.38891	0.15895	0.83188	0.20835
			1.48418	1.74848	0.87898	1.43888	0.18027	0.05088	2.00144	2.14823	0.0187	0.81488	1.8555	1.38885	0.02188	2.20834	0.78738	1.30154	0.38293	1.58841	0.82332	0.37188	0.90995	0.41071	0.23873	4.07083	0.40881	1.23949	0.75825	0.81728	0.842	1.33402	1.20851
			2.93732	0.45853	0.38322	1.11848	1.82012	0.18708	1.83817	1.05858	2.8738	1.38358	0.114	1.18877	0.87851	1.28323	0.23878	0.85849	0.8988	0.37384	1.10813	1.75288	0.76383	0.18874	0.08753	0.08251	0.72728	0.13918	0.70453	0.39812	0.38485	0.00471	1.13154
			1.82898	1.57302	1.88895	1.13351	0.78097	1.52483	0.10553	2.47852	1.02522	1.08194	0.5877	1.42814	2.58883	1.20238	0.10791	0.50332	0.54858	0.47787	2.87248	0.51533	0.38881	1.81222	0.1053	2.28583	0.48884	1.45878	1.4981	0.05781	0.94298	0.88231	0.03788
			1.82508	0.83408	2.83808	0.13238	0.0132	1.31342	1.8183	0.87834	1.73878	0.04304	2.055	0.0774	2.05213	0.18438	0.18218	0.82093	1.00893	0.50852	0.02807	1.07882	0.81878	1.2084	1.22183	0.87084	0.53187	1.13321	0.84158	0.28021	4.21775	0.45825	2.08337
			2.72149	1.41185	0.35887	1.31148	1.37438	1.19414	5.22791	0.80148	0.98282	0.20574	0.252	2.53158	0.17892	4.17003	0.23344	0.23575	0.04882	0.88888	0.05821	1.88455	0.27475	1.25158	1.25052	5.22088	1.14812	0.18002	0.35317	0.8885	0.34084	0.08911	1.83771
			0.13021	0.30589	1.45342	0.88021	1.17888	0.27423	0.42288	1.78428	1.01785	1.0054	0.2988	0.82358	2.07488	1.18443	0.82944	0.47238	0.23581	0.15871	0.18853	1.27588	4.08	1.31887	0.52034	1.88234	0.81922	0.87838	0.81338	2.58241	1.25747	0.01848	1.18228
			0.09135	0.02327	0.74273	0.12807	0.74823	0.89458	0.70758	0.40141	2.20887	2.41877	1.8878	1.28758	0.21874	1.88095	0.0527	1.58988	0.71524	2.18873	2.20582	0.8888	1.43131	1.27778	0.53387	0.14335	2.28818	0.53021	0.3803	0.43538	0.58473	2.82317	0.93484
			0.51745	0.13483	0.54531	0.47222	0.01057	0.28157	0.34115	0.22587	2.01334	1.38792	1.501	0.83438	1.38127	0.82857	0.42378	3.88314	0.01437	0.9774	0.83874	0.02101	0.1451	0.88747	0.11128	0.80081	0.11478	0.80944	0.78905	0.11423	1.35493	1.85717	0.18548
			0.07828	1.02483	1.77044	3.11558	0.17875	1.01228	1.42841	0.12152	0.5818	0.28718	0.3885	1.88189	0.34135	1.32293	0.21872	0.09505	1.84103	1.03845	2.43888	1.77785	0.31888	0.25485	0.20412	0.25111	0.17152	0.02548	0.74193	1.00513	0.88928	3.83445	0.30587
Average			1.363483	0.880472	0.875107	0.759308	0.804208	0.853989	1.047088	1.056437	1.043884	0.988845	1.327347	1.130002	1.324938	1.201788	0.801857	0.998879	0.888847	0.920187	1.253531	0.835044	1.056561	0.828802	0.734815	1.322088	0.802318	0.9431	1.051758	1.091803	1.258748	0.888842	0.703704
Moving range average			1.128489	0.780237	0.98713	0.732857	0.888448	0.733451	0.960348	1.283528	1.184255	1.038383	1.771589	1.118958	1.815462	1.201782	0.370271	0.872588	0.888808	0.805381	1.324376	0.919142	0.982485	0.80834	0.890285	1.428189	0.847858	0.854553	0.878072	1.028858	1.804757	1.033232	0.729158
T statistic			2.243028	2.071487	1.388888	1.783351	1.373048	2.018834	1.808701	1.18425	1.335028	1.545188	1.370094	1.283008	1.288825	1.850138	3.83609	2.124114	1.002757	3.194583	1.810712	2.169708	2.048346	3.010084	2.784478	1.755838	1.805415	1.645818	2.628184	2.381845	1.28827	1.147438	1.584092
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0.713652	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.894143	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0.771341	0.774801	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.757123	0	0
31	1.3	0.775	0	0	0.822183	0	0.812985	0	0	0	0.783215	0	0.811449	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.879	0	0	0	0	0	0	0	0	0	0.902498	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.922723
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.93857	0	0	0	0	0	0	0.954826	0	0	0	0	0
35	1.7	0.983	0	0	0	1.028342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.012038	0	0	0	0	0	0	0
36	1.8	1.035	0	0	0	0	0	0	1.038437	0	0	0	0	0	0	1.060571	0	0	0	0	0	0	0	0	0	0	1.037782	0	0	0	0	0	0
37	1.9	1.086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.087433	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1.138	0	1.174448	0	0	0	1.148585	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.161638	0	0	0	0	0	0	0	0	0	0
39	2.1	1.189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.201298	0	0	0	1.224551	0	0	0	0	0	0	0	0	0	0	0
40	2.2	1.24	1.281944	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.332741	0	0	0
42	2.4	1.342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2.5	1.393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.457358	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.538084	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.852148	0	0	0	0	0	0	0	0	0	0	0

49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.745291	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3.3	1.799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.119408	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator shape parameter			1.261944	1.174448	0.822183	1.026342	0.812985	1.148585	1.039437	0.713652	0.793215	0.902498	0.811449	0.771341	0.774801	1.080571	2.119408	1.201298	1.087433	1.745291	0.93657	1.224551	1.181638	1.652148	1.538084	1.012036	1.037782	0.954828	1.457358	1.332741	0.757123	0.894143	0.822723
Estimator scale parameter			1.080446	0.74989	1.084396	0.739819	1.112207	0.74482	1.007342	1.480324	1.315785	1.107975	1.635774	1.478852	1.710035	1.133182	0.283974	0.829835	0.798804	0.527228	1.338427	0.783581	0.898548	0.501851	0.477812	1.307188	0.773123	0.987718	0.721088	0.818218	1.862538	1.38257	0.782839
Control chart constant d2			1.020222	1.012227	0.986087	0.985958	0.984409	1.009447	0.987555	0.945475	0.980941	0.979048	0.984198	0.958898	0.957548	1.000083	1.083841	1.014784	1.003132	1.050169	0.984048	1.018934	1.010983	1.045796	1.03988	0.994174	0.987353	0.986812	1.034753	1.025967	0.954187	0.841348	0.982048
Control chart constant d3			0.968508	0.875051	1.013999	0.988525	1.015388	0.977336	0.987191	1.032098	1.018483	1.002818	1.015623	1.022005	1.021435	0.985101	0.831587	0.972946	0.982553	0.9438	0.998561	0.971194	0.978089	0.947514	0.952805	0.980018	0.98736	0.996386	0.956854	0.983823	1.024388	1.035776	1.000258
Control chart constant D4			3.939784	3.989267	4.237728	4.083362	4.245424	4.005938	4.074471	4.33333	4.28224	4.173258	4.248718	4.281231	4.278198	4.080378	3.624988	3.973828	4.042878	3.731117	4.147421	3.980413	3.898876	3.784074	3.808717	4.093187	4.075801	4.133928	3.843447	3.902737	4.293788	4.351832	4.157818
Upper contro limit X			4.675943	3.19201	3.87157	2.9668	3.878795	3.033758	3.835173	5.085612	4.740858	4.18477	6.83838	4.647077	6.386188	4.808917	1.646205	3.576421	2.888212	2.849578	5.291073	3.648551	3.812703	2.573805	2.728763	5.826477	3.352042	3.541547	3.587502	4.094412	6.304184	4.258471	2.831187
Lower control limit X			-1.84902	-1.43197	-2.22138	-1.44818	-2.17038	-1.32578	-1.84104	-2.95274	-2.85349	-2.18488	-4.1847	-2.38907	-3.73631	-2.40332	-0.44249	-1.58288	-1.13082	-0.80924	-2.78401	-1.77848	-1.78858	-0.8163	-1.25883	-2.98088	-1.74741	-1.65535	-1.48388	-1.91081	-3.78867	-2.32818	-1.52378
Upper control limit MR			4.438122	3.112574	4.225586	2.882511	4.19639	2.938158	3.912908	5.475273	5.04758	4.33753	7.523356	4.78951	6.911268	4.879087	1.34222	3.487281	2.703108	2.250785	5.492744	3.640181	3.848833	2.288838	2.628138	5.837575	3.454717	3.532862	3.374823	4.007581	6.890503	4.498248	3.031707
Normal upper control limit X			4.359443	2.95557	3.527048	2.708384	3.533058	2.804088	3.801185	4.416877	4.193299	3.764208	6.038888	4.11495	5.821378	4.388028	1.588818	3.317538	2.648863	2.53025	4.775808	3.37857	3.818381	2.448728	2.570808	5.1158	3.056728	3.215847	3.387055	3.822811	5.528718	3.7148	2.842855
Normal lower control limit X			-1.63252	-1.19483	-1.77083	-1.18978	-1.72484	-1.09887	-1.50706	-2.304	-2.10583	-1.78432	-3.38427	-1.83895	-2.8718	-1.89443	-0.38281	-1.32378	-0.90957	-0.68882	-2.20874	-1.50848	-1.50324	-0.78812	-1.10098	-2.4701	-1.45208	-1.32985	-1.28354	-1.63821	-3.00823	-1.78132	-1.23555
Normal upper control limit MR			3.681365	2.549814	3.258821	2.384975	3.230248	2.398917	3.138417	4.129201	3.870148	3.308837	5.780487	3.658749	5.27833	3.927424	1.210045	2.851552	2.185015	1.978418	4.32808	3.003755	3.1454	1.898056	2.255883	4.680719	2.770147	2.79288	2.888538	3.355775	5.244347	3.378802	2.382889

OBJECTIVE # 3

Exponential (Mean=1) k = 30 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	0.03862	0.17089	0.5208	1.09754	0.2983	0.86332	1.48244	0.13188	0.05831	0.15844	0.75087	0.08478	1.01287	0.78828	1.02318	1.22234	1.03824	1.20815	0.81225	0.1857	0.84418	0.03878	0.28857	1.38288	2.71838	0.12838	0.08222	0.00108	0.38218	1.17518	0.00573
			0.27508	3.11145	1.02382	1.43057	4.12308	1.78437	0.85287	0.2273	0.4135	0.19495	0.13088	0.184	1.15528	0.53777	0.28803	0.14188	0.82318	0.3498	2.80308	3.3032	1.18848	0.75251	0.24038	0.38328	2.88051	0.35401	0.48036	0.18508	3.87481	0.88751	0.218
			1.08773	1.11712	1.07088	0.78151	0.8858	0.39328	0.79378	0.84374	0.43585	0.58875	0.17458	0.55378	1.73418	2.18751	1.80208	2.3887	1.18295	0.28815	0.54783	3.0348	0.44485	1.0888	0.53324	0.53831	0.53475	4.14788	1.28888	0.84482	0.8848	0.3881	0.50481
			0.81517	0.78877	1.82084	0.23113	0.82728	0.88881	2.02404	0.29828	1.08087	0.01753	1.15771	2.04088	2.48582	1.88845	2.83388	0.18572	0.88182	0.30848	1.01778	0.4583	0.11105	0.78448	0.26207	1.03487	0.13082	0.58808	0.8718	0.08888	0.52825	0.83818	0.04858
			0.83085	0.1482	0.28203	0.0851	0.33818	0.25825	1.37827	0.13512	0.1285	0.53028	0.37078	1.70877	0.48531	0.4102	0.28788	0.487	1.75471	0.85707	2.8382	0.1888	1.12138	1.34883	0.07327	1.427	0.18787	0.47824	0.40882	1.84084	0.81185	0.45378	0.70854
			2.73382	0.52598	1.75838	0.73507	1.08337	2.47018	1.28282	3.85277	1.57542	2.40148	1.88002	3.05417	0.55108	0.37558	1.38738	0.80588	1.28457	0.12317	0.07188	1.8444	0.73048	0.08888	0.21632	0.38883	1.482	0.28918	0.48831	0.72821	2.43854	0.82744	0.71224
			0.78388	0.18858	2.28418	3.87625	0.8528	1.3348	1.82782	1.0337	1.25501	1.08074	0.52174	0.58758	0.87738	1.73514	0.24108	2.8554	1.13827	0.88522	2.12883	0.108	1.81318	0.4278	0.1175	3.50288	0.48371	0.81835	0.18558	2.55888	2.58222	0.08032	0.88252
			0.05858	0.83818	2.78831	0.70744	1.85724	1.41235	0.28723	0.22328	1.18075	1.78802	1.83785	0.13247	0.87027	0.34118	0.88478	0.5153	0.45484	2.18828	0.7005	0.5037	0.32888	1.05878	0.31057	0.28715	2.85841	1.88104	1.48358	0.28335	1.81834	2.10841	2.28788
			1.37834	0.25833	1.88882	0.58518	0.51811	0.88148	1.58718	2.8243	0.8458	0.38888	0.52835	0.77885	2.82372	1.11172	3.30374	0.14521	0.85778	0.83788	0.24243	1.5888	0.53341	0.0701	0.77885	0.43228	3.87845	0.2048	0.52881	0.42072	0.03181	2.87883	0.28707
		10	0.98308	0.07814	0.88567	0.81988	0.57135	0.08834	0.21028	1.75887	2.85372	0.2533	0.08853	0.50574	1.81228	1.8278	2.82342	0.4078	0.38528	1.82448	1.04258	0.4184	0.14788	0.2881	0.01078	0.42821	1.13734	0.28428	0.18818	0.07873	2.88571	0.24877	5.85028
			0.05558	0.38153	0.38881	1.37798	0.4538	0.53433	0.45088	0.23088	0.10851	0.04808	0.88377	0.58845	0.11411	0.35827	1.05284	2.22818	2.05177	1.42823	1.28037	0.8737	0.2585	2.70358	2.8823	1.88785	0.5734	0.0828	1.07705	0.57144	1.05838	0.33823	0.84234
			1.14855	0.78588	0.25478	1.28448	0.84815	2.8493	0.88888	1.0274	0.25832	0.45834	0.79548	0.3028	3.13837	0.34708	1.57873	1.72271	0.19737	0.85823	0.85306	3.202	0.79035	1.08538	1.0703	1.88877	0.18748	0.02335	3.08182	2.84208	1.18432	1.18013	2.84848
			0.20844	0.73701	0.78853	0.0213	3.88048	0.43074	0.28118	2.47872	0.88536	4.08577	0.71283	0.81288	0.84783	0.88188	0.40038	1.88118	0.77045	0.34137	0.00318	0.1885	0.51888	0.3084	0.05221	0.242	3.4823	0.5731	0.73258	2.25828	0.18378	2.10327	1.08528
			1.5082	0.88819	1.10438	0.344	0.27044	0.27345	1.75048	2.83877	1.42875	0.28225	0.58338	0.41084	4.52885	3.7478	0.38803	0.19803	0.42085	0.08348	0.41123	0.4557	1.3588	0.28445	1.51158	0.12185	0.22071	1.88481	0.2582	0.70888	0.35777	0.51225	0.77023
New observations k =			1.80332	8.30888	0.08115	1.72058	0.20888	0.54443	0.18848	0.84784	0.88508	0.43508	0.42118	0.43738	3.88888	1.12882	0.22001	0.20084	0.14807	1.10347	0.42771	1.5284	1.01287	0.27838	0.10018	0.88718	0.24178	0.81831	0.7201	0.00448	0.85558	0.02103	2.3718
			1.88318	0.18798	0.15181	2.14802	1.50183	0.70888	0.5353	0.43875	1.83882	0.17218	2.28231	0.83818	4.08588	2.38882	0.18301	0.17888	3.12188	2.18125	0.24888	1.811	0.4183	2.1278	1.58787	1.85088	4.25883	0.43311	0.83288	1.28845	0.08748	0.58438	0.20848
			0.18872	0.72112	0.34523	0.48318	2.83855	0.25257	1.77108	1.28882	0.03188	0.48102	1.87848	0.03351	0.54155	0.52704	0.22478	1.51148	0.44413	5.32588	2.28808	0.1088	0.01481	0.87388	0.88404	0.00048	0.4548	2.01831	0.48883	2.57878	0.71132	3.87515	0.22388
			2.84885	0.30382	0.56185	1.34448	0.78811	2.38387	1.81838	0.55574	0.30753	0.88582	0.5458	0.5411	0.88888	0.81507	0.88323	0.81331	0.84807	1.88834	1.81818	2.8882	0.29588	0.78333	0.28852	1.45483	0.71088	0.42241	0.47038	2.8817	0.54078	0.85717	0.88042
			2.30252	0.28382	0.2558	2.04744	0.15174	3.25873	0.15138	1.58888	3.07887	0.18282	2.28882	0.0835	5.28731	2.13542	1.31828	0.8301	2.47343	1.21874	0.85815	1.1872	1.18228	3.11888	0.88875	0.53375	0.43571	0.08548	1.18874	0.22022	0.01848	0.48141	3.32853
		20	0.18407	2.05788	0.80811	0.37884	0.80138	0.82878	0.88302	0.8481	1.52482	1.42888	0.25871	0.10504	0.28823	2.07052	0.01885	0.8381	8.33158	2.08885	0.15727	0.5208	2.02583	0.8188	1.21705	1.00224	2.88772	0.12511	4.08818	0.43538	1.18558	1.11133	0.88834
			0.17453	0.18823	3.11125	1.18217	0.47873	0.25208	0.45588	0.78311	1.38988	2.05877	0.73188	0.47001	0.1885	0.31154	0.31388	0.88707	0.16434	0.48323	0.52345	0.3013	0.41183	0.48885	0.23488	0.85083	0.08053	0.87017	0.45028	1.5843	1.08887	0.27785	0.3102
			0.88517	0.08254	0.20523	0.2057	0.80223	0.28804	2.82232	0.85358	2.5857	0.23428	0.72185	0.80883	1.28123	0.08824	0.22858	1.58485	0.87898	0.18887	1.01585	0.0835	4.2833	1.5558	0.02838	0.28883	2.80738	0.40803	0.41443	0.53443	0.4113	1.43772	0.38103
			0.78283	0.85034	0.83847	1.07827	0.28084	0.37028	0.78817	2.88018	0.88088	3.88344	1.84438	0.01812	0.80544	1.75751	4.05125	0.58575	1.83824	2.81283	0.00272	11.7303	0.88778	4.8802	0.83423	1.27757	0.53838	0.58532	0.45433	0.48878	2.18584	0.27855	0.14172
			0.18838	2.15572	0.48858	0.00858	0.08481	4.48314	0.53571	1.35738	0.10508	0.15332	1.05234	1.10882	1.28222	1.43388	1.84861	1.88215	0.20507	1.35057	0.71343	0.0845	0.88818	1.8	1.35888	0.81008	0.43534	1.18878	0.1845	0.42888	2.01387	0.42854	0.37884
			0.1824	0.24555	0.41342	1.38888	0.08103	1.82285	4.88188	0.13883	1.57508	0.21013	0.88574	1.78254	3.32204	3.08318	1.45888	0.45428	0.88821	0.80745	2.77758	1.4418	0.44242	0.3412	1.01584	0.52818	1.51878	1.88128	0.32554	0.2753	0.78515	0.31552	0.28843
			0.88888	1.35488	1.34087	0.83883	2.78121	0.08081	0.214	0.10434	0.08708	0.58758	0.58014	0.31784	1.82233	0.21514	1.18111	0.72473	0.80522	0.21111	1.88848	2.8574	1.48785	1.75484	0.88837	3.82388	0.10851	2.15717	1.87788	2.18422	1.53488	0.34238	0.47825
			0.88521	0.57492	1.77147	2.11238	0.2055	0.35705	0.00225	0.81835	0.08805	0.5553	0.84353	0.81238	0.4343	0.0042	0.57818	0.85334	1.32528	0.48803	2.85185	2.5488	1.18885	1.20285	1.75572	0.11828	1.27388	0.02308	0.2235	0.2183	5.81177	1.18058	1.78452
			0.12321	0.51883	0.8888	0.04875	0.83131	0.03508	1.10848	2.0227	0.84855	1.08478	0.3331	3.0575	0.88888	0.10438	1.4108	2.78154	0.78353	0.84888	0.71818	0.1708	0.30548	2.0277	0.84403	4.08048	3.47318	1.18518	0.58881	0.05875	0.17327	1.43288	0.43377
			1.14774	0.04833	1.47879	0.52785	0.08407	1.23071	1.2281	1.88438	0.17431	1.03875	1.05881	2.05338	1.18852	1.80748	0.13	0.98382	0.37458	0.08885	0.85288	2.4827	0.7851	2.85458	0.88028	0.25838	0.08232	0.01388	0.55061	0.38114	1.10552	0.84384	2.84455
		30	0.21832	2.10738	0.18485	0.08478	1.13588	2.82873	1.78884	0.05781	1.03448	3.03583	1.08258	0.20758	1.81881	1.82047	0.00088	0.01543	2.25037	0.57503	0.80844	0.8888	0.18031	2.58112	2.40083	0.50028	1.24311	0.5051	0.57021	0.42761	3.13742	1.88527	1.85245
Estimator shape parameter			1.281844	1.174448	0.822163	1.026342	0.812985	1.148585	1.038437	0.713852	0.783215	0.802488	0.811449	0.771341	0.774801	1.080571	2.118408	1.201298	1.087433	1.745201	0.83857	1.224551	1.161636	1.652148	1.538084	1.012036	1.037782	0.954826	1.457358	1.332741	0.757123	0.884143	0.822723
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.080446	0.74968	1.084388	0.738818	1.112207	0.74482	1.007342	1.480324	1.315785	1.107875	1.835774	1.478852	1.710035	1.133182	0.283874	0.828835	0.788804	0.527228	1.338427	0.763581	0.808548	0.501851	0.477812	1.307108	0.773123	0.887718	0.721088	0.818218	1.882539	1.30257	0.782839
Control chart constant d2			1.020222	1.012227	0.988087	0.895958	0.984488	1.009447	0.987555	0.845475	0.880841	0.978048	0.884188	0.958888	0.857548	1.000083	1.063841	1.014784	1.003132	1.050188	0.984048	1.018834	1.010863	1.045786	1.03888	0.884174	0.887353	0.888812	1.034753	1.025887	0.854187	0.941348	0.882048
Control chart constant d3			0.888508	0.975051	1.013888	0.888525	1.015388	0.977336	0.887181	1.032088	1.018483	1.002819	1.015623	1.022005	1.021435	0.985101	0.931587	0.872848	0.882553	0.8438	0.888581	0.871184	0.878088	0.847514	0.852805	0.880018	0.88736	0.888388	0.858854	0.883823	1.024388	1.035778	1.000258
Control chart constant D4			3.838784	3.888267	4.237728	4.083352	4.245424	4.005838	4.074471	4.33333	4.26224	4.173258	4.248718	4.281231	4.278188	4.080378	3.624088	3.873628	4.042878	3.731117	4.147421	3.880413	3.888878	3.764074	3.808717	4.083187	4.075881	4.133828	3.843447	3.802737	4.283788	4.351632	4.157818
Upper contro limit X			4.875843	3.19281	3.97157	2.8888	3.878785	3.033758	3.835173	5.085812	4.740858	4.18477	6.83838	4.847077	8.388188	4.808817	1.848205	3.578421	2.888212	2.848578	5.281073	3.848551	3.812703	2.573805	2.728783	5.828477	3.352042	3.541847	3.587502	4.084412	8.384184	4.258471	2.831187
Lower control limit X			-1.84882	-1.43187	-2.22138	-1.44818	-2.17038	-1.32578	-1.84184	-2.85274	-2.85348	-2.18488	-4.1847	-2.38887	-3.73831	-2.40332	-0.44248	-1.58288	-1.13082	-0.88824	-2.78481	-1.77848	-1.78858	-0.8183	-1.25883	-2.88888	-1.74741	-1.85535	-1.48388	-1.81881	-3.78887	-2.32818	-1.52378
Upper control limit MR			4.438122	3.112574	4.225588	2.892511	4.19838	2.838158	3.812888	5.475273	5.04758	4.33753	7.523355	4.78051	8.811288	4.878887	1.34222	3.487281	2.703108	2.258785	5.482744	3.840181	3.848833	2.288838	2.828138	5.837575	3.454717	3.532882	3.374823	4.007581	8.880503	4.498248	3.031707
False alarm in X? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	1	0	1	0	0	0	1
False alarm in X? (Y=1/N=0)			0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0	0	0	0	0
Total false alarm in X			0	1	0	1	1	1	1	0	0	0	0	0	0	0	1	0	1	1	0	1	1	1	1	0	1	1	1	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	1	0	1	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	1	1	0	1	1	1	0	0	0	0	1	0	0	0	0
Total false alarm in MR			0	1	0	1	0	1	1	0	0	0	0	0	0	0	1	0	1	1	0	1	1	1	1	0	1	1	1	0	0	0	1
Sub-total X control charts with at least one false alarm k 30 =							105																										
Sub-total MR control charts with at least one false alarm k 30 =							90																										
Normal upper control limit X			4.358443	2.95557	3.527048	2.708384	3.533058	2.804888	3.801185	4.418877	4.183288	3.784208	6.038888	4.11485	5.821378	4.388028	1.588818	3.317538	2.848883	2.53025	4.775808	3.37857	3.818381	2.448728	2.870888	5.1158	3.058728	3.215847	3.387056	3.822811	5.528718	3.7148	2.842855
Normal lower control limit X			-1.83252	-1.18483	-1.77883	-1.18878	-1.72484	-1.08887	-1.50705	-2.304	-2.10583	-1.78432	-3.38427	-1.83885	-2.8715	-1.88443	-0.38281	-1.32378	-0.80857	-0.88882	-2.28874	-1.50848	-1.50324	-0.78812	-1.10088	-2.4701	-1.45288	-1.32885	-1.28354	-1.83921	-3.00823	-1.78132	-1.23555
Normal upper control limit MR			3.881385	2.548814	3.258821	2.384875	3.230248	2.388817	3.138417	4.128281	3.870148	3.388837	5.788487	3.858748	5.27833	3.827424	1.210045	2.851552	2.185015	1.878418	4.32888	3.003755	3.1454	1.888058	2.255883	4.880718	2.770147	2.78288	2.888538	3.355775	5.244347	3.378802	2.382888
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
False alarm in X? (Y=1/N=0)			0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1	1	0	1	0	1	0	0	0	1
False alarm in X? (Y=1/N=0)			0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	1	1	1	0	0	1	0	0	0	1	0	1
Total false alarm in X			0	1	0	1	1	1	1	0	0	1	0	0	0	0	1	0	1	1	0	1	1	1	1	0	1	1	1	0	1	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	1	1	0	0	0	1	0	0	0	0	1	0	1	1	0	1	0	1	1	0	1	0	1	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	1	0	0	1	0	0	0	0	1	0	1	1	0	1	1	1	0	0	1	0	1	0	1	0	0
Total false alarm in MR			0	1	0	1	1	1	1	0	0	1	0	0	0	0	1	0	1	1	0	1	1	1	1	0	1	1	1	0	1	0	1
Sub-total normal X control charts with at least one false alarm k 30 =							128																										
Sub-total normal MR control charts with at least one false alarm k 30 =							127																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							5																										
Sub-total MR control charts with at least one false alarm k 1 =							3																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							7																										
Sub-total MR control charts with at least one false alarm k 1 =							11																										
False alarm in X? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							41																										
Sub-total MR control charts with at least one false alarm k 10 =							35																										
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							56																										
Sub-total MR control charts with at least one false alarm k 10 =							61																										

OBJECTIVE # 3

Exponential (Mean=1)   k = 30 obs   Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14
		1	1.4983	1.37803	3.23374	1.26930	1.50648	1.23082	0.55041	1.00047	1.09632	1.02512	1.00123
			1.32052	1.99210	3.25484	1.02431	1.40268	1.30828	1.30083	1.51374	2.14848	1.90225	1.34778
			1.13465	1.03139	2.09118	1.39903	1.87624	2.20124	1.64313	1.29504	1.06182	3.67298	1.01547
			1.4552	1.00573	1.01307	2.20257	3.08294	5.87051	2.03648	1.79247	2.09728	1.32851	1.50728
			1.80015	1.35458	1.0923	1.08387	2.43398	2.44651	1.40492	1.817	1.62254	1.04448	2.31298
			5.35365	2.12183	2.35837	1.38281	1.61374	1.28509	1.00878	4.70181	1.44243	1.52808	2.19784
			2.085	2.52648	2.64585	1.18802	1.15557	2.23114	1.02378	1.23582	2.28437	1.31201	1.10323
			1.26484	1.47968	1.32402	1.52988	1.00347	1.35123	2.91004	3.3308	1.17232	2.58027	2.2823
			3.81730	4.21043	2.90570	1.13288	2.94158	1.14404	1.16762	2.02586	1.17842	1.00381	2.5563
		10	1.05737	1.36099	3.80357	1.7455	2.9103	1.58157	1.56144	1.22741	1.33022	2.53402	1.05828
			1.77088	4.82994	1.0903	3.01897	1.58163	2.18548	1.25096	1.01038	1.15275	7.18031	1.80043
			1.71332	1.57785	1.36501	2.22083	1.12389	3.56408	2.00678	1.18605	1.17748	2.15611	1.07885
			1.05211	1.17201	2.37084	2.72698	1.48398	2.10050	1.19036	1.51482	2.78035	1.08736	1.65883
			1.21827	3.25758	1.48701	4.91598	3.32128	1.09388	1.07114	1.14835	3.56587	3.70875	1.17871
New observations k =			1.48059	1.24603	2.72482	1.24597	1.18303	1.46058	1.58539	2.08098	2.81018	1.48533	1.10208
			1.50225	1.57871	1.03753	1.04985	3.30228	2.5298	2.78208	1.40318	2.58747	1.20711	1.08543
			1.28152	1.71471	1.28781	1.01127	1.41135	1.41562	1.43138	1.08550	1.04168	5.87088	1.08842
			1.08680	1.15481	2.39505	1.28441	1.20682	1.72845	2.28303	1.0818	1.42775	8.87997	1.80885
			2.510	1.54754	2.11025	1.53623	1.11182	1.01567	2.50455	1.20876	2.15198	1.3293	1.50988
		20	1.38557	1.52207	1.08742	1.12503	1.20385	1.43536	1.0813	1.17874	2.83444	1.42547	2.82455
			4.25107	1.72108	1.05375	1.07855	1.78055	3.75058	1.14339	1.14098	1.87318	1.02293	3.54544
			2.64730	1.33433	2.92871	1.33024	1.05202	2.08871	1.40185	2.21524	2.1258	1.08375	1.10284
			2.01714	2.77036	4.05027	2.58287	1.18081	3.01651	1.26207	1.77808	1.34428	4.04157	1.82057
			5.18812	2.13443	1.55432	3.049	2.30728	1.52798	1.07086	2.37989	1.43298	3.30533	1.15248
			2.78375	3.50124	1.5803	1.70085	1.15444	1.81549	1.11722	3.21084	1.0588	1.40815	5.71418
			1.23002	4.00587	4.98737	2.48177	1.72231	1.18598	2.47504	1.00221	2.44528	2.73811	1.86474
			1.41451	1.60063	1.16118	1.08271	1.10535	2.04648	1.16221	1.82037	1.77305	1.62258	1.80884
			1.14824	1.25098	2.33810	1.42832	2.13048	1.57128	1.17948	1.05085	1.45522	1.14088	2.45127
			1.51851	1.95038	2.10865	2.22727	1.08680	2.14123	1.37042	1.01748	1.08894	1.71788	1.73713
		30	1.01535	1.04871	1.5704	1.70772	1.6067	3.06148	3.10777	1.24021	2.25251	2.71407	1.2182
Estimator shape parameter			1.281944	1.174448	0.822183	1.028342	0.812985	1.148585	1.038437	0.713852	0.783215	0.802488	0.811448
			0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.080448	0.74988	1.084388	0.738819	1.112207	0.74482	1.007342	1.480324	1.315785	1.107876	1.835774
Control chart constant d2			1.020222	1.012227	0.988087	0.885858	0.884488	1.009447	0.887555	0.945475	0.880841	0.879846	0.884198
Control chart constant d3			0.888508	0.875051	1.013888	0.888525	1.015388	0.877336	0.887181	1.032088	1.018483	1.002818	1.015823
Control chart constant D4			3.838784	3.888287	4.237728	4.083352	4.245424	4.005838	4.074471	4.33333	4.28224	4.173258	4.248718
Upper contro limit X			4.875843	3.19291	3.87157	2.9888	3.878785	3.033758	3.835173	5.085812	4.748858	4.18477	8.83838
Lower control limit X			-1.84902	-1.43187	-2.22138	-1.44818	-2.17838	-1.32578	-1.84184	-2.85274	-2.85348	-2.18488	-4.1847
Upper control limit MR			4.438122	3.112574	4.225588	2.882511	4.18838	2.838158	3.812888	5.475273	5.04758	4.33753	7.523355
False alarm in X? (Y=1/N=0)			1	1	0	0	0	1	1	0	0	0	0
False alarm in X? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	1	0
False alarm in X? (Y=1/N=0)			1	1	1	1	0	1	0	0	0	0	0
Total false alarm in X			1	1	1	1	0	1	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	1	0	1	0	1	1	0	0	1	0
Sub-total X control charts with at least one false alarm k 30 =							179						
Sub-total MR control charts with at least one false alarm k 30 =							88						
Normal upper control limit X			4.358443	2.95557	3.527048	2.708384	3.533058	2.884888	3.601185	4.418877	4.183298	3.784288	8.038888
Normal lower control limit X			-1.63252	-1.18483	-1.77883	-1.18878	-1.72484	-1.08887	-1.50705	-2.304	-2.10583	-1.78432	-3.38427
Normal upper control limit MR			3.881385	2.548814	3.258821	2.384875	3.230248	2.388817	3.138417	4.128201	3.870148	3.388637	5.788487
False alarm in X? (Y=1/N=0)			1	1	1	0	0	1	1	1	0	0	0
False alarm in X? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	1	0
False alarm in X? (Y=1/N=0)			1	1	1	1	0	1	0	0	0	1	0
Total false alarm in X			1	1	1	1	0	1	1	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0
Total false alarm in MR			0	1	1	1	0	1	1	0	0	1	0
Sub-total normal X control charts with at least one false alarm k 30 =							201						
Sub-total normal MR control charts with at least one false alarm k 30 =							140						
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							14						
Sub-total MR control charts with at least one false alarm k 1 =							6						
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							19						
Sub-total MR control charts with at least one false alarm k 1 =							12						
False alarm in X? (Y=1/N=0)			1	1	0	0	0	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							109						
Sub-total MR control charts with at least one false alarm k 10 =							31						
False alarm in X? (Y=1/N=0)			1	1	1	0	0	1	1	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							132						
Sub-total MR control charts with at least one false alarm k 10 =							84						

1	2	3	15	16	17	18	19	20	21	22	23	24
		1	3.0478	4.07158	1.01871	1.13852	1.80087	1.80331	4.10875	1.34811	4.29705	3.45478
			1.17547	3.28715	2.95255	1.10858	2.43983	1.95824	4.20851	1.88587	1.20327	3.85182
			1.00208	1.49082	1.60323	3.85214	1.4823	1.04488	1.00743	2.48481	1.32818	1.44757
			1.56778	1.60173	2.48083	1.72938	3.88843	1.48283	2.53728	1.75828	1.30538	3.38185
			1.52817	1.14888	1.84403	2.14348	1.85105	1.00817	3.21815	2.23051	2.88588	1.27188
			2.36338	3.00867	1.10585	3.81948	2.08548	1.32228	1.88422	1.15858	1.81034	2.18798
			1.4537	1.84718	1.32007	1.8898	1.31372	1.07425	1.18294	1.88552	2.58884	2.29458
			1.80978	1.3848	1.54211	2.84201	1.15123	1.18182	1.88818	1.31782	1.31347	2.18184
			2.71298	2.12001	2.8024	1.88584	1.84894	2.88432	1.40558	1.72887	1.72217	1.45784
		10	1.0208	1.06723	2.82318	1.01198	2.80787	2.11088	2.28257	4.34728	1.27425	1.38282
			1.95082	1.05884	1.83165	1.45942	1.32328	2.58822	3.21085	1.11383	1.14452	1.72488
			1.55089	1.08807	1.03808	2.88138	2.0785	1.53458	1.58043	3.27014	1.22171	1.27488
			2.01857	2.80288	2.18884	1.74884	3.78788	1.80444	3.73145	1.02884	1.08842	1.8228
			1.10884	1.33348	1.05553	3.02081	1.82878	1.63848	1.57284	4.48887	1.07757	2.48788
New observations k =			1.44272	1.17085	3.03341	1.288	1.81384	1.42225	2.32288	8.58481	2.33278	2.88871
			1.44982	2.48523	1.11846	1.45231	1.81173	1.51447	2.04817	1.00547	1.48888	1.88888
			2.84035	1.40421	1.4528	2.70876	3.65868	1.5102	2.02411	2.19824	2.53384	1.88834
			1.58088	1.72418	2.8533	1.63827	2.78215	2.18838	1.28841	1.88818	1.88882	1.27838
			1.23483	1.15573	1.08885	2.82248	1.1173	2.32518	1.85313	1.18843	2.53888	2.74887
		20	2.24423	1.37103	1.80853	3.41388	1.03252	1.8878	1.5888	1.08873	1.48887	1.01188
			1.0882	1.94828	1.03132	1.30018	1.47187	2.1285	1.38818	3.27825	1.2441	2.88533
			1.12332	1.57803	1.27528	1.82917	1.54032	1.78214	1.17838	1.85443	1.78343	2.58848
			1.38704	4.24193	1.78388	1.04257	1.83878	5.88858	3.45828	1.08288	3.05524	2.18883
			1.19386	2.14813	1.84108	1.17243	5.17882	2.04851	3.02138	1.44851	1.8851	1.28838
			2.0315	2.83288	1.48083	2.33815	1.83388	1.38785	3.58821	2.18838	1.15741	1.13882
			1.87852	1.5703	1.08858	1.2128	1.3888	1.23001	2.33781	3.78827	1.48581	1.28878
			1.55018	1.08354	2.10058	2.8882	1.51143	1.38485	1.38288	1.88848	1.44121	1.38388
			1.78858	1.13888	1.75473	2.53888	1.2828	1.45321	1.84121	2.08858	2.58117	2.28278
			1.81728	1.80941	1.8138	1.18828	1.03131	1.22844	1.41833	1.02328	2.40084	2.21881
		30	2.08732	2.30885	2.84352	2.07845	1.03388	3.83212	1.24418	1.88834	1.24281	1.84488
Estimator shape parameter			0.771341	0.774881	1.088571	2.118408	1.201288	1.087433	1.745281	0.83857	1.224551	1.181838
			0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.476852	1.710035	1.133182	0.283874	0.828835	0.788884	0.627228	1.338427	0.783581	0.988548
Control chart constant d2			0.858888	0.857548	1.000083	1.083841	1.014784	1.003132	1.050188	0.884048	1.018834	1.010883
Control chart constant d3			1.022006	1.021435	0.885101	0.831567	0.872848	0.882553	0.8438	0.888581	0.871184	0.878888
Control chart constant D4			4.281231	4.278198	4.080378	3.824888	3.873828	4.042878	3.731117	4.147421	3.880413	3.888878
Upper contro limit X			4.847077	8.388188	4.888917	1.848285	3.578421	2.888212	2.848578	5.281873	3.848551	3.812783
Lower control limit X			-2.38887	-3.73831	-2.40332	-0.44248	-1.58288	-1.13882	-0.88824	-2.78481	-1.77848	-1.79858
Upper control limit MR			4.78851	8.811288	4.878887	1.34222	3.487281	2.783188	2.258785	5.482744	3.848181	3.848833
False alarm in X? (Y=1/N=0)			0	0	0	1	1	0	1	0	1	0
False alarm in X? (Y=1/N=0)			0	0	0	1	1	0	1	1	0	0
False alarm in X? (Y=1/N=0)			0	0	0	1	1	1	1	0	0	0
Total false alarm in X			0	0	0	1	1	1	1	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	1	1	0	0	0
Total false alarm in MR			0	0	0	1	1	1	1	1	0	0
Sub-total X control charts with at least one false alarm k 30 =												
Sub-total MR control charts with at least one false alarm k 30 =												
Normal upper control limit X			4.11485	8.821378	4.388028	1.588618	3.317538	2.848883	2.53025	4.775888	3.37057	3.818381
Normal lower control limit X			-1.83885	-2.8715	-1.88443	-0.38281	-1.32378	-0.88957	-0.88882	-2.28874	-1.50848	-1.50324
Normal upper control limit MR			3.858748	5.27833	3.827424	1.210045	2.851552	2.185015	1.878418	4.32888	3.003755	3.1454
False alarm in X? (Y=1/N=0)			0	0	0	1	1	1	1	0	1	1
False alarm in X? (Y=1/N=0)			0	0	0	1	1	0	1	1	0	0
False alarm in X? (Y=1/N=0)			0	0	0	1	1	1	1	0	0	0
Total false alarm in X			0	0	0	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	1	1	0	0	0
Total false alarm in MR			0	0	0	1	1	1	1	1	1	0
Sub-total normal X control charts with at least one false alarm k 30 =												
Sub-total normal MR control charts with at least one false alarm k 30 =												
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 1 =												
Sub-total MR control charts with at least one false alarm k 1 =												
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 1 =												
Sub-total MR control charts with at least one false alarm k 1 =												
False alarm in X? (Y=1/N=0)			0	0	0	1	1	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =												
Sub-total MR control charts with at least one false alarm k 10 =												
False alarm in X? (Y=1/N=0)			0	0	0	1	1	1	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 10 =												
Sub-total MR control charts with at least one false alarm k 10 =												

1	2	3	25	26	27	28	29	30	31	32	33	34
		1	1.3428	1.01367	4.08488	1.04368	1.17282	1.49001	1.08358	1.30832	1.00402	1.62511
			1.08784	1.87325	1.28138	1.24588	2.15888	1.48838	2.7553	1.18284	2.88488	1.21803
			1.58725	1.12214	1.02871	2.20811	2.27645	2.55384	1.52851	1.57381	2.1886	2.04271
			1.74188	2.44368	3.08432	1.22285	1.43482	2.88788	1.48782	2.23135	1.57888	1.61884
			1.54551	1.05887	2.51148	4.24885	1.0878	1.18743	2.02883	1.22341	2.3238	1.03418
			1.4885	3.44083	1.82488	1.14183	1.01878	3.88822	1.45024	4.00058	1.35787	1.183
			2.27742	2.37488	1.14251	2.40881	1.88842	1.87874	2.58254	4.2858	1.38485	1.46882
			1.37435	3.38988	1.3348	2.58228	2.4881	4.05183	1.7588	2.8575	1.33111	1.71853
			1.3851	2.38841	2.0831	1.84253	2.85518	2.4848	1.13588	4.53451	1.23588	2.61818
		10	1.54828	2.3403	1.20888	1.52221	1.48728	1.58831	1.88822	1.25248	1.85514	2.25178
			1.71028	1.88818	2.58882	1.24387	1.12483	3.57887	1.55584	2.78288	1.0358	1.08488
			1.07371	1.10701	2.17315	1.25455	2.82887	1.2477	2.20758	2.84277	2.32852	1.78737
			1.38212	1.30318	3.48885	2.77823	1.17782	2.88888	1.35881	1.78217	1.20811	1.35855
			1.83478	2.88205	3.40221	4.84583	1.48131	3.88888	1.05784	1.83113	1.03183	1.47882
New observations k =			4.24884	1.43337	2.0201	2.08288	1.31558	5.18832	3.88813	1.45882	2.05818	1.8885
			1.48082	1.6318	2.04852	3.07242	1.72838	1.45837	3.01782	1.5883	1.87182	2.30881
			1.24883	2.27122	2.28382	1.87814	1.77243	1.88888	3.13283	1.24148	2.41847	2.88212
			1.28814	2.41187	1.12881	4.58583	3.01887	1.33825	1.24881	1.78878	2.88288	1.01888
			2.28735	2.82258	2.83818	1.34838	1.18381	1.65814	1.51828	2.4783	2.10842	1.40553
		20	4.12878	1.28758	2.81581	2.04757	4.34883	1.82725	1.50415	1.38725	2.31558	1.51215
			1.4578	2.88872	1.08883	2.70432	1.87524	1.20785	1.8851	1.34218	1.33884	1.87887
			1.54148	1.48443	1.34201	1.82334	1.88472	1.44275	2.03526	1.82487	1.57783	2.35888
			1.07078	1.48855	1.33102	1.37187	1.73817	0.7887	1.85485	1.35872	4.28588	2.55354
			1.38572	1.37583	4.08885	4.24887	2.58743	4.75523	1.84272	1.48728	1.88417	1.88422
			1.8484	1.3533	1.74831	1.38758	2.08823	1.4301	1.54463	1.20347	1.10003	1.21088
			2.05552	2.01838	1.78035	2.48583	2.3082	3.88885	3.93842	1.28211	1.08854	1.05815
			1.25882	2.18584	2.28368	1.25851	1.38788	1.18535	1.17884	1.85278	2.85183	2.57873
			1.22004	4.73735	1.88881	1.34472	1.64534	3.27044	1.17558	1.15528	1.14784	2.88844
			1.18718	2.20885	2.30883	1.03415	1.82085	1.78534	1.88882	1.30782	1.02147	1.42444
		30	1.32708	1.04823	1.41175	2.41882	1.0888	1.38484	1.83538	2.45421	1.71831	1.35558
Estimator shape parameter			1.852148	1.538884	1.012838	1.037782	0.854828	1.457358	1.332741	0.757123	0.884143	0.822723
			0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.501851	0.477812	1.307188	0.773123	0.887719	0.721888	0.818218	1.882538	1.38257	0.782838
Control chart constant d2			1.045788	1.03888	0.884174	0.887363	0.888612	1.034753	1.025887	0.854187	0.841348	0.882048
Control chart constant d3			0.847514	0.852805	0.888818	0.88738	0.888388	0.858854	0.863823	1.024388	1.035778	1.000258
Control chart constant D4			3.784074	3.888717	4.083187	4.075881	4.133828	3.843447	3.882737	4.283788	4.351632	4.157818
Upper contro limit X			2.573885	2.728783	5.828477	3.352842	3.541547	3.587582	4.884412	8.384184	4.258471	2.831187
Lower control limit X			-0.8163	-1.25883	-2.88888	-1.74741	-1.85535	-1.48388	-1.81881	-3.78887	-2.32819	-1.52378
Upper control limit MR			2.288838	2.828138	5.837575	3.454717	3.532882	3.374823	4.007581	8.888583	4.488248	3.031707
False alarm in X? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	1	0	1	1	1	0	0	0	0
False alarm in X? (Y=1/N=0)			0	1	0	1	0	1	0	0	1	0
Total false alarm in X			1	1	0	1	1	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	1	0	0	0	0
Total false alarm in MR			1	0	0	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =												
Sub-total MR control charts with at least one false alarm k 30 =												
Normal upper control limit X			2.448728	2.570888	5.1158	3.058728	3.215847	3.387055	3.822811	5.528718	3.7148	2.842955
Normal lower control limit X			-0.78812	-1.10088	-2.4701	-1.45208	-1.32885	-1.28354	-1.83821	-3.00823	-1.78132	-1.23555
Normal upper control limit MR			1.888058	2.255883	4.888718	2.770147	2.79288	2.888538	3.355775	5.244347	3.378882	2.382888
False alarm in X? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	1	0	1	1	1	1	0	0	1
False alarm in X? (Y=1/N=0)			0	1	0	1	0	1	1	0	1	1
Total false alarm in X			1	1	0	1	1	1	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	1	0	1	0	1	0	0	0	0
Total false alarm in MR			1	1	0	1	1	1	0	0	0	0
Sub-total normal X control charts with at least one false alarm k 30 =												
Sub-total normal MR control charts with at least one false alarm k 30 =												
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =												
Sub-total MR control charts with at least one false alarm k 1 =												
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =												
Sub-total MR control charts with at least one false alarm k 1 =												
False alarm in X? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =												
Sub-total MR control charts with at least one false alarm k 10 =												
False alarm in X? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =												
Sub-total MR control charts with at least one false alarm k 10 =												

OBJECTIVE # 3

Exponential (Mean=1)   k = 30 obs   SNR 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	3.75108	4.5844	2.38253	2.0856	2.30883	4.10735	3.78855	2.93898	2.89198	2.88388	3.76108	2.23131	2.11547	3.08035	2.23187	7.38840	2.43331	2.70440	2.47087	2.00202	3.4852	8.06887	2.88511	2.27723	3.38811	4.88888	2.95881	3.17758	3.18483	3.01588	3.12784
			8.41182	3.10967	2.80500	2.3077	4.62480	2.2481	2.5034	3.10577	2.07587	2.58481	2.25057	2.00078	2.87128	3.28134	2.28815	2.90551	2.88315	2.34854	2.58808	2.10778	4.14412	2.50817	2.78872	2.58723	2.0755	4.08814	2.37412	2.03454	2.81717	2.13242	2.21488
			2.25837	2.69227	2.51870	3.4027	2.51187	2.2858	2.18458	2.34195	2.04887	2.55626	2.74611	2.40884	2.21525	2.31401	2.5855	4.19888	2.1888	3.20788	2.84298	4.85277	2.28888	2.16314	2.00388	2.25385	2.41888	2.27782	2.3884	3.78327	2.88878	2.45382	2.29428
			2.15423	2.38373	3.21426	2.7198	2.48930	2.01448	2.31057	2.33075	2.05877	3.88497	2.58718	4.17741	3.45388	2.02718	2.20588	2.30072	2.43889	4.23311	4.85198	4.82881	4.85338	3.49283	2.38888	2.57378	2.48541	3.58107	2.23183	2.17055	4.82837	3.58488	2.32227
			3.34005	2.48585	2.30726	2.0871	2.04084	3.31135	2.40837	2.57424	5.91333	2.29573	3.08852	2.13085	2.88741	2.1124	3.08581	4.71917	2.15578	2.38384	2.88077	2.1843	2.178	2.0884	4.87351	2.35188	2.04838	3.17475	3.05303	2.88131	2.00188	3.33784	2.18483
			3.02808	2.27888	3.88827	3.3887	3.00127	2.21988	2.02748	2.81261	2.0798	3.27715	2.59053	2.81828	2.93388	3.91128	2.88821	2.82788	3.19178	2.38387	2.00611	2.78378	2.2352	2.06575	2.04711	3.82421	2.38855	2.14727	4.88831	3.03482	3.84388	5.38872	3.71088
			3.32388	2.12474	2.44885	2.5188	2.4173	2.50771	2.47888	3.88371	2.83473	2.2191	3.72828	2.84887	2.283	3.72153	2.78782	2.21881	4.1822	3.88873	3.87273	2.43758	5.58557	2.04478	2.44221	3.15522	2.88054	2.03438	2.5138	2.88187	2.78151	2.01828	3.07718
			3.17581	3.48358	8.5248	2.3923	2.7738	2.01355	3.88103	2.81273	2.05517	2.04827	2.31837	2.1145	3.27213	2.82782	2.25886	2.3372	2.72777	2.481	2.83852	2.48145	2.29282	2.7718	2.15823	4.84578	2.32087	3.02862	2.23384	2.38287	2.77713	3.38174	5.88888
			2.48416	2.02821	2.88807	5.7516	2.04352	5.68008	3.48775	3.02483	2.20585	2.80832	6.02173	2.35383	2.82933	2.28743	3.37485	2.04485	2.04198	2.72888	3.75848	2.08882	2.98443	3.3448	2.38388	4.87742	2.2248	2.28881	8.02833	2.81794	2.78528	3.44858	2.87218
		10	2.28308	2.61838	2.95858	2.1427	2.84217	4.49321	2.1074	3.53037	2.03711	3.71888	3.82453	4.52025	3.47342	5.34875	2.32888	2.5873	3.18788	3.87883	2.74012	3.38875	2.41876	2.40035	2.72284	2.45837	2.88837	2.20481	2.15478	3.24888	2.78525	2.41181	2.72815
			3.39805	3.85184	2.83947	2.7008	5.76842	3.47874	2.32549	3.68316	3.51378	2.20864	2.07031	5.64305	2.22753	2.57324	4.24123	5.11838	2.17828	2.81127	2.72788	3.50877	2.30495	2.22878	3.58828	2.48847	2.87551	2.88883	3.7328	2.51412	2.24188	3.01881	2.00378
			2.6881	5.44287	2.51537	2.7885	2.02145	3.40094	3.86	3.1832	2.43147	3.38807	2.01149	2.35488	2.81475	2.28817	2.55427	2.87444	3.01185	3.81248	2.37172	3.00285	2.13871	2.00808	2.18181	2.08871	2.1841	3.88838	2.08818	4.83217	2.43122	2.08849	2.8542
			3.80774	4.25312	3.35316	2.8878	4.40862	2.08953	2.42111	2.01827	4.41847	2.02887	3.41702	2.58551	3.24855	2.02851	5.08812	2.88848	3.28854	2.48885	2.38488	2.04887	2.43828	3.11427	2.13838	4.52778	2.88048	2.08822	3.47115	2.83887	2.74181	2.48382	2.0882
			2.11805	2.58926	3.18072	2.0837	2.34508	2.80188	2.88844	2.27243	4.3438	2.34357	3.63531	4.08427	3.77382	2.33845	2.23553	2.38836	3.63888	2.88104	2.84888	5.20887	2.90238	2.78788	2.48118	8.07753	2.77558	2.83387	2.70312	3.07888	2.87307	2.55543	2.33858
New observations k =			2.19884	3.38058	2.39848	2.9227	2.47883	2.88215	7.51008	3.28178	2.53788	2.17034	2.88031	2.08454	2.23485	2.41182	2.28587	2.31488	3.57788	2.01738	2.17783	2.1788	3.30335	2.10327	2.75318	2.98882	2.48458	2.47215	2.15823	2.88174	2.1888	2.35004	2.07888
			3.08388	3.13808	3.24125	2.9182	2.08071	4.38088	2.48787	4.11497	2.38443	2.25871	6.80573	2.18882	3.40831	2.04151	2.48783	2.16452	8.5158	2.48421	2.80148	3.5828	3.64333	2.9838	2.57522	2.34588	2.71514	2.71782	2.82818	2.28883	2.98712	2.88488	3.78284
			2.80145	4.15895	3.49143	5.1822	2.1838	2.38882	2.0305	2.48152	2.11882	2.19127	2.45878	2.97442	2.88174	2.58122	3.32077	2.27881	3.23734	8.70418	2.83187	6.15318	2.07418	3.08151	2.35878	2.02818	2.20813	4.42878	3.42349	2.88735	2.38858	2.78843	2.48718
			2.40723	2.88554	2.15872	2.4375	2.78111	2.20257	3.80187	2.74088	4.55218	2.30333	2.65882	2.55758	3.1481	2.08127	4.45824	2.41714	2.55348	3.73838	2.28582	2.98521	2.11428	8.71583	2.34487	3.8488	2.53877	2.35133	5.8583	2.40334	2.89384	3.84383	2.48938
			2.88847	2.8881	2.18841	2.8186	3.88352	2.58808	3.8331	2.88832	3.81881	4.17855	2.68977	2.083	2.32551	2.87884	3.07249	2.70307	2.81134	3.71881	3.47857	3.538	2.17888	2.37307	2.52327	5.11377	2.40003	2.87788	3.20438	4.47888	3.48572	2.15888	2.84727
		20	3.12514	2.78787	2.58808	2.8201	8.14014	2.85782	2.23081	3.27858	3.30458	2.87103	2.48105	3.77458	2.18355	5.28881	2.51248	3.518	2.38364	2.25108	2.41274	3.88388	2.18873	8.81888	3.37002	2.88852	2.4851	2.32182	2.05011	2.30388	2.28788	2.88781	2.27258
			2.12758	2.49578	2.41017	2.1758	2.8254	2.30312	2.84114	4.08821	3.5823	8.54114	3.18447	4.27881	2.78832	3.07377	2.35816	4.42715	5.78883	2.27188	2.45881	2.33818	3.72247	2.18187	2.41185	2.00084	3.48178	2.83352	2.58122	2.53638	4.13538	3.03888	2.04783
			2.41531	2.01834	2.48333	2.5451	2.84178	3.88889	2.03283	2.88872	3.45885	2.38127	2.33872	2.0484	3.51787	2.51492	2.73187	2.38837	2.37288	2.11334	2.88487	2.14198	2.22034	2.49821	3.48582	2.5077	2.88388	2.33884	2.28383	2.84817	2.02588	2.53285	3.01832
			2.88727	3.83888	3.88882	3.5884	2.57583	2.85192	2.88711	3.58538	6.18677	3.21831	2.54878	2.47786	2.91858	3.33785	3.83158	2.8105	3.13885	2.21388	4.52785	2.40848	2.18881	2.77152	2.30328	3.76885	4.88287	2.21488	3.78878	2.1818	2.21228	2.52887	3.21351
			2.44428	3.838	2.54888	2.0354	3.82032	2.77882	3.852	3.24188	3.58814	2.47382	2.21855	4.83338	3.44074	2.28583	4.01885	3.17437	2.82842	2.74887	2.04881	2.4888	4.38888	3.53507	8.85353	2.88882	2.45847	4.18878	2.45841	2.8821	3.44184	2.32854	2.82248
			2.38283	3.88944	3.28558	2.8885	3.64887	2.86188	3.15888	2.53412	5.45276	2.0783	2.78885	3.02778	7.42258	2.14888	2.4288	4.01883	3.03388	4.38783	4.43848	3.83878	4.82437	2.82543	2.72483	3.85284	3.154	2.22821	2.4487	2.22823	2.02887	2.88887	5.84072
			5.81584	2.28284	3.15153	4.8375	2.82891	5.87754	4.4118	4.28548	4.07518	2.58877	2.40114	4.0538	2.88278	2.1338	2.27721	4.58888	3.0888	4.82348	3.48885	2.11143	2.40421	2.58307	3.20285	2.28282	2.78388	2.18782	2.88277	2.03282	2.12178	2.85125	2.48895
			4.38853	2.78816	3.45578	2.0437	2.82884	2.78875	2.7888	2.38548	2.68885	3.83815	2.81394	2.95234	2.18285	3.7528	2.78881	3.53585	3.40144	2.04448	2.03148	2.98863	2.18248	2.83848	3.47378	2.05882	2.07185	2.0211	2.25284	2.18584	3.24877	2.78128	3.85344
			2.58517	2.49121	2.58188	2.8838	2.27887	8.88883	2.51958	2.05887	2.78748	3.28848	2.33813	3.40304	2.57488	3.84888	3.82788	2.87107	2.74041	2.82428	2.44243	3.48247	3.75888	2.02885	2.82818	2.82281	2.88874	2.51077	2.53582	4.30388	2.33388	8.38282	2.23287
			2.25844	2.44927	2.37882	2.4382	2.03825	2.39778	2.29481	4.35853	3.25611	2.73828	2.82278	2.38121	2.14405	2.83587	2.48814	2.42581	2.18838	2.85728	2.58853	4.73878	2.70488	2.27784	4.17458	2.10432	2.19415	2.34458	2.18888	4.3988	2.18887	2.45544	2.78324
		30	7.01271	2.88858	2.02881	2.788	2.88481	2.77388	4.8347	3.11101	3.48288	2.20547	2.35348	2.8817	2.12488	2.87883	2.8847	2.84578	3.85882	2.22778	5.37071	3.87587	2.83583	2.44228	3.88828	2.50433	2.40022	5.4833	4.21183	3.61001	2.58014	3.27188	3.81318
Estimator shape parameter			1.281844	1.174448	0.822183	1.028342	0.812885	1.148585	1.038437	0.713852	0.783215	0.882498	0.811449	0.771341	0.774881	1.088671	2.118488	1.281288	1.887433	1.745281	0.83857	1.224561	1.181838	1.852148	1.538884	1.012838	1.037782	0.854828	1.457358	1.332741	0.767123	0.884143	0.922723
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.080448	0.74980	1.084388	0.738818	1.112287	0.74482	1.007342	1.488324	1.315785	1.107878	1.835774	1.478852	1.710836	1.133182	0.283874	0.828835	0.788884	0.527228	1.338427	0.783581	0.988548	0.581851	0.477812	1.387188	0.773123	0.887718	0.721888	0.818218	1.882538	1.38257	0.782838
Control chart constant d2			1.020222	1.012227	0.988087	0.985858	0.984488	1.008447	0.887555	0.945478	0.988841	0.878848	0.884188	0.958888	0.857548	1.000083	1.083841	1.014794	1.003132	1.058188	0.984848	1.018934	1.018883	1.045798	1.03888	0.984174	0.887353	0.988812	1.034753	1.025887	0.854187	0.941348	0.982048
Control chart constant d3			0.988508	0.875051	1.013888	0.988525	1.015388	0.877338	0.987181	1.032088	1.018463	1.002818	1.015823	1.022886	1.021435	0.885101	0.831587	0.872848	0.882553	0.8438	0.888561	0.871184	0.878888	0.947514	0.952885	0.988818	0.98738	0.988388	0.958854	0.983823	1.024388	1.035778	1.000258
Control chart constant D4			3.939784	3.989287	4.237728	4.083352	4.245424	4.005838	4.074471	4.33333	4.28224	4.173258	4.248718	4.281231	4.278188	4.080378	3.624888	3.873628	4.042878	3.731117	4.147421	3.880413	3.988878	3.784074	3.888717	4.083187	4.075881	4.133928	3.843447	3.882737	4.283798	4.351832	4.157818
Upper contro limit X			4.875843	3.18291	3.87157	2.9888	3.878785	3.033758	3.835173	5.885812	4.748858	4.18477	8.83838	4.847077	8.388188	4.888817	1.848285	3.578421	2.888212	2.848578	5.281073	3.848551	3.812783	2.573885	2.726763	5.828477	3.352842	3.541547	3.587582	4.884412	8.384184	4.258471	2.831187
Lower control limit X			-1.84882	-1.43187	-2.22138	-1.44818	-2.17838	-1.32578	-1.84184	-2.88274	-2.85348	-2.18488	-4.1847	-2.38887	-3.73831	-2.48332	-0.44248	-1.58288	-1.13882	-0.88824	-2.78481	-1.77848	-1.78858	-0.8183	-1.25883	-2.88888	-1.74741	-1.65535	-1.48388	-1.81881	-3.78887	-2.32818	-1.52378
Upper control limit MR			4.438122	3.112574	4.225588	2.882511	4.18838	2.838158	3.812888	5.475273	5.04758	4.33753	7.523355	4.78851	8.811288	4.878887	1.34222	3.487281	2.783188	2.258785	5.482744	3.848181	3.848833	2.288838	2.628138	5.837578	3.454717	3.532882	3.374823	4.887581	8.888583	4.488248	3.831787
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	0	0	1	0	0	0	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	0	1	1
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	1	0	0	0	0	1	0	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	0	0	1
False alarm in X? (Y=1/N=0)			1	1	0	1	0	1	1	0	1	1	0	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1
Total false alarm in X			1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	1
Total false alarm in MR			1	1	0	1	0	1	1	0	0	1	0	0	0	0	1	1	1	1	0	0	0	1	1	0	0	1	1	0	0	0	1
Sub-total X control charts with at least one false alarm k 30 =							225																										
Sub-total MR control charts with at least one false alarm k 30 =							89																										
Normal upper control limit X			4.358443	2.95557	3.527048	2.708384	3.533058	2.884888	3.001185	4.418877	4.183298	3.764208	8.038888	4.11485	5.821378	4.388828	1.588618	3.317538	2.848863	2.53025	4.775808	3.37857	3.818381	2.448728	2.570888	5.1158	3.058728	3.215847	3.387056	3.822811	5.528718	3.7148	2.842956
Normal lower control limit X			-1.83252	-1.19483	-1.77883	-1.18878	-1.72484	-1.08887	-1.50705	-2.304	-2.10583	-1.78432	-3.38427	-1.83885	-2.8715	-1.88443	-0.38281	-1.32378	-0.88857	-0.88882	-2.28874	-1.58848	-1.50324	-0.78812	-1.10098	-2.4701	-1.45208	-1.32865	-1.28354	-1.83821	-3.00823	-1.78132	-1.23556
Normal upper control limit MR			3.881385	2.548814	3.258821	2.384875	3.230248	2.388817	3.138417	4.128201	3.870148	3.388837	5.788487	3.858748	5.27833	3.827424	1.210845	2.851552	2.185815	1.878418	4.32808	3.003755	3.1454	1.888854	2.255883	4.880718	2.770147	2.79288	2.888538	3.355775	5.244347	3.378882	2.382888
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	1	0	0	1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	0	1	1
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1
Total false alarm in X			1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1
False alarm in MR? (Y=1/N=0)			1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	1	0	1	1	1	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	1	1	0	0	0	1	0	0	0	0	1	0	1	1	0	0	0	1	1	0	0	1	0	0	0	1	1
Total false alarm in MR			1	1	1	1	1	1	1	0	0	1	0	0	0	0	1	1	1	1	0	1	1	1	1	0	1	1	1	0	0	1	1
Sub-total normal X control charts with at least one false alarm k 30 =							238																										
Sub-total normal MR control charts with at least one false alarm k 30 =							147																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							43																										
Sub-total MR control charts with at least one false alarm k 1 =							23																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	1	0	0	0	1	1	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	1	0	1	1	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 1 =							58																										
Sub-total MR control charts with at least one false alarm k 1 =							47																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	0	0	1	0	0	0	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							175																										
Sub-total MR control charts with at least one false alarm k 10 =							51																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	1	0	0	1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	1	0	1	1	1	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							203																										
Sub-total MR control charts with at least one false alarm k 10 =							91																										

OBJECTIVE # 3

EXPONENTIAL (Mean = 1)   k = 50 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			0.0638	0.58084	0.12802	0.10611	0.38023	0.86537	1.81734	2.02867	1.67086	1.77852	0.31311	0.92084	1.56516	0.01674	0.56732	1.01920	1.00498	2.18328	3.03182	1.47827	3.38341	1.05187	0.20548	1.30088	0.30084	1.11956	1.30846	0.48411	0.08200	0.58535	0.47758
			0.58088	0.33243	0.18219	0.8054	0.18187	0.28629	0.03431	0.95186	0.28515	1.857	1.31486	1.43789	0.38182	0.76568	1.27402	0.38409	3.08682	1.13979	1.1208	3.8406	0.61361	0.53088	0.12161	0.03555	0.18864	0.38567	2.80978	0.78608	0.65869	2.82523	1.74871
			0.10897	2.08149	0.28318	1.48215	0.26986	1.83281	0.1711	0.18656	0.17132	0.72029	0.82041	0.36112	1.87316	1.18701	0.7166	1.4378	0.02262	0.09609	0.50233	0.98856	2.49211	0.13511	1.60023	0.04412	0.37349	0.24137	0.33913	0.18218	3.03814	0.51148	1.81072
			0.4188	0.26928	0.44473	0.70188	0.32078	0.55744	2.57112	0.63144	4.28372	0.87027	0.88203	0.17456	0.0787	0.14538	0.28335	0.75882	0.81845	0.49532	3.03401	0.2842	0.63336	0.36291	0.04283	0.38136	0.03028	0.83873	2.0478	0.20701	0.70788	1.81142	0.98874
			0.86438	0.33081	2.02882	2.04242	1.40761	1.00181	0.73858	1.18432	0.3708	0.2381	1.70488	1.58838	0.08417	0.28716	0.28792	0.34721	0.76348	0.20528	0.63742	0.12464	0.33536	0.22214	0.42388	1.80385	0.28553	0.30742	0.2247	1.02638	2.69868	0.83347	0.43118
			0.3176	0.1898	0.57434	1.64307	0.24988	1.98087	0.25033	0.9497	0.84817	1.38057	0.43687	1.58271	0.28626	0.48836	0.38814	1.9012	0.83498	1.82077	0.30254	0.00841	1.34778	0.86093	0.22183	0.34418	0.43367	1.86607	2.01221	1.17798	1.33488	0.46435	0.96082
			1.67864	1.00658	0.89434	0.20124	0.82488	0.62387	0.40931	0.32836	1.36421	0.09311	0.78238	0.58874	0.74104	4.8701	0.75733	0.87825	0.20881	1.07228	0.28012	0.7368	0.98148	2.57854	1.49738	0.81683	0.49282	0.47631	0.30186	1.41203	0.13078	0.20086	0.28078
			1.76776	0.07698	1.22898	0.62846	0.13747	0.30778	0.48767	1.93388	0.48748	0.37308	0.25884	0.62106	2.80901	1.96245	0.10896	1.136	0.74018	0.78119	1.48384	0.87878	1.28078	1.64573	1.74736	0.11005	0.48451	0.93885	0.80063	2.90556	1.85563	0.1232	0.33889
			0.98208	0.9802	0.89605	0.34859	0.08809	1.08628	0.07982	1.28009	1.38121	0.80812	1.43727	0.28082	1.34228	0.86434	0.8708	0.80409	2.78143	0.06494	0.34782	0.10884	2.49877	0.376	1.021	0.28852	0.11706	1.12283	0.88151	0.71688	0.48706	0.47484	0.87664
			0.03982	0.1788	3.44428	2.86115	0.0867	0.24043	0.17637	0.14024	1.79238	0.10727	2.30614	0.78463	0.8882	2.48837	0.29227	0.16831	0.63908	0.42258	1.30883	1.81887	1.24768	0.4573	1.86248	0.85882	1.1921	1.63588	0.4168	0.81017	1.32834	1.43234	1.74821
			1.80712	0.38476	0.16131	0.35637	1.50938	0.32048	0.80357	0.20706	0.89594	0.24608	1.27402	0.20163	0.4579	1.84834	0.98265	3.64834	2.37784	0.78988	0.15838	1.52814	1.51278	1.081	1.88122	0.37477	1.33892	0.16456	0.63508	0.07775	0.72108	0.83098	1.78678
			0.06206	0.2631	0.67098	0.78187	0.89134	3.84013	0.57846	0.88346	1.20873	0.21881	0.84865	0.12184	0.66242	1.06307	0.98548	2.36463	1.68488	0.19818	2.80243	1.20008	0.0217	4.81882	0.30723	2.57786	2.22616	1.71748	0.73803	1.14983	2.84708	2.8388	0.63182
			0.08934	0.27898	0.44231	0.28952	0.26811	1.48073	0.56172	0.6831	2.446	0.53198	1.80237	0.48644	0.28866	0.46723	0.88374	0.99874	0.78344	0.38181	0.18541	1.2988	0.36184	0.61783	0.33238	0.18811	1.01786	1.67648	2.26503	6.70418	0.01772	2.38847	0.22201
			0.30834	0.01298	0.23646	0.17683	2.98024	4.13404	3.48617	0.2828	0.48231	0.80562	0.84103	1.06811	0.28892	3.18834	0.00414	0.00738	0.6413	0.07387	2.50281	1.03206	0.11104	0.0158	3.71907	1.08864	1.02632	1.08768	0.89138	2.03817	0.38354	0.0188	0.25288
			0.80866	1.83445	3.02092	3.11061	2.23381	4.26887	0.10887	1.88542	2.28881	2.31634	3.82011	3.08886	1.28178	0.07717	0.58717	1.57498	1.59848	1.58943	1.40763	1.12886	0.8378	0.86471	0.67098	0.04004	0.11443	3.2141	0.95258	2.38889	0.86048	1.36416	1.11922
			1.34168	1.31524	1.26802	0.3387	0.0373	0.70081	0.31348	0.76242	0.8208	0.23881	1.81082	1.68764	0.8257	0.11618	0.06128	1.64247	1.14731	0.48208	0.23751	2.19508	2.3828	1.80498	0.10827	1.57006	0.21806	0.64813	1.07858	0.03431	0.62888	3.01583	0.8038
			0.61376	2.20811	0.01384	0.38467	1.61171	0.1288	0.81333	1.22477	0.18748	3.81142	0.01112	0.23814	0.10498	1.87482	2.54808	0.08519	0.38248	0.80361	0.20886	0.38847	2.05788	0.82748	1.37786	1.38486	1.1863	0.81037	2.01584	0.04311	0.81717	0.75676	1.55583
			0.22372	2.86226	0.11428	1.77786	0.21684	4.30646	0.06465	0.83048	0.47576	1.84432	2.27328	2.00438	0.47408	0.80286	1.96372	0.00108	0.29448	0.2234	1.41176	1.08114	3.83273	0.98857	0.45712	3.46523	1.45976	1.3804	1.23416	0.38848	0.34382	3.40566	0.21886
			0.17687	0.48323	1.2443	3.43087	4.87683	0.8307	0.22078	1.66302	1.08507	0.27258	2.16612	0.79802	0.341	0.88728	1.73384	0.28844	3.91481	0.49019	0.41918	2.00881	0.28188	0.72888	1.03786	1.28448	1.67253	0.05781	1.68483	0.04184	1.17782	0.17637	0.07676
			0.85918	1.74832	2.87857	0.62727	1.12842	0.15628	1.70228	0.32046	0.88772	0.36888	0.3058	0.11381	0.08098	1.88195	0.52872	0.43078	3.18018	0.18136	0.16867	0.12738	0.58183	2.89038	2.08401	0.36132	0.41804	2.17138	0.12284	0.73808	0.08478	1.484	0.02872
			0.33023	1.28001	1.85821	1.61283	0.83334	0.88887	0.51891	0.81838	0.13366	0.20377	2.83813	0.5737	3.3862	2.01838	1.21041	0.73187	2.13838	0.89568	0.13662	0.34201	0.38858	0.18537	1.28187	2.84581	0.05808	0.82786	0.88182	0.41223	0.38831	2.28178	0.3068
			0.74784	1.1046	0.17306	0.08128	0.04102	0.26488	0.14646	0.32586	0.35438	2.40827	0.11651	0.88838	1.73024	1.71106	0.48232	0.08781	5.32878	1.06764	0.22978	6.15408	3.21088	0.22488	0.87204	1.38474	0.61382	1.27862	0.28133	0.24868	0.21812	0.1886	0.7643
			2.3228	1.23181	0.0314	0.65384	0.1083	1.08663	0.78784	1.10738	1.78844	0.00119	1.13878	0.63686	2.83437	0.82741	0.86563	0.1786	2.70228	3.98478	2.38518	0.27833	0.03873	0.38844	0.18883	1.29803	1.20486	2.19862	0.30381	0.103	0.59678	0.44882	1.20331
			0.49686	0.82237	1.00131	0.88688	1.28208	1.06266	2.54035	0.10724	2.16024	0.08782	0.48841	0.61148	0.04783	0.62267	1.68828	2.48718	0.38958	4.68263	0.28788	0.08488	0.02813	0.72843	1.80089	1.43836	1.31218	0.80708	0.15484	1.10887	0.40832	0.48137	2.80088
			1.34836	1.08585	1.48227	0.33768	0.4834	0.37612	0.48643	1.14728	0.18838	0.19757	1.47346	0.98558	1.2483	0.14988	0.78188	0.72827	0.48058	0.48841	0.381	0.18538	4.12201	0.85181	0.10342	0.04888	0.83302	1.38323	1.48748	1.99034	0.01252	0.10871	0.15802
			1.32254	0.14237	0.14478	1.06103	0.40837	1.01028	0.24837	0.82884	4.88641	0.4342	1.62106	0.20888	0.1988	0.37347	1.48543	0.7778	0.45258	0.0804	0.87088	0.84821	0.44728	0.19888	0.73623	1.74134	0.781	0.54854	1.98801	0.25298	2.19314	0.07063	2.28584
			1.78874	2.72382	0.6844	0.38016	0.87618	2.61854	0.88882	0.62381	1.28124	0.10338	0.24048	2.82797	0.70224	2.80728	0.04884	1.85882	0.00375	0.63748	0.86878	1.8502	1.04083	0.28836	1.72134	0.33088	0.58873	1.28888	1.36082	2.0801	0.80688	0.13849	3.08496
			1.7143	1.61407	0.14034	2.38926	0.03833	1.7819	0.23728	0.5783	0.80887	0.48464	4.56694	0.76138	0.26206	3.06674	0.277	1.31888	1.3488	1.29104	0.80702	0.8408	1.78118	1.04122	0.10688	6.18871	1.85778	0.36215	3.81488	0.25886	0.61898	1.10113	0.86727
			0.40813	0.26898	0.00433	0.0188	0.2032	0.68478	0.22884	0.8212	0.03328	0.85834	1.8813	0.16305	2.24473	0.81464	0.08489	2.30433	0.38887	0.24828	0.84224	2.78388	0.11638	4.74118	0.23227	0.28114	0.78828	0.01442	0.80148	0.01872	1.78148	0.13467	0.50611
			2.16531	0.68114	1.08376	0.88377	0.17486	2.88284	0.03833	0.82882	0.00718	0.28582	1.34328	2.02684	1.43883	0.43884	0.49264	0.1381	0.12783	1.41728	0.88878	0.38818	2.38881	1.2226	0.2188	0.88082	1.35884	0.73622	1.48844	0.10458	0.78818	1.28813	0.22813
			0.48809	1.222	1.22832	0.10891	1.18718	0.80713	0.42118	0.47701	0.04808	0.28048	0.88073	0.33612	1.78886	0.40313	3.18453	0.08383	2.34886	0.68011	0.08872	0.8886	0.04328	0.37328	0.17832	1.38824	1.74271	0.80728	0.30435	1.33003	1.91081	0.08658	0.72862
			0.4336	1.7407	0.12017	1.8941	0.81886	1.67388	1.30081	0.43761	0.10743	2.61072	1.23832	1.82898	0.15872	2.20837	0.22862	0.12383	5.37851	1.80186	0.23151	0.27648	1.17388	0.86836	0.12733	0.82486	2.48367	0.72888	0.2077	0.18241	2.02421	0.12838	1.63788
			0.27348	0.81428	0.70786	0.83801	0.63618	2.84808	0.0436	0.34882	1.38723	0.30083	0.37118	0.32318	1.44478	1.12873	0.66898	0.14582	1.6344	0.03478	1.58776	1.94882	0.02858	0.19807	1.2082	0.98823	1.20022	1.34284	0.48548	1.10881	2.43671	0.38216	0.47028
			4.22726	2.14002	0.41158	0.41548	0.83908	0.82984	0.45461	0.81488	0.47714	1.22833	0.43188	0.80617	0.5842	0.48441	0.18481	2.33186	1.6388	0.66372	0.13462	2.38484	0.28336	1.83761	0.11716	1.46186	0.44248	3.07774	0.87288	3.95078	0.44813	0.46302	1.11366
			0.83036	0.02388	1.64421	0.38008	0.42281	2.31784	0.21137	3.23788	0.68803	0.3827	1.63718	0.9804	0.04288	0.81447	0.00713	0.46248	0.04441	4.27288	0.882	0.17881	0.17432	0.67364	2.61726	3.28861	0.6817	0.24843	1.43488	0.10617	0.26058	0.2567	0.48853
			0.33758	0.26421	0.3858	4.10803	0.88726	0.88912	1.29076	0.00613	1.18486	1.2887	1.48188	0.26118	1.83188	0.24188	0.10842	0.41488	1.07484	3.34487	0.13138	4.11886	0.08577	0.10127	0.84853	0.77831	0.38488	1.37118	2.0288	2.08377	0.80826	1.24432	0.44934
			2.73288	0.63364	0.38763	0.75811	1.15474	1.20138	0.0787	0.08877	1.2761	0.14181	0.03288	0.6231	0.56673	0.07301	2.04278	0.38828	0.68778	0.78884	1.58781	1.22438	1.67288	0.62108	0.45714	1.88018	0.64113	1.79847	1.18273	6.37882	0.18048	0.18108	0.02488
			1.16181	1.38084	1.37033	1.40788	0.74224	0.26678	1.00431	1.38294	1.04043	0.25486	1.87074	0.08888	0.08088	0.87277	0.17807	1.24748	0.80422	0.58784	3.88862	0.11318	3.22488	0.12578	0.00822	0.18088	0.88283	0.88888	1.3124	0.08307	0.87822	0.38182	1.18086
			0.00456	1.78269	0.42882	1.87088	1.33988	2.12881	0.82561	1.61701	1.33068	1.9628	0.45827	1.21884	0.23741	4.04728	0.08682	1.78021	0.03628	0.12711	0.03484	1.80721	0.88284	0.43872	0.84827	0.03811	4.48846	2.8307	0.4148	0.03224	1.24145	1.03808	0.1887
			2.78138	0.07131	0.72404	0.07878	1.00814	0.65871	0.87648	1.88613	0.38684	1.23284	1.76487	1.20188	0.31028	0.17881	2.21887	3.17886	1.18236	0.01008	1.1228	0.28884	1.84281	1.62087	1.4283	1.17847	1.6288	0.74838	1.28383	1.82862	0.22832	2.41588	0.38481
			0.78158	0.47843	0.67808	0.08184	0.85108	3.87732	1.07461	0.78537	0.93948	0.98718	1.02027	0.74348	0.22862	0.24881	3.22273	0.33847	0.41778	1.80387	0.08243	1.47588	0.82338	0.98888	0.47488	0.81022	1.16286	1.7811	0.48133	0.63158	2.28215	0.84118	2.08888
			0.74373	0.70328	1.88216	1.48828	0.28387	2.23281	0.64814	1.13507	0.38818	0.21777	1.80728	0.07282	1.87815	0.48411	2.28884	1.88884	2.22408	0.41628	0.18847	0.23364	0.38728	0.18372	0.8772	0.08188	1.3802	0.15687	0.22868	0.45381	0.60432	0.88824	0.38484
			1.75752	4.42784	0.1368	1.73218	0.48828	0.04686	2.00886	0.3487	2.18888	0.56341	0.20818	1.27288	0.68854	1.28888	0.34183	0.78682	0.28893	0.33441	1.31884	1.16313	2.88017	0.27348	0.19821	2.84473	1.5828	0.60662	0.70878	2.02872	1.43282	2.0301	0.31288
			1.46218	0.83233	0.13889	0.06342	1.40213	0.38888	0.83594	0.78182	0.37843	3.40883	0.38326	0.78867	0.88147	0.08281	0.13628	1.87238	1.861	0.0887	0.08346	2.88108	0.73616	0.04421	0.48833	0.13176	2.73867	0.2348	0.60272	1.16898	0.012	1.07818	0.11846
			0.4878	4.18323	0.28184	0.28886	0.28848	0.40881	0.38714	1.26863	7.98761	0.41788	0.34532	3.08838	1.74126	1.13638	0.87676	0.84924	0.34788	0.84842	0.47813	0.52768	1.88528	0.32888	2.34844	0.18802	1.18681	2.82408	3.67888	0.64187	0.08282	1.88883	2.81088
			0.6648	0.23362	0.23078	4.08814	0.4821	1.88231	0.80682	0.07888	0.18348	0.87124	0.13637	0.81684	0.18588	2.44187	1.28854	0.88318	1.07137	0.14423	0.13788	0.62743	0.76428	0.48287	0.06188	0.27361	0.71703	1.14071	0.40728	0.10877	0.7488	1.36262	0.6988
			0.1482	1.26818	6.69884	3.82882	1.18728	0.34868	0.52845	2.02481	3.08678	0.12738	0.45878	2.20311	0.84838	2.61483	0.02888	2.86133	0.83143	0.11112	1.28382	0.82658	0.38888	1.31884	0.45867	0.31183	0.27883	1.88483	0.31344	0.42813	1.84008	0.02501	0.34846
			2.7111	3.12824	0.79874	0.12377	0.42161	0.18782	0.64774	0.14324	0.88752	0.00408	0.44358	2.3672	0.81012	1.30622	0.88888	0.63748	0.15888	3.08828	0.74412	0.78388	2.03811	2.84842	2.78842	0.2888	0.66341	0.88427	0.31658	0.88368	0.04278	0.78308	0.14848
			3.37688	0.00068	0.24487	1.30607	0.03048	2.24213	0.03247	1.23388	1.28015	0.87483	0.12547	1.03861	0.78658	0.34881	1.82688	0.2618	0.01888	0.28882	0.64317	0.78187	0.86442	0.18883	0.38767	0.62186	0.06742	1.68083	0.04624	0.13388	0.17672	0.8288	0.21174
			1.20418	2.07238	1.03443	0.15014	0.80182	1.3686	1.08078	0.50083	1.25874	0.60738	1.13332	0.24081	0.65898	0.88174	0.88411	0.62268	0.58037	0.82888	0.02315	0.04281	0.73802	0.12022	0.45648	0.47678	0.14821	0.00786	0.68478	1.64387	0.23602	0.83114	1.34173
Average			1.06283	1.08714	0.89887	1.10888	0.77808	1.33738	0.7118	0.86081	1.22147	0.83848	1.13733	1.0886	0.88821	1.17228	0.8484	1.01048	1.28508	0.8666	1.02888	1.13678	1.20761	0.81363	0.87776	1.04418	0.95888	1.08868	1.03884	1.06728	0.82808	0.88368	0.8676
Moving range average			0.9957	1.14508	0.89322	1.28024	0.77936	1.3196	0.76248	0.7416	1.37466	0.82208	1.06272	1.06178	0.87586	1.01834	0.83271	0.84862	1.17117	0.98483	1.28813	1.2007	1.32611	0.94881	0.87747	1.20266	0.68606	1.04588	0.81147	1.18547	0.98583	0.9472	0.78018
T statistic			1.82672	1.60626	1.49352	1.66412	1.86482	2.28083	1.88724	2.62338	1.6743	1.71886	2.2081	2.13886	1.83408	2.11606	1.44122	1.82418	1.48384	1.48133	1.44877	1.77182	1.58262	1.82218	1.74882	1.63711	2.43313	2.31581	2.74238	1.2842	1.71833	1.81704	2.13208
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.219	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.278	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.398	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.462	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.618	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.77192	0	0	0
31	1.3	0.776	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0.87583	0	0	0	0	0	0	0	0	0	0	0	0.84843	0	0.87065	0.88929	0.85236	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.879	0	0.88173	0	0.80714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.81156	0	0	0.8863	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0.96984	0	0	0	0	0	0	0.94358	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	0	0	0	0	0	0	0	0.88181	0	0	0	0	0	0	0	0	0	1.02036	0	0	1.00736	0	0	0	0	0	0.89253	0	0
36	1.8	1.036	0	0	0	0	1.06296	0	1.06929	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.04832	0	0	0	0	0	0	0	1.04389	0
37	1.9	1.088	1.09838	0	0	0	0	0	0	0	0	0	0	0	1.10371	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1.138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

39	2.1	1.189	0	0	0	0	0	0	0	0	0	0	0	1.20837	0	1.19867	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.20637
40	2.2	1.24	0	0	0	0	0	1.20837	0	0	0	0	1.24413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.29808	0	0	0	0	0
42	2.4	1.342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.35888	0	0	0	0	0	0
43	2.5	1.393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	1.45603	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.51882	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.597	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3.3	1.798	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.848	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.758	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.958	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.058	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.666	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator shape parameter			1.09838	0.98173	0.87563	0.90714	1.08298	1.20837	1.08929	1.45603	0.98884	0.98181	1.24413	1.20837	1.10371	1.19867	0.84843	0.94358	0.87086	0.98829	0.86238	1.02035	0.91158	1.04832	1.00736	0.8983	1.35888	1.29808	1.51882	0.77182	0.98263	1.04388	1.20637
Estimator scale parameter			0.86748	1.2443	1.02858	1.22217	0.732	1.03808	0.88587	0.68124	1.25872	0.8464	0.81416	0.88361	0.80474	0.87882	0.99888	1.07088	1.45301	1.08816	1.20801	1.11311	1.32488	0.87318	0.87136	1.16237	0.70424	0.84844	0.88504	1.38987	0.93303	0.92332	0.71148
Control chart constant d2			1.00446	0.87586	0.8748	0.87874	1.00034	1.02227	1.00107	1.03488	0.98884	0.98158	1.01888	1.01565	1.00483	1.01438	0.87081	0.98604	0.87411	0.87389	0.87115	0.98622	0.9804	0.98838	0.98368	0.97841	1.02794	1.02331	1.03842	0.86701	0.98167	0.98807	1.01517
Control chart constant d3			0.98146	1.00555	1.00837	1.00222	0.98487	0.98883	0.98428	0.85873	0.98487	0.9822	0.98877	0.87233	0.88107	0.8733	1.01016	0.98772	1.00706	1.00724	1.0088	0.98815	1.00188	0.9885	0.98052	1.00338	0.98221	0.98588	0.86364	1.02181	0.99212	0.98878	0.87263
Control chart constant D4			4.03626	4.18844	4.19425	4.18989	4.0688	3.92871	4.06484	3.84408	4.17318	4.10733	3.84862	3.98801	4.0326	3.87828	4.21888	4.14221	4.18821	4.19928	4.2128	4.08748	4.1883	4.08886	4.08844	4.1786	3.88988	3.82004	3.81788	4.28072	4.10682	4.07181	3.97128
Upper centre limit X			4.02847	4.81738	3.95526	5.02881	3.11533	5.20886	2.98877	3.01077	5.38263	3.82813	4.23788	4.17862	3.60227	4.18406	3.42244	3.88316	4.87186	3.92788	5.04281	4.75517	5.26228	3.75887	3.82911	4.7314	2.8836	4.10676	3.67218	4.77345	3.84788	3.81076	3.16318
Lower control limit X			-1.82121	-2.42311	-2.1676	-2.81146	-1.55817	-2.53487	-1.57317	-1.28818	-2.84868	-1.86117	-1.98283	-2.03853	-1.72688	-1.83948	-1.72886	-1.87223	-2.34183	-2.01868	-2.88348	-2.48386	-2.84727	-1.83172	-2.07381	-2.84308	-0.77884	-1.8888	-1.68431	-2.85888	-1.88577	-1.88343	-1.44788
Upper control limit MR			4.01788	4.79727	4.18581	5.33821	3.18322	5.1813	3.08157	2.86037	5.88761	3.78718	4.15776	4.1748	3.53106	4.0482	3.51077	3.82088	4.8188	4.05181	5.47388	4.8078	5.62078	3.86378	4.00416	5.02244	2.31466	4.08888	3.47873	5.07486	3.88861	3.85881	3.08832
Normal upper control limit X			3.70075	4.14268	3.54041	4.51368	2.85082	4.8487	2.73888	2.83287	4.8772	3.28078	3.83713	3.88677	3.21708	3.88083	3.08306	3.62781	4.37887	3.62184	4.48478	4.3281	4.73173	3.43201	3.47741	4.24242	2.63868	3.88117	3.48307	4.21012	3.48478	3.4828	2.83266
Normal lower control limit X			-1.5866	-1.8483	-1.74287	-2.28822	-1.28486	-2.17182	-1.31808	-1.11128	-2.43428	-1.81378	-1.88248	-1.72878	-1.44086	-1.63808	-1.38826	-1.60888	-1.84874	-1.81068	-2.42647	-2.06788	-2.31871	-1.80478	-1.72181	-2.18411	-0.82668	-1.88202	-1.3862	-2.08654	-1.84286	-1.65548	-1.21736
Normal upper control limit MR			3.26383	3.74214	3.24584	4.18383	2.54881	4.31213	2.48177	2.42321	4.48204	3.01328	3.4483	3.4372	2.88182	3.32782	2.72128	3.08323	3.82737	3.16307	4.24684	3.82388	4.33048	3.08451	3.18438	3.82882	1.84482	3.41784	2.8787	3.87411	3.16834	3.08544	2.84883

OBJECTIVE # 3

Exponential (Mean=1) k = 50 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	0.03862	0.17089	0.5208	1.08754	0.2983	0.86332	1.48244	0.13108	0.05831	0.15644	0.75867	0.09478	1.01287	0.78828	1.02318	1.22234	1.03824	1.20815	0.81225	0.1857	0.64410	0.03678	0.28857	1.38288	2.71838	0.12838	0.08222	0.00108	0.38218	1.17518	0.00573
			0.27508	3.11145	1.02382	1.43057	4.12308	1.78437	0.65287	0.2273	0.4135	0.18485	0.13088	0.184	1.15528	0.53777	0.28803	0.14188	0.82318	0.3488	2.88308	3.3032	1.18848	0.75251	0.24038	0.38328	2.88051	0.35401	0.48038	0.18508	3.87481	0.88751	0.218
			1.08773	1.11712	1.07088	0.78151	0.9856	0.39328	0.79378	0.84374	0.43585	0.58875	0.17456	0.55378	1.73418	2.18751	1.88208	2.3867	1.18285	0.28815	0.54783	3.0348	0.44485	1.0888	0.53324	0.53831	0.53475	4.14788	1.28888	0.84492	0.8848	0.3881	0.50481
			0.61517	0.78877	1.82084	0.23113	0.62728	0.86881	2.02404	0.28828	1.08087	0.01753	1.15771	2.04088	2.48582	1.98845	2.83388	0.18572	0.88192	0.30848	1.01778	0.4583	0.11105	0.76448	0.26207	1.03487	0.13082	0.58888	0.8718	0.08888	0.52825	0.83818	0.04858
			0.83085	0.1482	0.29203	0.0851	0.33818	0.25825	1.37827	0.13512	0.1285	0.53028	0.37078	1.70877	0.48531	0.4102	0.29788	0.487	1.75471	0.85707	2.8382	0.1888	1.12138	1.34883	0.07327	1.427	0.18787	0.47824	0.40882	1.84064	0.81185	0.45378	0.70854
			2.73382	0.52598	1.75838	0.73507	1.08337	2.47018	1.26282	3.95277	1.57542	2.40148	1.88002	3.05417	0.55108	0.37558	1.38738	0.88588	1.28457	0.12317	0.87188	1.8444	0.73048	0.08888	0.21832	0.30883	1.482	0.28818	0.48831	0.72821	2.43854	0.82744	0.71224
			0.78368	0.18858	2.28418	3.87825	0.8528	1.3348	1.82782	1.0337	1.25501	1.08074	0.52174	0.58758	0.87738	1.73514	0.24108	2.8554	1.13827	0.88522	2.12883	0.108	1.91318	0.4278	0.1175	3.50288	0.48371	0.81835	0.18558	2.55888	2.58222	0.08032	0.88252
			0.05858	0.83618	2.78031	0.70744	1.85724	1.41235	0.28723	0.22328	1.18075	1.78802	1.63795	0.13247	0.07027	0.34118	0.98478	0.5153	0.45484	2.18828	0.7085	0.5037	0.32888	1.05878	0.31057	0.28715	2.85841	1.88104	1.48358	0.28335	1.81834	2.10841	2.28788
			1.37834	0.25833	1.80862	0.58518	0.51811	0.88148	1.58718	2.8243	0.8458	0.38888	0.52835	0.77885	2.82372	1.11172	3.30374	0.14521	0.85778	0.83788	0.24243	1.5898	0.53341	0.0701	0.77885	0.43228	3.87845	0.2048	0.52881	0.42072	0.83181	2.87883	0.28787
		10	0.88308	0.07814	0.89587	0.81888	0.57135	0.09034	0.21028	1.75887	2.85372	0.2533	0.08853	0.50574	1.81228	1.8278	2.82342	0.4078	0.38528	1.82448	1.04258	0.4184	0.14788	0.2881	0.01078	0.42821	1.13734	0.28428	0.18818	0.07873	2.88571	0.24877	5.85028
			0.05558	0.38153	0.38881	1.37788	0.4538	0.53433	0.45088	0.23088	0.10851	0.04808	0.88377	0.58845	0.11411	0.35827	1.05284	2.22818	2.08177	1.42823	1.28037	0.8737	0.2585	2.70358	2.8823	1.08785	0.5734	0.0828	1.07785	0.57144	1.05838	0.33823	0.84234
			1.14855	0.78588	0.25478	1.28446	0.84815	2.8493	0.88888	1.0274	0.25832	0.45834	0.78549	0.3028	3.13837	0.34788	1.57873	1.72271	0.18737	0.85823	0.85308	3.202	0.78035	1.08538	1.0703	1.88877	0.18748	0.02335	3.08182	2.84288	1.18432	1.18013	2.84848
			0.20844	0.73701	0.78853	0.0213	3.88048	0.43074	0.28118	2.47872	0.88538	4.08577	0.71283	0.81288	0.94783	0.88188	0.40038	1.88118	0.77045	0.34137	0.00318	0.1885	0.51888	0.3084	0.05221	0.242	3.4823	0.5731	0.73258	2.25828	0.18378	2.10327	1.08528
			1.5082	0.88618	1.10438	0.344	0.27044	0.27345	1.75048	2.03877	1.42875	0.28225	0.58338	0.41884	4.52885	3.7478	0.38803	0.19803	0.42085	0.88348	0.41123	0.4557	1.3508	0.28445	1.51158	0.12185	0.22071	1.88481	0.2582	0.70888	0.35777	0.51225	0.77023
New observations k =			1.80332	0.30968	0.08115	1.72058	0.20888	0.54443	0.18848	0.84784	0.88508	0.43508	0.42118	0.43738	3.88888	1.12882	0.22001	0.20084	0.14907	1.10347	0.42771	1.5284	1.01287	0.27838	0.10018	0.88718	0.24178	0.81831	0.7201	0.00448	0.85558	0.02103	2.3718
			1.88318	0.18798	0.15181	2.14802	1.50183	0.70888	0.5353	0.43875	1.63882	0.17218	2.28231	0.83818	4.08588	2.30882	0.18301	0.17888	3.12188	2.18125	0.24888	1.811	0.4183	2.1278	1.58787	1.85088	4.25883	0.43311	0.83288	1.28845	0.08748	0.58438	0.20848
			0.18872	0.72112	0.34523	0.48318	2.83855	0.25257	1.77108	1.28882	0.03188	0.48102	1.67846	0.03351	0.54155	0.52704	0.22478	1.51148	0.44413	5.32588	2.28888	0.1888	0.01481	0.87388	0.88404	0.00048	0.4548	2.01831	0.48883	2.57878	0.71132	3.87515	0.22388
			2.84895	0.30382	0.58185	1.34448	0.78011	2.38397	1.91838	0.55574	0.30753	0.88582	0.5458	0.5411	0.88888	0.81507	0.88323	0.81331	0.84887	1.88834	1.81818	2.9882	0.29588	0.78333	0.28852	1.45483	0.71088	0.42241	0.47038	2.8817	0.54078	0.85717	0.88042
			2.30252	0.28362	0.2558	2.04744	0.15174	3.25873	0.15138	1.58888	3.07887	0.18282	2.28882	0.0835	5.28731	2.13542	1.31828	0.9301	2.47343	1.21874	0.85815	1.1872	1.18228	3.11888	0.88875	0.53375	0.43571	0.08548	1.18874	0.22022	0.01848	0.48141	3.32853
		20	0.18407	2.05788	0.88811	0.37884	0.88138	0.62878	0.88302	0.8481	1.52482	1.42888	0.25871	0.10504	0.28823	2.07052	0.81885	0.9381	0.33158	2.08885	0.15727	0.5208	2.02583	0.0188	1.21705	1.00224	2.88772	0.12511	4.08818	0.43638	1.18558	1.11133	0.88834
			0.17453	0.18823	3.11125	1.18217	0.47873	0.25208	0.45588	0.78311	1.38888	2.85877	0.73188	0.47001	0.1885	0.31154	0.31388	0.88707	0.18434	0.48323	0.52345	0.3013	0.41183	0.48885	0.23488	0.85083	0.08053	0.97017	0.45028	1.5843	1.08887	0.27795	0.3102
			0.88517	0.09254	8.20523	0.2057	0.88223	0.28884	2.82232	0.85358	2.5857	0.23428	0.72186	0.88883	1.28123	0.88824	0.22858	1.56485	0.87888	0.18887	1.01585	0.0835	4.2833	1.5558	0.02838	0.29083	2.00738	0.40803	0.41443	0.53443	0.4113	1.43772	0.38103
			0.78283	0.85034	0.83847	1.07827	0.28084	0.37028	0.78817	2.88018	0.88888	3.88344	1.84438	0.01812	0.80544	1.75751	4.05125	0.58575	1.83824	2.81283	0.00272	11.7383	0.88778	4.8802	0.83423	1.27757	0.53838	0.58532	0.45433	0.48878	2.18584	0.27855	0.14172
			0.18838	2.15572	0.48858	0.00858	0.08481	4.48314	0.53571	1.35738	0.18508	0.15332	1.05234	1.10882	1.28222	1.43388	1.84881	1.98215	0.20507	1.35057	0.71343	0.0845	0.88818	1.8	1.35888	0.81008	0.43534	1.18878	0.1845	0.42888	2.01387	0.42854	0.37884
			0.1824	0.24555	0.41342	1.30888	0.88103	1.82285	4.88188	0.13883	1.57508	0.21013	0.88574	1.79254	3.32204	3.08318	1.45888	0.45428	0.88821	0.88745	2.77758	1.4418	0.44242	0.3412	1.01584	0.52018	1.51078	1.88128	0.32554	0.2753	0.78515	0.31552	0.28843
			0.96689	1.35488	1.34087	0.83093	2.78121	0.08061	0.214	0.10434	0.08708	0.58758	0.58014	0.31784	1.82233	0.21514	1.18111	0.72473	0.80522	0.21111	1.88848	2.0574	1.48785	1.75484	0.88837	3.82388	0.10951	2.15717	1.87788	2.18422	1.53488	0.34238	0.47825
			0.88521	0.57482	1.77147	2.11238	0.2055	0.35705	0.00225	0.81835	0.08805	0.5563	0.94353	0.81238	0.4343	0.0042	0.87818	0.85334	1.32528	0.48803	2.85185	2.5488	1.18885	1.20285	1.75572	0.11828	1.27388	0.02388	0.2235	0.2183	5.81177	1.18058	1.78452
			0.12321	0.51883	0.8888	0.04875	0.83131	0.03508	1.10848	2.0227	0.84855	1.08478	0.3331	3.0575	0.88888	0.10438	1.4108	2.79154	0.78353	0.84888	0.71818	0.1708	0.30548	2.0277	0.84403	4.88048	3.47318	1.18518	0.58881	0.05875	0.17327	1.43288	0.43377
			1.14774	0.04833	1.47878	0.52785	0.08407	1.23071	1.2281	1.88438	0.17431	1.03875	1.05881	2.05338	1.18852	1.88748	0.13	0.88382	0.37458	0.88805	0.85288	2.4827	0.7851	2.85458	0.88028	0.25838	0.88232	0.01388	0.55051	0.38114	1.18552	0.64384	2.64455
		30	0.21832	2.10738	0.18485	0.08478	1.13588	2.82873	1.78884	0.05781	1.03448	3.03583	1.08258	0.20758	1.81881	1.82047	0.00088	0.01543	2.25037	0.57503	0.88844	0.8888	0.18831	2.58112	2.40083	0.50028	1.24311	0.5051	0.57021	0.42781	3.13742	1.88527	1.85245
Estimator shape parameter			1.090375	0.88173	0.875631	0.80714	1.062857	1.286374	1.080283	1.455828	0.888838	0.881812	1.244128	1.208372	1.103713	1.198873	0.848433	0.943577	0.870848	0.888283	0.852358	1.020348	0.811581	1.046318	1.007348	0.888288	1.358884	1.288084	1.518818	0.771825	0.882529	1.043883	1.205387
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.957477	1.244302	1.028548	1.222187	0.731887	1.03888	0.885872	0.591241	1.258721	0.845408	0.814158	0.883513	0.884743	0.87882	0.98888	1.070885	1.453012	1.088185	1.208889	1.113108	1.324858	0.873184	0.871351	1.18237	0.704238	0.848437	0.885037	1.388871	0.833028	0.823318	0.711484
Control chart constant d2			1.004454	0.875858	0.874888	0.878744	1.000341	1.022273	1.001074	1.03488	0.888838	0.881581	1.018878	1.015546	1.004828	1.014358	0.970505	0.98504	0.874108	0.873882	0.871151	0.985218	0.980403	0.888381	0.88358	0.878408	1.027943	1.023308	1.038422	0.957088	0.881874	0.888087	1.015174
Control chart constant d3			0.981457	1.00555	1.008372	1.002223	0.98487	0.988835	0.984281	0.858728	0.884874	0.882195	0.888788	0.87233	0.881085	0.873302	1.010158	0.987718	1.007051	1.007237	1.008588	0.988148	1.00188	0.988502	0.988518	1.003383	0.982213	0.98588	0.853842	1.021808	0.882117	0.888784	0.872834
Control chart constant D4			4.035247	4.18944	4.184255	4.188888	4.058803	3.928708	4.054844	3.844088	4.12318	4.107328	3.848518	3.888005	4.032487	3.878283	4.218082	4.142214	4.19821	4.188288	4.212888	4.087458	4.188302	4.088848	4.088441	4.178505	3.888488	3.92004	3.817887	4.280718	4.108822	4.071808	3.871284
Upper contro limit X			4.028487	4.81738	3.955253	5.028811	3.11533	5.208851	2.988773	3.010774	5.382528	3.828134	4.237582	4.175522	3.502287	4.184048	3.422445	3.883151	4.871951	3.827588	5.042808	4.755188	5.282287	3.758873	3.828114	4.731403	2.883682	4.165747	3.872188	4.773452	3.847882	3.810753	3.183158
Lower control limit X			-1.92121	-2.42311	-2.1576	-2.81148	-1.55817	-2.53487	-1.57317	-1.28818	-2.84858	-1.85117	-1.88283	-2.03853	-1.72588	-1.83848	-1.72585	-1.87223	-2.34183	-2.01858	-2.88348	-2.48385	-2.84727	-1.83172	-2.07381	-2.84388	-0.77884	-1.9888	-1.58431	-2.85888	-1.88577	-1.88343	-1.44788
Upper control limit MR			4.017879	4.797288	4.185813	5.338211	3.183221	5.181288	3.081588	2.850374	5.887588	3.787183	4.157748	4.174503	3.531048	4.048202	3.918785	3.820884	4.818802	4.051807	5.473081	4.807798	5.520784	3.853783	4.004155	5.02244	2.314553	4.088881	3.478728	5.074853	3.888507	3.858812	3.088325
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
False alarm in X? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0	0	0	1
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0	1	0	0
Total false alarm in X			0	1	0	0	1	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1	0	1	0	0	1	0	1	0	1	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	1	0	1	0	0
Total false alarm in MR			0	1	0	0	1	0	1	1	0	1	0	0	1	0	1	0	1	0	0	1	0	0	0	0	1	0	1	0	1	0	1
Sub-total X control charts with at least one false alarm k 30 =							109																										
Sub-total MR control charts with at least one false alarm k 30 =							96																										
Normal upper control limit X			3.700753	4.14258	3.540414	4.513578	2.850817	4.848705	2.73888	2.832888	4.877205	3.280757	3.837127	3.885772	3.217058	3.888825	3.063048	3.527808	4.378888	3.521538	4.484777	4.329104	4.731728	3.432013	3.477411	4.242418	2.538558	3.881172	3.483074	4.210122	3.484782	3.4828	2.832547
Normal lower control limit X			-1.5955	-1.8483	-1.74287	-2.28822	-1.28485	-2.17192	-1.31808	-1.11128	-2.43428	-1.81379	-1.88248	-1.72878	-1.44085	-1.53808	-1.38825	-1.50888	-1.84874	-1.81055	-2.42547	-2.05758	-2.31871	-1.88478	-1.72181	-2.15411	-0.82558	-1.88202	-1.3852	-2.08558	-1.84285	-1.55548	-1.21735
Normal upper control limit MR			3.253834	3.742141	3.24584	4.183832	2.54881	4.312131	2.491771	2.423207	4.492045	3.013278	3.440298	3.437203	2.881818	3.327822	2.72128	3.083231	3.827372	3.15307	4.245542	3.82388	4.330448	3.084511	3.184377	3.828821	1.944818	3.417838	2.8787	3.874107	3.158344	3.085437	2.548828
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1
False alarm in X? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0	0	1	1
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0	1	0	0
Total false alarm in X.			0	1	0	0	1	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1	0	1	0	0	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	1	0	0	1	0	0	0	0	1	0	1	0	0	1	0	1	0	1	1	0	1	0	1	0	0
Total false alarm in MR			0	1	0	0	1	0	1	1	0	1	0	0	1	0	1	0	1	1	0	1	0	1	0	1	1	1	1	0	1	0	1
Sub-total normal X control charts with at least one false alarm k 30 =							132																										
Sub-total normal MR control charts with at least one false alarm k 30 =							130																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							9																										
Sub-total MR control charts with at least one false alarm k 1 =							9																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							9																										
Sub-total MR control charts with at least one false alarm k 1 =							11																										
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							39																										
Sub-total MR control charts with at least one false alarm k 10 =							33																										
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1
Sub-total X control charts with at least one false alarm k 10 =							54																										
Sub-total MR control charts with at least one false alarm k 10 =							58																										

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Exponential (Mean=1)		k = 50 obs		Shift 1 process standard deviation																													
		1	1.4983	1.37903	3.23374	1.28939	1.58648	1.23082	6.55041	1.88947	1.09832	1.82512	1.89123	3.0478	4.07158	1.01871	1.13852	1.80087	1.80331	4.10875	1.34811	4.28705	3.45478	1.2428	1.01387	4.88488	1.04388	1.17282	1.48001	1.88358	1.30832	1.00402	1.82511
			1.32852	1.99218	3.25484	1.82431	1.40298	1.30828	1.30883	1.51374	2.14848	1.90225	1.34778	1.17547	3.28715	2.95255	1.18859	2.43863	1.85824	4.20851	1.88587	1.20327	3.85182	1.08784	1.87325	1.28138	1.24598	2.15808	1.48838	2.7553	1.18284	2.90498	1.21803
			1.13485	1.03139	2.09118	1.38903	1.87624	2.20124	1.84313	1.29584	1.08182	3.87298	1.01547	1.09208	1.48882	1.80323	3.85214	1.4823	1.04488	1.00743	2.40481	1.32818	1.44757	1.58725	1.12214	1.02871	2.20811	2.27845	2.55384	1.52851	1.57381	2.1908	2.04271
			1.4552	1.88573	1.01307	2.20257	3.08294	5.97051	2.83848	1.78247	2.08728	1.32851	1.58728	1.58778	1.80173	2.48083	1.72938	3.88843	1.48283	2.53728	1.75828	1.30538	3.38185	1.74188	2.44388	3.08432	1.22285	1.43482	2.88788	1.48782	2.23135	1.57808	1.81884
			1.89015	1.35458	1.0923	1.88387	2.43398	2.44851	1.40492	1.817	1.82254	1.04448	2.31298	1.52817	1.14888	1.84403	2.14348	1.85105	1.00817	3.21815	2.23051	2.88588	1.27188	1.54551	1.05887	2.51148	4.24885	1.0878	1.18743	2.02883	1.22341	2.3238	1.03418
			5.35385	2.12183	2.35837	1.38291	1.81374	1.28508	1.09878	4.70181	1.44243	1.52888	2.18784	2.38338	3.00887	1.10585	3.81948	2.08548	1.32228	1.88422	1.15858	1.81034	2.18788	1.4685	3.44083	1.82488	1.14183	1.01878	3.88822	1.45024	4.00058	1.35787	1.183
			2.085	2.52846	2.84585	1.18802	1.15557	2.23114	1.82379	1.23582	2.28437	1.31201	1.18323	1.4537	1.84718	1.32007	1.8898	1.31372	1.07425	1.18284	1.88552	2.58884	2.29458	2.27742	2.37488	1.14251	2.40901	1.88042	1.87874	2.59254	4.2858	1.38405	1.48802
			1.28484	1.47868	1.32402	1.52888	1.88347	1.35123	2.91004	3.3306	1.17232	2.58827	2.2823	1.88978	1.3848	1.54211	2.84201	1.15123	1.18102	1.88818	1.31782	1.31347	2.18104	1.37435	3.38889	1.3348	2.58228	2.4881	4.05183	1.7598	2.8575	1.33111	1.71853
			3.81738	4.21843	2.88578	1.13288	2.94158	1.14404	1.18762	2.02588	1.17842	1.88381	2.5553	2.71298	2.12881	2.8024	1.88584	1.84884	2.88432	1.40558	1.72887	1.72217	1.45704	1.3851	2.38841	2.0831	1.04253	2.85518	2.4848	1.13588	4.53451	1.23508	2.81018
		10	1.05737	1.38099	3.80357	1.7455	2.9183	1.58157	1.58144	1.22741	1.33822	2.53402	1.05828	1.0208	1.08723	2.82318	1.01188	2.88787	2.11088	2.28257	4.34728	1.27425	1.38202	1.54828	2.3403	1.20888	1.52221	1.48728	1.58831	1.88822	1.25248	1.85514	2.25178
			1.77088	4.82984	1.0803	3.01897	1.58183	2.18548	1.25898	1.81038	1.15275	7.18831	1.88043	1.85892	1.05884	1.83185	1.45842	1.32328	2.58822	3.21885	1.11383	1.14452	1.72408	1.71028	1.88818	2.58882	1.24387	1.12483	3.57087	1.55584	2.78298	1.0358	1.08488
			1.71332	1.57785	1.38501	2.22883	1.12389	3.58488	2.88678	1.18865	1.17748	2.15811	1.07885	1.55898	1.88807	1.83888	2.88138	2.0795	1.53458	1.58043	3.27814	1.22171	1.27488	1.07371	1.10701	2.17315	1.25455	2.02887	1.2477	2.20758	2.84277	2.32852	1.78737
			1.05211	1.17201	2.37084	2.72698	1.48398	2.10058	1.18838	1.51482	2.78835	1.88738	1.85883	2.01857	2.88288	2.18884	1.74884	3.78788	1.88444	3.73145	1.02884	1.88942	1.8228	1.38212	1.30318	3.48885	2.77823	1.17782	2.08888	1.35881	1.78217	1.20811	1.35855
			1.21827	3.25758	1.48701	4.81598	3.32128	1.09388	1.07114	1.14835	3.58587	3.70875	1.17871	1.10884	1.33348	1.05553	3.02881	1.82078	1.83848	1.57204	4.48887	1.07757	2.48798	1.83478	2.88205	3.40221	4.84583	1.48131	3.88888	1.05784	1.83113	1.03183	1.47082
New observations k =			1.48858	1.24803	2.72482	1.24587	1.18303	1.48858	1.58539	2.88099	2.81818	1.48533	1.18208	1.44272	1.17885	3.03341	1.288	1.81394	1.42225	2.32288	8.58481	2.33278	2.08071	4.24804	1.43337	2.0201	2.08208	1.31558	5.18832	3.88013	1.45882	2.05818	1.8885
			1.59225	1.57871	1.03753	1.04985	3.39228	2.5298	2.78208	1.48319	2.58747	1.20711	1.08543	1.44882	2.48523	1.11848	1.45231	1.81173	1.51447	2.04817	1.00547	1.40908	1.88889	1.48082	1.8318	2.04852	3.07242	1.72038	1.45037	3.01782	1.5883	1.87102	2.30881
			1.28152	1.71471	1.28761	1.81127	1.41135	1.41582	1.43138	1.08559	1.04188	5.87088	1.08842	2.84835	1.40421	1.4528	2.70878	3.85888	1.5102	2.02411	2.19024	2.53384	1.88834	1.24883	2.27122	2.29382	1.87814	1.77243	1.00808	3.13283	1.24148	2.41847	2.88212
			1.08888	1.15481	2.38595	1.28441	1.28882	1.72945	2.28383	1.0818	1.42775	6.87887	1.88885	1.58888	1.72418	2.8533	1.83827	2.78215	2.18838	1.28841	1.88818	1.88902	1.27038	1.28814	2.41187	1.12881	4.58593	3.01887	1.33825	1.24081	1.78878	2.88288	1.01898
			2.519	1.54754	2.11025	1.53823	1.11182	1.01567	2.50455	1.28878	2.15188	1.3283	1.58888	1.23483	1.15573	1.08885	2.82248	1.1173	2.32518	1.85313	1.10843	2.53888	2.74887	2.28735	2.82258	2.83818	1.34838	1.18301	1.85814	1.51828	2.4703	2.10842	1.40553
		20	1.38557	1.52207	1.08742	1.12593	1.20385	1.43538	1.0813	1.17874	2.83444	1.42547	2.82456	2.24423	1.37103	1.88853	3.41388	1.03252	1.8078	1.5888	1.08073	1.48887	1.01188	4.12879	1.28758	2.81581	2.04757	4.34083	1.82725	1.50415	1.38725	2.31558	1.51215
			4.25107	1.72108	1.85375	1.07855	1.78055	3.75058	1.14338	1.14888	1.87318	1.02293	3.54544	1.0882	1.94828	1.03132	1.30018	1.47187	2.1285	1.38818	3.27828	1.2441	2.88533	1.4578	2.88872	1.88883	2.70432	1.87524	1.20785	1.8851	1.34218	1.33884	1.87887
			2.84738	1.33433	2.82871	1.33824	1.85202	2.88871	1.40185	2.21524	2.1258	1.89375	1.18294	1.12332	1.57803	1.27528	1.82817	1.54032	1.78214	1.17838	1.95443	1.78343	2.58848	1.54148	1.48443	1.34201	1.82334	1.88472	1.44275	2.03528	1.02487	1.57783	2.35888
			2.01714	2.77838	4.85827	2.58287	1.18861	3.01851	1.28207	1.77888	1.34428	4.04157	1.82057	1.38704	4.24183	1.78388	1.04257	1.83878	5.88858	3.45828	1.09288	3.05524	2.18883	1.07078	1.48855	1.33102	1.37107	1.73817	8.7887	1.85408	1.35872	4.28588	2.55354
			5.18812	2.13443	1.55432	3.048	2.30728	1.52798	1.87888	2.37888	1.43288	3.30533	1.15248	1.10388	2.14813	1.84108	1.17243	5.17802	2.04851	3.02138	1.44851	1.8051	1.28838	1.38572	1.37583	4.08005	4.24887	2.58743	4.75523	1.84272	1.48728	1.80417	1.88422
			2.78375	3.58124	1.5803	1.70885	1.15444	1.81548	1.11722	3.21884	1.0588	1.40815	5.71418	2.0315	2.83288	1.48083	2.33815	1.83388	1.38785	3.58821	2.18838	1.15741	1.13802	1.8484	1.3533	1.74831	1.38758	2.08823	1.4301	1.54483	1.20347	1.10003	1.21098
			1.23092	4.00587	4.88737	2.48177	1.72231	1.18588	2.47504	1.08221	2.44528	2.73811	1.88474	1.87852	1.5703	1.08858	1.2128	1.3898	1.23001	2.33781	3.78827	1.48581	1.25878	2.05552	2.01838	1.78035	2.48583	2.3082	3.88885	3.83842	1.20211	1.08854	1.05815
			1.41451	1.80083	1.18118	1.08271	1.18535	2.04848	1.18221	1.82037	1.77305	1.62256	1.88884	1.55918	1.08354	2.10058	2.8882	1.51143	1.38405	1.38208	1.98848	1.44121	1.38388	1.25882	2.18584	2.28388	1.25851	1.38788	1.18535	1.17084	1.85278	2.85183	2.57873
			1.14824	1.25098	2.33818	1.42832	2.13848	1.57128	1.17848	1.05885	1.45522	1.14086	2.45127	1.78858	1.13888	1.75473	2.53889	1.2828	1.45321	1.84121	2.08058	2.58117	2.28278	1.22004	4.73735	1.88891	1.34472	1.84534	3.27044	1.17558	1.15528	1.14784	2.80844
			1.51851	1.85938	2.18885	2.22727	1.88888	2.14123	1.37042	1.01748	1.88894	1.71798	1.73713	1.81728	1.88941	1.9138	1.18828	1.03131	1.22944	1.41833	1.02328	2.40084	2.21881	1.18718	2.20885	2.30883	1.03415	1.92085	1.78534	1.88892	1.30782	1.02147	1.42444
		30	1.01535	1.84871	1.5704	1.70772	1.8867	3.08148	3.10777	1.24021	2.25251	2.71407	1.2182	2.08732	2.30885	2.84352	2.07845	1.03388	3.83212	1.24418	1.88834	1.24291	1.84408	1.32708	1.84823	1.41175	2.41802	1.0898	1.38484	1.83538	2.45421	1.71831	1.35558
Estimator shape parameter			1.099375	0.98173	0.875831	0.90714	1.002957	1.286374	1.089293	1.455929	0.999038	0.991812	1.244128	1.208372	1.103713	1.196873	0.848433	0.843577	0.870648	0.889283	0.852358	1.020348	0.911501	1.048318	1.007348	0.898298	1.358894	1.299084	1.518818	0.771825	0.992528	1.043893	1.205387
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.957477	1.244302	1.020545	1.222167	0.731997	1.03966	0.985872	0.591241	1.258721	0.845405	0.914159	0.983513	0.804743	0.97982	0.98998	1.070885	1.453012	1.099185	1.208008	1.113108	1.324858	0.873184	0.871351	1.18237	0.704236	0.848437	0.985037	1.388871	0.833028	0.923318	0.711484
Control chart constant d2			1.004454	0.975856	0.974898	0.970744	1.000341	1.022273	1.001074	1.03468	0.999038	0.991581	1.018678	1.015546	1.004928	1.014358	0.970505	0.98504	0.974108	0.973892	0.971151	0.995218	0.980403	0.988381	0.98358	0.978408	1.027843	1.023309	1.038422	0.957008	0.991874	0.988087	1.015174
Control chart constant d3			0.981457	1.00555	1.008372	1.002223	0.98487	0.980835	0.984261	0.956728	0.994874	0.992185	0.988768	0.97233	0.981085	0.973302	1.010156	0.987718	1.007051	1.007237	1.008588	0.989148	1.00188	0.988502	0.980518	1.003383	0.982213	0.98588	0.953842	1.021808	0.982117	0.988784	0.972834
Control chart constant D4			4.035247	4.18944	4.184255	4.188888	4.058803	3.928708	4.054844	3.944088	4.12318	4.107328	3.848518	3.989005	4.032487	3.978283	4.218882	4.142214	4.18821	4.189289	4.212888	4.087456	4.188302	4.088848	4.088441	4.178505	3.889889	3.82884	3.817687	4.288719	4.188822	4.071889	3.871294
Upper contro limit X			4.026487	4.61739	3.955253	5.028811	3.11533	5.208851	2.988773	3.010774	5.302528	3.628134	4.237582	4.175522	3.502287	4.184846	3.422445	3.883151	4.871851	3.827588	5.042808	4.755188	5.282287	3.758873	3.828114	4.731403	2.883802	4.185747	3.872188	4.773452	3.847882	3.810753	3.183156
Lower control limit X			-1.82121	-2.42311	-2.1575	-2.81146	-1.55817	-2.53487	-1.57317	-1.28818	-2.84858	-1.95117	-1.98293	-2.03853	-1.72588	-1.83848	-1.72585	-1.87223	-2.34183	-2.01858	-2.88348	-2.48385	-2.84727	-1.93172	-2.07381	-2.84308	-0.77984	-1.9888	-1.58431	-2.85888	-1.88577	-1.88343	-1.44798
Upper control limit MR			4.017879	4.797288	4.185813	5.338211	3.183221	5.181298	3.091588	2.850374	5.887588	3.787183	4.157749	4.174583	3.631048	4.048282	3.510785	3.920884	4.918802	4.051807	5.473081	4.887788	5.520784	3.853783	4.004155	5.02244	2.314553	4.099881	3.479728	6.074853	3.988507	3.858812	3.098325
False alarm in X? (Y=1/N=0)			1	0	0	0	0	1	1	1	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	1	0	1	0	0
False alarm in X? (Y=1/N=0)			0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	1	0	0	0	1	1	0	1	1	0	1	0	0	1	1	0	0	0	0	0	1	0	1	0	1	0	0	1	0
Total false alarm in X			1	1	1	0	1	1	1	1	0	1	1	0	1	0	1	1	1	1	1	0	0	1	1	0	1	1	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Total false alarm in MR			0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							186																										
Sub-total MR control charts with at least one false alarm k 30 =							89																										
Normal upper control limit X			3.700753	4.14258	3.540414	4.513578	2.850817	4.848705	2.73966	2.832868	4.877205	3.290757	3.837127	3.885772	3.217058	3.880825	3.063048	3.527808	4.370888	3.521638	4.484777	4.328104	4.731728	3.432013	3.477411	4.242416	2.539558	3.881172	3.463074	4.210122	3.494782	3.4828	2.832547
Normal lower control limit X			-1.5955	-1.9483	-1.74267	-2.29822	-1.29465	-2.17182	-1.31806	-1.11128	-2.43428	-1.61379	-1.68248	-1.72878	-1.44085	-1.53806	-1.38825	-1.50888	-1.84874	-1.61055	-2.42547	-2.05758	-2.31871	-1.60478	-1.72181	-2.15411	-0.82558	-1.88202	-1.3852	-2.09556	-1.64285	-1.55548	-1.21735
Normal upper control limit MR			3.253834	3.742141	3.24584	4.183832	2.54891	4.312131	2.481771	2.423207	4.492045	3.013278	3.440288	3.437203	2.881618	3.327822	2.72128	3.083231	3.827372	3.15307	4.245542	3.92388	4.330448	3.084511	3.194377	3.828021	1.844818	3.417838	2.9787	3.874107	3.158344	3.085437	2.540629
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	0	1	0	0	1	0	1	1	0	1	0	0	0	0	0	1	1	0	1	0	1	0	0
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	1	0	0	1	0	0	0	0	1	1	0	1	1	0	0	1	0	0	1	1	1	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	1	0	0	0	1	1	0	1	1	0	1	0	0	1	1	1	0	0	0	0	1	0	1	0	1	0	0	1	0
Total false alarm in X			1	1	1	1	1	1	1	1	0	1	1	0	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0
Total false alarm in MR			1	0	1	0	0	0	1	1	0	1	1	0	1	0	0	1	1	1	1	1	0	0	0	1	1	0	1	0	1	0	0
Sub-total normal X control charts with at least one false alarm k 30 =							210																										
Sub-total normal MR control charts with at least one false alarm k 30 =							154																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							12																										
Sub-total MR control charts with at least one false alarm k 1 =							8																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							19																										
Sub-total MR control charts with at least one false alarm k 1 =							21																										
False alarm in X? (Y=1/N=0)			1	0	0	0	0	1	1	1	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							110																										
Sub-total MR control charts with at least one false alarm k 10 =							40																										
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	0	1	0	0	1	0	1	1	0	1	0	0	0	0	0	1	1	0	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							130																										
Sub-total MR control charts with at least one false alarm k 10 =							78																										

OBJECTIVE # 3

Exponential (Mean=1)   k = 50 obs   Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	3.75108	4.5844	2.38253	2.0856	2.30883	4.10735	3.78855	2.83898	2.98186	2.88380	3.78108	2.23131	2.11547	3.08035	2.23187	7.38849	2.43331	2.70449	2.47087	2.00202	3.4852	6.08887	2.88511	2.27723	3.38811	4.08898	2.85881	3.17758	3.18483	3.01588	3.12784
			6.41182	3.10887	2.80508	2.3877	4.62489	2.2481	2.5034	3.10577	2.07587	2.56481	2.25057	2.00079	2.07128	3.28134	2.28815	2.90551	2.80315	2.34854	2.58808	2.10779	4.14412	2.50917	2.78072	2.58723	2.0755	4.08814	2.37412	2.03454	2.81717	2.13242	2.21408
			2.25837	2.88227	2.51879	3.4027	2.51187	2.2858	2.16456	2.34186	2.04887	2.55828	2.74811	2.40884	2.21525	2.31401	2.5855	4.18898	2.1888	3.20788	2.84298	4.85277	2.28899	2.18314	2.00388	2.25385	2.41988	2.27782	2.3084	3.78327	2.88878	2.45392	2.29429
			2.15423	2.38373	3.21428	2.7198	2.48839	2.01448	2.31057	2.33075	2.05877	3.88487	2.58718	4.17741	3.45388	2.02718	2.20598	2.30072	2.43088	4.23311	4.85198	4.82081	4.95338	3.48283	2.38008	2.57378	2.48541	3.58107	2.23183	2.17055	4.82837	3.58488	2.32227
			3.34005	2.48585	2.38728	2.0871	2.04084	3.31135	2.40837	2.57424	5.81333	2.29573	3.08852	2.13085	2.98741	2.1124	3.08581	4.71817	2.15578	2.38384	2.88077	2.1843	2.178	2.0894	4.87351	2.35188	2.04838	3.17475	3.05383	2.88131	2.00188	3.33784	2.18483
			3.02988	2.27888	3.88827	3.3887	3.00127	2.21808	2.02748	2.81281	2.0798	3.27715	2.58053	2.81828	2.83388	3.81128	2.88821	2.82708	3.18178	2.38387	2.00811	2.76378	2.2352	2.08575	2.04711	3.82421	2.38855	2.14727	4.88831	3.03482	3.84388	5.38872	3.71088
			3.32398	2.12474	2.44885	2.5188	2.4173	2.50771	2.47888	3.88371	2.83473	2.2181	3.72828	2.84887	2.283	3.72153	2.78782	2.21881	4.1622	3.08873	3.87273	2.43758	5.58557	2.04478	2.44221	3.15522	2.98054	2.03438	2.5138	2.68187	2.78151	2.01628	3.07718
			3.17581	3.48358	8.5248	2.3823	2.7738	2.01355	3.80103	2.81273	2.05517	2.04827	2.31837	2.1145	3.27213	2.82782	2.25088	2.3372	2.72777	2.481	2.83852	2.48145	2.29292	2.7718	2.45823	4.84578	2.32087	3.02982	2.23384	2.38287	2.77713	3.38174	5.90888
			2.48418	2.02821	2.89807	5.7518	2.04352	5.80008	3.48775	3.02483	2.20585	2.80832	5.02173	2.35383	2.92833	2.28743	3.37485	2.04405	2.04188	2.72808	3.75848	2.08092	2.98443	3.3448	2.38308	4.87742	2.2248	2.28801	6.02833	2.81784	2.70528	3.44858	2.87218
		10	2.28308	2.81838	2.85858	2.1427	2.84217	4.48321	2.1074	3.53037	2.03711	3.71888	3.82453	4.52025	3.47342	5.34875	2.32888	2.5873	3.18788	3.87883	2.74012	3.38875	2.41878	2.40035	2.72204	2.45837	2.80837	2.20401	2.15478	3.24088	2.78525	2.41181	2.72015
			3.38805	3.85184	2.83847	2.7009	5.78842	3.47974	2.32548	3.88318	3.51378	2.20884	2.07031	5.84305	2.22753	2.57324	4.24123	5.11838	2.17029	2.81127	2.72798	3.58877	2.30495	2.22878	3.58829	2.48947	2.87551	2.88893	3.7328	2.51412	2.24108	3.01891	2.00378
			2.8881	5.44287	2.51537	2.7985	2.02145	3.40084	3.88	3.1832	2.43147	3.38807	2.01149	2.35408	2.81475	2.28817	2.55427	2.87444	3.01185	3.81248	2.37172	3.00285	2.13871	2.00808	2.10181	2.08871	2.1841	3.88838	2.09818	4.83217	2.43122	2.09848	2.8542
			3.80774	4.25312	3.35315	2.8878	4.40082	2.08953	2.42111	2.01827	4.41847	2.02807	3.41702	2.58551	3.24855	2.02851	5.08812	2.88048	3.28354	2.48885	2.38488	2.04887	2.43028	3.11427	2.13038	4.52778	2.80048	2.08022	3.47115	2.83087	2.74101	2.48382	2.0882
			2.11805	2.58928	3.18072	2.0837	2.34508	2.90188	2.88844	2.27243	4.3438	2.34357	3.83531	4.08427	3.77382	2.33845	2.23553	2.38838	3.83888	2.88104	2.84888	5.20897	2.90238	2.78788	2.48118	6.07753	2.77558	2.83387	2.70312	3.07808	2.87307	2.55543	2.33858
New observations k =			2.18884	3.38058	2.38848	2.8227	2.47803	2.88215	7.51008	3.28178	2.53788	2.17034	2.88031	2.08454	2.23485	2.41182	2.28587	2.31488	3.57788	2.01738	2.17783	2.1708	3.30335	2.10327	2.75318	2.98802	2.48458	2.47215	2.15823	2.88174	2.1088	2.35004	2.07808
			3.08388	3.13808	3.24125	2.8182	2.08071	4.38088	2.48707	4.11487	2.38443	2.25871	6.80573	2.18882	3.40831	2.04151	2.48783	2.18452	8.5158	2.48421	2.90148	3.5828	3.84333	2.9838	2.57522	2.34588	2.71514	2.71702	2.82818	2.28083	2.98712	2.88488	3.78284
			2.90145	4.15995	3.48143	5.1822	2.1838	2.38862	2.0305	2.48152	2.11002	2.18127	2.45878	2.97442	2.88174	2.58122	3.32077	2.27881	3.23734	8.70418	2.83187	5.15318	2.07418	3.08151	2.35878	2.02818	2.20813	4.42878	3.42348	2.88735	2.38058	2.78843	2.48718
			2.40723	2.88554	2.15872	2.4375	2.78111	2.20257	3.80187	2.74088	4.55218	2.30333	2.85882	2.55758	3.1481	2.08127	4.45824	2.41714	2.55348	3.73838	2.29582	2.88521	2.11428	8.71583	2.34487	3.8408	2.53877	2.35133	5.8583	2.40334	2.89304	3.84383	2.48938
			2.88847	2.8881	2.18841	2.8198	3.08352	2.50808	3.8331	2.80832	3.81881	4.17855	2.80877	2.083	2.32551	2.97884	3.07248	2.70307	2.81134	3.71881	3.47857	3.538	2.17888	2.37307	2.52327	5.11377	2.40003	2.87798	3.20438	4.47888	3.48572	2.15088	2.84727
		20	3.12514	2.78787	2.58808	2.8201	8.14014	2.85702	2.23081	3.27858	3.30458	2.87103	2.48105	3.77458	2.18355	5.29881	2.51248	3.518	2.38354	2.25108	2.41274	3.08388	2.19873	6.91888	3.37002	2.88852	2.4851	2.32182	2.05011	2.30388	2.29798	2.88781	2.27258
			2.12758	2.48576	2.41017	2.1758	2.8254	2.30312	2.84114	4.08921	3.5823	8.54114	3.18447	4.27881	2.78832	3.07377	2.35818	4.42715	5.78063	2.27188	2.45881	2.33818	3.72247	2.16197	2.41185	2.00084	3.48178	2.83352	2.58122	2.53838	4.13538	3.03088	2.04703
			2.41531	2.01034	2.48333	2.5451	2.84178	3.88088	2.03283	2.08872	3.45885	2.38127	2.33872	2.0404	3.51787	2.51482	2.73187	2.38837	2.37288	2.11334	2.88407	2.14188	2.22034	2.48821	3.48582	2.5077	2.88388	2.33884	2.28383	2.84817	2.02588	2.53205	3.01832
			2.88727	3.03068	3.88802	3.5884	2.57583	2.85192	2.88711	3.58538	8.18877	3.21831	2.54878	2.47705	2.81858	3.33785	3.83158	2.8105	3.13085	2.21388	4.52785	2.40849	2.18861	2.77152	2.30328	3.78885	4.88287	2.21488	3.79878	2.1818	2.21228	2.52807	3.21351
			2.44428	3.038	2.54088	2.0354	3.82032	2.77082	3.052	3.24198	3.50814	2.47302	2.21855	4.03338	3.44074	2.20583	4.01888	3.17437	2.82842	2.74087	2.04881	2.4088	4.30808	3.53507	5.85353	2.98882	2.45847	4.10978	2.45841	2.8821	3.44184	2.32854	2.82248
			2.30283	3.80844	3.28558	2.8805	3.84887	2.08108	3.15808	2.53412	5.45278	2.0783	2.78895	3.02778	7.42258	2.14888	2.4288	4.01883	3.03308	4.38763	4.43848	3.83978	4.82437	2.82543	2.72483	3.85284	3.154	2.22821	2.4487	2.22823	2.02087	2.88897	8.84072
			5.81584	2.28204	3.15153	4.9375	2.82881	5.57754	4.4118	4.28548	4.07518	2.58877	2.40114	4.0538	2.88278	2.1338	2.27721	4.58888	3.0888	4.82348	3.48805	2.11143	2.40421	2.58307	3.20285	2.28282	2.78308	2.18782	2.88277	2.03282	2.12178	2.85125	2.48895
			4.38053	2.78818	3.45578	2.0437	2.82004	2.70875	2.7888	2.38548	2.88805	3.83815	2.81384	2.55234	2.18285	3.7528	2.79801	3.53585	3.40144	2.04448	2.03148	2.98053	2.18248	2.83048	3.47378	2.05882	2.07185	2.0211	2.25284	2.18584	3.24877	2.78128	3.85344
			2.58517	2.48121	2.58108	2.0038	2.27887	8.80893	2.51858	2.05807	2.78748	3.28048	2.33813	3.40304	2.57488	3.84888	3.82708	2.87107	2.74041	2.82428	2.44243	3.48247	3.75808	2.02085	2.92818	2.82281	2.08874	2.51077	2.53502	4.30388	2.33388	8.38282	2.23287
			2.25844	2.44927	2.37882	2.4302	2.03825	2.38778	2.28401	4.35853	3.25811	2.73828	2.82278	2.38121	2.14405	2.83587	2.48814	2.42581	2.18838	2.85725	2.58553	4.73878	2.70488	2.27784	4.17458	2.10432	2.18415	2.34458	2.18088	4.3088	2.18807	2.45544	2.78324
		30	7.01271	2.98858	2.02001	2.768	2.88481	2.77388	4.8347	3.11101	3.49288	2.20547	2.35348	2.8817	2.12488	2.87883	2.8847	2.84578	3.85882	2.22778	8.37071	3.87587	2.83583	2.44228	3.88028	2.50433	2.40022	5.4833	4.21183	3.81001	2.58014	3.27188	3.91318
Estimator shape parameter			1.098375	0.88173	0.875831	0.90714	1.082857	1.286374	1.088293	1.455828	0.888638	0.881812	1.244128	1.208372	1.103713	1.188873	0.848433	0.843577	0.878848	0.888283	0.852358	1.020348	0.811581	1.048318	1.007348	0.888298	1.358884	1.298064	1.518818	0.771825	0.982528	1.043893	1.205387
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.957477	1.244302	1.028545	1.222187	0.731887	1.03988	0.885872	0.581241	1.258721	0.845405	0.914158	0.883513	0.804743	0.87862	0.88888	1.070885	1.453012	1.088185	1.208808	1.113108	1.324858	0.873184	0.871351	1.18237	0.704238	0.848437	0.885037	1.388871	0.833028	0.823318	0.711484
Control chart constant d2			1.004454	0.975858	0.974898	0.978744	1.000341	1.022273	1.001074	1.03408	0.988838	0.981581	1.018878	1.015548	1.004828	1.014358	0.870505	0.98504	0.874108	0.873882	0.971151	0.885218	0.880403	0.988381	0.98358	0.878408	1.027843	1.023308	1.038422	0.857008	0.991874	0.998067	1.015174
Control chart constant d3			0.981457	1.00555	1.008372	1.002223	0.98487	0.988835	0.984281	0.958728	0.994874	0.992185	0.989788	0.97233	0.981085	0.973302	1.010158	0.987718	1.007051	1.007237	1.008588	0.989148	1.00188	0.988502	0.988518	1.003383	0.982213	0.98588	0.953842	1.021808	0.992117	0.988784	0.972834
Control chart constant D4			4.035247	4.18944	4.184255	4.188888	4.058803	3.828708	4.054844	3.844088	4.12318	4.107328	3.849518	3.988005	4.032487	3.978283	4.218082	4.142214	4.18821	4.188288	4.212888	4.087458	4.188302	4.088848	4.088441	4.178505	3.888888	3.82004	3.817807	4.280718	4.108822	4.071808	3.871284
Upper contro limit X			4.028487	4.81738	3.855253	5.028811	3.11533	6.208851	2.888773	3.010774	5.382528	3.828134	4.237582	4.175522	3.502287	4.184048	3.422445	3.883151	4.871851	3.827588	5.042808	4.755188	5.282287	3.758873	3.828114	4.731403	2.883802	4.185747	3.872188	4.773452	3.847882	3.810753	3.183158
Lower control limit X			-1.82121	-2.42311	-2.1575	-2.81148	-1.55817	-2.53487	-1.57317	-1.28818	-2.84858	-1.85117	-1.86283	-2.03853	-1.72588	-1.83848	-1.72585	-1.87223	-2.34183	-2.01858	-2.88348	-2.48385	-2.84727	-1.83172	-2.07381	-2.84308	-0.77884	-1.8888	-1.58431	-2.85888	-1.88577	-1.88343	-1.44798
Upper control limit MR			4.017879	4.787288	4.185813	5.330211	3.183221	6.181298	3.091588	2.850374	5.887508	3.787183	4.157749	4.174503	3.531048	4.049202	3.510785	3.820884	4.918802	4.051807	5.473081	4.807798	5.520784	3.853793	4.004155	5.02244	2.314553	4.098881	3.478728	5.074853	3.888507	3.858812	3.098325
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	1	1
False alarm in X? (Y=1/N=0)			1	0	0	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	1	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1
Total false alarm in MR			1	0	0	0	1	0	1	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	1	1	1	0	0	1	1
Sub-total X control charts with at least one false alarm k 30 =							242																										
Sub-total MR control charts with at least one false alarm k 30 =							91																										
Normal upper control limit X			3.700753	4.14258	3.540414	4.513578	2.850817	4.848705	2.73988	2.832888	4.877205	3.290757	3.837127	3.885772	3.217058	3.880825	3.083048	3.527808	4.378888	3.521538	4.484777	4.328104	4.731728	3.432013	3.477411	4.242418	2.538558	3.881172	3.483074	4.210122	3.484782	3.4828	2.832547
Normal lower control limit X			-1.5955	-1.9483	-1.74287	-2.29822	-1.28485	-2.17182	-1.31808	-1.11128	-2.43428	-1.81378	-1.88248	-1.72878	-1.44085	-1.53808	-1.36825	-1.50888	-1.84874	-1.81055	-2.42547	-2.05758	-2.31871	-1.80478	-1.72181	-2.15411	-0.82558	-1.88202	-1.3852	-2.08558	-1.84285	-1.55548	-1.21738
Normal upper control limit MR			3.253834	3.742141	3.24584	4.183832	2.54891	4.312131	2.491771	2.423207	4.482045	3.013278	3.440288	3.437203	2.881818	3.327822	2.72128	3.083231	3.827372	3.15307	4.245542	3.92388	4.330449	3.094511	3.194377	3.828821	1.844818	3.417038	2.9787	3.874107	3.158344	3.095437	2.540829
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			1	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	1
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	1	1
Total false alarm in MR			1	0	1	0	1	0	1	1	0	1	1	0	1	0	1	1	0	1	0	0	0	1	1	0	1	1	1	0	0	1	1
Sub-total normal X control charts with at least one false alarm k 30 =							248																										
Sub-total normal MR control charts with at least one false alarm k 30 =							147																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							41																										
Sub-total MR control charts with at least one false alarm k 1 =							20																										
False alarm in X? (Y=1/N=0)			1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							63																										
Sub-total MR control charts with at least one false alarm k 1 =							46																										
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	1	1	1	1	0	1	0	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	1	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							181																										
Sub-total MR control charts with at least one false alarm k 10 =							49																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	1	0	0	1	1
Sub-total X control charts with at least one false alarm k 10 =							211																										
Sub-total MR control charts with at least one false alarm k 10 =							89																										

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
GAMMA (1.5, 1.0)			k = 10 obs																														
			1.79574	1.22835	0.72557	0.22395	1.67833	0.69753	0.54296	0.65421	2.37564	2.2972	0.44554	3.2464	1.26337	0.50933	1.86802	0.14822	1.57276	2.02907	0.15899	0.73534	0.60199	1.7622	2.60077	0.50785	4.63503	0.84843	2.18999	2.33154	0.02156	0.80436	0.90743
			1.20022	1.71005	0.15979	0.95487	1.7528	0.36727	1.67016	0.77461	2.21882	1.39282	0.9565	1.16932	0.29065	1.33235	4.13881	0.33649	1.05818	4.49852	1.0791	0.57673	1.79959	0.69248	0.39598	2.0741	0.65295	0.6779	0.91437	3.9837	1.84143	0.55982	2.23232
			1.34603	1.97557	1.8791	1.47514	2.74865	1.55108	2.56422	0.52248	0.49387	1.10224	0.86145	1.25764	0.06428	0.24405	0.38794	1.11563	1.71666	0.71574	3.1573	1.64313	4.23362	0.98822	1.71816	1.85331	0.1574	2.43853	0.15766	2.54762	1.47001	0.11716	0.22286
			0.15757	2.69776	1.63957	1.72165	2.73408	0.32037	2.09113	1.93005	0.21084	0.99762	0.3565	2.4736	0.9925	0.5602	1.70358	3.92393	0.11638	1.60068	1.3067	5.81137	2.63019	3.31027	0.52133	2.2339	1.74258	2.13057	6.40118	0.79669	0.35863	1.426	1.50206
			4.85418	0.82612	0.37712	1.48199	0.72056	1.17909	0.29307	0.61101	1.91566	1.14997	2.83183	1.87698	2.70293	0.30692	1.97782	3.29652	1.81708	0.80158	2.59861	0.83784	0.77401	3.41112	1.03713	0.41078	3.76747	0.55811	0.25396	0.75685	6.98428	1.83509	0.59766
			1.39439	0.52161	1.03165	0.50773	2.05812	0.06264	0.70377	0.15458	3.71811	1.23812	3.15487	0.12564	0.39654	2.07073	0.55253	2.23953	0.64898	1.55983	1.85566	1.10315	0.63025	1.57992	2.12968	1.05888	2.37066	2.66251	1.47433	0.95204	1.55163	0.90686	0.20658
			1.10873	1.76417	0.16783	1.47476	2.25868	4.4375	1.76244	4.44532	1.35373	0.34997	0.67662	1.35955	0.26045	1.8922	1.71652	0.66302	1.57969	1.41336	0.08158	1.60273	3.26991	1.39714	0.44653	0.64281	2.94892	1.81016	0.34515	1.66951	4.07069	0.8067	0.59539
			1.72437	1.666	1.25492	3.10243	0.56143	2.4526	3.26461	0.11665	0.83669	2.36504	2.22495	0.82043	0.11306	1.01052	2.32822	0.62144	0.32552	0.41915	0.16126	0.63608	2.00513	1.52547	0.50447	2.83643	0.22479	1.9766	0.90601	2.55382	2.07674	1.63213	3.87685
			2.36852	0.24727	0.89048	1.11715	0.61844	1.75589	0.57314	2.25004	1.26404	2.8984	0.9853	0.52693	2.01676	0.20584	0.98766	1.61987	4.06974	1.47475	2.38545	2.49264	4.8736	2.21752	1.53706	0.74144	1.30673	4.08328	1.29517	0.54841	0.27253	0.78068	1.48198
			1.31515	0.21021	1.79584	2.33416	1.63513	0.28209	1.10646	1.30324	3.39055	3.46168	0.24678	2.17692	3.93214	1.00117	1.21549	0.69647	0.65178	0.16417	0.43607	1.71792	2.87465	1.62655	1.96797	2.06184	0.67776	0.54134	1.8364	1.57909	2.36371	0.23792	3.16288
Average			1.72649	1.28671	0.99219	1.43938	1.67642	1.31261	1.4772	1.27642	1.7778	1.72531	1.27423	1.50354	1.20327	0.97553	1.68766	1.46811	1.35547	1.46771	1.32207	1.71569	2.36929	1.87109	1.28611	1.44213	1.84845	1.77274	1.57742	1.77213	2.10112	0.91067	1.4766
Moving range average			1.40945	0.72023	0.85137	0.9454	0.82261	1.4678	1.16542	1.69457	1.23415	0.61555	1.10112	1.04976	1.13852	0.6965	1.37566	1	1.66592	1.35576	1.43457	1.63062	1.77854	0.75708	1.0592	1.18488	1.61082	1.39815	2.02931	1.07867	2.64104	0.62813	1.52167
T statistic			3.92601	3.55263	3.35198	4.85926	6.99869	1.77015	4.01435	1.98588	3.5581	5.79397	3.06141	3.56297	1.43073	4.48037	5.14026	2.43026	2.72444	3.11714	1.7077	3.83939	4.28571	11.0715	4.57945	5.01	2.14013	4.61561	1.94829	5.54308	1.38629	3.92085	2.4938
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.81987	0	0
32	1.4	0.827	0	0	0	0	0	0	0	0	0	0	0	0	0.64296	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.879	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	0	0	0	1.01948	0	0	0	0	0	0	0	0	0	0	0	0	0.98701	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1.8	1.035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1.9	1.086	0	0	0	0	0	0	0	1.13066	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.11111	0	0	0	0
38	2	1.138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	2.1	1.189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.20947	0	0	0	0	0	0
40	2.2	1.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2.4	1.342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.35743	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.38964
43	2.5	1.393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.50746	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	1.67832	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.70657	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3.3	1.799	0	0	1.82499	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	1.92832	0	0	0	0	0	0	1.92905	0	0	1.93148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.0707	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	2.11428	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.11163	0
58	4	2.152	0	0	0	0	0	0	2.15925	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.29585	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	2.39358	0	0	0	0	0	0	0	0	2.44362	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.4618	0	0	0	0	0
62	4.8	2.554	0	0	0	2.58392	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.72513	0	0	0	0	0	0	0	0	2.66	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.92753	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	3.05396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	3.65734	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.6969	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######
Estimator shape parameter			2.11426	1.92632	1.82499	2.58392	3.65734	1.01948	2.15925	1.13086	1.92905	3.05396	1.67832	1.93148	0.84296	2.39358	2.72513	1.35743	1.50746	1.70657	0.98701	2.0707	2.29585	5.6969	2.44362	2.66	1.20947	2.4618	1.11111	2.92753	0.81987	2.11163	1.38984
Estimator scale parameter			0.81659	0.66796	0.54367	0.55705	0.45637	1.28753	0.68413	1.12892	0.92159	0.56494	0.75923	0.77844	1.4274	0.40756	0.6193	1.08006	0.89917	0.86003	1.33948	0.82856	1.03199	0.32644	0.52631	0.54215	1.52832	0.7201	1.41968	0.60533	2.56274	0.43126	1.06243
Control chart constant d2			1.06349	1.05739	1.05353	1.07469	1.0896	0.99511	1.06478	1.0078	1.05748	1.08244	1.04708	1.05757	0.9696	1.0707	1.07729	1.02783	1.03787	1.04841	0.99095	1.06218	1.06839	1.10305	1.07181	1.07613	1.01555	1.0722	1.00573	1.08059	0.96567	1.06341	1.03019
Control chart constant d3			0.93171	0.93744	0.94088	0.91974	0.89887	0.98924	0.93044	0.97869	0.93735	0.90973	0.94643	0.93727	1.01094	0.92429	0.91657	0.9623	0.95409	0.9453	0.99272	0.93298	0.92677	0.87533	0.92306	0.91801	0.97232	0.92262	0.9804	0.91228	1.01434	0.93179	0.96038
Control chart constant D4			3.62618	3.67496	3.70519	3.53647	3.4328	4.06805	3.61575	4.01567	3.[illegible]742	3.47868	3.75451	3.67351	4.22053	3.5681	3.5164	3.89041	3.82157	3.74446	4.11073	3.63672	3.58669	3.37333	3.55923	3.52533	3.96895	3.55611	4.02783	3.49185	4.23964	3.62681	3.87467
Upper contro limit X			5.70239	3.33014	3.4165	4.07846	3.94132	5.73766	4.76072	6.32078	5.27898	3.43131	4.42908	4.48138	4.72592	2.92705	5.51653	4.38488	6.17066	5.34715	5.66507	6.33813	7.36339	3.93014	4.2508	4.74531	6.6069	5.68475	7.63068	4.7668	10.3059	2.68269	5.90786
Lower control limit X			-2.24941	-0.75672	-1.43213	-1.1997	-0.56848	-3.11245	-1.80633	-3.78794	-1.72339	0.0193	-1.88061	-1.4743	-2.31939	-0.97599	-2.14321	-1.45266	-3.45092	-2.41174	-3.02092	-2.90675	-2.6248	-0.18796	-1.67859	-1.86105	-2.91	-2.13926	-4.47583	-1.22255	-6.10367	-0.86135	-2.95466
Upper control limit MR			5.11091	2.64663	3.15448	3.34338	2.82385	6.00045	4.21386	6.80486	4.53452	2.1413	4.13417	3.85631	4.80516	2.48517	4.83736	3.89042	6.36644	5.07656	5.89712	5.95194	6.37906	2.55387	3.76993	4.1771	6.39328	4.97199	6.17374	3.76857	11.1971	2.2781	5.89599
Normal upper control limit X			5.47502	3.20222	3.25646	3.95375	3.86421	5.21634	4.57671	5.78327	5.06011	3.3624	4.20274	4.29546	4.23125	2.82792	5.34632	4.1257	5.78612	5.07343	5.13741	6.06841	7.09945	3.88459	4.10312	4.59341	6.13255	5.49124	6.97454	4.64094	9.12517	2.58123	5.52361
Normal lower control limit X			-2.02204	-0.6288	-1.27209	-1.07498	-0.51137	-2.59112	-1.62231	-3.23043	-1.50452	0.08821	-1.65428	-1.28837	-1.82471	-0.67686	-1.971	-1.19347	-3.07517	-2.13802	-2.49326	-2.63703	-2.36087	-0.14241	-1.53091	-1.70915	-2.43566	-1.94575	-3.81969	-1.09669	-4.92292	-0.75988	-2.57041
Normal upper control limit MR			4.60607	2.35372	2.78227	3.08957	2.68829	4.79678	3.80858	5.53787	4.0332	2.01161	3.59646	3.43062	3.72069	2.27615	4.49565	3.26801	5.44423	4.4306	4.68816	5.34848	5.81227	2.47413	3.48146	3.87219	5.26417	4.56917	6.6318	3.52511	6.63092	2.05273	4.97283

OBJECTIVE # 3

Gamma (1.5 1.0) k = 10 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	1.78780	0.9463	1.9862	0.5872	0.7909	1.05884	1.38781	1.04793	0.44140	1.20824	0.94356	2.91482	2.4139	2.32385	0.56132	3.74088	0.13818	0.20521	1.63817	1.97735	2.82637	1.13803	1.03881	0.2703	0.88932	0.25472	1.43587	2.71934	2.13876	0.54902	0.25846
			1.81298	2.20992	0.41629	1.10322	1.82583	0.41878	1.23596	1.30304	1.30035	0.12711	0.98727	5.35341	0.48102	2.31019	2.31495	0.17124	0.5684	0.40822	0.07808	3.43389	0.41487	5.63811	1.05094	0.8884	0.88121	4.8789	1.20118	0.6162	2.32993	1.07308	1.35818
			0.14143	2.63458	0.22837	0.289	0.72957	2.20814	0.19049	1.98014	1.09884	2.88853	2.15785	1.32115	2.55577	0.58215	1.10217	0.05373	1.30104	2.08219	2.48043	0.85026	0.50535	0.18343	4.82498	0.23815	1.03289	2.47988	2.88978	1.95165	2.81141	0.88821	2.58804
			0.65584	0.91267	1.23723	2.5042	2.82822	2.14412	0.82163	1.88894	4.47702	0.26458	1.83414	0.74982	1.29584	0.85213	2.80857	2.20954	1.78831	1.77151	0.12329	2.39983	1.12829	1.79548	0.75773	2.1778	1.81618	0.70712	2.20318	1.45574	2.49022	0.8208	0.4895
			1.59087	0.74918	0.20818	0.55838	2.79424	2.56339	0.73377	3.52062	0.9708	1.14479	0.31954	2.47745	0.62148	1.50382	0.58842	0.40131	1.01238	1.30225	1.08242	0.7981	0.7587	0.47484	0.85133	3.83078	2.07877	0.58378	0.24259	3.85585	1.39881	3.58037	0.2385
			1.94105	3.08173	0.75517	0.47984	3.01452	0.51575	0.62259	3.38805	0.07128	0.74689	5.85858	2.51205	0.5515	3.31244	0.01812	0.13074	0.88434	0.51138	1.28098	0.81987	0.29805	0.79629	2.7159	2.14184	1.30847	1.08133	2.71003	0.07384	0.18077	0.92904	1.43942
			1.80587	1.6322	2.86508	4.58205	0.28772	2.87734	1.54115	2.08411	0.24981	0.39558	0.12871	1.82342	0.80229	2.01232	1.18294	0.84641	5.4552	2.85	0.49827	3.19881	1.2864	0.80756	0.24871	3.48834	1.18517	0.58818	2.38822	1.59435	2.87738	0.57745	3.24818
			0.89989	0.70108	0.13831	0.79714	1.70199	0.22358	0.84052	1.63834	1.74285	1.95718	1.28588	0.27383	0.81039	0.43314	0.34875	1.2738	0.111	5.0234	2.38387	3.07587	2.17835	1.17592	1.15408	1.9333	0.81985	3.85947	0.01277	0.85318	3.88843	1.17719	0.92521
			0.91482	2.2157	0.20525	0.49989	1.17452	1.98773	0.28237	0.63832	1.82435	2.44241	3.82892	0.83888	1.43407	2.13744	1.8838	1.67333	2.24137	1.64088	1.83424	0.10784	0.77022	2.07182	2.3505	0.87954	1.18245	0.93158	0.77581	3.09513	0.48287	1.43897	1.38789
		10	0.27312	0.54537	0.39181	2.39388	0.55848	1.27501	0.7038	3.08008	0.888	0.5829	0.87827	0.80457	0.88103	0.3183	0.82485	3.32508	1.43717	3.29844	0.3487	3.08874	2.84928	0.10324	2.35844	0.81737	1.40864	1.73282	1.78838	0.84841	1.05738	0.77733	2.1233
			1.12411	0.19852	0.80588	1.75574	0.54191	0.34574	0.86268	0.85752	0.48088	2.89583	1.73989	2.64947	3.01832	1.23105	0.4807	0.08032	0.31212	0.8146	0.7295	4.97794	1.45858	0.98891	0.4133	0.80818	1.84052	0.84887	2.49175	0.843	2.48958	0.45058	1.00818
			0.03554	1.49231	0.8839	0.38765	1.02354	0.3985	0.23547	1.29877	0.48727	1.11333	3.03259	1.3298	1.33478	1.34887	1.31835	3.78141	0.37012	1.25433	1.18488	4.33182	0.37555	0.48228	0.44411	0.52778	2.10814	0.00984	1.84887	1.8908	2.2163	0.71852	0.82874
			0.95409	0.82914	0.07248	1.00482	1.8431	0.09187	0.2524	2.12948	0.83823	0.02848	2.75885	0.79329	0.41845	3.87054	1.0852	1.8514	0.47033	0.9089	0.88919	2.32853	1.45087	2.48855	1.78218	0.14848	0.13438	2.53758	2.12907	1.08547	0.58837	2.59954	2.47547
			0.82748	0.89858	0.78322	0.88911	2.27431	2.10388	1.67285	3.25224	8.38305	4.51455	1.88345	0.41872	2.23789	1.83987	2.11024	0.832	0.21144	2.84653	3.28154	0.23358	0.78055	0.22335	1.30823	0.37258	0.58084	0.48373	0.83831	0.23733	0.51044	2.38288	0.13178
New observations k =			0.31008	0.89012	0.82275	1.1838	1.34382	0.86442	3.5899	2.1814	1.45857	0.42555	0.3518	0.02884	1.71424	0.78894	1.19249	0.3585	0.50844	0.19488	4.3141	1.87458	1.50432	2.14843	1.58131	1.1088	0.75849	1.54075	1.80113	1.58099	1.5883	2.28584	0.15181
			2.02288	1.24044	4.90382	0.77811	0.77114	1.80194	1.88789	1.01078	0.47083	1.28248	1.35852	0.88821	0.30892	1.07503	0.77198	3.18375	0.83794	1.1111	3.48808	0.87958	0.84191	1.83391	2.15818	2.50584	2.50907	0.91437	1.37598	1.75324	1.45828	1.98488	0.88324
			0.41817	2.69951	0.09834	0.14351	2.09828	2.38949	1.95261	2.74353	0.08433	0.75174	1.81758	1.37579	1.0027	0.57501	1.78507	8.11337	2.9857	1.38393	0.38289	2.4872	3.87172	2.87288	0.88187	1.71284	0.19128	1.10441	4.08585	0.94207	3.44903	0.07781	0.88182
			1.81013	2.0086	0.57871	0.88588	0.28775	0.55551	3.04438	3.02187	1.05807	0.22892	3.01892	1.49881	2.8948	0.02878	1.03403	0.78707	0.10228	0.10743	1.89134	1.08321	2.70394	1.79595	1.05891	0.13437	1.22704	1.81502	4.83403	1.1818	2.69093	3.18018	2.78328
			3.59188	0.8731	1.48839	0.03845	1.78378	0.42548	1.05114	0.12889	0.54298	4.73908	0.3608	0.9544	1.89208	2.13344	1.82842	0.49108	1.01898	2.49824	1.52859	1.20854	0.73939	0.57557	0.8845	1.00148	1.01213	0.93819	0.83444	2.23313	1.28884	1.12588	4.24873
		20	0.8218	2.21078	1.75838	0.73837	0.28937	0.40124	3.08551	0.52505	2.37788	0.84037	0.52785	0.35583	0.48052	1.97545	0.84258	2.43585	0.77212	4.13722	0.45755	2.01042	0.858	0.58218	1.90032	0.58038	0.07478	0.21854	0.04877	0.88524	0.25988	0.28395	0.72951
			1.56401	2.44027	2.38048	1.2492	0.7947	3.33535	1.23783	1.59788	0.31822	0.17254	4.30999	2.59981	1.88315	2.49231	3.01203	1.00875	0.40838	2.88218	8.82852	3.11883	0.87884	1.75425	0.93149	0.10904	1.91382	1.0155	3.14484	0.20881	2.0293	2.88928	1.29815
			0.89518	1.91013	2.82888	0.908	1.08874	0.42522	0.80859	2.14443	0.19284	2.41198	1.12198	0.80434	1.44567	0.81481	1.79282	1.11885	1.84835	2.87234	2.80893	2.25349	1.52189	0.98033	1.10472	0.80293	1.34578	0.89973	1.13082	1.72288	1.1427	0.18798	0.79778
			1.97049	3.53855	1.388	1.01509	0.32733	0.41257	0.28387	0.56355	0.27138	2.2821	0.08173	2.37542	0.38338	2.5888	1.84187	2.08472	0.58308	0.28021	3.18193	0.8481	0.53985	0.84872	4.35578	1.45184	1.72231	4.42737	1.32988	1.8834	0.63518	0.38275	1.78388
			1.91838	0.21508	0.14384	1.56054	3.1981	1.03831	0.58071	5.04888	2.10798	2.40583	0.28848	0.77023	0.49325	2.80948	[illegible]43732	1.56535	3.13084	1.30194	4.84819	1.88011	1.01384	1.82387	2.03448	0.70133	2.51717	0.08172	2.48787	0.73087	1.23077	1.71218	2.30338
			0.32485	0.84879	3.25081	0.89433	1.29095	0.19283	0.32752	0.88884	1.1506	0.53778	0.82095	2.01822	1.41474	0.02258	0.38284	1.30749	0.85847	0.57422	0.61771	1.01109	1.48753	0.88348	0.80205	0.80853	0.81338	0.99888	1.02408	0.34281	1.57387	0.47007	0.70172
			0.2553	3.41849	0.7808	1.70025	0.58894	3.84085	0.70802	2.70224	1.22874	0.9838	0.629	1.24874	0.3714	1.2809	0.777	0.71834	2.02415	3.84982	1.41158	4.48783	3.30862	2.18775	1.15589	1.57358	2.33822	3.38549	0.04785	1.14752	0.18407	1.87894	0.18883
			4.5084	0.80528	0.8828	5.48724	0.54182	0.23772	0.80145	0.35789	1.83757	3.3088	0.78873	0.58553	0.31109	0.78088	1.82049	0.14144	0.03183	0.58948	2.73418	1.90425	1.80717	0.02124	0.7408	0.21872	1.7377	3.5884	1.2207	1.53876	1.5238	0.82551	0.88801
			1.2074	3.07431	2.3028	2.4874	2.32163	1.22181	0.89377	0.30185	2.00187	3.39278	2.87528	1.09354	1.475	1.1385	0.41788	0.42738	3.55214	1.00154	1.88441	2.80113	0.88425	0.38788	1.98019	1.83737	1.58884	0.89987	2.14773	0.85213	2.78884	0.80482	3.33838
			5.81181	1.32418	2.11837	0.31788	0.87484	0.03	1.07785	0.24804	2.02341	0.05489	1.88302	4.40598	0.53183	0.72083	4.88088	0.88212	3.4752	1.20295	2.22047	1.61389	0.88884	0.08812	1.03315	0.58284	0.44337	3.05488	0.42333	0.77878	3.5348	0.08873	4.04159
		30	3.01123	2.08882	2.35558	2.13218	2.7438	3.85498	2.12252	0.05732	1.28182	1.37854	0.88875	1.42089	0.87885	1.7805	0.88155	1.88484	0.18203	0.08152	0.54885	0.85298	2.20382	0.91485	1.03428	3.17101	1.55058	1.34037	2.22212	0.38871	3.50349	1.80951	2.44153
Estimator shape parameter			2.114283	1.926318	1.824988	2.583925	3.657345	1.019478	2.158249	1.13098	1.929049	3.053957	1.67832	1.931483	0.842979	2.303585	2.725128	1.357432	1.507463	1.708568	0.987005	2.070898	2.295854	5.698899	2.443824	2.080001	1.209488	2.461803	1.111109	2.02753	0.619873	2.111834	1.389838
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.818582	0.887985	0.543888	0.567053	0.458371	1.287527	0.884125	1.128915	0.921581	0.584041	0.750232	0.778438	1.4274	0.407581	0.819295	1.080083	0.888174	0.880033	1.338478	0.828558	1.031988	0.32844	0.528311	0.542154	1.528318	0.720098	1.418884	0.805332	2.582738	0.431284	1.082428
Control chart constant d2			1.08349	1.057388	1.053535	1.074893	1.089587	0.995107	1.084784	1.007804	1.057484	1.082439	1.047078	1.057571	0.9888	1.0707	1.077294	1.027834	1.037874	1.048412	0.993952	1.082181	1.068388	1.103047	1.071811	1.078128	1.015565	1.072203	1.00573	1.080582	0.98587	1.083413	1.030188
Control chart constant d3			0.931714	0.937441	0.940877	0.91974	0.898867	0.989237	0.930443	0.97889	0.937352	0.909734	0.948435	0.937273	1.010938	0.824288	0.81857	0.982302	0.954093	0.945302	0.982724	0.832978	0.828788	0.875328	0.923058	0.918013	0.972323	0.922818	0.980402	0.912278	1.014343	0.831788	0.980384
Control chart constant D4			3.828184	3.874977	3.705187	3.538471	3.432803	4.088053	3.815753	4.015873	3.874202	3.478878	3.754511	3.873514	4.22053	3.588101	3.518388	3.890408	3.82157	3.744458	4.110731	3.838723	3.588892	3.37333	3.558228	3.525328	3.988051	3.558107	4.027835	3.491848	4.239842	3.828807	3.874874
Upper contro limit X			5.702395	3.33014	3.418505	4.078485	3.941321	5.737883	4.780722	8.320775	5.278982	3.431312	4.429075	4.481383	4.725821	2.827051	5.518527	4.384881	8.170858	5.347153	5.885088	8.338134	7.383388	3.830141	4.250801	4.745308	8.008802	5.884748	7.830881	4.788804	10.30501	2.88269	5.907881
Lower control limit X			-2.24841	-0.75872	-1.43213	-1.1887	-0.58848	-3.11245	-1.80833	-3.78784	-1.72338	0.0183	-1.88081	-1.4743	-2.31938	-0.87588	-2.14321	-1.45288	-3.45882	-2.41174	-3.02882	-2.90875	-2.8248	-0.18798	-1.87858	-1.88105	-2.81	-2.13928	-4.47583	-1.22255	-8.10387	-0.88135	-2.85488
Upper control limit MR			5.110909	2.848833	3.154477	3.343384	2.823855	8.000454	4.213855	8.804857	4.534517	2.141295	4.134187	3.858308	4.805183	2.485175	4.837357	3.890422	8.388438	5.078581	5.887118	5.951941	8.378078	2.55387	3.789827	4.177095	8.393279	4.871987	8.173743	3.788589	11.18707	2.278102	5.895882
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
False alarm in X? (Y=1/N=0)			1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0
Total false alarm in X			1	1	1	1	0	0	0	0	1	1	1	1	0	1	0	1	0	0	1	0	0	1	1	0	0	1	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Total false alarm in MR			0	1	1	1	1	0	0	0	1	1	1	1	0	1	0	1	0	0	1	0	0	1	1	0	0	1	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 30 =							119																										
Sub-total MR control charts with at least one false alarm k 30 =							109																										
Normal upper control limit X			5.475015	3.202218	3.256463	3.953748	3.864212	5.216335	4.578705	5.783288	5.080109	3.362404	4.202745	4.295458	4.23125	2.827818	5.34832	4.125895	5.788115	5.073432	5.137408	8.088412	7.000454	3.884581	4.103121	4.58341	8.132554	5.491238	8.874537	4.840842	9.125187	2.581228	5.523808
Normal lower control limit X			-2.02204	-0.8288	-1.27208	-1.07498	-0.51137	-2.59112	-1.62231	-3.23043	-1.50452	0.088208	-1.85428	-1.28837	-1.82471	-0.87688	-1.871	-1.19347	-3.07517	-2.13802	-2.49328	-2.83703	-2.38087	-0.14241	-1.53081	-1.70915	-2.43588	-1.94575	-3.81988	-1.08888	-4.92292	-0.75988	-2.57041
Normal upper control limit MR			4.808068	2.353715	2.78227	3.089571	2.898298	4.798778	3.808578	5.537868	4.033202	2.011614	3.59848	3.430818	3.720887	2.276155	4.495848	3.288011	5.444234	4.430802	4.888184	5.348481	5.812289	2.474127	3.461458	3.872191	5.284171	4.569169	8.8318	3.525108	8.830822	2.052725	4.872832
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
False alarm in X? (Y=1/N=0)			1	1	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0
Total false alarm in X			1	1	1	1	0	0	0	0	1	1	1	1	0	1	0	1	0	0	1	0	0	1	1	0	0	1	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	1	1	1	0	0	0	0	1	1	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Total false alarm in MR			0	1	1	1	1	0	0	0	1	1	1	1	0	1	0	1	0	0	1	0	0	1	1	0	0	1	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 30 =							132																										
Sub-total MR control charts with at least one false alarm k 30 =							136																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							5																										
Sub-total MR control charts with at least one false alarm k 1 =							4																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							5																										
Sub-total MR control charts with at least one false alarm k 1 =							8																										
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							56																										
Sub-total MR control charts with at least one false alarm k 10 =							53																										
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	1	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							61																										
Sub-total MR control charts with at least one false alarm k 10 =							69																										

OBJECTIVE # 3

Gamma (1 5 1 0) k = 10 obs Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	2 65207	2 13038	2 3490	2 71021	5 62301	1 52943	1 82927	2 6375	3 58790	2 08555	3 98233	2 18493	2 07528	3 17881	1 7151	1 91288	2.08983	1.88817	1 7517	2 81863	3 85641	4 17887	2.5504	2.38093	1 38101	2 5019	2 25442	2 38711	1 34589	2.75401	1 79287
			2 95613	1 90033	1 903	3 17776	1 37999	4 83623	1 57265	4 4072	1 87512	3 98328	7 73382	2 07493	4 24382	3 6858	4.0052	1.8097	1 85232	2.8857	3.3808	4 78088	1 82098	2.71481	2 21254	1 50313	1 95088	3 22465	2 69378	1 78884	3 08458	1 65215	1 82598
			1 28522	8 21134	2 771	2 53660	1 81013	1 94511	1 40427	5 0009	2 24891	3 38618	3 22218	2 42588	4 21678	1 6111	6.40382	1 92033	1 8483	2 20845	3.988	2 93037	3.83718	2 88778	2 17188	1 88788	2 58884	5 95678	1 53952	2.2224	1 48148	1 98957	2 18195
			1 71595	1 7123	6 0428	1 42901	4 61048	2 52003	3 24078	2 6878	4 73421	6 14522	2 82032	1 81088	3 07711	3 0912	2 82048	2 06374	3.3272	5.01835	2.1858	4 07003	2 37888	2 42738	1.88058	2 88819	5.30787	1 50705	2 80755	1.87831	2 27438	2 5821	1 99834
			2 99032	3 50472	2 5294	1 46945	2 33418	3 00993	2 14131	5 1626	4 33962	3 02499	2.24705	1 72378	3 05942	2.38078	2.00201	1 83178	2 17192	1 88312	1 6772	2 20441	4 40885	3.9183	3 04441	1.89086	1 98044	2 14938	1 49831	1 46426	3 08844	2 82712	2 28871
			2 35728	2 386	4 6618	1 87704	1 35716	1 84857	2 8322	2 5908	2 98009	2 38841	4.48078	4 00448	2 55841	6 20984	1 97488	2 25836	3 34132	1 82818	1 8372	2 09938	4 12352	1 44733	2 84555	2.58282	1 71282	2 45928	2 43858	2 58191	2 38458	3 20033	1 57237
			2 16402	1 83823	1 617	1 59892	2 15562	3 10841	4 28028	2 1005	1 94832	2 12898	3 52977	1 48381	5.34278	3 98702	4 38512	2.88312	1 98984	1.88408	5.2076	1 81551	2 15885	2 37031	2 52371	2 6113	2.21808	5 44088	1 41328	1 49515	1 82188	1 51995	3 13738
			4 28815	3 05418	1 6828	3 48879	5 02632	2 37652	1 98007	2 2383	2 72787	1.82281	1 73898	1 85387	4 94084	2.98828	4.5837	3 11129	3.08834	1.98818	2 1783	2 83318	1 81884	2.42882	1 32842	2.3422	2 42052	1 57711	3 04803	3 88249	2 15223	3 03828	1 88338
			1 77698	1 78727	1 4178	1 3013	2 38635	1 70994	2 2875	3 3898	3 12248	2 32918	1 55714	1.85811	2 4878	2 18558	1.99824	3.81749	1.84448	1 87305	8.2088	2.82781	1.8211	3 18082	2 17881	1.88117	1.42814	3 58855	2 03808	1 41208	4 8816	2 28178	2 78903
		10	1 58969	4 0982	4 4016	1 73873	1 30852	2 08814	5 00581	2 804	2 54153	3 63375	2 17384	2 04228	2 12241	2.88128	3.43875	1 48362	2.58143	2.51434	3.0748	2.54498	5 73208	2.81443	2.54505	3 75175	3.5233	1.83423	1 84598	1.88847	3.58877	1 83858	3 98283
			2 08192	1 94228	3 128	1 8107	2 8235	2 97451	2 09593	1 9864	1 85181	3 72082	4 44837	4 04497	1.25098	2.28988	1.827	5 18333	2.13778	1.83298	1 8525	1 74388	2.58822	1.41183	3.0187	1 35743	8.8208	1 7005	1 57081	2 18018	1 77498	3 1748	2 54952
			3 23235	1 99088	1 655	1 80851	1 98278	2 1808	4 20427	1 6232	1 65203	3.0301	1 35584	2 18938	4 57846	2 82763	4.21213	1 48882	1 7038	3.51531	2 4814	2 03827	2.58495	2 21228	4.34388	4 74704	1 55834	1 44378	4 83741	2.40888	1 80938	1 42738	1 43198
			2 57798	2 05275	4 3356	1 47858	1 9474	2 8805	3 84431	3 2051	2 27013	2 58189	3 84584	1 85998	2 04743	3 00821	2 00765	2.87218	2.88842	3.8071	1.7381	3 74415	3 81701	2.38213	1 70854	2.21402	2 08775	3.20128	2 32345	1 30111	1.54898	1 58292	4 05503
			3 04348	1 49880	2 7301	1 68955	1 44043	3 38148	2 72908	1 9158	1 89035	1.81542	7 70508	1 84187	3.5284	2.38138	1 84848	2 15328	2 23988	2.07838	2.2853	4.83	3 58484	1 28088	3 78784	1 48954	3 35828	1 88488	3 12814	1.54	1.51081	2 53458	3.0077
New observations k =			3 3219	1 96997	2 4304	5 1144	3 58893	1 71402	1 7177	7 0008	1 71958	1 7371	4.3812	1 70082	2 51873	3 03218	1.34118	4 12248	1 49182	2.38488	2.0887	3 93887	3.49777	1 55779	3.02822	4 58181	2 18412	8 09398	1 73553	1 82238	2 07838	1 70285	4 47509
			1 46515	1 50902	2 1384	1 83137	3 48758	2 32884	4 08852	1 8118	1 8098	2.08881	1 88438	2.81544	1 80528	3.0031	1.8113	1 40038	2 77032	3 77144	3 1784	2 38878	1.74842	2 88487	1.38888	4 52838	2.8827	1 63988	2.9757	2 05365	4 00235	2 1045	1 45149
			2 16353	3 73604	1 8358	2 04212	2 51732	3 88672	1 417	2.202	1.72884	1 88318	2 78107	3 88948	3.75284	1.41258	3 12455	1 98031	1.89852	3 50198	1.4223	2.30742	2 18895	2 08308	2.32724	2 02198	4 28385	1.54942	1 53184	1 50103	2 87714	1 81338	1 8477
			1 85114	2 82126	1 8788	2 29848	2 20375	3.01287	2 90898	1.8282	1.61324	1.83881	3 73328	2 77705	3.21827	2 74854	2.33784	2.22	2.8829	1 88475	2 8834	1 75877	2.58887	1 42248	1.81338	2 80181	1 48558	3 78288	3 32888	1 31858	2.50898	4 92535	2 38457
			1 5755	2 86037	1 8833	5.00831	3 38673	2 41565	3 01818	1 4088	2.81258	5 1078	2.83805	4 80101	2.88481	1.3823	3.9485	2 75743	2.23438	1.78213	2.7008	2 23851	5 74358	1 54282	3.1188	2.10058	3 08887	2.33153	2 25045	3.08592	5 78328	1 78047	5 8284
		20	2 83143	1 72038	10 7337	1 44838	1 83107	1.70174	2 52702	2.0093	4.04347	2.31831	4 83471	2 82425	2.08858	2.01831	1.58724	2.13734	4.2858	1.81888	1.9808	2 78754	1.8892	4 98783	1.51585	1 87083	4 38388	2.95846	2 32118	2 67814	2 80104	2 3028	2 27512
			2 02397	3 28736	1 8852	2 38136	1 74757	5 88360	4 87127	2 6947	1 98345	3 73757	1 38501	2.33887	1.98291	2.85703	1.8244	1.4804	1.83518	3 82788	1.8785	2 28588	1 80525	3 88128	3 54482	1 87813	4 82848	1 85047	3 25408	2 33037	2 00313	2 71215	3 86288
			4 1793	1 24489	2 4593	1 82492	3 38197	2 58181	2 94089	2.2898	2 34341	2 01055	1.5577	2.36407	2.38821	2.08867	2.73287	2.00848	2.03895	5.82387	1.5878	4 33708	3 28748	1 78827	3 57844	3.81103	3 38224	1 92481	4 04503	2 88878	3.4468	2.43298	2 218
			1 60658	1 35623	2 7307	1 3983	2 05742	2 08486	2.38152	1.957	2 45296	4.34788	1 64483	2.24807	1.55824	1.38382	1 98312	2 18813	2.04831	1 78572	2 4033	4 48781	1.30522	3.75288	1.83842	3 74704	2 52837	2 58482	2.82138	3.05185	3 01045	1 58205	2 12024
			3 11358	2 90207	1 7568	3.08241	2 78008	2 85221	2.51283	2.0762	2.87015	2.53482	4.04421	5.60388	4.22888	3.8353	2.78588	2 57375	1.58585	2 38873	3 0288	1.45288	2.83288	1.38887	2.25518	2.88251	5 10158	3.50712	1 80571	1 71808	1.83878	3 24342	5.25845
			3 87715	1 95924	1.508	1 8258	1 38824	3.00328	4 58698	2 7141	1 89828	1 7172	1.47572	2 18753	2.88558	1.34398	7 18857	2 02173	1.4553	2 28283	3.1288	1.8854	3.21858	2.83838	2 88888	5 18784	8 20783	2 507	2 84449	1.80283	3 55824	2 38525	3 54833
			2 98058	1 44695	1 2941	5 11427	1 83741	3 18951	3.42812	1 8705	2.2471	1.88847	1.88828	1.83325	1.45705	1.38888	4.23784	1 83528	1.31884	2 18313	2 4988	3 14788	3.48888	3.57875	1 45847	4.85383	2.32241	1 51085	4 17135	5.2548	3.50741	2 33215	3.2059
			4 34001	3 05381	3.2788	2 17432	3.38015	2.88673	3 01895	1 8282	1.58748	3 38874	1 72318	1.28254	2.5472	1.98818	1 58498	1.81305	2.35388	1 50888	8.8827	2 05102	2.7862	2.88775	1.27117	3 52888	3 0878	2 0343	1.50033	8 7128	2 48825	5.8875	1 83411
			1 68391	4 88808	1 8532	3 47344	1.7884	2.34587	2 58833	2.4504	1 98541	2.85587	2.84284	1.45457	3.08833	3.83837	2.78414	2 98042	3.17825	4.85848	1.7258	2 57238	2.38787	2.41571	1.38834	1 74418	2.3443	3 73843	7 32223	2.98872	2 75449	3.51308	1 70488
			1 67867	1 57178	3 8332	1 48731	2 01147	1.85714	2.53865	1.5293	3.88538	3.1715	2.2012	2.1188	1.548	4.4818	1.48803	1 83322	3.93837	2 18022	3.441	2.18252	1 87887	3.82083	3 11887	2 18554	2 13845	8 07272	2.73883	3 15838	2.88984	3.82882	2 44098
		30	2 07284	2 67355	5 8021	1.40286	1 98262	3.50038	2.75822	1 7503	1.88848	2.0251	2.83192	1.5108	2.23805	1.85887	2.38084	3 79188	2.18298	4 11488	1.5114	1 35111	2.83877	3.30283	4 04188	4.38298	1.51335	3 95441	3.38527	2 1522	2.5418	3 14802	7 92984
Estimator shape parameter			2 114263	1 926318	1 824088	2.583925	3.657345	1.019478	2 158249	1.13066	1 828049	3.053857	1 67832	1.831483	0.842878	2.393585	2.725128	1.357432	1.507463	1 708568	0.987005	2 070898	2.295854	5.898898	2.443824	2 080001	1.209468	2 461803	1 111100	2.92753	0 618873	2.111834	1 389839
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0 816592	0 667865	0.543668	0 657053	0.458371	1.287527	0 864125	1 128815	0.821581	0.584841	0 759232	0 778438	1.4274	0 407581	0.818295	1.080063	0.888174	0.860033	1.339478	0 828558	1.031988	0.32844	0.526311	0.542154	1.528318	0 720098	1.419884	0 685332	2.582738	0.431284	1 082428
Control chart constant d2			1.08348	1 057388	1 053535	1.074693	1 089597	0.995107	1 064784	1 007804	1.057484	1 082438	1.047078	1.057571	0.9898	1.0707	1.077284	1.027834	1 037874	1.048412	0.988952	1 082181	1 088386	1 103047	1.071811	1.076128	1.015555	1 072203	1.00573	1 080582	0.98587	1 063413	1 030108
Control chart constant d3			0 931714	0 937441	0 940877	0.91874	0.898887	0.989237	0 930443	0.97888	0 937352	0.909734	0.948435	0 937273	1.010938	0.824288	0.81857	0 982302	0.854093	0.945302	0.882724	0 932878	0.828789	0.875328	0 823058	0 818013	0 872323	0 922618	0.880402	0 812279	1 014343	0 931789	0 880384
Control chart constant D4			3 828184	3 874877	3 705187	3.538471	3.432803	4.088053	3 815753	4.015873	3.674202	3.478878	3.754511	3.873514	4.22053	3.588101	3 518388	3.880408	3.82157	3 744458	4.110731	3.638723	3 588692	3.37333	3.558228	3 525328	3.888851	3 556107	4 027835	3 481849	4.238842	3.828807	3 874874
Upper contro limit X			5 702395	3 33014	3.418505	4 078465	3.941321	5.737663	4.780722	6.320775	5.278882	3.431312	4.428075	4.481383	4.725821	2.827051	5.518527	4.384881	6.170858	5.347153	5.865088	6 338134	7.363388	3.830141	4.250801	4 745308	6 608902	5 684748	7 630881	4 788804	10 30581	2 88208	5 907861
Lower control limit X			-2 24941	0.75872	-1 43213	-1 1987	-0 58848	-3.11245	-1 80833	-3 76794	-1.72338	0.0193	-1 88081	-1.4743	-2.31938	-0.97598	-2.14321	-1.45288	-3.45882	-2.41174	-3.02092	-2.90875	-2.8248	-0 18788	-1.87858	-1.88105	-2.81	-2 13826	-4 47583	-1 22255	-8 10387	-0.86135	-2 95466
Upper control limit MR			5.110908	2 646833	3 154477	3 343384	2.823855	6.000454	4.213855	6 804857	4.534517	2.141285	4 134107	3.858308	4.805183	2.485175	4.837357	3.890422	6.368438	5.078561	5.887118	5.951841	6.378078	2.55387	3 768927	4 177085	6.383279	4 871987	6 173743	3 708589	11 18707	2.278102	5 895982
False alarm in X? (Y=1/N=0)			0	1	1	0	1	0	1	0	0	1	1	0	1	1	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	1	1	1	0	0	0	1	0	1	1	1	0	1	0	1	0	0	0	0	0	1	1	1	1	1	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	1	1	1	0	1	0	0	0	1	0	1	0	1	1	0	0	1	1	0	0	0	0	1	0	1	0	1	0	1	1
Total false alarm in X			0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	1	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0
Total false alarm in MR			0	1	1	1	1	0	0	0	0	1	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 30 =							169																										
Sub-total MR control charts with at least one false alarm k 30 =							103																										
Normal upper control limit X			5 475015	3 202219	3.256483	3 953748	3.864212	5.216335	4.578705	5 783206	5.080100	3.362404	4.202745	4.205456	4.23125	2.827819	5.34632	4.125095	6.786115	6.073432	5 137408	6.008412	7.098454	3.884501	4 103121	4 50341	6 132554	5.491239	6 874537	4 840942	9 125107	2 581228	5 523808
Normal lower control limit X			-2.02204	-0.6288	-1 27208	-1 07488	-0.51137	-2.58112	-1.62231	-3.23043	-1.50452	0 088208	-1.05428	-1.28837	-1.82471	-0.87888	-1.871	-1.19347	-3.07517	-2 13802	-2.48328	-2.63703	-2 38087	-0 14241	-1 53091	-1.70815	-2.43588	-1 94575	-3.81989	-1 09688	-4 92282	-0 75888	-2 57041
Normal upper control limit MR			4.608088	2 353715	2.78227	3 089571	2.688288	4.798778	3.808578	5.537889	4.033202	2.011614	3.58848	3.430818	3.720887	2.278155	4.495648	3.268011	5.444234	4.430802	4 688184	5.348481	5.812288	2.474127	3 481458	3.872191	5 284171	4 589188	6.8318	3 525108	8 830922	2 052725	4 872832
False alarm in X? (Y=1/N=0)			0	1	1	0	1	0	1	0	0	1	1	0	1	1	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0
False alarm in X? (Y=1/N=0)			0	1	1	1	0	0	0	1	0	1	1	1	1	1	0	1	0	0	0	0	0	1	1	1	1	1	0	0	0	1	1
False alarm in X? (Y=1/N=0)			0	1	1	1	0	1	1	0	0	1	0	1	0	1	1	0	0	1	1	0	0	1	0	1	1	1	1	1	0	1	1
Total false alarm in X			0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	1	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	1	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	1	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1
Total false alarm in MR			0	1	1	1	1	0	0	0	0	1	1	1	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	1	0	1	1
Sub-total X control charts with at least one false alarm k 30 =							183																										
Sub-total MR control charts with at least one false alarm k 30 =							125																										
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 1 =							23																										
Sub-total MR control charts with at least one false alarm k 1 =							14																										
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 1 =							26																										
Sub-total MR control charts with at least one false alarm k 1 =							27																										
False alarm in X? (Y=1/N=0)			0	1	1	0	1	0	1	0	0	1	1	0	1	1	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	1	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							109																										
Sub-total MR control charts with at least one false alarm k 10 =							57																										
False alarm in X? (Y=1/N=0)			0	1	1	0	1	0	1	0	0	1	1	0	1	1	1	0	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	1	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							115																										
Sub-total MR control charts with at least one false alarm k 10 =							70																										

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Gamma (1 5, 1 0)		k = 10 obs		Shift 2 process standard deviation																													
		1	3 09805	2 99891	3 25734	2 8507	2 7704	4 07697	4 13347	3 8121	3 67380	4 80067	2 82675	4 1864	3 23005	3.20867	3 38024	3 1845	5 89331	3 8071	5 08029	4 1448	2.67926	4 18152	2.87018	5 79453	2 83878	3 26455	2 7326	5 15416	2 84312	2.85177	2 68852
			3 95722	7 53409	3 81343	5 46481	2 7732	3 47557	5 42632	3 6575	3 35454	4 88741	3 48972	2 9712	2 90645	3.4477	5 35912	2.8853	3 81347	2.8028	3 86992	3 9198	6 01325	3 87336	4 72018	4 56305	6.37252	4 51636	3 71875	8.8565	3 04084	3 08248	3 2047
			4 19473	5 55434	4 30776	4 48993	3 8042	7 45784	4 32898	4 1872	4 27224	5 22188	3 80552	5 5314	3 65978	2 87892	4 84582	3 092	5 83861	3 7255	2 99288	3.2262	3.5288	2.92125	3 00837	4 8503	2 54549	7 73988	2.72058	2 59431	3.21928	2 54178	3 61858
			4 9063	4 08737	4 31498	4 34433	3 5908	2 92975	3 32159	4 1838	3 21298	3 93114	3 45082	2 9382	3 98291	3 83214	2 80843	7 0844	3 13417	3 9402	6 69388	2 9351	3 10706	3 27319	4.39884	3 63357	3 41637	3 34998	4.3861	4 78734	2 60129	3 28718	8 40472
			3 72512	3 3873	6 22327	2 92463	2 7941	5 08368	3 10638	2 6008	3 27994	3 88087	3 73012	2 7732	3 15671	5 84822	2 8883	5 0856	3 94857	4 6758	5 18095	3 7288	5 45918	3.35419	2.7589	3.27825	4.7492	3 6554	2 85695	3 9009	2.7594	4 48754	5 64814
			3 33227	3 37696	2 69038	3 32597	3 6191	4 68131	8 06281	5 332	4 04834	2 73538	3 93837	2 7734	2 96956	7 15388	5 89205	2 8131	3 34752	3.716	3 15852	5 7687	3.6449	4 04878	2.62483	2.88303	6.61132	4 11218	4 14636	2.8748	2 9817	5 88185	3 77005
			6 71895	5 37135	2 95045	5 01535	3 9403	4 11523	3 17898	3 738	3 72049	3 35163	5 95319	4 5691	6 45878	3.1119	3.51255	3 4274	2 58448	3.1342	2.93733	2.5571	5 49779	4 32831	3.62134	2 59055	3.53546	2 83298	2 63208	6 78354	2.70713	2 58115	3 51417
			3 39455	5 07051	5 25631	8 60482	6 3873	4 44694	2 95674	4 1651	4 24814	3 08512	2 8921	3 0814	3 81316	3.38542	4 82534	3 1103	6.22285	5 3083	3 17229	3 3842	2 83482	2 95191	3 19828	2 80378	4 7416	5 87584	2 85698	6 51919	2.9309	4 86957	5 44489
			4 3048	5 03954	3 33551	2 8005	3 328	3 59715	4 14522	4 2421	3 38108	6 33333	2.82572	3 6082	5 00415	3.87384	3 35778	2 8416	5 78225	2.7497	4 84888	2.8344	2 66843	2 65284	2.65055	2.56836	3 18134	2 78198	3.84866	3 28084	4.72331	4 27452	2 9889
		10	3 99776	6 99803	6 19851	3 13509	6 1947	2 99448	4 36484	2 9883	3 00495	3 83938	2.83358	5 6183	2 99475	5.37248	3 89011	5 4459	2 58102	2 5722	3.34276	3 8834	2.47048	4 43364	6.62557	5 94847	3 14185	3 71412	3.68781	4 51897	2 82808	2.94504	6 58182
			2 66516	3 01835	2 70242	3 8358	2 6982	4 51709	8 92002	5 0736	3 19473	2 54727	5.05318	8 6232	2 87894	5.74348	3.69455	4 4484	3 42227	8 7499	2.84787	3 2821	2 83085	4 44589	4 14188	3 37205	4 36852	3 98703	2.58235	4 56239	3 88708	5 38554	4 24327
			3 27553	3 47935	3 94505	3 46543	4 9213	3 45699	5 25888	4 5753	4.01479	3.72102	5 43972	4 3972	3 16001	3 41857	4 83802	3 4018	4 80283	3.9782	4.5618	3.3134	4 11457	2.7228	4.03314	2.79557	5.9381	4 47835	4 72137	2 98333	4 89836	6 05503	3 78585
			5 217	3 20119	4 46395	6 11162	3 5044	4 00906	3 0985	3 8132	2 78128	4 20279	3.45933	5.2812	3 15621	3.38304	4 00088	4 0207	2.54779	7 5358	2 85158	3.7185	4 15494	4 88388	3.49818	3.80806	3.53851	3 49868	4 20881	2 74865	4 07805	2 67374	5 87708
			4 30814	3 72292	2 8507	3 52731	3 3291	3 87713	2 52942	4 2648	4 77013	3.05734	6.5869	3.5335	4.00547	4.42688	4 21087	3.6876	3.3202	2.5317	3.23222	2 971	5 12293	5 88158	5.2391	2 82105	5.6052	2 72929	3.57015	4 01278	5 75694	4 04208	4 4787
New observations k =			3 53345	3 46145	4 30814	3 57393	7 4873	4 21847	4 50126	3 1077	3 30701	3 88902	4 88855	7 1507	3 1089	5.55561	3.34877	6.377	3.43884	3 1305	3.88874	3.8018	4 19541	5.53522	3.35471	6.00936	4 08314	2 48273	3 68368	3 99844	4.61788	4 74748	4 98125
			3 29005	2 81756	3 67968	2 65964	5 1019	6 82569	2 70876	2 8823	3 4764	4 02185	2 80914	3 5292	3 29741	4 46785	5.2556	3 2582	2.5743	8 6736	4 53368	2 7163	3.31818	2.84248	7 44715	5 71102	2 83823	5 38155	4 36338	5 34988	2 78751	2 98661	2 62135
			6 77387	2 88959	3 73691	4 18452	4 0188	4 7134	6 63942	3 2279	3 28979	3 83889	3 15801	2 7542	2 88799	2 81584	2.89449	4 2297	3.09414	5 5119	7 00637	2 8612	4 28925	4 1217	4 10182	4 11158	3 65213	3 75844	3 78895	2 65391	2 98084	4 98738	3 51943
			3 14728	5 25078	3 67829	5 09124	3 3941	3 64083	3 91467	2 8071	3 94992	3 51081	2 88261	3 8813	5.3754	3 71032	4.9853	4 8218	3 11215	4 6822	8.57304	3 1098	4 27648	3.51583	3 52025	8 81897	5 38544	2.89844	3 52261	2 57492	3.07471	2 81147	6 08173
			8 05418	4 05509	2.58222	4 4488	3.7263	2 82482	3 88883	6 5895	4 90286	4 14482	2 91142	5.3245	6 8884	3 18779	3 13355	3 2322	3 30208	3.7873	2 84387	3 1313	7 43834	3.28338	4.38328	4 48321	8 73798	2.70505	3 21818	2 65683	6.60808	2 83019	2 92785
		20	5 84315	3 53289	3 58355	7 81682	3.596	3 60768	4.21574	3.0747	4 21028	3 15448	2 82846	3.4595	3 20886	5 00528	2 83447	3 4498	3.40087	3.6275	2.80777	4.8883	4.54344	3 51187	2.54857	4 19801	6 58198	4 1072	5 65587	3 72118	3.8182	2 74388	3 14552
			2 6837	2 78331	3 27852	4 79188	3.5739	2 78118	2 87368	3 1803	3 94978	4 15704	2.81188	3 5748	2 77882	4 34489	4 79453	3 2981	4.95737	3 8285	2 81138	4.8257	8 58487	3.08358	2.581	3.48817	6 10297	3.32453	3.74583	2 7509	2.9754	2.80545	3 29584
			3 33781	2 72044	2 62998	4 45015	4.021	6.01212	2 82982	3.7182	5 38748	2 75541	7 80854	2 4731	3.78881	7 08543	2.82834	3.8378	2.92512	3.8087	3.58122	4 3052	3.23833	3 61831	3.02357	3 19833	4 15056	3 30182	3 59888	6.0387	5 48758	3 24281	3 62958
			3 04041	4 92034	8 32721	3 40232	2 833	3.32088	3 20533	4.503	7 00228	2.81489	4.81252	5.8542	4.00534	5.5807	5 61845	2.5789	5 17188	4.525	6.20042	3.0782	4.2811	3.28528	3 48477	2.81198	3 77855	2 97177	3 83785	3.88805	3 12412	3 40884	4 07487
			2 65545	3 59249	3 28875	3 82184	3 1109	5.38147	2.93381	8.7627	5 83382	3.80875	2.57843	7 1823	2.56288	5.23208	4.0888	2.8723	3.0108	4.9358	6.88113	3 6888	8.00783	3 48118	3.28827	5.21349	6.87782	3 88252	6 47403	3.4488	2 78543	2 82882	3 12332
			6 80558	2 79088	3 72598	6 37786	3 5473	2 96423	4 68781	3 994	5 15075	3.88877	5.8873	3.4881	2.58857	2.928	4.63345	2.952	5.74085	4 4823	5.8797	3 0188	4 15148	2.89302	3 88587	6 42043	6 20283	2.5873	2 54189	3 88301	5.88585	2 83708	2 83855
			4 08208	3 30856	3 70858	3 53379	3 3289	4 57474	3.38021	4.7407	3.0798	3.8831	4 08188	5 7034	4.25137	3.31275	3.23057	3.0779	2.53878	2.7848	6.00811	4.8958	3.47107	3.71326	4.24209	4 13403	4 65245	3 38833	2.92852	5 12778	3 42735	5 8349	4 88485
			2 71783	2 78978	3.84747	4 61044	3.5909	7 74312	5 47821	5.474	4 54361	6.0881	4.70258	3.0889	2 98882	5 12751	4 2878	5 9087	3.28376	5.2289	2.8831	3.8788	4.4181	3 18352	5 54589	4 37825	3.49803	2 99888	4 20215	4.0245	2 74871	3 78882	4 02438
			4 20852	5 07338	3.5497	3 19237	4 1332	6 43277	2.72247	2.7308	5 84018	3.74087	5.6309	3.8018	4.80864	3.81351	4.84773	2 7765	6.34846	3.8179	4.82878	3.1383	3.54163	2.88827	4 03153	6 98882	2.83183	3.71843	2 87287	2 54944	2.48888	2 70523	2 78832
			3 50852	4 87352	7 72583	4 69773	2 9917	4 25538	5 20288	3.8879	5.72848	2 81958	4.87788	3.5845	3 18227	3.61828	3.5582	3.8248	2.85688	3.5422	3.78863	5.4888	2.87334	6.2419	3 56988	3.25063	6 7288	7 73883	4 38884	4 19818	4.8146	2 85814	3 11872
		30	3 70328	6 32148	7 60538	3.24988	7 1741	3.81505	6.87628	6 9841	3.32405	2.52185	2.87881	4 5878	2.55381	3.23138	6.67823	6.43	2.5113	3.1011	4 18531	3.3513	4.83449	3.03507	4 13781	3.18858	5.45482	4.08587	3.57232	2.99918	2.90336	3 50336	3 30889
Estimator shape parameter			2 114263	1 926318	1.824988	2 583925	3.657345	1.019478	2 160249	1 13088	1 829048	3.053857	1.67832	1.831483	0.842879	2.383585	2.725128	1.357432	1.507483	1 706568	0.987005	2.070698	2.285854	5.888889	2 443624	2.000001	1 209408	2 481803	1 111109	2.82753	0.819873	2 111634	1 389839
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0 816582	0 667985	0 543668	0 557053	0.458371	1.287527	0 884125	1 128915	0.821591	0.564841	0 758232	0.778439	1.4274	0.407561	0.619295	1 080063	0 889174	0.880033	1 339478	0.828558	1 031988	0.32844	0.528311	0 542154	1 528318	0 720098	1.419884	0 605332	2.582739	0 431264	1 062428
Control chart constant d2			1 08349	1 057386	1 053535	1.074693	1.089587	0 995107	1 064784	1 007804	1 057484	1 082438	1.047078	1.057571	0.9888	1.0707	1.077294	1 027834	1.037874	1 048412	0.990952	1 082181	1 088388	1 103047	1.071811	1.076128	1 015555	1 072203	1 00573	1 080582	0.98587	1 063413	1 030188
Control chart constant d3			0 931714	0 937441	0 940877	0.91974	0 899967	0 989237	0 930443	0 97969	0 937352	0.909734	0 946435	0.937273	1.010938	0 924288	0.91857	0 962302	0.954093	0 945302	0 892724	0.832978	0 926789	0.875328	0 923058	0 918013	0 872323	0 922818	0 990402	0 912278	1.014343	0 931788	0 860384
Control chart constant D4			3 626184	3 674977	3 705187	3 536471	3 432803	4 088053	3.615753	4 015673	3.674202	3.470878	3 754511	3.673514	4.22063	3.508101	3.516398	3.890409	3.82157	3 744458	4 110731	3.636723	3 580692	3.37333	3 558228	3.525328	3 968951	3 556107	4 027835	3 491849	4.236842	3 626807	3 874674
Upper contro limit X			5.702395	3 33014	3.418505	4.078485	3.941321	5.737863	4.780722	8.320775	5.278802	3 431312	4.420075	4.481383	4.725921	2.827051	5.518527	4.384881	6.170858	5.347153	5.885068	6.338134	7 363398	3.930141	4 250801	4 745308	6.808902	5 884748	7 630681	4.766804	10 30591	2 68289	5 807861
Lower control limit X			-2 24941	-0 75672	-1.43213	-1 1997	-0.58848	-3 11245	-1.80833	-3.78794	-1.72339	0.0193	-1.88081	-1 4743	-2 31939	-0.87588	-2.14321	-1 45288	-3.45892	-2.41174	-3.02082	-2.80675	-2.6248	-0 18796	-1.67859	-1.86105	-2 81	-2 13928	-4.47583	-1 22255	-6 10367	-0 86135	-2 95408
Upper control limit MR			6 110909	2 648833	3 154477	3.343384	2.823855	8.000454	4 213855	8.804857	4 534517	2.141295	4 134187	3.856309	4.805163	2.485175	4.837357	3.890422	6.368439	5.076561	5.897118	5.951941	6.379078	2.55387	3.769027	4 177085	6.383279	4 971987	8 173743	3 768588	11 18707	2.276102	5 895982
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	0	1	0	0	1	1	1	1	1	0	1	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	0	0	1	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	0	1	0
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	1	1	1	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	1	0	1	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Total false alarm in MR			0	1	1	1	1	0	1	0	0	1	1	1	0	1	0	1	0	1	0	0	0	1	1	1	0	0	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 30 =							217																										
Sub-total MR control charts with at least one false alarm k 30 =							108																										
Normal upper control limit X			6.475015	3.202219	3.258463	3.953748	3.864212	5.218335	4.576705	5.783286	5.080109	3.362404	4.202745	4 285456	4.23125	2.827919	5.34632	4 125695	5.788115	5.073432	5 137409	6.068412	7 089454	3.884581	4 103121	4 59341	6 132554	5 491239	6 974537	4 640842	6 125187	2 581228	5 523808
Normal lower control limit X			-2.02204	-0 8288	-1 27209	-1.07498	-0.51137	-2.59112	-1.62231	-3.23043	-1.50452	0 088208	-1.85428	-1.28837	-1 82471	-0.87686	-1.971	-1 18347	-3.07517	-2 13802	-2.49328	-2.63703	-2 38087	-0.14241	-1.53091	-1 70915	-2.43568	-1 94575	-3 81069	-1.09669	-4 92292	-0 75988	-2 57041
Normal upper control limit MR			4 808068	2.353715	2.78227	3.089571	2.688286	4.798778	3.808578	5.537889	4 033202	2.011614	3.59846	3.430816	3.720887	2.278155	4.495648	3.288011	5 444234	4.430802	4 688164	5.348481	5 912289	2.474127	3 461458	3 872191	5.264171	4 569109	6.6318	3 525108	6 630922	2 052725	4 972832
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	1	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	0	0	1	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	0	1	0
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	1	1	1	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			1	1	1	1	1	0	1	0	0	0	0	1	0	1	0	0	0	1	1	0	0	1	1	1	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	1	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Total false alarm in MR			1	1	1	1	1	0	1	0	0	1	1	1	0	1	0	1	0	1	1	0	0	1	1	1	0	0	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 30 =							229																										
Sub-total MR control charts with at least one false alarm k 30 =							142																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Sub-total X control charts with at least one false alarm k 1 =							54																										
Sub-total MR control charts with at least one false alarm k 1 =							34																										
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 1 =							88																										
Sub-total MR control charts with at least one false alarm k 1 =							45																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	0	1	0	0	1	1	1	1	1	0	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	1	1	1	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							188																										
Sub-total MR control charts with at least one false alarm k 10 =							62																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	0	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	1	1	1	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0
Sub-total X control charts with at least one false alarm k 10 =							180																										
Sub-total MR control charts with at least one false alarm k 10 =							82																										

OBJECTIVE # 3

GAMMA (1.5, 1.0)   k = 30 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			4.17803	1.34895	0.12357	1.08324	1.70457	0.85518	2.05197	0.25203	0.90198	0.1904	0.88801	0.78862	0.85155	2.58473	2.38492	1.88148	2.88418	5.07821	1.38411	0.38915	0.5878	2.13678	2.18482	1.72757	2.58922	3.3047	0.84538	0.48248	0.8797	1.48288	2.70438
			0.38276	0.49672	1.31495	3.38753	0.81841	1.83504	0.23344	0.00511	5.07525	2.86185	2.28982	0.78139	0.37425	0.7178	2.80036	1.12988	0.89478	0.31517	1.88223	2.34865	1.34922	2.13387	0.74589	0.65581	2.87018	2.15768	1.07487	1.14958	1.48502	4.78889	2.47108
			0.70845	1.87645	3.28838	2.08464	5.42848	0.70839	0.94898	2.03775	2.03869	0.90917	0.12924	2.07494	1.38857	1.08101	2.48238	0.44181	0.42201	3.52863	0.44845	1.88864	0.12072	1.08278	0.87108	0.83388	3.30848	1.335	2.78577	1.97138	3.18867	0.86787	0.9525
			0.80747	0.74812	3.76887	1.3025	2.4957	0.44128	2.01308	0.34824	2.09882	0.77069	0.25347	1.3057	3.20178	1.15805	3.82794	1.29103	1.57008	0.38207	1.31337	0.39564	0.52579	0.49107	1.3881	0.19744	1.54888	1.13088	0.58149	0.44857	0.62048	2.80797	0.75057
			4.57893	1.23684	1.19177	3.11818	2.57114	0.6823	0.85512	2.00468	0.34922	0.48283	1.45812	0.823	0.98291	1.34409	1.39579	1.81318	0.35408	2.15588	1.49911	3.87234	0.75085	1.37408	0.98868	0.92504	1.82848	0.55947	0.821	1.5878	1.28585	0.23897	3.18877
			3.34035	0.0923	1.80824	0.18249	2.07384	1.41742	0.89998	0.22011	1.92025	1.41247	5.58624	1.88382	0.95121	3.44428	1.88900	0.35058	2.27073	1.14415	2.44509	0.589	2.7553	0.07187	0.1758	1.88845	1.38374	0.48785	0.82885	2.10383	0.48481	1.03719	1.27084
			3.13418	3.44085	0.25489	0.86558	0.2204	0.82007	1.12331	2.83853	2.02592	0.78439	0.4455	0.93432	1.86427	1.30067	1.31887	5.20712	1.8851	0.24388	1.86275	0.43081	1.78211	2.84867	0.03417	0.32881	2.31182	1.04287	3.37272	2.35188	0.88348	2.1794	3.41417
			2.52337	3.07345	0.17358	1.38202	3.13189	0.78278	1.53691	0.81288	0.41455	0.51841	3.23308	0.14844	1.49599	4.80335	1.175	1.12823	0.99209	3.55822	0.83332	1.27868	0.85424	0.30885	0.62178	1.8928	1.87088	0.89085	2.5368	1.0898	0.85874	0.97868	1.74877
			1.1845	1.89544	2.89501	0.27557	2.40724	1.12312	3.10465	0.50709	4.14928	3.86187	2.20187	0.3128	0.18942	0.63871	2.81425	1.33741	1.07431	0.41044	0.07852	1.53328	1.70861	1.87185	1.9953	0.64789	2.27178	0.88428	2.87095	1.88157	1.41814	1.37795	0.22701
			0.82848	1.58441	0.88179	3.41358	0.2473	0.71213	0.89523	2.29868	3.92856	1.34411	0.88591	0.84207	0.53783	0.8883	2.02154	2.83173	1.53818	1.88428	0.98867	0.85021	0.81487	1.30818	1.78805	7.17422	1.15758	0.834	0.55448	1.02885	0.95775	0.8082	0.82728
			0.48939	0.89703	0.86441	1.22973	5.42384	2.01832	1.62812	1.00713	2.7271	1.75864	1.87811	0.73799	0.5855	1.63083	0.87185	3.30381	0.28812	1.87235	0.50843	3.34874	1.22755	1.82335	1.84129	1.12498	4.3088	1.81858	1.17172	0.74342	0.82834	1.32829	1.43512
			0.08418	0.21784	2.70804	3.30585	1.22508	0.43084	2.09104	0.05508	1.35671	2.15833	0.41315	1.83842	0.82081	1.38783	0.29708	2.47107	1.2155	1.70404	2.80378	0.88248	0.43885	2.48471	0.81817	2.81475	3.3585	1.82808	1.13898	2.10841	0.28838	0.21322	1.57507
			0.75348	0.45298	4.32712	2.12257	0.80825	1.88911	0.93751	0.12481	0.80665	2.03108	0.86432	2.17777	2.51518	0.84712	0.41583	2.77425	2.17821	1.0738	1.24475	1.81285	5.58751	1.00875	0.20271	1.01868	1.2328	2.80239	0.68088	1.88884	0.32983	1.43313	0.81382
			6.51718	2.22844	0.51528	2.83504	1.28005	0.37717	0.87924	2.31843	2.42862	1.3991	1.01483	3.03787	1.84472	3.23821	3.58087	2.03745	0.57862	0.84518	0.45525	0.7815	2.01782	0.47018	0.38777	0.43338	0.75291	1.48434	0.3818	1.05158	2.23888	0.8037	1.34493
			2.48273	0.38338	1.86848	0.57844	0.82773	1.94591	3.34809	0.20831	1.9237	1.82418	0.3224	0.42402	0.51352	0.72728	1.525	0.99825	0.80556	1.01577	0.52337	2.79548	0.25742	3.37875	0.02182	2.87378	2.98012	1.45302	0.28888	0.80585	1.07814	3.44201	0.87291
			0.46931	2.02535	1.83871	0.03898	0.8111	2.28478	0.30495	1.34418	0.35277	1.13007	0.07282	1.82452	0.80788	1.45783	1.22882	5.12503	0.78798	1.04007	2.38323	1.71172	1.11852	2.36108	4.3188	1.73481	1.17231	0.89082	4.57133	1.13043	0.73335	0.23821	4.39192
			1.14484	2.89831	1.11597	0.11345	3.53981	0.42378	2.55131	1.35455	0.52495	0.5451	1.07447	0.12884	6.04703	1.51887	0.90834	1.74872	1.11988	2.07258	1.43258	0.86499	0.23504	1.51791	0.32924	2.82208	4.78874	1.25588	2.78811	1.38831	1.31991	0.1349	1.59153
			0.60943	1.82558	1.70466	1.48133	0.83605	0.31872	0.03685	1.15	0.83454	0.70562	0.51405	2.49098	0.84289	1.25085	5.95297	1.88888	2.87483	0.8157	1.35111	3.63375	4.55831	3.98052	4.72828	0.77704	1.8848	1.82293	1.48583	3.87824	0.25192	1.78052	0.55223
			4.33285	0.63981	0.78352	7.85382	2.94987	1.03289	1.32294	0.68085	4.19453	1.59871	1.04852	1.02749	1.04287	0.03104	0.32813	0.79082	1.08715	6.32433	1.30773	0.33202	1.31289	4.78853	1.50483	0.44011	1.55855	5.18748	0.57308	0.48412	1.35198	0.12295	1.03487
			0.33013	0.07463	0.75832	1.9781	0.81233	1.7893	0.44492	2.47895	1.12586	4.49528	1.18895	0.31887	2.39852	0.84518	0.57135	1.83983	0.85556	4.76405	0.12291	1.38583	6.75108	1.87883	0.75151	3.98737	0.12521	0.4881	0.8577	0.17338	1.48727	1.88184	0.15302
			3.30524	1.43273	1.25527	4.30288	1.56235	0.79995	0.34824	0.58231	0.91413	0.58128	1.80018	0.89838	2.75737	3.11233	1.88437	1.51823	0.0153	1.48548	1.88184	2.13841	0.22862	2.78878	1.58551	0.18527	1.218	1.80841	0.94422	0.43488	0.84852	1.14809	0.24816
			0.83988	1.08661	1.00238	1.88538	0.07881	3.47723	3.31184	0.0258	1.87219	2.38877	4.08487	3.9358	0.04288	0.33167	0.58298	0.69892	1.82725	1.31588	2.81701	1.12804	0.35234	0.47353	0.55794	1.09483	1.87891	3.33535	1.05748	2.48077	1.05301	0.43544	0.7839
			0.69845	1.74309	0.37192	4.04187	0.87875	0.94853	1.31323	2.03314	1.8378	0.6394	0.08707	2.58928	0.78248	1.58807	0.18981	0.83325	1.18414	1.2228	0.71245	1.14254	0.51482	0.35881	3.83114	0.50184	3.27744	3.30112	0.8038	2.78813	0.05381	2.53381	2.7848
			1.96313	1.52922	0.58094	0.22448	1.71803	1.03888	2.83033	3.35901	4.9236	0.18173	1.88275	0.48198	7.03898	1.37514	3.08148	1.54577	0.38328	1.47482	1.24581	1.48238	0.34129	2.33885	3.0208	2.18182	2.07428	0.0537	0.73487	0.74858	3.33489	0.85737	0.13834
			1.06247	0.86697	1.00525	0.89038	1.01587	1.58911	0.94784	3.84758	0.29812	3.9055	1.08525	1.17787	1.88133	2.21804	1.85023	0.84434	1.8894	1.27338	1.01703	0.48712	0.37034	1.09148	2.11828	0.2734	1.05841	0.89888	0.88534	1.14053	3.23821	0.2553	0.55024
			1.6254	3.42269	0.12898	1.41207	0.15284	0.75379	0.18498	4.03425	0.3869	2.30048	0.08838	0.29788	1.99188	1.59718	3.85468	0.15497	1.13785	4.82534	3.81051	0.80783	3.88821	0.52335	1.38827	0.83898	2.28858	5.04584	1.48745	1.81818	1.73501	1.14078	1.98057
			0.25128	0.08714	0.32542	0.77421	1.2558	0.36903	0.34801	1.30532	1.77551	0.83095	0.3085	1.00258	1.12515	1.09254	0.744	2.88518	1.18318	0.75018	0.24388	1.88324	1.77224	3.57412	2.82294	2.85813	1.88558	0.42404	2.24128	2.80857	1.02788	1.08348	0.93223
			1.59108	1.78368	0.8882	0.88935	3.20928	1.88882	0.97254	2.38309	2.31924	1.28888	2.43865	0.53489	1.78482	3.23178	1.82811	1.50835	1.00478	1.02884	2.41483	1.49081	0.95182	0.03212	0.47887	3.58858	1.4253	1.05831	1.04888	2.49928	0.53387	4.75521	1.05003
			2.21298	1.43067	0.90388	1.80251	1.02857	1.15528	1.33855	0.10318	1.92381	1.22587	0.24738	3.35022	2.88103	1.41917	2.10848	4.97817	0.42333	0.50288	2.63142	1.44058	1.71883	2.20384	0.17888	0.22538	0.55748	1.30514	1.84372	1.84373	0.47523	0.8047	0.30585
			1.02558	0.25625	6.43131	3.28342	3.20721	4.00911	0.32443	0.48283	2.14583	0.01847	1.38444	1.85295	1.75211	5.38708	0.58872	0.46848	0.38278	0.88382	2.25471	1.5023	2.04777	1.43187	4.81838	0.80305	1.02843	0.55541	0.51388	0.48883	0.88788	1.02093	1.04792
Average			1.774443	1.354517	1.493258	1.918762	1.777135	1.249832	1.29078	1.338782	1.909048	1.484907	1.321578	1.293839	1.674398	1.764341	1.802898	1.831888	1.155411	1.835758	1.459595	1.458409	1.551318	1.728728	1.520342	1.548897	1.980893	1.633838	1.382548	1.479888	1.144407	1.383848	1.358084
Moving range average			1.812937	1.144532	1.156318	1.801281	1.758218	0.977473	1.248899	1.273148	1.430022	1.241307	1.4091	1.119031	1.507894	1.434928	1.427521	1.46937	0.887024	1.590271	1.068732	1.214229	1.888048	1.485251	1.381278	1.732781	1.18814	1.182327	0.902823	0.882888	0.789581	1.548418	1.159783
T statistic			2.357308	2.472799	2.333581	2.128511	2.980079	4.708423	2.725888	1.402258	3.471891	2.644514	2.13822	3.023318	2.522931	3.400834	3.340078	3.507828	3.381643	3.005288	3.450881	4.80861	2.088814	2.532558	1.750213	2.429888	5.805102	3.228818	4.240202	4.82582	3.51252	2.554407	2.990143
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0	0	0	0	0	0.828175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.879	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.009111	0	0	0	0	0	0	0	0	0	0
36	1.8	1.035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1.9	1.086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1.138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.186305	0	0	0	0	0	0	0	0	0	0	0
39	2.1	1.189	0	0	0	1.204051	0	0	0	0	0	0	1.208492	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	2.2	1.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	1.320226	0	1.308118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2.4	1.342	0	1.379128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.357294	0	0	0	0	0	0	0	0
43	2.5	1.393	0	0	0	0	1.43384	0	0	0	0	0	0	0	1.404895	0	0	0	0	0	0	0	0	1.409804	0	0	0	0	0	0	0	1.420748	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	1.466702	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	1.506192	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.641873
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	1.658802	0	0	0	0	0	1.880287	0	0	0	0	0	0	0	0	0	0	0	0	0

49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.762006	0	0	0	0	0
51	3.3	1.798	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.819480	0	1.838821	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	1.885085	0	0	0	0	1.849323	0	0	0	0	1.874847	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.948813	0	0	0	0	0	0	0	0	0	0	0	0	1.90828	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.273101	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	2.508211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.557338	0	0	0	0	0	0	0	2.568838	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.858578	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator shape parameter			1.320228	1.379128	1.308118	1.204051	1.43384	2.508211	1.508182	0.828175	1.885085	1.466702	1.208482	1.658882	1.404885	1.849323	1.819480	1.948813	1.838821	1.680287	1.874847	2.557338	1.188385	1.408804	1.008111	1.357284	2.858578	1.762006	2.273101	2.568838	1.90828	1.420748	1.641873
Estimator scale parameter			1.344045	0.882155	1.141534	1.58442	1.238423	0.498338	0.855848	1.818545	1.012398	0.988778	1.093577	0.778841	1.182002	0.84884	0.98088	0.940002	0.828002	1.082527	0.778514	0.570284	1.305388	1.224873	1.508818	1.138882	0.889543	0.828887	0.808221	0.578441	0.800341	0.974098	0.827083
Control chart constant d2			1.024894	1.029421	1.024036	1.015051	1.033211	1.073178	1.037918	0.9871	1.055894	1.035351	1.015484	1.04613	1.031228	1.054501	1.053313	1.058183	1.054127	1.047171	1.055488	1.074172	1.013573	1.031588	0.993804	1.027824	1.081058	1.050932	1.087818	1.074381	1.058858	1.032331	1.045288
Control chart constant d3			0.984816	0.961008	0.985387	0.972735	0.957815	0.821508	0.954057	1.013103	0.938786	0.958183	0.972387	0.947233	0.958534	0.940025	0.941072	0.938715	0.940356	0.948355	0.938151	0.920355	0.973848	0.958258	0.990328	0.98231	0.911845	0.943143	0.927383	0.920132	0.938098	0.958834	0.947943
Control chart constant D4			3.888101	3.87882	3.815333	3.872048	3.854881	3.548378	3.82128	4.232725	3.688743	3.839288	3.988508	3.781588	3.867828	3.687858	3.708812	3.688881	3.700577	3.753802	3.688952	3.540558	3.881082	3.885318	4.085215	3.880477	3.488472	3.725282	3.581274	3.538088	3.880724	3.880123	3.787858
Upper contro limit X			8.49528	4.689982	4.880781	7.243478	8.87843	3.982395	4.895108	5.288183	5.972014	5.061878	5.484503	4.502887	6.061082	5.838829	5.868701	5.897823	3.822925	6.417448	4.497247	4.849588	6.577235	5.987881	5.720188	6.804517	5.225321	4.95183	3.918438	3.945047	3.388135	5.883717	4.888818
Lower control limit X			-2.94837	-1.98095	-1.88427	-3.40385	-3.32218	-1.48253	-2.31355	-2.8108	-2.15382	-2.13188	-2.84135	-1.81522	-2.71228	-2.32785	-2.28281	-2.33385	-1.3121	-2.74583	-1.57808	-1.93275	-3.4748	-2.53451	-2.87851	-3.51072	-1.28353	-1.88415	-1.15334	-0.88587	-1.08732	-3.11582	-1.97048
Upper control limit MR			8.305132	4.44058	4.527372	7.154778	6.788816	3.408448	4.785108	5.388887	5.272122	4.785734	5.583435	4.20833	5.831871	5.305888	5.281887	5.398822	3.20848	8.003345	3.843572	4.298045	6.780077	5.883884	5.887584	6.741344	4.078511	4.329887	3.241588	3.124828	2.906229	5.877078	4.389823
Normal upper control limit X			8.084188	4.388488	4.588574	6.710404	8.447822	3.848595	4.607288	4.724815	5.712285	4.788258	5.088188	4.288884	5.884757	5.570833	5.588485	5.738788	3.481327	6.088138	4.301988	4.887741	6.087388	5.823871	5.220551	6.155357	5.080307	4.725134	3.783141	3.827814	3.244356	5.502077	4.44254
Normal lower control limit X			-2.51528	-1.88845	-1.58208	-2.87088	-2.88385	-1.34873	-2.02571	-2.04725	-1.8842	-1.83844	-2.42803	-1.88231	-2.33588	-2.08195	-1.8837	-2.07881	-1.1505	-2.41782	-1.38278	-1.77082	-2.88478	-2.17022	-2.17987	-3.08156	-1.12852	-1.45748	-1.01804	-0.88844	-0.95554	-2.73418	-1.72841
Normal upper control limit MR			5.271077	3.740332	3.778848	5.888588	6.738313	3.184383	4.075181	4.188848	4.873311	4.058582	4.60484	3.658882	4.827788	4.888337	4.88514	4.801802	2.833435	5.228417	3.492818	3.988088	5.548214	4.788442	4.548887	5.882727	3.820748	3.788485	2.848771	2.885303	2.58035	5.080224	3.780108

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Gamma (1 5, 1 0)		k = 30 obs																															
		1	1.78789	0.8483	1.9862	0.5872	0.7909	1.05884	1.36781	1.04783	0.44149	1.20824	0.84356	2.91482	2.4138	2.32385	0.58132	3.74088	0.13818	0.20521	1.83817	1.87735	2.82837	1.13803	1.03881	0.2703	0.88832	0.25472	1.43587	2.71834	2.13878	0.54802	0.25848
			1.81298	2.20092	0.41829	1.10322	1.82583	0.41676	1.23598	1.38304	1.38035	0.12711	0.98727	5.35341	0.48102	2.31018	2.31485	0.17124	0.5884	0.48822	0.87808	3.43388	0.41487	5.83811	1.05084	0.8884	0.88121	4.8789	1.20118	0.8182	2.32883	1.07308	1.35818
			0.14143	2.63458	0.22637	0.289	0.72957	2.20814	0.10049	1.98014	1.09884	2.88853	2.15765	1.32115	2.55577	0.58215	1.10217	0.05373	1.30104	2.08219	2.48043	0.85028	0.50535	0.18343	4.82488	0.23815	1.03288	2.47888	2.88878	1.95185	2.81141	0.88821	2.58804
			0.65584	0.91287	1.23723	2.5042	2.82822	2.14412	0.62163	1.88894	4.47702	0.26456	1.83414	0.74982	1.29584	0.85213	2.80857	2.20954	1.78531	1.77151	0.12328	2.38083	1.12829	1.78549	0.75773	2.1778	1.81818	0.70712	2.20318	1.45574	2.49022	0.8208	0.4895
			1.59087	0.74918	0.20618	0.55838	2.78424	2.56338	0.73377	3.52082	0.9708	1.14478	0.31954	2.47745	0.62148	1.50392	0.58842	0.40131	1.01238	1.30225	1.08242	0.7991	0.7587	0.47484	0.85133	3.83078	2.07877	0.56378	0.24258	3.65585	1.39881	3.58037	0.2385
			1.84105	3.08173	0.75517	0.47884	3.01452	0.51575	0.62259	3.38905	0.07128	0.74688	5.85858	2.51205	0.5515	3.31244	0.01812	0.13074	0.68434	0.51138	1.28088	0.81887	0.28805	0.79829	2.7159	2.14184	1.30847	1.88133	2.71003	0.07384	0.18077	0.82984	1.43842
			1.80587	1.8322	2.88509	4.58205	0.28772	2.97734	1.54115	2.09411	0.24981	0.38558	0.12671	1.92342	0.80228	2.01232	1.19284	0.84841	5.4552	2.85	0.48827	3.19081	1.2884	0.80756	0.24871	3.48834	1.19517	0.58818	2.38822	1.58435	2.97738	0.57745	3.24818
			0.89989	0.70106	0.13831	0.78714	1.70199	0.22356	0.84052	1.83834	1.74285	1.85718	1.28588	0.27383	0.81038	0.43314	0.34875	1.2738	0.111	5.0234	2.38387	3.07587	2.17835	1.17592	1.15408	1.8333	0.81885	3.85847	0.01277	0.85318	3.88843	1.17718	0.82521
			0.91492	2.2157	0.20525	0.49869	1.17452	1.98773	0.28237	0.83832	1.82435	2.44241	3.92892	0.83888	1.43407	2.13744	1.8838	1.87333	2.24137	1.84088	1.93424	0.10784	0.77022	2.07182	2.3505	0.87854	1.18245	0.93156	0.77581	3.09513	0.46287	1.43897	1.38788
		10	0.27312	0.54537	0.39181	2.38388	0.55848	1.27501	0.7038	3.08008	0.688	0.5828	0.97627	0.80457	0.88103	0.3183	0.82485	3.32508	1.43717	3.28044	0.3487	3.08874	2.84828	0.10324	2.35844	0.81737	1.40884	1.73282	1.78838	0.84841	1.05738	0.77733	2.1233
			1.12411	0.18852	0.80568	1.75574	0.54181	0.34574	0.88288	0.85752	0.48088	2.89583	1.73988	2.84947	3.01832	1.23105	0.4807	0.08032	0.31212	0.8148	0.7285	4.87784	1.45858	0.88991	0.4133	0.80818	1.84052	0.94887	2.48175	0.843	2.48958	0.45058	1.00818
			0.03554	1.49231	0.9839	0.38765	1.02354	0.3865	0.23547	1.29877	0.48727	1.11333	3.03258	1.3298	1.33478	1.34887	1.31835	3.78141	0.37012	1.25433	1.18488	4.33192	0.37555	0.48228	0.44411	0.52778	2.10814	8.00984	1.64887	1.8808	2.2183	0.71852	0.62874
			0.85409	0.62914	0.07248	1.00482	1.8431	0.09167	0.2524	2.12848	0.83823	0.02848	2.75885	0.78329	0.41845	3.97054	1.0852	1.8514	0.47033	0.8088	0.88918	2.32853	1.45097	2.48855	1.78218	0.14848	0.13438	2.53758	2.12907	1.08547	0.58837	2.59954	2.47547
			0.82749	0.89858	0.78322	0.88911	2.27431	2.10368	1.87285	3.25224	0.38305	4.51455	1.86345	0.41972	2.23788	1.83987	2.11024	0.8325	0.21144	2.84853	3.28154	0.23358	0.78055	0.22335	1.30823	0.37258	0.58084	0.48373	0.83831	0.23733	0.51044	2.38288	0.13178
New observations k =			0.31008	0.89012	0.82275	1.1838	1.34382	0.88442	3.5889	2.1814	1.45857	0.42555	0.3518	0.02884	1.71424	0.70884	1.18248	0.3585	0.50844	0.18488	4.3141	1.87458	1.50432	2.14843	1.58131	1.1088	0.75848	1.54075	1.80113	1.58099	1.5883	2.28584	0.15181
			2.02288	1.24044	4.90382	0.77911	0.77114	1.80194	1.98789	1.01078	0.47083	1.28248	1.35852	0.88821	0.30892	1.07503	0.77188	3.18375	0.83784	1.1111	3.48808	0.87858	0.84191	1.83391	2.15818	2.50584	2.50907	0.91437	1.37598	1.75324	1.45928	1.88488	0.88324
			0.41817	2.89951	0.08834	0.14351	2.09828	2.38849	1.95281	2.74353	0.08433	0.75174	1.91758	1.37579	1.0027	0.57501	1.78507	8.11337	2.8857	1.38383	0.38288	2.4872	3.87172	2.87288	0.80187	1.71284	0.18128	1.10441	4.08585	0.94207	3.44903	0.07781	0.88182
			1.81013	2.0086	0.57871	0.88568	0.28775	0.55551	3.04438	3.02187	1.05807	0.22892	3.01882	1.48881	2.8848	0.02878	1.03403	0.78707	0.10228	0.10743	1.88134	1.09321	2.70384	1.78595	1.05881	0.13437	1.22704	1.81502	4.63403	1.1818	2.89093	3.18018	2.78328
			3.59198	0.8731	1.48638	0.03845	1.78376	0.42548	1.05114	0.12809	0.54298	4.73808	0.3808	0.9544	1.88288	2.13344	1.82842	0.49108	1.01888	2.48824	1.52858	1.20854	0.73838	0.57557	0.8045	1.08148	1.01213	0.93819	0.93444	2.23313	1.28884	1.12588	4.24873
		20	0.6218	2.21078	1.75838	0.73637	0.28837	0.40124	3.08551	0.52505	2.37788	0.84037	0.52785	0.35583	0.48852	1.87545	0.84258	2.43585	0.77212	4.13722	0.45755	2.01042	0.858	0.59218	1.80032	0.58038	0.07478	0.21854	0.04877	0.88524	0.25998	0.28385	0.72851
			1.56401	2.44027	2.38048	1.2492	0.7847	3.33535	1.23783	1.58788	0.31922	0.17254	4.30998	2.58881	1.88315	2.48231	3.01283	1.00875	0.40838	2.88218	8.82852	3.11883	0.67884	1.75425	0.93149	0.10804	1.91362	1.0155	3.14484	0.20881	2.0283	2.88928	1.28815
			0.89518	1.91013	2.82888	0.808	1.08874	0.42522	0.80858	2.14443	0.18294	2.41188	1.12198	0.80434	1.44587	0.81481	1.78292	1.11865	1.84835	2.87234	2.88883	2.25348	1.52188	0.88033	1.10472	0.80283	1.34578	0.88873	1.13882	1.72288	1.1427	0.18788	0.79778
			1.87048	3.53855	1.388	1.01508	0.32733	0.41257	0.29387	0.58355	0.87138	2.2821	0.08173	2.37542	0.38338	2.5888	1.84187	2.08472	0.58308	0.28821	3.18183	0.8481	0.53985	0.84872	4.35578	1.45184	1.72231	4.42737	1.32988	1.8834	0.83519	0.38275	1.76388
			1.81838	0.21508	0.14384	1.58054	3.1861	1.03031	0.50071	8.04888	2.10788	2.40583	0.28848	0.77023	0.48325	2.88848	2.43732	1.58535	3.13084	1.30184	4.84818	1.88011	1.01384	1.62387	2.03448	0.70133	2.51717	0.08172	2.49787	0.73087	1.23077	1.71218	2.30338
			0.32485	0.84878	3.25081	0.99433	1.29095	0.18263	0.32752	0.88884	1.1508	0.53778	0.82095	2.01822	1.41474	0.02258	0.38284	1.30748	0.85847	0.57422	0.81771	1.01188	1.48753	0.86848	0.80205	0.80853	0.81338	0.89898	1.02408	0.34281	1.57387	0.47007	0.70172
			0.2553	3.41848	0.7808	1.70025	0.58894	3.84085	0.70802	2.70224	1.22874	0.9838	0.828	1.24874	0.3714	1.2889	0.777	0.71834	2.02415	3.84982	1.41158	4.49783	3.30082	2.18775	1.15588	1.57358	2.33822	3.38548	0.04785	1.14752	0.18407	1.87884	0.18983
			4.5084	0.80528	0.8828	5.46724	0.54182	0.23772	0.80145	0.35789	1.83757	3.3088	0.78873	0.56553	0.31188	0.78088	1.82048	0.14144	0.03183	0.58948	2.73418	1.90425	1.88717	0.02124	0.7408	0.21872	1.7377	3.5884	1.2207	1.53878	1.5238	0.92551	0.08801
			1.2074	3.07431	2.3028	2.4874	2.32183	1.22181	0.88377	0.30185	2.00187	3.38276	2.67528	1.09354	1.475	1.1385	0.41788	0.42738	3.55214	1.00154	1.88441	2.80113	0.88425	0.38788	1.88019	1.83737	1.58884	0.80867	2.14773	0.85213	2.79084	0.80482	3.33838
			5.81181	1.32418	2.11837	0.31788	0.87484	0.03	1.07785	0.24804	2.02341	0.05488	1.08302	4.40588	0.53183	0.72083	4.88088	0.88212	3.4752	1.20285	2.22047	1.81388	0.88804	0.08012	1.03315	0.58264	0.44337	3.95488	0.42333	0.77878	3.5348	0.08873	4.04158
		30	3.01123	2.08862	2.35556	2.13218	2.7438	3.85498	2.12252	0.05732	1.28182	1.37854	0.88875	1.42088	0.87865	1.7885	0.88155	1.88484	0.18203	0.08152	0.54885	0.85288	2.20382	0.81485	1.03428	3.17101	1.55058	1.34037	2.22212	0.38871	3.50348	1.80951	2.44153
Estimator shape parameter			1.320228	1.379128	1.308118	1.204051	1.43384	2.508211	1.508192	0.828175	1.885085	1.408702	1.208492	1.858892	1.404885	1.848323	1.818488	1.848813	1.838821	1.880287	1.874847	2.557338	1.188395	1.408804	1.008111	1.357294	2.958578	1.782898	2.273101	2.588838	1.80828	1.420748	1.841873
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.344045	0.882155	1.141534	1.58442	1.239423	0.498338	0.855848	1.818545	1.012389	0.898778	1.093577	0.778841	1.192002	0.94884	0.88088	0.840002	0.828002	1.092527	0.778514	0.570284	1.305388	1.224973	1.508818	1.138892	0.888543	0.928897	0.808221	0.578441	0.800341	0.874098	0.827093
Control chart constant d2			1.024894	1.029421	1.024036	1.015051	1.033211	1.073178	1.037818	0.9871	1.055894	1.035351	1.015484	1.04813	1.031228	1.054501	1.053313	1.058183	1.054127	1.047171	1.055488	1.074172	1.013573	1.031588	0.983804	1.027824	1.081058	1.050932	1.087818	1.074381	1.058858	1.032331	1.045288
Control chart constant d3			0.964818	0.961008	0.965307	0.972735	0.957815	0.921508	0.954057	1.013103	0.938788	0.958183	0.972387	0.947233	0.959534	0.940025	0.941072	0.938715	0.940358	0.948355	0.938151	0.920355	0.973848	0.958258	0.990328	0.98231	0.911845	0.943143	0.927383	0.920132	0.938099	0.958834	0.947843
Control chart constant D4			3.909101	3.87982	3.915333	3.972048	3.854091	3.548378	3.82128	4.232725	3.686743	3.830286	3.989508	3.781588	3.867828	3.897858	3.708812	3.888881	3.700577	3.753802	3.889852	3.540558	3.981082	3.885318	4.095215	3.880477	3.488472	3.725282	3.581274	3.539089	3.880724	3.880123	3.787858
Upper contro limit X			8.49528	4.689982	4.880791	7.243478	8.87643	3.862395	4.895108	5.298163	5.872014	5.061878	5.484503	4.502887	6.061092	5.836829	5.888701	5.987823	3.822825	8.417448	4.487247	4.849589	8.577235	5.987981	5.720198	8.804517	5.225321	4.95183	3.818438	3.945047	3.386135	5.883717	4.888818
Lower control limit X			-2.84637	-1.88095	-1.88427	-3.40395	-3.32218	-1.48253	-2.31355	-2.8108	-2.15392	-2.13188	-2.84135	-1.81522	-2.71228	-2.32795	-2.28281	-2.33385	-1.3121	-2.74583	-1.57808	-1.83275	-3.4748	-2.53451	-2.87851	-3.51072	-1.28353	-1.88415	-1.15334	-0.88587	-1.08732	-3.11582	-1.87048
Upper control limit MR			8.305132	4.44058	4.527372	7.154778	8.788818	3.488448	4.785108	5.388887	5.272122	4.785734	5.583435	4.20833	5.831871	5.305888	5.281887	5.380822	3.20848	8.083345	3.843572	4.288045	6.780077	5.883884	5.897584	8.741344	4.078511	4.328987	3.241588	3.124829	2.808228	5.877078	4.388823
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
Total false alarm in X			0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	1	1	0	1	1	0	0	0	0	0	1	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0
Total false alarm in MR			0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	1	1	1	0	0
Sub-total X control charts with at least one false alarm k 30 =							115																										
Sub-total MR control charts with at least one false alarm k 30 =							101																										
Normal upper control limit X			6.064168	4.398486	4.568574	8.710404	8.447822	3.849595	4.607288	4.724815	5.712295	4.788256	5.088188	4.209984	5.684757	5.570633	5.509405	5.730789	3.481327	8.080130	4.301980	4.887741	6.067390	5.623871	5.220551	6.155357	5.090307	4.725134	3.783141	3.827814	3.244355	5.502077	4.44254
Normal lower control limit X			-2.51528	-1.68845	-1.58208	-2.87088	-2.80365	-1.34973	-2.02571	-2.04725	-1.8842	-1.83644	-2.42803	-1.88231	-2.33508	-2.08195	-1.8837	-2.07801	-1.1505	-2.41782	-1.38278	-1.77082	-2.98478	-2.17022	-2.17987	-3.08158	-1.12852	-1.45748	-1.01804	-0.86844	-0.95554	-2.73418	-1.72841
Normal upper control limit MR			5.271077	3.740332	3.778849	5.888588	5.738313	3.194383	4.075181	4.180849	4.873311	4.058502	4.80494	3.858892	4.927789	4.889337	4.88514	4.801902	2.833435	5.228417	3.482818	3.988098	5.549214	4.788442	4.548897	5.882727	3.820748	3.788485	2.948771	2.885303	2.58035	5.080224	3.790108
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	1	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0
Total false alarm in X			0	0	1	0	0	0	0	1	1	0	1	1	0	0	0	1	1	0	1	1	0	1	0	0	0	1	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0
Total false alarm in MR			0	0	1	0	0	1	0	1	1	1	1	1	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	1	1	0	0
Sub-total normal X control charts with at least one false alarm k 30 =							139																										
Sub-total normal MR control charts with at least one false alarm k 30 =							135																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							2																										
Sub-total MR control charts with at least one false alarm k 1 =							7																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							3																										
Sub-total MR control charts with at least one false alarm k 1 =							10																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							45																										
Sub-total MR control charts with at least one false alarm k 10 =							43																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	1	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							53																										
Sub-total MR control charts with at least one false alarm k 10 =							57																										

OBJECTIVE # 3

Gamma (1 5, 1 0)   k = 30 obs   Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	2.85267	2.13038	2.3490	2.71021	5.62301	1.52943	1.82927	2.8375	3.58798	2.08555	3.98233	2.18493	2.07528	3.17881	1.7151	1.91268	2.08983	1.88817	1.7517	2.81883	3.85641	4.17887	2.5504	2.38083	1.38101	2.5019	2.25442	2.38711	1.34588	2.75401	1.78287
			2.85013	1.80033	1.803	3.17770	1.37090	4.83823	1.57285	4.4072	1.87512	3.98328	7.73382	2.07483	4.24382	3.8858	4.0052	1.8087	1.85232	2.8857	3.3808	4.79088	1.82096	2.71481	2.21254	1.50313	1.95088	3.22485	2.88378	1.79884	3.08458	1.65215	1.82588
			1.28522	8.21134	2.771	2.53868	1.81013	1.94511	1.40427	5.0980	2.24891	3.38618	3.22218	2.42566	4.21878	1.8111	6.40382	1.82033	1.8483	2.20845	3.888	2.93037	3.63716	2.88778	2.17188	1.88788	2.58094	5.95878	1.53852	2.2224	1.48148	1.98957	2.18195
			1.71595	1.7123	6.0428	1.42901	4.61046	2.52003	3.24078	2.6878	4.73421	6.14522	2.82032	1.81088	3.07711	3.0812	2.62048	2.08374	3.3272	5.01835	2.1856	4.07003	2.37888	2.42738	1.88058	2.88818	5.30787	1.50705	2.80755	1.97831	2.27438	2.5821	1.98834
			2.88932	3.50472	2.5294	1.48945	2.33418	3.00893	2.14131	5.1828	4.33962	3.02490	2.24705	1.72378	3.05842	2.38078	2.00201	1.83178	2.17182	1.88312	1.8772	2.20441	4.40885	3.8183	3.04441	1.88088	1.98044	2.14938	1.49831	1.48428	3.08844	2.82712	2.28871
			2.35728	2.368	4.6618	1.87704	1.35718	1.84857	2.9322	2.5808	2.98008	2.38841	4.49078	4.00449	2.55841	8.20884	1.87488	2.25838	3.34132	1.82818	1.8372	2.08938	4.12352	1.44733	2.84555	2.58282	1.71282	2.45928	2.43858	2.58181	2.38458	3.20033	1.57237
			2.18402	1.83823	1.817	1.58892	2.15562	3.10841	4.28028	2.1005	1.94832	2.12806	3.52977	1.48381	5.34278	3.98702	4.38512	2.86312	1.98884	1.88408	5.2078	1.81551	2.15885	2.37031	2.52371	2.8113	2.21808	5.44088	1.41328	1.49515	1.82188	1.51995	3.13738
			4.28815	3.05418	1.6628	3.46879	5.02832	2.37852	1.90007	2.2383	2.72797	1.82281	1.73888	1.85387	4.94884	2.98828	4.5837	3.11128	3.08934	1.98818	2.1783	2.83318	1.81884	2.42882	1.32842	2.3422	2.42052	1.57711	3.04803	3.88248	2.15223	3.03828	1.88338
			1.77600	1.78727	1.4178	1.3913	2.38835	1.70894	2.2875	3.3888	3.12248	2.32818	1.55714	1.85911	2.4678	2.18558	1.88824	3.81748	1.64448	1.87305	8.2088	2.82781	1.8211	3.18882	2.17881	1.88117	1.42814	3.58855	2.03808	1.41208	4.8818	2.28179	2.78903
		10	1.58900	4.0982	4.4018	1.73973	1.39852	2.68814	5.00581	2.804	2.54163	3.63375	2.17384	2.04228	2.12241	2.86128	3.43875	1.48382	2.58143	2.51434	3.0748	2.54488	5.73208	2.81443	2.54505	3.78175	3.5233	1.83423	1.84588	1.88847	3.58877	1.93858	3.98283
			2.08192	1.94228	3.128	1.8107	2.8235	2.97451	2.09583	1.8868	1.85181	3.72082	4.44837	4.04497	1.25088	2.20888	1.927	5.18333	2.13778	1.83288	1.8525	1.74388	2.58822	1.41183	3.0187	1.35743	6.6208	1.7005	1.57081	2.18018	1.77498	3.1748	2.54952
			3.23235	1.98088	1.655	1.80651	1.96278	2.1808	4.20427	1.8232	1.85203	3.0301	1.35504	2.18838	4.57848	2.82783	4.21213	1.48892	1.7038	3.51531	2.4814	2.03827	2.58495	2.21228	4.34388	4.74704	1.55834	1.44378	4.83741	2.40888	1.60938	1.42738	1.43188
			2.57790	2.05275	4.3358	1.47858	1.8474	2.8805	3.84431	3.2051	2.27013	2.58180	3.94504	1.85098	2.04743	3.00821	2.00785	2.6721(	2.88842	3.8071	1.7381	3.74415	3.81701	2.38213	1.78854	2.21402	2.08775	3.20128	2.32345	1.30111	1.54898	1.58292	4.05503
			3.04340	1.49886	2.7301	1.66955	1.44043	3.38148	2.72908	1.9158	1.89035	1.81542	7.70500	1.84167	3.5284	2.38138	1.84848	2.15328	2.23988	2.07838	2.2853	4.83	3.58484	1.28888	3.78784	1.48854	3.35828	1.89488	3.12814	1.54	1.51081	2.53458	3.0077
New observations k =			3.3218	1.98097	2.4304	5.1144	3.58893	1.71402	1.7177	7.0008	1.71058	1.7371	4.3812	1.70092	2.51873	3.03218	1.34118	4.12248	1.49182	2.38488	2.0887	3.93867	3.49777	1.55779	3.02822	4.58181	2.18412	8.08398	1.73553	1.82238	2.07838	1.70285	4.47508
			1.48516	1.50902	2.1364	1.83137	3.40758	2.32884	4.08852	1.0118	1.8098	2.00861	1.88438	2.91544	1.60528	3.0831	1.8113	1.48038	2.77032	3.77144	3.1784	2.38878	1.74842	2.88467	1.38888	4.52839	2.9827	1.83088	2.9757	2.05385	4.00235	2.1045	1.45148
			2.18353	3.73604	1.6358	2.04212	2.51732	3.88872	1.417	2.202	1.72884	1.80318	2.78107	3.69948	3.75294	1.41258	3.12455	1.88031	1.88852	3.50199	1.4223	2.30742	2.18885	2.08308	2.32724	2.02198	4.28365	1.54942	1.53184	1.50103	2.87714	1.81338	1.8477
			1.85114	2.82128	1.8780	2.29848	2.20375	3.01297	2.80896	1.8292	1.81324	1.83861	3.73328	2.77705	3.21827	2.74854	2.33784	2.22	2.8028	1.88475	2.8834	1.75877	2.58887	1.42248	1.81338	2.88181	1.48558	3.78288	3.32888	1.31858	2.50898	4.82535	2.38457
			1.5755	2.68037	1.8833	5.00831	3.30873	2.41585	3.01818	1.4088	2.81258	5.1078	2.93905	4.90101	2.89481	1.3823	3.8485	2.75743	2.23438	1.78213	2.7008	2.23851	5.74358	1.54282	3.1188	2.18058	3.08887	2.33153	2.25045	3.08592	5.78328	1.78047	5.8284
		20	2.83143	1.72039	10.7337	1.44838	1.83187	1.70174	2.52702	2.0093	4.04347	2.31831	4.83471	2.82425	2.08858	2.01831	1.58724	2.13734	4.2858	1.81888	1.9808	2.78754	1.8892	4.98783	1.51585	1.87883	4.38368	2.95948	2.32118	2.87814	2.80104	2.3028	2.27512
			2.02397	3.28738	1.8852	2.30138	1.74757	5.86368	4.87127	2.8847	1.89345	3.73757	1.39501	2.33887	1.88291	2.85703	1.8244	1.4904	1.83518	3.82788	1.8785	2.28588	1.80525	3.88128	3.54482	1.97813	4.82849	1.85047	3.25408	2.33037	2.08313	2.71215	3.88288
			4.1793	1.24489	2.4593	1.62482	3.38187	2.56191	2.94089	2.2898	2.34341	2.01065	1.5577	2.38407	2.38821	2.09887	2.73287	2.00848	2.03095	5.82387	1.5878	4.33788	3.28748	1.78827	3.57844	3.81103	3.38224	1.82481	4.04503	2.88878	3.4488	2.43298	2.218
			1.86658	1.35623	2.7307	1.3983	2.05742	2.88468	2.38152	1.857	2.45298	4.34786	1.64403	2.24907	1.55624	1.38382	.98312	2.18813	2.04831	1.78572	2.4033	4.48781	1.30522	3.75288	1.83842	3.74704	2.52837	2.58482	2.82138	3.05185	3.01045	1.58205	2.12024
			3.11358	2.90207	1.7588	3.08241	2.78009	2.85221	2.51283	2.0762	2.87015	2.53482	4.04421	5.60388	4.22808	3.9353	2.78588	2.57375	1.59585	2.38873	3.0298	1.45288	2.83288	1.38887	2.25518	2.88251	5.10158	3.50712	1.80571	1.71808	1.83878	3.24342	5.25845
			3.87715	1.95824	1.508	1.8258	1.38824	3.00328	4.58808	2.7141	1.89820	1.7172	1.47572	2.18753	2.88558	1.34308	7.19857	2.02173	1.4553	2.28283	3.1288	1.8854	3.21858	2.63038	2.88888	5.18784	6.20783	2.507	2.84448	1.90283	3.55824	2.38525	3.54833
			2.98058	1.44895	1.2841	5.11427	1.83741	3.18951	3.42812	1.8705	2.2471	1.88847	1.98628	1.83325	1.45705	1.38888	4.23794	1.63528	1.31984	2.18313	2.4888	3.14788	3.48988	3.57875	1.45847	4.85383	2.32241	1.51085	4.17135	5.2548	3.50741	2.33215	3.2058
			4.34001	3.05381	3.2708	2.17432	3.38015	2.88873	3.01895	1.8292	1.58746	3.38874	1.72318	1.28254	2.5472	1.88818	1.58498	1.81305	2.35388	1.50888	8.9827	2.05102	2.7882	2.88775	1.27117	3.52898	3.0878	2.0343	1.50033	8.7128	2.48825	5.9875	1.83411
			1.88391	4.86808	1.8532	3.47344	1.7684	2.34587	2.58833	2.4504	1.88541	2.85567	2.84294	1.45457	3.08833	3.83837	2.78414	2.98042	3.17825	4.85848	1.7258	2.57238	2.38787	2.41571	1.38834	1.74418	2.3443	3.73843	7.32223	2.98872	2.75448	3.51308	1.70488
			1.87887	1.57176	3.8332	1.48731	2.01147	1.85714	2.53865	1.5293	3.88530	3.1715	2.2012	2.1188	1.548	4.4818	1.49803	1.93322	3.83837	2.18022	3.441	2.18252	1.87807	3.82093	3.11887	2.18554	2.13845	8.07272	2.73883	3.15838	2.88984	3.82802	2.44088
		30	2.07284	2.87355	5.8021	1.40288	1.88262	3.50038	2.75822	1.7503	1.89840	2.0251	2.83182	1.5108	2.23805	1.85887	2.38084	3.79188	2.18298	4.11408	1.5114	1.35111	2.93877	3.30283	4.04188	4.38298	1.51335	3.85441	3.38527	2.1522	2.5418	3.14802	7.92084
Estimator shape parameter			1.320228	1.379129	1.308118	1.204051	1.43384	2.508211	1.508192	0.828175	1.885865	1.408702	1.208402	1.858892	1.404885	1.848323	1.818480	1.848813	1.838821	1.880287	1.874847	2.557338	1.188395	1.408804	1.008111	1.357294	2.858576	1.782898	2.273101	2.508938	1.90828	1.420748	1.641973
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.344045	0.982155	1.141534	1.58442	1.238423	0.498338	0.855848	1.818545	1.012388	0.988776	1.083577	0.778841	1.182002	0.84884	0.88088	0.840002	0.828002	1.082527	0.778514	0.570284	1.305388	1.224873	1.508818	1.138892	0.888543	0.928897	0.808221	0.578441	0.808341	0.974098	0.827083
Control chart constant d2			1.024894	1.028421	1.024038	1.015051	1.033211	1.073178	1.037818	0.9871	1.055894	1.035351	1.015484	1.04813	1.031228	1.054501	1.053313	1.058183	1.054127	1.047171	1.055488	1.074172	1.013573	1.031588	0.983804	1.027824	1.081058	1.050932	1.087818	1.074381	1.058858	1.032331	1.045288
Control chart constant d3			0.984816	0.981008	0.985397	0.972735	0.957815	0.921508	0.954057	1.013103	0.838788	0.958183	0.872387	0.947233	0.958534	0.840025	0.941072	0.938715	0.840358	0.948355	0.938151	0.920355	0.973848	0.958256	0.988328	0.98231	0.811845	0.943143	0.827383	0.828132	0.838088	0.958834	0.947843
Control chart constant D4			3.909101	3.87982	3.815333	3.972048	3.854081	3.548378	3.82128	4.232725	3.886743	3.838286	3.888508	3.761586	3.887628	3.887058	3.788912	3.888881	3.700577	3.753882	3.888852	3.540558	3.981082	3.885318	4.085215	3.880477	3.488472	3.725282	3.591274	3.539088	3.880724	3.880123	3.787858
Upper contro limit X			6.49528	4.889982	4.880791	7.243478	6.87843	3.982395	4.885108	5.288163	5.872014	5.881878	5.484503	4.502887	6.061082	5.838828	5.888701	5.987823	3.822825	6.417448	4.487247	4.848588	6.577235	5.987881	5.720198	6.604517	5.225321	4.95183	3.918438	3.945047	3.386135	5.883717	4.888818
Lower control limit X			-2.94837	-1.98895	-1.89427	-3.40395	-3.32218	-1.48253	-2.31355	-2.6108	-2.15382	-2.13188	-2.84135	-1.81522	-2.71228	-2.32785	-2.28281	-2.33385	-1.3121	-2.74583	-1.57808	-1.93278	-3.4748	-2.53451	-2.87851	-3.51072	-1.28353	-1.88415	-1.15334	-0.98587	-1.08732	-3.11582	-1.97048
Upper control limit MR			6.305132	4.44058	4.527372	7.154778	6.768818	3.468448	4.785108	5.388887	5.272122	4.785734	5.583435	4.20833	5.831871	6.305888	6.281887	5.380822	3.20848	6.003345	3.943572	4.288045	6.760077	5.883884	5.887584	6.741344	4.078511	4.329887	3.241588	3.124828	2.808228	6.877078	4.368823
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	1	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	1	0	1
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	1	1	1	1	1	1	1
Total false alarm in X			0	1	1	0	0	1	1	1	0	1	1	1	0	1	1	0	1	0	1	0	0	0	0	0	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1
Total false alarm in MR			0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1	0	1
Sub-total X control charts with at least one false alarm k 30 =							177																										
Sub-total MR control charts with at least one false alarm k 30 =							98																										
Normal upper control limit X			6.084168	4.398488	4.588574	6.710404	6.447922	3.849595	4.887288	4.724815	5.712295	4.788258	5.088188	4.288884	5.884757	5.570833	5.588495	5.738788	3.481327	6.088138	4.301988	4.887741	6.087388	5.823871	5.220551	6.155357	5.090307	4.725134	3.783141	3.827814	3.244355	5.502077	4.44254
Normal lower control limit X			-2.51528	-1.88845	-1.58208	-2.87088	-2.88365	-1.34873	-2.02571	-2.04725	-1.8842	-1.83844	-2.42883	-1.88231	-2.33598	-2.08185	-1.8937	-2.07881	-1.1505	-2.41782	-1.38278	-1.77082	-2.98478	-2.17022	-2.17987	-3.08158	-1.12852	-1.45748	-1.01884	-0.88844	-0.85554	-2.73418	-1.72841
Normal upper control limit MR			5.271077	3.740332	3.778849	5.888588	5.738313	3.184383	4.075191	4.188849	4.873311	4.058582	4.88484	3.858882	4.927788	4.888337	4.88514	4.881982	2.833435	5.228417	3.492818	3.888898	5.549214	4.788442	4.548897	5.882727	3.820748	3.798485	2.949771	2.885303	2.58035	5.080224	3.780108
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	1	1	0	1	1	0	0	1	1	0	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	1	0	1	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	1	0	1
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	1	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	1	1	1	1	1	1	1
Total false alarm in X			0	1	1	0	0	1	1	1	0	1	1	1	0	1	1	0	1	0	1	1	0	0	0	0	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	1
Total false alarm in MR.			0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	1	1	0	1
Sub-total normal X control charts with at least one false alarm k 30 =							182																										
Sub-total normal MR control charts with at least one false alarm k 30 =							132																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							13																										
Sub-total MR control charts with at least one false alarm k 1 =							8																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							16																										
Sub-total MR control charts with at least one false alarm k 1 =							14																										
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							105																										
Sub-total MR control charts with at least one false alarm k 10 =							38																										
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	1	1	0	1	1	0	0	1	1	0	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							122																										
Sub-total MR control charts with at least one false alarm k 10 =							61																										

OBJECTIVE # 3

Gamma (1.5 1.0)   k = 30 obs   Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	3.00805	2.89891	3.25734	2.8507	2.7704	4.87697	4.13347	3.8121	3.67388	4.88087	2.82875	4.1884	3.23005	3.28887	3.38824	3.1845	5.88331	3.8071	5.08828	4.1448	2.87826	4.18152	2.87018	5.79453	2.83878	3.28456	2.7328	5.15418	2.84312	2.85177	2.88852
			3.05722	7.53408	3.81343	5.48481	2.7732	3.47557	5.42632	3.8575	3.35454	4.88741	3.48872	2.9712	2.80645	3.4477	5.35812	2.8853	3.61347	2.8828	3.98982	3.9188	8.01325	3.87338	4.72018	4.58305	8.37252	4.51836	3.71975	8.8585	3.04084	3.08248	3.2047
			4.10473	5.55434	4.30778	4.48983	3.8042	7.45784	4.32998	4.1872	4.27224	5.22188	3.80552	8.5314	3.65876	2.87892	4.94582	3.092	5.93881	3.7255	2.88288	3.2282	3.5288	2.92125	3.08837	4.8503	2.54548	7.73888	2.72058	2.58431	3.21828	2.54178	3.81858
			4.8083	4.08737	4.31498	4.34433	3.5808	2.92975	3.32158	4.1836	3.21298	3.83114	3.45862	2.9382	3.98281	3.83214	2.90843	7.0844	3.13417	3.8402	8.88388	2.8351	3.10705	3.27318	4.38884	3.63357	3.41837	3.34898	4.3881	4.78734	2.88128	3.28718	8.40472
			3.72512	3.3873	8.22327	2.92483	2.7941	5.08388	3.10638	2.8008	3.27894	3.89097	3.73012	2.7732	3.15871	5.84822	2.8883	5.0858	3.94857	4.8758	5.18885	3.7288	5.45818	3.35418	2.7588	3.27825	4.7482	3.8554	2.85885	3.9808	2.7594	4.46754	5.84814
			3.35227	3.37898	2.88038	3.32587	3.8191	4.68131	8.06281	5.332	4.04834	2.73538	3.83837	2.7734	2.98858	7.15388	5.88205	2.8131	3.34752	3.718	3.15852	5.7887	3.8448	4.04878	2.82483	2.88303	8.81132	4.11218	4.14836	2.8748	2.9817	5.88185	3.77005
			8.71805	5.37135	2.85045	5.01535	3.9403	4.11523	3.17898	3.738	3.72049	3.35183	5.85318	4.5881	8.45878	3.1119	3.51255	3.4274	2.58449	3.1342	2.83733	2.5571	5.48778	4.32831	3.82134	2.58055	3.53548	2.83298	2.83288	8.78354	2.70713	2.58115	3.51417
			3.39455	5.07051	5.25631	8.60482	8.3873	4.44694	2.95874	4.1851	4.24814	3.08512	2.8821	3.0814	3.61318	3.38542	4.82534	3.1103	5.22295	5.3083	3.17228	3.3842	2.83482	2.85181	3.18828	2.88378	4.7418	5.87584	2.85898	8.51918	2.9308	4.88957	5.44488
			4.3048	5.03954	3.33551	2.8005	3.328	3.58715	4.14522	4.2421	3.38108	8.33333	2.82572	3.8882	5.08415	3.67384	3.35778	2.8416	5.78225	2.7487	4.84888	2.8344	2.88843	2.85284	2.85055	2.58838	3.18134	2.78198	3.84988	3.28884	4.72331	4.27452	2.8888
		10	3.80776	6.90803	8.18851	3.13508	8.1947	2.90448	4.38484	2.9883	3.00485	3.83938	2.83358	5.8183	2.88475	5.37248	3.88011	5.4458	2.58102	2.5722	3.34278	3.8834	2.47048	4.43384	8.82557	5.84847	3.14195	3.71412	3.88781	4.51887	2.82808	2.84504	8.58182
			2.80516	3.01835	2.70242	3.8358	2.8082	4.51708	8.82002	5.0738	3.19473	2.54727	5.05318	8.8232	2.87884	5.74348	3.88455	4.4484	3.42227	8.7498	2.84787	3.2821	2.93885	4.44588	4.14188	3.37205	4.38852	3.88703	2.58236	4.58238	3.88708	5.38554	4.24327
			3.27553	3.47835	3.84505	3.48543	4.9213	3.45699	5.25886	4.5753	4.01478	3.72102	5.43872	4.3872	3.16001	3.41857	4.83802	3.4018	4.80283	3.9782	4.5818	3.3134	4.11457	2.7228	4.03314	2.78557	5.8381	4.47835	4.72137	2.88333	4.88838	8.05583	3.78585
			5.217	3.20118	4.48395	8.11182	3.5044	4.00908	3.0885	3.8132	2.79128	4.20278	3.45833	5.2812	3.15821	3.38384	4.88088	4.0207	2.54778	7.5358	2.85158	3.7185	4.15494	4.88388	3.48818	3.88888	3.53851	3.48888	4.20881	2.74885	4.07805	2.87374	5.87708
			4.30814	3.72292	2.8507	3.52731	3.3291	3.87713	2.52942	4.2848	4.77013	3.05734	8.5888	3.5335	4.00547	4.42889	4.21887	3.8878	3.3202	2.5317	3.23222	2.871	5.12283	5.88158	5.2381	2.82105	5.8852	2.72828	3.57015	4.01278	5.75894	4.04208	4.4787
New observations k =			3.53345	3.46145	4.30814	3.57393	7.4973	4.21847	4.50128	3.1077	3.30701	3.98902	4.88855	7.1507	3.1088	5.55581	3.34877	8.377	3.43884	3.1305	3.98874	3.8018	4.19541	5.53522	3.35471	8.00938	4.08314	2.48273	3.88388	3.88844	4.81788	4.74748	4.98125
			3.29005	2.91758	3.87088	2.65984	5.1018	6.82569	2.70878	2.8623	3.4784	4.02185	2.80814	3.5282	3.28741	4.48785	5.2558	3.2582	2.5743	8.8738	4.53388	2.7183	3.31818	2.84248	7.44715	5.71102	2.83823	5.38155	4.38338	5.34888	2.78751	2.59881	2.82135
			8.77387	2.88958	3.73881	4.18452	4.0188	4.7134	6.63842	3.2278	3.28979	3.83889	3.15801	2.7542	2.88798	2.81584	2.88448	4.2297	3.99414	5.5118	7.00837	2.9812	4.28825	4.1217	4.18182	4.11158	3.85213	3.75844	3.78885	2.85381	2.99084	4.98738	3.51843
			3.14720	5.25076	3.87829	5.08124	3.3841	3.84083	3.81487	2.8071	3.84892	3.51091	2.88281	3.8813	5.3754	3.71032	4.9853	4.8218	3.11215	4.8822	8.57304	3.1088	4.27848	3.51583	3.52025	8.81887	5.38544	2.88844	3.52281	2.57482	3.07471	2.81147	8.08173
			8.05418	4.05508	2.58222	4.4488	3.7283	2.82482	3.88983	8.5895	4.90288	4.14482	2.91142	5.3245	8.8884	3.18779	3.13355	3.2322	3.30208	3.7873	2.84397	3.1313	7.43834	3.28338	4.38328	4.48321	8.73798	2.70505	3.21818	2.85883	8.88808	2.83018	2.82785
		20	5.64315	3.53289	3.58355	7.61862	3.588	3.80788	4.21574	3.0747	4.21828	3.15448	2.92048	3.4595	3.28888	5.88528	2.83447	3.4488	3.48887	3.8275	2.88777	4.8883	4.54344	3.51187	2.54857	4.18881	5.58198	4.1072	5.85587	3.72118	3.8182	2.74388	3.14552
			2.6837	2.78331	3.27852	4.78188	3.5738	2.78118	2.87388	3.1803	3.84878	4.15704	2.81188	3.5748	2.77882	4.34408	4.78453	3.2881	4.85737	3.9295	2.81138	4.8257	8.58487	3.88358	2.581	3.48817	8.10287	3.32453	3.74583	2.7588	2.8754	2.88545	3.28584
			3.33781	2.72044	2.62998	4.45015	4.021	8.01212	2.82882	3.7182	6.36748	2.75541	7.80854	2.4731	3.78891	7.08543	2.92834	3.8378	2.92512	3.9087	3.58122	4.3052	3.23833	3.81831	3.02357	3.18833	4.15058	3.30182	3.58988	8.0387	5.48758	3.24281	3.82058
			3.04041	4.92034	6.32721	3.40232	2.833	3.32698	3.20533	4.503	7.00228	2.81488	4.81252	6.8542	4.00534	5.5887	5.81845	2.5788	5.17188	4.525	5.20042	3.0782	4.2811	3.28528	3.48477	2.81108	3.77855	2.87177	3.83785	3.88885	3.12412	3.40904	4.07487
			2.85545	3.59248	3.28875	3.62184	3.1108	5.38147	2.93381	6.7827	5.63362	3.90875	2.57843	7.1823	2.58288	8.23208	4.0888	2.8723	3.0108	4.8358	5.88113	3.8888	8.00783	3.48118	3.28827	5.21348	8.87782	3.88252	8.47483	3.4488	2.78543	2.82882	3.12332
			8.90558	2.79080	3.72508	8.37788	3.5473	2.98423	4.68781	3.984	5.15075	3.98877	5.8873	3.4881	2.58857	2.828	4.83345	2.852	5.74085	4.4823	5.8787	3.0188	4.15148	2.89382	3.88587	8.42843	8.20283	2.5873	2.54188	3.88381	5.88505	2.83708	2.83055
			4.06206	3.30658	3.70858	3.53378	3.3289	4.57474	3.38021	4.7407	3.0798	3.8831	4.08188	5.7034	4.25137	3.31275	3.23057	3.0779	2.53878	2.7848	5.08011	4.8858	3.47187	3.71328	4.24208	4.13403	4.85245	3.38833	2.92852	5.12778	3.42735	5.8348	4.88485
			2.71703	2.78978	3.84747	4.61044	3.5908	7.74312	5.47821	5.474	4.54381	6.0881	4.70258	3.0808	2.88882	8.12751	4.2878	5.8887	3.28378	5.2208	2.8831	3.8788	4.4181	3.18352	5.54588	4.37825	3.48803	2.88888	4.20215	4.0245	2.74871	3.78882	4.02438
			4.20852	6.07338	3.5497	3.19237	4.1332	6.43277	2.72247	2.7308	5.84018	3.74087	5.8308	3.8018	4.90884	3.81351	4.04773	2.7785	8.34848	3.8178	4.82878	3.1383	3.54183	2.88827	4.83153	8.98882	2.83183	3.71843	2.87287	2.54844	2.48888	2.70523	2.78832
			3.50852	4.87352	7.72583	4.88773	2.8817	4.25539	5.20288	3.8978	5.72848	2.81858	4.87788	3.5845	3.18227	3.61028	3.5592	3.8248	2.85888	3.5422	3.78863	5.4888	2.87334	8.2419	3.58888	3.25853	8.7288	7.73883	4.38884	4.18818	4.8148	2.85814	3.11872
		30	3.70326	6.32148	7.80538	3.24988	7.1741	3.81505	6.87628	5.8841	3.32405	2.52185	2.87881	4.5878	2.55381	3.23138	8.87023	8.43	2.5113	3.1011	4.18531	3.3513	4.83448	3.03507	4.13781	3.18858	5.45482	4.08587	3.87232	2.88818	2.88338	3.50338	3.30888
Estimator shape parameter			1.320220	1.379120	1.308118	1.204051	1.43384	2.508211	1.508182	0.828175	1.805605	1.486702	1.208482	1.858882	1.404695	1.848323	1.818480	1.948813	1.839821	1.880287	1.874847	2.557338	1.188305	1.408804	1.008111	1.357284	2.958578	1.782898	2.273101	2.588838	1.90826	1.420748	1.641973
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.344045	0.982155	1.141534	1.59442	1.238423	0.498336	0.855848	1.818545	1.012308	0.908778	1.093577	0.778041	1.192002	0.94884	0.99088	0.940002	0.828002	1.092527	0.778514	0.570284	1.305388	1.224873	1.508818	1.138882	0.889543	0.928887	0.608221	0.578441	0.600341	0.874098	0.827093
Control chart constant d2			1.024984	1.029421	1.024038	1.015051	1.033211	1.073178	1.037818	0.9871	1.055894	1.035351	1.015484	1.04813	1.031228	1.054501	1.053313	1.058183	1.054127	1.047171	1.055488	1.074172	1.013573	1.031588	0.983804	1.027824	1.081058	1.050832	1.087818	1.074381	1.068858	1.032331	1.045288
Control chart constant d3			0.984818	0.981008	0.985387	0.872735	0.957815	0.821508	0.954057	1.013103	0.938788	0.958183	0.972387	0.947233	0.958534	0.940025	0.941072	0.936715	0.940358	0.948355	0.938151	0.920355	0.873848	0.959258	0.880328	0.98231	0.811845	0.943143	0.927383	0.920132	0.938098	0.958834	0.947843
Control chart constant D4			3.908101	3.87982	3.915333	3.872048	3.854081	3.548378	3.82128	4.232725	3.888743	3.838288	3.909508	3.781588	3.887828	3.897858	3.708912	3.888861	3.700577	3.753802	3.889852	3.540558	3.881092	3.885318	4.095215	3.890477	3.488472	3.725282	3.591274	3.539089	3.880724	3.880123	3.787858
Upper contro limit X			6.49528	4.689982	4.880781	7.243478	6.87843	3.982385	4.895108	5.288183	5.872014	6.081878	5.484503	4.502897	6.081092	5.830829	5.888701	5.987823	3.822825	6.417448	4.487247	4.848588	6.577235	5.987981	5.720198	6.604517	5.225321	4.95183	3.818439	3.945047	3.388135	5.883717	4.888818
Lower control limit X			-2.84637	-1.88085	-1.88427	-3.40385	-3.32218	-1.48253	-2.31355	-2.8108	-2.15382	-2.13188	-2.84135	-1.91522	-2.71228	-2.32785	-2.28291	-2.33385	-1.3121	-2.74593	-1.57808	-1.93275	-3.4748	-2.53451	-2.87951	-3.51072	-1.28353	-1.88415	-1.15334	-0.88567	-1.08732	-3.11582	-1.87048
Upper control limit MR			6.305132	4.44058	4.527372	7.154778	6.768818	3.488448	4.765108	5.388887	5.272122	4.765734	5.583435	4.20833	5.831871	5.305888	5.281897	5.380822	3.20849	6.003345	3.843572	4.288045	6.780077	5.883884	5.887584	6.741344	4.078511	4.328897	3.241588	3.124829	2.908228	5.877078	4.389823
False alarm in X? (Y=1/N=0)			1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	0	1	0	1	1	1	1	1	0	1
False alarm in X? (Y=1/N=0)			1	1	0	1	1	1	1	1	0	0	1	1	1	0	0	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	0	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0
Total false alarm in MR			0	1	0	0	0	1	1	0	0	1	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0
Sub-total X control charts with at least one false alarm k 30 =							237																										
Sub-total MR control charts with at least one false alarm k 30 =							111																										
Normal upper control limit X			6.084188	4.308488	4.588574	6.710404	6.447822	3.849585	4.807288	4.724815	5.712295	4.786258	5.088188	4.288884	5.884757	5.570833	5.598495	5.738788	3.461327	6.089138	4.301988	4.887741	6.087398	5.623871	5.220551	6.155357	5.090307	4.725134	3.783141	3.827814	3.244355	5.502077	4.44254
Normal lower control limit X			-2.51528	-1.88845	-1.58208	-2.87088	-2.89385	-1.34973	-2.02571	-2.04725	-1.8942	-1.83844	-2.42803	-1.88231	-2.33588	-2.08195	-1.8937	-2.07801	-1.1505	-2.41782	-1.38278	-1.77082	-2.98478	-2.17022	-2.17987	-3.08156	-1.12852	-1.45748	-1.01804	-0.88844	-0.85554	-2.73418	-1.72841
Normal upper control limit MR			5.271077	3.740332	3.778849	5.888588	5.738313	3.194383	4.075191	4.180848	4.673311	4.058592	4.80494	3.858882	4.927788	4.888337	4.88514	4.801902	2.833435	5.228417	3.482818	3.988088	5.548214	4.788442	4.548697	5.862727	3.820748	3.788485	2.840771	2.885303	2.58035	5.060224	3.780108
False alarm in X? (Y=1/N=0)			1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	0	1	0	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	0	1	1	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	1	0	0
Total false alarm in MR			0	1	1	0	0	1	1	0	0	1	1	1	0	0	0	0	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0
Sub-total normal X control charts with at least one false alarm k 30 =							243																										
Sub-total normal MR control charts with at least one false alarm k 30 =							144																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							48																										
Sub-total MR control charts with at least one false alarm k 1 =							31																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							58																										
Sub-total MR control charts with at least one false alarm k 1 =							39																										
False alarm in X? (Y=1/N=0)			1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	0	1	0	1	1	1	1	1	0	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							181																										
Sub-total MR control charts with at least one false alarm k 10 =							59																										
False alarm in X? (Y=1/N=0)			1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	0	1	0	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	1	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							187																										
Sub-total MR control charts with at least one false alarm k 10 =							78																										

OBJECTIVE # 3

GAMMA (1.5, 1.0)

k = 50 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			0.61	0.66458	1.40276	1.41058	1.74610	0.1110	0.62562	2.50100	1.40480	0.47903	0.82700	1.64012	7.20270	2.40843	3.81021	1.63210	0.82183	2.17003	2.56571	0.89400	0.06592	1.10076	0.77416	1.00786	0.37033	1.03682	0.87607	2.47123	1.34100	0.47477	1.04000
			0.44444	2.44403	0.78600	2.04137	3.41710	1.46356	1.36700	2.91660	8.11041	0.32280	1.31303	0.1602	1.2901	0.20230	0.90750	0.10006	3.70984	1.93021	1.90150	0.77630	0.02900	3.00302	0.90552	4.19081	0.90907	2.16241	1.34830	0.6263	0.32300	0.11421	3.37206
			0.58173	2.10407	1.64044	1.04016	1.6071	0.71423	1.60002	0.30017	1.70574	0.41092	0.76526	0.41011	2.03110	1.00024	0.36061	1.00979	1.16081	0.90201	1.01240	1.07007	0.33034	1.67220	0.74444	2.57563	0.36827	1.13460	1.60001	1.700	2.69720	0.44524	1.5600
			0.47061	1.64614	0.40016	1.72911	1.6030	0.05063	1.14136	0.66702	4.61390	0.46030	3.40061	0.13426	1.32140	0.00364	4.04006	0.70761	1.00380	0.40206	2.60177	0.06917	1.09040	2.30307	1.00014	0.30423	0.61166	0.8274	0.70000	1.34772	0.33324	1.30276	2.61730
			1.17601	1.13764	1.6553	4.30314	6.00440	1.70300	0.90030	1.20667	2.66372	2.90650	0.46684	2.6194	0.80600	0.46131	4.10740	1.05410	0.40904	1.20174	1.30013	2.60014	0.74101	0.60704	1.0007	1.20201	1.70022	0.14167	0.31024	2.42060	0.62006	1.22100	2.40101
			1.02106	4.00273	1.60601	0.72000	0.40940	1.00670	4.4744	0.60206	1.63003	2.10614	0.41632	4.07036	0.56051	0.03563	1.14440	1.07632	0.37000	0.93904	1.04203	0.72650	1.70067	1.0267	1.0036	1.00010	0.24064	1.61073	0.70416	0.60704	1.00052	1.00610	0.60707
			3.23073	1.01411	0.04602	2.67964	1.30733	1.62011	1.49653	1.03041	0.60640	2.04442	0.26370	2.10070	0.60466	0.11600	1.2667	1.303	0.00047	0.22603	0.7724	2.50030	4.14022	0.32660	0.7030	0.17236	1.07023	3.400	0.40116	2.90104	1.20316	2.90147	0.70446
			0.26620	0.02202	2.70451	0.02610	3.00676	1.20920	0.79670	0.0100	0.20337	3.32164	0.04263	0.60072	3.5410	4.20503	0.60004	0.60012	3.0040	1.35160	0.67767	0.32290	1.57430	0.70421	0.91900	1.90006	1.30230	1.0226	0.45030	0.00207	3.04070	1.1207	1.00105
			6.90020	2.77600	0.32104	3.00004	3.20040	2.20470	0.24603	1.70436	1.90363	4.19453	0.27004	0.00690	2.04016	2.06147	1.37064	0.61006	2.04771	1.00007	1.96412	2.4250	0.76906	0.76600	0.72114	3.13430	2.0603	1.14711	0.00504	0.40321	0.70726	0.00053	1.74003
			0.21611	1.20160	2.32006	1.45100	0.07203	1.13017	0.07217	0.00206	1.57040	2.64506	0.0003	3.40770	0.30371	0.3043	0.72010	0.31071	0.30743	1.31107	1.06043	0.05104	0.03002	1.12474	0.31790	0.20631	2.26107	0.42563	0.20313	1.9027	0.00341	0.74067	0.61713
			1.00376	1.77212	2.00004	1.03172	4.01100	0.31494	0.42623	2.26664	2.70660	0.02301	0.41110	4.26012	3.3161	0.76023	4.24262	0.00300	1.74040	0.03370	0.00010	0.10141	1.00907	0.71006	0.6747	0.43003	0.71037	0.03001	2.93573	0.03744	0.4932	2.02646	4.09210
			0.22092	2.43726	1.0043	0.20001	1.70624	0.72160	2.13707	1.00421	1.30600	2.00017	0.60727	3.47070	2.70412	0.00407	1.76036	0.05562	6.60402	2.26504	0.02070	1.00743	3.59273	1.60655	1.01606	0.00004	0.74020	0.70065	1.17420	0.40027	0.7234	0.00006	0.47053
			2.07074	1.40129	1.22000	0.32100	1.46732	0.27007	0.10002	1.30400	1.26442	0.03630	0.22120	0.02441	3.20101	0.67075	4.31650	0.03637	2.1006	2.06121	0.04476	0.9143	0.02077	0.40693	0.06140	0.10070	1.00123	0.40366	0.0033	1.06711	1.70006	0.00640	0.70130
			2.00031	0.47460	1.00006	2.03054	5.14677	0.70410	1.62077	1.04040	3.00472	0.00097	1.43000	0.60421	4.19002	0.60416	2.00760	0.0002	0.37100	0.43444	1.30430	2.60304	2.30040	1.00400	0.71700	0.1400	1.40200	2.24023	0.44037	0.63104	1.03007	2.06052	3.30126
			0.17601	0.34007	0.04001	4.06012	0.06561	1.60000	1.20046	3.02206	1.40420	0.72064	1.07300	2.40073	1.00037	1.94074	0.00071	0.53420	1.14074	2.11476	3.31060	2.20600	1.23017	1.00004	0.03112	3.06633	0.00041	0.00070	1.01320	0.22070	0.01322	0.00165	1.00334
			0.00461	3.29920	1.10207	0.00053	0.700	6.30731	1.01072	1.34120	0.6632	0.76063	3.66560	2.30023	0.03374	0.94711	0.00003	1.04440	0.40611	0.20250	0.6340	0.06002	0.3004	0.10706	0.07261	4.000	1.04673	1.11033	2.03502	1.12363	1.02102	2.20716	2.00420
			0.60313	0.37646	0.74300	0.4662	2.00670	0.60700	0.30654	2.30001	0.10006	0.33100	0.23066	0.02647	1.02404	0.60733	0.00760	0.62640	0.00070	3.06606	0.4062	0.0066	0.72720	0.64344	0.00006	0.7413	2.36020	1.26124	3.76036	0.62003	1.30112	3.22621	0.64300
			3.17006	1.40076	1.00324	1.00007	2.0400	0.24053	0.61023	0.2636	0.00152	0.44633	0.67006	0.64406	1.30204	0.30706	0.17204	0.47202	0.046	0.33400	3.01260	2.60476	0.07020	3.27005	1.34524	0.0663	1.72736	2.07272	0.07447	1.3003	1.40607	0.04761	0.30062
			0.20236	1.67264	1.60092	3.30300	1.57703	1.79300	0.0112	0.33262	1.00616	0.61067	0.96040	1.43332	1.41077	0.60100	0.36077	0.02016	0.71616	2.26444	0.20050	1.00770	3.04630	2.30442	1.64631	1.63101	0.4600	2.0073	0.06713	1.3217	2.00023	1.03206	4.12020
			1.96760	2.01032	0.3641	0.22070	1.54600	1.77004	0.03102	1.4006	0.7202	2.13697	1.70610	0.07330	1.0700	2.06432	0.00361	1.13720	0.01002	0.40042	4.13050	2.0036	1.00932	0.72217	2.7023	2.46100	3.20030	2.16436	1.06057	0.00300	1.63034	1.70022	1.67700
			6.94607	0.23690	1.10602	1.22009	0.64045	0.00206	0.00000	1.42000	2.00633	3.30411	0.47407	0.04260	2.03406	3.00706	0.24779	0.70107	2.02710	2.70602	1.27610	1.27230	1.13130	2.60306	0.67632	1.0220	0.00612	3.02427	2.06014	0.40149	4.22036	2.06511	1.64100
			3.20465	3.04733	0.00050	0.00236	0.05426	0.00560	0.02776	3.00014	1.03601	1.10024	0.70001	0.62373	0.06456	2.30026	1.42030	1.07711	2.21204	2.74002	0.47764	0.00062	0.03013	0.61812	0.31144	1.61440	0.2007	0.30614	0.30643	1.71055	0.30053	4.64267	0.3330
			2.07366	2.14404	0.77021	2.01727	0.2071	1.32041	0.0066	0.00224	0.5237	3.00174	4.47024	2.36731	1.01014	2.30402	0.31720	0.40063	0.00316	4.2772	2.44003	1.0004	0.64743	1.303	2.30071	3.23249	1.03046	0.04110	1.01030	1.40203	2.14201	0.13650	0.06750
			1.95100	1.61171	2.34054	1.61500	1.26104	2.40620	0.60107	2.63600	2.00320	1.02000	1.04156	2.04004	0.27623	0.02110	0.00077	1.22022	0.27642	1.00446	2.02210	2.22207	6.62247	2.00020	0.14760	1.04603	0.37006	1.71277	0.60200	0.94600	2.6037	0.00607	0.65201
			2.4747	1.01770	1.5600	0.45124	1.4606	0.40076	0.30651	1.00677	1.1007	3.1362	0.07223	0.20030	1.62031	0.00347	0.00006	2.3101	2.10040	1.22000	5.70100	1.34011	1.06103	1.23006	0.63102	3.66136	0.64436	0.20000	0.70642	0.1665	0.63700	2.00141	0.02152
			1.94346	1.11260	0.30112	3.00400	3.30006	1.00700	1.60024	2.11744	2.33024	0.19006	2.17741	0.67616	0.04014	0.0000	1.00463	0.03033	0.70001	0.06202	3.00100	0.30311	0.03600	0.13004	0.0040	2.00176	1.4136	0.3706	2.00147	0.16066	2.0616	0.03067	0.1637
			0.1646	2.21202	1.36003	0.34074	2.00007	1.0060	0.17303	1.60032	1.06016	0.73617	0.02300	1.03406	7.01227	1.70400	1.22006	3.04721	0.2023	1.90304	1.00000	0.10006	1.00016	1.03406	0.05400	0.60501	1.10600	0.23361	0.20023	3.22344	1.01640	1.20002	0.07413
			0.40027	0.93324	1.00504	0.02002	1.30043	0.09666	0.62703	1.40076	3.01614	1.03293	2.62066	0.40303	1.21027	4.00706	3.46003	1.21626	0.10207	0.20001	0.60033	0.6060	1.07104	0.3003	1.77444	1.00073	4.73064	0.4010	0.20000	0.21161	0.04047	0.67074	0.04106
			1.47100	2.1306	0.61004	0.00324	2.61234	1.62170	4.20320	1.02043	1.70072	2.67206	0.00240	0.00770	0.17166	2.21667	1.06100	4.21100	0.12704	0.0002	0.40300	0.63160	0.10142	0.30243	1.17100	0.73200	0.26200	3.00406	0.01370	0.06147	1.21702	3.2070	1.56000
			0.97362	2.21340	2.20004	0.00770	0.00111	3.10606	1.47021	0.00006	0.30043	1.23000	1.04222	0.20010	0.04202	2.03070	3.64113	0.00060	1.10730	0.06700	6.10121	0.04067	2.77004	0.00406	4.32033	2.40727	4.10771	1.30645	0.40411	1.20064	1.70167	2.0062	2.0047
			2.2306	1.33407	1.10130	0.33100	2.34012	3.10600	0.00006	1.01700	1.22302	1.3212	2.70700	0.32040	3.07000	0.20022	4.10000	0.7626	0.70371	2.06000	2.27003	0.04000	0.03743	0.10600	0.4710	1.03002	1.07303	1.06044	1.03070	1.01701	2.60010	0.00707	0.20642
			1.40683	4.27069	1.0702	1.03042	2.0367	0.34107	2.13036	0.44413	0.0072	1.20026	1.43213	2.03000	0.13022	1.14206	3.60310	0.60212	4.1202	0.00033	2.02130	0.70000	0.7007	0.00236	0.72643	1.14271	1.42701	1.62666	2.4020	2.70201	1.13000	0.00617	1.00306
			2.60643	1.170	1.1307	3.36407	2.00021	2.06703	1.93270	0.01700	1.14600	1.0426	0.02064	1.43600	0.73061	1.16449	1.23104	0.77303	0.60204	3.00770	1.1029	2.27030	0.26002	1.43066	3.20011	1.7702	1.76400	0.60217	2.00741	6.03013	0.00402	3.77303	1.79606
			6.4886	4.2640	0.32706	4.40042	4.04500	0.03400	1.29412	0.16617	0.76470	2.00610	0.20367	0.77674	1.61063	1.00150	3.0401	2.00304	0.72117	0.76234	0.00306	0.00007	0.4227	2.34600	0.00400	0.07467	0.64012	2.00272	1.70364	0.06666	0.63223	2.0077	1.0231
			1.42916	1.00033	1.10073	2.47210	3.26002	1.44106	0.17073	2.00602	1.00414	1.61044	0.60062	2.76734	0.30403	0.00004	2.74443	0.02071	0.14001	1.04760	0.20004	2.02007	1.12746	1.00636	1.60005	2.32633	2.30070	0.00124	3.42644	1.06700	2.30617	2.06004	0.30020
			0.78076	1.03100	0.71020	0.70367	1.2300	0.14003	1.20320	2.02400	0.01404	1.06072	1.0700	0.45061	0.32411	0.60421	4.73002	0.37076	0.20746	0.61207	2.07064	1.04201	0.40900	0.01707	3.22104	0.10610	7.33024	0.00300	1.1703	4.36043	4.04241	1.03000	0.40600
			0.42126	0.16006	0.90604	4.32563	1.73201	1.36043	2.41360	1.7200	1.20637	1.04005	0.22200	0.76014	1.40741	3.43006	0.60006	1.6607	0.43020	6.0737	4.34000	2.37964	0.02033	0.00006	1.04420	0.00627	1.34317	0.70460	2.07043	2.00400	1.10000	0.6420	0.74030
			1.61902	0.20632	0.00674	0.23072	1.31076	3.62333	0.67676	1.11422	0.01333	0.04067	0.00752	3.00206	0.10312	0.00076	1.63076	0.00370	3.34324	1.03400	1.70442	1.04070	3.74103	0.10066	0.03110	2.01200	0.71316	1.72000	0.02200	0.10021	1.60300	1.00301	0.71332
			2.59400	0.46717	3.16056	0.62041	1.00143	1.04031	2.76400	3.70020	0.03179	0.62001	2.02300	6.10101	0.77007	0.92010	0.20103	1.04034	3.00007	0.00307	2.00246	2.60222	0.70003	0.04400	0.00021	1.13072	3.0316	4.30633	0.00017	0.03641	1.34204	0.00607	1.21423
			1.09604	4.66303	0.9643	2.07604	3.62437	1.60061	3.00022	2.00020	2.02020	1.00067	0.71400	0.27706	1.00076	0.11310	2.60020	1.40664	2.20006	0.61070	1.14103	1.00021	1.71031	0.61070	0.23004	1.30402	0.04630	0.94034	1.77407	1.67047	0.30012	2.4062	0.43064
			3.00400	0.41071	0.04030	0.00071	1.43170	0.34746	1.01003	3.47736	3.41103	0.7027	1.16073	0.01264	1.43200	1.01116	0.31332	2.00026	2.00211	0.61632	0.62033	1.66040	2.3100	0.40700	0.70011	0.37410	2.00360	1.70041	3.40645	0.02630	0.00100	1.13031	0.672
			8.30704	1.00140	1.36610	1.70020	0.70017	1.03027	1.06660	0.04000	0.20604	0.03130	0.0000	0.31020	0.7002	6.06377	0.70000	3.76167	2.01022	0.00106	2.60004	1.01003	2.00000	0.34000	0.62320	2.06707	1.61203	1.60012	3.40072	1.60103	1.40204	0.07060	0.63731
			2.23636	0.30400	1.10310	0.27044	1.31761	3.36640	0.71314	0.00002	0.04746	0.10061	1.10200	1.77006	0.00070	0.404	0.63742	1.00646	2.01200	1.23606	0.04002	3.07307	0.00037	1.000	4.00030	0.24420	0.06300	2.03733	0.36064	2.13703	3.00114	1.01701	1.30660
			2.30110	1.2700	2.20407	0.70017	1.22116	1.70044	0.00601	1.60003	3.04701	0.73413	2.22102	0.00144	3.6003	1.30440	1.10002	2.60000	0.30002	1.4666	2.30070	0.0462	0.61703	0.29406	1.00410	0.60020	0.62204	0.00346	6.10001	1.21001	2.66612	1.30070	1.01400
			1.11301	0.77671	1.00630	2.00006	2.70547	0.60470	1.00200	1.02100	1.71037	0.07632	0.62000	1.47632	3.40026	1.00002	0.06070	0.00263	1.04201	1.01077	1.12000	1.36493	0.01300	0.02261	0.07031	0.02077	0.00063	1.0006	3.20070	1.0616	0.06073	1.01120	1.31727
			0.74678	3.20332	1.17401	0.00220	4.23007	0.21244	2.66001	0.24760	0.01020	1.3607	1.1604	1.01644	2.06010	2.06611	2.1170	0.66166	1.40112	0.73107	2.00076	2.76061	1.34274	2.46006	1.20626	0.30476	1.30301	3.30063	0.74000	1.4430	6.30070	2.46402	1.20701
			0.63406	0.06101	0.10011	0.10627	2.20100	2.600	1.10000	0.04672	0.31041	3.63006	1.02722	0.12363	0.00020	0.61744	2.71440	0.70000	1.0302	1.0007	4.23771	1.02702	0.33000	0.33301	1.31224	2.00601	2.43067	2.10741	0.67116	0.74140	1.74040	2.46627	0.16001
			1.03060	0.49904	1.20600	0.33001	0.63000	0.12116	2.60061	0.00075	0.00711	1.36172	0.10020	2.0340	0.4740	0.01104	1.04710	0.42000	1.04000	0.10003	1.33102	0.30006	1.2001	0.32301	2.10040	0.40144	1.00003	1.06477	0.00004	1.31650	0.37211	0.3737	1.0007
			0.6261	1.04033	1.40000	0.0001	1.0001	2.20007	0.47006	0.72220	2.64703	2.60450	0.30405	0.67012	6.13016	0.30446	1.16217	2.7034	0.34434	0.10027	1.6342	2.44204	2.0003	1.14624	2.77406	0.70310	1.20071	2.60745	1.00623	1.00316	0.67237	1.24002	0.30690
			0.61906	0.40306	0.70120	2.22276	0.4407	0.10000	1.32440	2.67073	2.30031	1.02710	3.4734	1.07442	0.70007	1.14206	3.02227	0.60052	2.24377	1.12476	2.43002	1.12044	0.00000	0.34200	1.1200	0.20104	1.33776	0.47162	0.00012	1.76001	0.10614	0.03070	1.60001
Average			1.70061	1.06634	1.22330	1.67364	2.02206	1.37602	1.24763	1.60100	1.00362	1.40624	1.19231	1.40723	1.70017	1.302	1.00766	1.31006	1.40627	1.41607	1.000	1.36376	1.44700	1.00630	1.26004	1.46406	1.63302	1.40166	1.4007	1.34240	1.6467	1.61770	1.30313
Moving range average			1.63741	1.40000	0.00416	1.66907	1.43242	1.26033	1.07702	1.0160	1.10320	0.94300	1.00054	1.24073	1.64473	1.23140	1.60600	1.26004	1.21770	1.22047	1.44642	1.15237	1.20740	0.96706	0.91047	1.20042	1.43021	1.12000	1.07746	1.07003	1.29410	1.10220	1.00302
T statistic			2.3063	2.78706	4.10403	2.10200	4.07630	2.22403	2.63020	4.07302	3.33406	2.31022	2.00294	2.46000	2.266	2.10126	2.43204	2.42203	2.26733	3.24673	4.1407	2.40304	3.61000	3.21023	3.76006	2.66273	2.10046	3.77640	3.30671	2.76601	2.0900	3.0606	3.40704
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.278	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.398	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.668	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.776	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.878	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1.8	1.035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1.9	1.086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1.136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

39	2.1	1.189	0	0	0	1.22086	0	0	0	0	0	0	0	0	0	1.18864	0	0	0	0	0	0	0	0	0	0	1.23613	0	0	0	0	0	0
40	2.2	1.24	0	0	0	0	0	1.26271	0	0	0	0	0	0	1.28868	0	0	0	1.28824	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	1.3346	0	0	0	0	0	0	0	0	1.30029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2.4	1.342	0	0	0	0	0	0	0	0	0	0	0	1.37264	0	0	1.36834	1.36384	0	0	0	1.38481	0	0	0	0	0	0	0	0	0	0	0
43	2.5	1.393	0	0	0	0	0	0	1.41253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.41888	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	0	1.4466	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.49438	0	0
45	2.7	1.495	0	1.6307	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.62348	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.87276	0
49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.77183	0	0	0	1.7673	0	0	0	0	0	0	0	0	0
51	3.3	1.799	0	0	0	0	0	0	0	0	1.81802	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.83186	0	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.8629
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.86881	0	0	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.02848	0	0	2.03874	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	2.20484	0	2.19006	0	0	2.18928	0	0	0	0	0	0	0	0	0	0	2.2278	0	0	0	0	0	0	0	0	0	0	0	0
59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.756	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.758	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.858	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.666	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator shape parameter			1.3346	1.6307	2.20484	1.22086	2.19006	1.26271	1.41253	2.18928	1.81802	1.30029	1.4466	1.37264	1.28868	1.18864	1.36834	1.36384	1.28824	1.77183	2.2278	1.38481	1.86881	1.7673	2.02848	1.41888	1.23613	2.03874	1.83186	1.62348	1.49438	1.87276	1.8629
Estimator scale parameter			1.3477	1.0761	0.55484	1.28886	0.82328	1.08783	0.88328	0.71305	0.88304	1.12782	0.82486	1.08086	1.30384	1.1701	1.38881	0.87444	1.16445	0.78866	0.85114	0.88479	0.73883	0.82388	0.81818	1.02448	1.24187	0.7287	0.80175	0.8812	1.03434	0.80736	0.70329
Control chart constant d2			1.0281	1.03877	1.08804	1.01881	1.08584	1.01843	1.03177	1.08682	1.06317	1.02341	1.03388	1.02894	1.02078	1.01388	1.0278	1.02766	1.02084	1.06133	1.08484	1.02883	1.06852	1.0607	1.08088	1.03227	1.01788	1.08118	1.05381	1.03883	1.03708	1.04881	1.06484
Control chart constant d3			0.86371	0.86263	0.92818	0.87148	0.92858	0.88818	0.85808	0.82861	0.8412	0.86581	0.85728	0.8614	0.88806	0.87386	0.88226	0.86263	0.86.	0.8428	0.82867	0.86068	0.8384	0.84336	0.83421	0.86888	0.87042	0.83383	0.84084	0.86331	0.85476	0.84888	0.8398
Control chart constant D4			3.80186	3.80805	3.80661	3.86244	3.80886	3.84481	3.86395	3.80804	3.708	3.8184	3.84878	3.88301	3.83421	3.88037	3.88886	3.88228	3.83686	3.72226	3.80074	3.87708	3.86586	3.72708	3.84711	3.88062	3.8646	3.84474	3.70306	3.81481	3.82718	3.76862	3.88857
Upper contro limit X			6.2834	5.84875	3.7387	6.17444	6.05482	5.081	4.3782	4.42082	4.97424	4.23248	4.29258	5.13221	6.308	6.03852	5.45704	4.88488	5.04386	4.88776	5.86131	4.72074	4.88923	3.82888	3.8638	5.20488	6.77248	4.65034	4.53588	4.43488	5.28844	4.84873	4.38567
Lower control limit X			-2.88838	-2.83808	-1.28281	-3.02717	-2.01082	-2.33086	-1.88394	-1.28887	-1.787	-1.3	-1.80787	-2.13778	-2.77186	-2.25253	-2.88181	-2.35878	-2.11341	-2.0878	-2.18832	-1.88323	-1.87607	-1.63828	-1.34083	-2.28858	-2.70621	-1.88728	-1.88868	-1.74883	-2.18804	-1.81316	-1.77832
Upper control limit MR			5.88873	5.8886	3.224	6.17772	5.16841	4.8878	4.16166	3.88804	4.38782	3.8888	4.1128	4.84107	6.08038	4.88173	6.08034	4.88083	4.7828	4.54282	5.20457	4.48788	4.42866	3.587	3.34875	4.88188	6.88742	4.08536	3.88883	4.086	4.86308	4.38816	4.00588
Normal upper control limit X			5.88736	5.81284	3.80148	6.72011	5.83188	4.72428	4.11204	4.28288	4.78086	3.87588	4.03418	4.813	5.87848	4.8872	6.06164	4.88758	4.70388	4.88102	5.74018	4.42867	4.06846	3.84171	3.88837	4.88881	5.36888	4.48288	4.33426	4.18042	4.88788	4.88887	4.18611
Normal lower control limit X			-2.28034	-2.30227	-1.1647	-2.67283	-1.78767	-1.87426	-1.81678	-1.14081	-1.64341	-1.04361	-1.84868	-1.81864	-2.34018	-1.88321	-2.27842	-2.02848	-1.77344	-1.83087	-1.8482	-1.70107	-1.7843	-1.44888	-1.1861	-1.87731	-2.28141	-1.48856	-1.38886	-1.60648	1.88828	-1.67339	-1.67886
Normal upper control limit MR			5.02424	4.86288	2.92212	5.88606	4.88118	4.11848	3.5197	3.31882	3.88887	3.0836	3.482	4.07432	5.04817	4.02448	5.11868	4.11463	3.97883	3.88861	4.72382	3.78686	3.84803	3.12784	3.00156	4.21708	4.70008	3.86308	3.5211	3.48848	4.2284	3.78834	3.64128

OBJECTIVE # 3

Gamma (1.5, 1.0)

k = 50 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	1.76780	0.9483	1.0862	0.5972	0.7900	1.05884	1.38781	1.04783	0.44149	1.20824	0.94358	2.91482	2.4138	2.32385	0.58132	3.74080	0.13616	0.20521	1.63817	1.97735	2.82637	1.13803	1.03861	0.2703	0.80932	0.25472	1.43587	2.71834	2.13878	0.54802	0.25848
			1.81290	2.20992	0.41829	1.10322	1.82583	0.41876	1.23586	1.38304	1.38035	0.12711	0.98727	5.35341	0.46102	2.31019	2.31495	0.17124	0.5684	0.48622	0.97808	3.43380	0.41487	5.63811	1.05084	0.9984	0.88121	4.8789	1.20116	0.6182	2.32993	1.07308	1.35818
			0.14143	2.83458	0.22037	0.289	0.72957	2.20814	0.19048	1.88014	1.08884	2.88853	2.15785	1.32115	2.55577	0.58215	1.10217	0.05373	1.30104	2.08218	2.48043	0.85028	0.50535	0.18343	4.82486	0.23815	1.03289	2.47988	2.08878	1.95185	2.81141	0.88821	2.58804
			0.65584	0.81287	1.23723	2.5042	2.62822	2.14412	0.62183	1.88884	4.47702	0.28458	1.83414	0.74862	1.29584	0.85213	2.80857	2.20854	1.78531	1.77151	0.12328	2.39883	1.12829	1.79548	0.75773	2.1778	1.81818	0.70712	2.20318	1.45574	2.49022	0.8208	0.4895
			1.59087	0.74918	0.20818	0.55836	2.70424	2.58338	0.73377	3.52082	0.8706	1.14478	0.31954	2.47745	0.62149	1.50392	0.58842	0.40131	1.01238	1.30225	1.08242	0.7881	0.7587	0.47484	0.85133	3.83078	2.07877	0.56378	0.24258	3.65585	1.38881	3.58037	0.2385
			1.84105	3.08173	0.75517	0.47984	3.01452	0.51575	0.82258	3.38805	0.07126	0.74889	8.85858	2.51205	0.5515	3.31244	0.01812	0.13074	0.68434	0.51138	1.28088	0.81887	0.28805	0.79828	2.7158	2.14184	1.30847	1.08133	2.71003	0.07364	0.18077	0.82804	1.43842
			1.60587	1.8322	2.88508	4.58205	0.28772	2.97734	1.54115	2.08411	0.24881	0.38558	0.12871	1.82342	0.80229	2.01232	1.19284	0.84841	5.4552	2.85	0.49827	3.19081	1.2084	0.80758	0.24871	3.48834	1.19517	0.59818	2.38822	1.58435	2.87738	0.57745	3.24818
			0.89988	0.70108	0.13831	0.78714	1.70188	0.22358	0.84052	1.83834	1.74265	1.85718	1.28588	0.27383	0.81838	0.43314	0.34875	1.2738	0.111	5.0234	2.38387	3.07587	2.17835	1.17582	1.15488	1.8333	0.91885	3.85847	0.01277	0.85318	3.88843	1.17718	0.82521
			0.81482	2.2157	0.20525	0.49888	1.17452	1.88773	0.28237	0.83832	1.82435	2.44241	3.92882	0.83888	1.43487	2.13744	1.8838	1.87333	2.24137	1.84088	1.83424	0.10784	0.77022	2.07162	2.3585	0.87954	1.18245	0.83158	0.77581	3.08513	0.48287	1.43887	1.36788
		10	0.27312	0.54537	0.38181	2.38388	0.55848	1.27501	0.7038	3.88888	0.888	0.5828	0.97827	0.80457	0.88183	0.3183	0.82485	3.32508	1.43717	3.28844	0.3487	3.08874	2.84828	0.10324	2.35844	0.81737	1.40884	1.73262	1.78838	0.84841	1.05738	0.77733	2.1233
			1.12411	0.18852	0.80588	1.75574	0.54181	0.34574	0.88288	0.85752	0.48888	2.89583	1.73888	2.84947	3.01832	1.23105	0.4807	0.08032	0.31212	0.8148	0.7285	4.97784	1.45858	0.88881	0.4133	0.88818	1.84052	0.84887	2.48175	0.843	2.48858	0.45058	1.88818
			0.03554	1.48231	0.9838	0.38785	1.02354	0.3885	0.23547	1.28677	0.48727	1.11333	3.03258	1.3288	1.33478	1.34887	1.31835	3.78141	0.37012	1.25433	1.18488	4.33182	0.37555	0.48228	0.44411	0.52778	2.10814	8.00964	1.84887	1.8888	2.2183	0.71852	0.82874
			0.85488	0.82814	0.07248	1.88482	1.8431	0.88187	0.2524	2.12948	0.83823	0.02848	2.75885	0.78328	0.41845	3.87054	1.0852	1.8514	0.47033	0.8888	0.88818	2.32853	1.45887	2.48855	1.78218	0.14848	0.13438	2.53758	2.12887	1.88547	0.58837	2.59854	2.47547
			0.82748	0.89858	0.78322	0.88911	2.27431	2.10368	1.87285	3.25224	8.38305	4.51455	1.88345	0.41872	2.23788	1.83887	2.11824	0.8325	0.21144	2.84853	3.28154	0.23358	0.78855	0.22335	1.38823	0.37258	0.58884	0.48373	0.83831	0.23733	0.51044	2.38288	0.13178
New observations k =			0.31888	0.88012	0.82275	1.1838	1.34382	0.88442	3.5888	2.1814	1.45857	0.42555	0.3518	0.02884	1.71424	0.70894	1.19248	0.3585	0.50844	0.18488	4.3141	1.87458	1.50432	2.14843	1.58131	1.1088	0.75849	1.54075	1.80113	1.58888	1.5883	2.28584	0.15181
			2.02288	1.24044	4.80382	0.77811	0.77114	1.80184	1.88788	1.01078	0.47083	1.28248	1.35852	0.88821	0.30882	1.07503	0.77188	3.18375	0.83784	1.1111	3.48888	0.87958	0.84181	1.83381	2.15818	2.50584	2.50887	0.81437	1.37588	1.75324	1.45928	1.98488	0.88324
			0.41817	2.88951	0.88834	0.14351	2.08828	2.38848	1.95281	2.74353	0.88433	0.75174	1.91788	1.37579	1.8827	0.57581	1.78587	8.11337	2.9857	1.38383	0.38288	2.4872	3.87172	2.87288	0.88187	1.71284	0.18128	1.10441	4.88585	0.84207	3.44903	0.07781	0.88182
			1.81013	2.0088	0.57871	0.88588	0.28775	0.55551	3.04438	3.02187	1.05887	0.22882	3.01882	1.48881	2.8848	0.02878	1.03483	0.78787	0.10228	0.10743	1.88134	1.88321	2.70384	1.79585	1.05881	0.13437	1.22784	1.81582	4.83483	1.1818	2.88883	3.18818	2.78328
			3.58188	0.8731	1.48838	0.03845	1.78378	0.42548	1.05114	0.12888	0.54298	4.73888	0.3888	0.8544	1.88288	2.13344	1.82842	0.48188	1.01888	2.48824	1.52858	1.20854	0.73838	0.57557	0.8845	1.88148	1.01213	0.83818	0.83444	2.23313	1.28884	1.12588	4.24873
		20	0.8218	2.21078	1.75838	0.73837	0.28837	0.40124	3.08561	0.52505	2.37788	0.84037	0.52785	0.35583	0.48852	1.87545	0.84258	2.43585	0.77212	4.13722	0.45755	2.01042	0.858	0.58218	1.80032	0.58838	0.07478	0.21854	0.04877	0.88524	0.25888	0.28385	0.72851
			1.58401	2.44027	2.38848	1.2482	0.7847	3.33535	1.23783	1.58788	0.31822	0.17254	4.30888	2.58861	1.88315	2.48231	3.01283	1.00875	0.48838	2.88218	0.82852	3.11883	0.87884	1.75425	0.83148	0.10884	1.81362	1.0155	3.14484	0.28881	2.0283	2.88828	1.28815
			0.89518	1.81013	2.82888	0.888	1.08874	0.42522	0.80858	2.14443	0.18284	2.41188	1.12198	0.80434	1.44587	0.81481	1.78282	1.11885	1.84835	2.87234	2.88883	2.25348	1.52188	0.88833	1.10472	0.80283	1.34578	0.88873	1.13082	1.72288	1.1427	0.18788	0.78778
			1.97048	3.53855	1.388	1.01588	0.32733	0.41257	0.28387	0.58355	0.27138	2.2821	0.88173	2.37542	0.38338	2.5888	1.84187	2.08472	0.58388	0.29021	3.18183	0.8481	0.53885	0.84872	4.35578	1.45184	1.72231	4.42737	1.32888	1.8834	0.83518	0.38275	1.78388
			1.91838	0.21588	0.14384	1.58854	3.1881	1.03831	0.58871	5.04888	2.10788	2.48583	0.28848	0.77023	0.48325	2.88848	2.43732	1.58635	3.13884	1.38184	4.84818	1.88811	1.01384	1.82387	2.03448	0.78133	2.51717	0.88172	2.48787	0.73887	1.23077	1.71218	2.30338
			0.32485	0.84878	3.25881	0.88433	1.28885	0.18263	0.32752	0.88884	1.1608	0.53778	0.82885	2.01822	1.41474	0.02258	0.38284	1.30748	0.85847	0.57422	0.81771	1.01188	1.48753	0.88348	0.80285	0.80853	0.81338	0.88888	1.02488	0.34281	1.57387	0.47887	0.70172
			0.2553	3.41848	0.7808	1.70025	0.58884	3.84885	0.70882	2.70224	1.22874	0.8638	0.829	1.24874	0.3714	1.2889	0.777	0.71834	2.02418	3.84882	1.41158	4.48783	3.30882	2.18775	1.15588	1.57358	2.33822	3.38548	0.04785	1.14752	0.18487	1.87884	0.18863
			4.5084	0.80528	0.8828	5.48724	0.54182	0.23772	0.80145	0.35788	1.83757	3.3088	0.79873	0.58553	0.31188	0.78888	1.82048	0.14144	0.03183	0.58848	2.73418	1.88425	1.80717	0.02124	0.7408	0.21872	1.7377	3.5884	1.2207	1.53878	1.5238	0.92561	0.08801
			1.2074	3.07431	2.3828	2.4874	2.32183	1.22181	0.88377	0.30185	2.00187	3.38278	2.87528	1.88354	1.478	1.1385	0.41788	0.42738	3.65214	1.00154	1.88441	2.88113	0.88425	0.38788	1.88819	1.83737	1.58884	0.88887	2.14773	0.85213	2.79884	0.80482	3.33838
			5.81181	1.32418	2.11837	0.31788	0.87484	0.03	1.07785	0.24884	2.02341	0.05488	1.98302	4.48588	0.53183	0.72083	4.88888	0.88212	3.4752	1.20288	2.22047	1.81388	0.88884	0.08812	1.03315	0.58284	0.44337	3.85488	0.42333	0.77879	3.5348	0.08873	4.04158
		30	3.01123	2.08842	2.35558	2.13218	2.7438	3.85488	2.12252	0.05732	1.28182	1.37854	0.98875	1.42888	0.87885	1.7885	0.88155	1.88484	0.18283	0.08152	0.54885	0.85288	2.20382	0.81485	1.03428	3.17101	1.55858	1.34037	2.22212	0.38871	3.50348	1.88951	2.44153
Estimator shape parameter			1.334501	1.538702	2.20484	1.220958	2.180057	1.252713	1.412525	2.18828	1.818023	1.300281	1.445488	1.372538	1.288582	1.188838	1.358338	1.353842	1.288237	1.771835	2.227588	1.384811	1.858888	1.757288	2.028475	1.418885	1.235132	2.038738	1.831863	1.523484	1.484388	1.672758	1.852887
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.3477	1.075101	0.554841	1.288856	0.923287	1.087831	0.883281	0.713866	0.883838	1.127824	0.824845	1.080849	1.383838	1.170102	1.388811	0.874443	1.154447	0.798848	0.851138	0.884783	0.738828	0.823881	0.818183	1.824478	1.241888	0.728888	0.801755	0.881202	1.034337	0.887358	0.703283
Control chart constant d2			1.028102	1.038773	1.088841	1.018808	1.085838	1.019427	1.031788	1.085817	1.053172	1.023408	1.033881	1.028844	1.020785	1.013882	1.027901	1.027852	1.020842	1.051328	1.088844	1.028828	1.058524	1.050887	1.088888	1.032273	1.017884	1.081182	1.05381	1.038827	1.03708	1.048808	1.064841
Control chart constant d3			0.983713	0.952528	0.929184	0.97148	0.929581	0.988158	0.958082	0.929612	0.941'95	0.985909	0.957285	0.981387	0.988048	0.873849	0.982247	0.982532	0.988802	0.842882	0.928572	0.880876	0.938403	0.943345	0.834288	0.958881	0.870418	0.833828	0.840835	0.953388	0.854745	0.948862	0.938802
Control chart constant D4			3.901849	3.808048	3.805888	3.862438	3.808865	3.944807	3.863851	3.888836	3.788805	3.9184	3.848785	3.883013	3.836211	3.888388	3.889982	3.892282	3.835848	3.722258	3.88074	3.877083	3.885853	3.727081	3.847188	3.888518	3.854488	3.844738	3.703045	3.814888	3.827178	3.758523	3.888588
Upper contro limit X			6.283388	5.948748	3.739888	6.174443	6.054821	5.080888	4.378201	4.420818	4.874244	4.232482	4.282584	5.13221	6.307987	5.038525	6.457037	4.984883	5.043847	4.887745	5.881313	4.720738	4.888228	3.828878	3.853881	5.204877	5.772481	4.850358	4.535885	4.43488	5.288442	4.848728	4.385572
Lower control limit X			-2.88838	-2.83808	-1.29281	-3.02717	-2.01052	-2.33088	-1.98384	-1.28887	-1.787	-1.3	-1.80787	-2.13775	-2.77186	-2.25253	-2.88181	-2.35878	-2.11341	-2.0878	-2.18832	-1.88323	-1.87587	-1.83825	-1.34083	-2.29558	-2.70521	-1.88728	-1.58858	-1.74883	-2.18884	-1.81318	-1.77932
Upper control limit MR			5.988726	5.888580	3.223888	6.177725	5.188408	4.987787	4.181553	3.888045	4.387818	3.8888	4.112588	4.841071	6.080378	4.881731	6.080344	4.988528	4.782881	4.54282	5.204587	4.487848	4.428551	3.587004	3.349748	4.881888	5.887418	4.085362	3.988834	4.084885	4.85308	4.388147	4.005688
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
Total false alarm in X			0	0	1	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	0	1	1	0	0	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
Total false alarm in MR			0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	0	1	0	0	1	1	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							100																										
Sub-total MR control charts with at least one false alarm k 30 =							87																										
Normal upper control limit X			5.887353	5.812038	3.80148	5.720108	5.831878	4.724287	4.112043	4.282881	4.750847	3.875888	4.034188	4.813002	5.878492	4.8872	6.051542	4.887551	4.703878	4.881015	5.740187	4.428575	4.858448	3.84171	3.888388	4.888815	5.358881	4.482848	4.334248	4.180423	4.887887	4.808988	4.185108
Normal lower control limit X			-2.29034	-2.30227	-1.1547	-2.57283	-1.78757	-1.87425	-1.81879	-1.14051	-1.54341	-1.04351	-1.84856	-1.81854	-2.34015	-1.88321	-2.27842	-2.02848	-1.77344	-1.83087	-1.9482	-1.70107	-1.7843	-1.44888	-1.1881	-1.87731	-2.29141	-1.49855	-1.38885	-1.50548	-1.88828	-1.57338	-1.57885
Normal upper control limit MR			5.024243	4.842875	2.92212	5.085048	4.881147	4.115477	3.518701	3.318822	3.888988	3.083887	3.482004	4.074318	5.048172	4.024485	5.118585	4.114533	3.979825	3.88851	4.72382	3.785858	3.848032	3.127841	3.001851	4.217088	4.700084	3.883079	3.521088	3.488481	4.228402	3.788344	3.541281
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0
Total false alarm in X			0	0	1	0	0	0	0	1	1	1	1	1	0	0	0	1	1	1	1	1	0	1	1	0	0	1	1	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0
Total false alarm in MR.			0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	0	1	0	0	1	1	0	0	1	1	1	0	0	0
Sub-total normal X control charts with at least one false alarm k 30 =							118																										
Sub-total normal MR control charts with at least one false alarm k 30 =							127																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							1																										
Sub-total MR control charts with at least one false alarm k 1 =							4																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							2																										
Sub-total MR control charts with at least one false alarm k 1 =							7																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							35																										
Sub-total MR control charts with at least one false alarm k 10 =							35																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							40																										
Sub-total MR control charts with at least one false alarm k 10 =							58																										

OBJECTIVE # 3

Gamma (1.5, 1.0)   k = 50 obs   Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	2.05287	2.13038	2.3490	2.71021	5.02301	1.52943	1.82827	2.8375	3.58789	2.08555	3.98233	2.18493	2.07528	3.17881	1.7151	1.81288	2.08863	1.88817	1.7517	2.61863	3.85641	4.17887	2.5504	2.39083	1.38101	2.5019	2.25442	2.38711	1.34589	2.75401	1.78287
			2.85813	1.80033	1.903	3.17778	1.37899	4.83823	1.57285	4.4072	1.87512	3.88328	7.73382	2.07483	4.24382	3.8858	4.0052	1.8097	1.85232	2.8957	3.3808	4.79089	1.82098	2.71481	2.21254	1.50313	1.85088	3.22485	2.88378	1.78884	3.08458	1.85215	1.82588
			1.28522	8.21134	2.771	2.53888	1.81013	1.94511	1.40427	5.0888	2.24881	3.38818	3.22218	2.42588	4.21878	1.8111	8.40382	1.82033	1.8483	2.20845	3.888	2.83037	3.83718	2.88778	2.17188	1.88788	2.58084	5.95878	1.53852	2.2224	1.48148	1.98857	2.18185
			1.71585	1.7123	8.0428	1.42801	4.81048	2.52003	3.24078	2.8878	4.73421	8.14522	2.82032	1.81088	3.07711	3.0812	2.82048	2.08374	3.3272	5.01835	2.1858	4.07003	2.37888	2.42738	1.88058	2.88818	5.30787	1.50705	2.88755	1.87831	2.27438	2.5821	1.98834
			2.88932	3.50472	2.5294	1.48845	2.33418	3.00883	2.14131	5.1828	4.33882	3.02488	2.24705	1.72378	3.05842	2.38078	2.00201	1.83178	2.17182	1.88312	1.8772	2.20441	4.40885	3.8183	3.04441	1.88088	1.98044	2.14838	1.48831	1.48428	3.08844	2.82712	2.28871
			2.35728	2.388	4.8818	1.87704	1.35718	1.84857	2.8322	2.5808	2.88808	2.38841	4.48078	4.00448	2.55841	8.20884	1.97488	2.25838	3.34132	1.82818	1.8372	2.08838	4.12352	1.44733	2.84555	2.50282	1.71282	2.45828	2.43858	2.58181	2.38458	3.20033	1.57237
			2.18402	1.83823	1.817	1.58882	2.15582	3.10841	4.28028	2.1005	1.84832	2.12888	3.52877	1.48381	5.34278	3.88702	4.38512	2.88312	1.88884	1.88408	5.2078	1.81551	2.15885	2.37031	2.52371	2.8113	2.21808	5.44088	1.41328	1.48515	1.82188	1.51885	3.13738
			4.28815	3.05418	1.8828	3.48878	5.02832	2.37852	1.88007	2.2383	2.72787	1.82281	1.73888	1.85387	4.84884	2.88828	4.5837	3.11128	3.08834	1.88818	2.1783	2.83318	1.81884	2.42882	1.32842	2.3422	2.42052	1.57711	3.04883	3.88248	2.15223	3.03828	1.88338
			1.77688	1.78727	1.4178	1.3813	2.38835	1.70884	2.2875	3.3888	3.12748	2.32818	1.55714	1.85811	2.4878	2.18558	1.88824	3.81748	1.84448	1.87308	8.2088	2.82781	1.8211	3.18882	2.17881	1.88117	1.42814	3.58855	2.03888	1.41208	4.8818	2.28178	2.78803
		10	1.58889	4.0882	4.4018	1.73873	1.38852	2.88814	5.00581	2.884	2.54183	3.83375	2.17384	2.04228	2.12241	2.88129	3.43875	1.48382	2.58143	2.51434	3.0748	2.54488	5.73208	2.81443	2.54505	3.75175	3.5233	1.83423	1.84588	1.88847	3.58877	1.83858	3.98283
			2.08182	1.84228	3.128	1.8107	2.8235	2.87451	2.08583	1.8888	1.85181	3.72082	4.44837	4.04487	1.25098	2.28988	1.827	5.18333	2.13778	1.83298	1.8525	1.74388	2.58822	1.41183	3.0187	1.35743	8.8208	1.7005	1.57081	2.18818	1.77488	3.1748	2.54852
			3.23235	1.88088	1.856	1.80851	1.88278	2.1808	4.20427	1.8232	1.85203	3.0301	1.35584	2.18838	4.57848	2.82783	4.21213	1.48882	1.7038	3.51531	2.4814	2.03827	2.58495	2.21228	4.34388	4.74704	1.55834	1.44378	4.83741	2.48888	1.88838	1.42738	1.43188
			2.57798	2.05275	4.3358	1.47858	1.8474	2.8805	3.84431	3.2051	2.27013	2.58188	3.84504	1.85888	2.04743	3.00821	2.00785	2.87218	2.88842	3.8071	1.7381	3.74415	3.81701	2.38213	1.70854	2.21402	2.08775	3.20128	2.32348	1.30111	1.54888	1.58282	4.05503
			3.04348	1.48888	2.7301	1.88955	1.44043	3.38148	2.72808	1.8158	1.88035	1.81542	7.70508	1.84187	3.5284	2.38138	1.84848	2.15328	2.23988	2.07838	2.2853	4.83	3.58484	1.28088	3.78784	1.48854	3.35828	1.88488	3.12814	1.54	1.51081	2.53458	3.0077
New observations k =			3.3218	1.98997	2.4304	5.1144	3.58883	1.71402	1.7177	7.0008	1.71958	1.7371	4.3812	1.70082	2.51073	3.03218	1.34118	4.12248	1.48182	2.38488	2.0887	3.93887	3.48777	1.55778	3.02822	4.58181	2.18412	8.08398	1.73553	1.82238	2.07838	1.70285	4.47508
			1.48515	1.50902	2.1384	1.83137	3.48758	2.32884	4.08852	1.8118	1.8088	2.08881	1.88438	2.81544	1.80528	3.0931	1.8113	1.40038	2.77032	3.77144	3.1784	2.38878	1.74842	2.88487	1.38888	4.52838	2.8827	1.83888	2.8757	2.05385	4.00235	2.1045	1.45148
			2.18353	3.73804	1.8358	2.04212	2.51732	3.88872	1.417	2.202	1.72884	1.80318	2.78107	3.88848	3.75284	1.41258	3.12455	1.88031	1.88852	3.50188	1.4223	2.30742	2.18085	2.08308	2.32724	2.02188	4.28385	1.54842	1.53184	1.50103	2.87714	1.81338	1.8477
			1.85114	2.82128	1.8788	2.29848	2.20375	3.01287	2.88888	1.8282	1.81324	1.83881	3.73328	2.77705	3.21827	2.74854	2.33784	2.22	2.8028	1.88475	2.8834	1.75877	2.58887	1.42248	1.81338	2.80181	1.48558	3.78288	3.32888	1.31858	2.50888	4.92535	2.38457
			1.5755	2.88037	1.8833	5.00831	3.38873	2.41585	3.01818	1.4088	2.81258	5.1078	2.83805	4.80101	2.88481	1.3823	3.8485	2.75743	2.23438	1.78215	2.7008	2.23851	5.74358	1.54282	3.1188	2.10058	3.08887	2.33153	2.25045	3.08582	5.78328	1.78047	5.8284
		20	2.83143	1.72038	10.7337	1.44838	1.83187	1.70174	2.52702	2.0083	4.04347	2.31831	4.83471	2.82425	2.08858	2.01831	1.58724	2.13734	4.2858	1.81888	1.8808	2.78754	1.8882	4.88783	1.51585	1.87083	4.38388	2.85848	2.32118	2.87814	2.80104	2.3028	2.27512
			2.02387	3.28738	1.8852	2.38138	1.74757	5.88388	4.87127	2.8847	1.88345	3.73757	1.38501	2.33887	1.88281	2.85703	1.8244	1.4804	1.83518	3.82788	1.8785	2.28588	1.80525	3.88128	3.54482	1.87813	4.82848	1.85047	3.25408	2.33037	2.08313	2.71215	3.88288
			4.1793	1.24488	2.4593	1.82482	3.38187	2.58181	2.84088	2.2888	2.34341	2.01055	1.5577	2.38407	2.38821	2.08887	2.73287	2.00848	2.03085	5.82387	1.5878	4.33708	3.28748	1.78827	3.57844	3.81103	3.38224	1.82481	4.04583	2.88878	3.4488	2.43288	2.218
			1.88858	1.35823	2.7307	1.3883	2.05742	2.88488	2.38152	1.887	2.45288	4.34788	1.84403	2.24807	1.55824	1.38382	1.88312	2.18813	2.04831	1.78572	2.4033	4.48781	1.30522	3.75288	1.83842	3.74704	2.52837	2.58482	2.82138	3.05185	3.01045	1.58285	2.12024
			3.11358	2.80207	1.7588	3.08241	2.78008	2.85221	2.51283	2.0782	2.87015	2.53482	4.04421	5.80388	4.22888	3.8353	2.78588	2.57375	1.58585	2.38873	3.0288	1.45288	2.83288	1.38887	2.25518	2.88251	5.10158	3.50712	1.88571	1.71888	1.83878	3.24342	5.25845
			3.87715	1.85824	1.508	1.8258	1.38824	3.00328	4.58808	2.7141	1.88828	1.7172	1.47572	2.18753	2.88558	1.34398	7.18857	2.02173	1.4553	2.28283	3.1288	1.8854	3.21858	2.83038	2.88808	5.18784	8.20783	2.507	2.84448	1.80283	3.55824	2.38525	3.54833
			2.88058	1.44885	1.2841	5.11427	1.83741	3.18851	3.42812	1.8708	2.2471	1.88847	1.88828	1.83325	1.45705	1.38888	4.23784	1.83528	1.31884	2.18313	2.4888	3.14708	3.48888	3.57875	1.45847	4.85383	2.32241	1.51085	4.17135	5.2548	3.50741	2.33215	3.2058
			4.34001	3.05381	3.2788	2.17432	3.38015	2.88873	3.01885	1.8292	1.58748	3.38874	1.72318	1.28254	2.5472	1.88818	1.58488	1.81305	2.35388	1.50888	8.8427	2.05102	2.7882	2.88775	1.27117	3.52888	3.0878	2.0343	1.50033	8.7128	2.48825	5.8875	1.83411
			1.88381	4.88808	1.8532	3.47344	1.7884	2.34587	2.58833	2.4504	1.88541	2.85587	2.84284	1.45457	3.08833	3.83837	2.78414	2.88042	3.17825	4.85848	1.7258	2.57238	2.38787	2.41571	1.38834	1.74418	2.3443	3.73843	7.32223	2.88872	2.75448	3.51308	1.70488
			1.87887	1.57178	3.8332	1.49731	2.01147	1.85714	2.53885	1.5283	3.88538	3.1715	2.2012	2.1188	1.548	4.4818	1.48803	1.83322	3.83837	2.18022	3.441	2.19252	1.87807	3.82083	3.11887	2.18554	2.13845	8.07272	2.73883	3.15838	2.88884	3.82802	2.44088
		30	2.07284	2.87355	5.8021	1.40288	1.88282	3.50038	2.75822	1.7503	1.88848	2.0251	2.83182	1.5188	2.23805	1.85887	2.38884	3.78188	2.18288	4.11408	1.5114	1.35111	2.83877	3.30283	4.04188	4.38288	1.51335	3.85441	3.38527	2.1522	2.5418	3.14802	7.82884
Estimator shape parameter			1.334501	1.539702	2.20494	1.220958	2.180057	1.252713	1.412525	2.18928	1.816023	1.300201	1.445408	1.372530	1.288582	1.189630	1.358338	1.353642	1.289237	1.771836	2.227508	1.384011	1.958000	1.757209	2.029475	1.419805	1.235132	2.038730	1.831053	1.523464	1.494308	1.872758	1.852087
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.3477	1.075101	0.554841	1.288858	0.823207	1.097631	0.883281	0.713055	0.883038	1.127624	0.824845	1.080840	1.393838	1.170102	1.388811	0.874443	1.154447	0.788840	0.851138	0.984793	0.738828	0.623881	0.618193	1.024478	1.241888	0.728898	0.881755	0.881202	1.034337	0.807358	0.703283
Control chart constant d2			1.028102	1.039773	1.088041	1.018088	1.085838	1.019427	1.031788	1.085817	1.053172	1.023408	1.033881	1.028844	1.020785	1.013882	1.027801	1.027552	1.020842	1.051328	1.068844	1.028828	1.058524	1.050887	1.080886	1.032273	1.017884	1.081182	1.05381	1.038827	1.03788	1.048888	1.054841
Control chart constant d3			0.983713	0.852528	0.828184	0.87148	0.828591	0.889158	0.858082	0.928812	0.841195	0.885888	0.857285	0.881387	0.888048	0.873849	0.882247	0.882532	0.888802	0.942882	0.828572	0.980876	0.838483	0.843345	0.834208	0.858881	0.870418	0.833928	0.840835	0.853308	0.854745	0.848882	0.838882
Control chart constant D4			3.901849	3.808048	3.805808	3.882438	3.808865	3.844807	3.863851	3.808836	3.708085	3.8194	3.848785	3.883013	3.836211	3.880388	3.888882	3.882282	3.835848	3.722258	3.80074	3.877083	3.885853	3.727081	3.847188	3.880518	3.854488	3.844738	3.703845	3.814808	3.827178	3.758523	3.888548
Upper contro limit X			6.293398	5.848748	3.738888	6.174443	6.054821	5.080988	4.379201	4.420818	4.874244	4.232482	4.292584	5.13221	6.307887	5.838525	6.457837	4.884883	5.843847	4.887745	5.881313	4.720738	4.888228	3.828878	3.853881	5.204877	5.772481	4.850358	4.535885	4.43489	5.288442	4.848728	4.385572
Lower control limit X			-2.88838	-2.83808	-1.20291	-3.02717	-2.01852	-2.33098	-1.88384	-1.28887	-1.767	-1.3	-1.80787	-2.13775	-2.77185	-2.25253	-2.88181	-2.35878	-2.11341	-2.0878	-2.18832	-1.88323	-1.87507	-1.83825	-1.34083	-2.28558	-2.70521	-1.88728	-1.58858	-1.74883	-2.18884	-1.81315	-1.77832
Upper control limit MR			5.988726	5.888588	3.223888	6.177725	5.188408	4.987787	4.181553	3.888045	4.387818	3.8888	4.112588	4.841071	6.080378	4.801731	6.080344	4.900528	4.782801	4.54292	5.204587	4.487848	4.428551	3.587004	3.349748	4.881888	5.887418	4.085362	3.888834	4.084895	4.95308	4.388147	4.005888
False alarm in X? (Y=1/N=0)			0	1	1	0	0	0	1	1	0	1	1	0	0	1	0	0	0	1	1	1	1	1	0	0	0	1	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	0	0	0	1	1	1	0	1	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	0	1	0	0	1	1	0	0	1	0	1	0	0	1	0	0	1	1	0	0	1	1	0	1	1	1	1	0	1	1
Total false alarm in X			0	1	1	0	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	1
Total false alarm in MR			0	1	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	1	0	0	1
Sub-total X control charts with at least one false alarm k 30 =							182																										
Sub-total MR control charts with at least one false alarm k 30 =							88																										
Normal upper control limit X			5.887353	5.812938	3.80148	5.720108	5.831878	4.724287	4.112043	4.282881	4.750847	3.975888	4.034186	4.813002	5.876482	4.8872	6.051542	4.687551	4.703878	4.881015	5.740187	4.428575	4.858448	3.84171	3.899308	4.888815	5.358881	4.462849	4.334248	4.190423	4.887887	4.808998	4.185108
Normal lower control limit X			-2.28034	-2.30227	-1.1547	-2.57283	-1.78757	-1.97425	-1.81879	-1.14051	-1.54341	-1.04351	-1.64958	-1.81854	-2.34015	-1.88321	-2.27842	-2.02848	-1.77344	-1.83087	-1.8482	-1.70107	-1.7843	-1.44898	-1.1861	-1.87731	-2.28141	-1.49855	-1.38885	-1.50548	-1.88828	-1.57338	-1.57885
Normal upper control limit MR			5.024243	4.882875	2.92212	5.085049	4.881147	4.115477	3.519701	3.319822	3.888988	3.083897	3.482004	4.074316	5.048172	4.024485	5.118585	4.114533	3.879825	3.88851	4.72382	3.785858	3.848032	3.127841	3.001551	4.217088	4.700084	3.883078	3.521088	3.488481	4.229402	3.788344	3.541281
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	1	1	0	1	1	0	0	1	1	0	0	1	1	1	1	1	0	0	0	1	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	1	0	0	0	1	1	0	1	1	1	0	0	0	1	0	0	0	1	1	1	1	0	1	1	1	0	1	1	1
False alarm in X? (Y=1/N=0)			0	0	1	0	0	1	1	0	0	1	1	1	0	0	1	0	0	1	1	1	0	1	1	1	1	1	1	1	0	1	1
Total false alarm in X			0	1	1	0	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	1
Total false alarm in MR			0	1	1	0	1	1	0	1	0	1	1	0	0	0	0	0	0	1	1	0	1	1	0	0	1	1	1	1	0	0	1
Sub-total normal X control charts with at least one false alarm k 30 =							183																										
Sub-total normal MR control charts with at least one false alarm k 30 =							122																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							14																										
Sub-total MR control charts with at least one false alarm k 1 =							10																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							18																										
Sub-total MR control charts with at least one false alarm k 1 =							14																										
False alarm in X? (Y=1/N=0)			0	1	1	0	0	0	1	1	0	1	1	0	0	1	0	0	0	1	1	1	1	1	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							104																										
Sub-total MR control charts with at least one false alarm k 10 =							38																										
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	1	1	0	1	1	0	0	1	1	0	0	1	1	1	1	1	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							119																										
Sub-total MR control charts with at least one false alarm k 10 =							56																										

OBJECTIVE # 3

Gamma (1.5, 1.0) k = 50 obs Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	3.00805	2.89891	3.25734	2.8507	2.7704	4.87897	4.13347	3.8121	3.87300	4.88087	2.82675	4.1864	3.23005	3.20867	3.38024	3.1845	5.89331	3.8071	5.88020	4.1448	2.67920	4.18152	2.87018	5.79453	2.83870	3.20455	2.7328	5.15418	2.94312	2.85177	2.88852
			3.95722	7.53409	3.81343	5.48481	2.7732	3.47557	5.42632	3.8575	3.35454	4.88741	3.48872	2.8712	2.90845	3.4477	5.35812	2.8853	3.81347	2.8028	3.88892	3.8198	6.01325	3.87336	4.72018	4.58305	6.37252	4.51836	3.71875	8.8585	3.04084	3.06248	3.2047
			4.10473	5.55434	4.30778	4.48983	3.8042	7.45784	4.32898	4.1872	4.27224	5.22188	3.80552	5.5314	3.85876	2.87882	4.84582	3.882	5.93881	3.7256	2.98288	3.2282	3.5288	2.82125	3.08837	4.8503	2.54548	7.73088	2.72056	2.58431	3.21828	2.54178	3.81858
			4.8063	4.08737	4.31486	4.34433	3.5808	2.92875	3.32158	4.1836	3.21286	3.83114	3.45082	2.8362	3.98281	3.83214	2.88843	7.0844	3.13417	3.8402	8.88388	2.8351	3.10705	3.27318	4.38884	3.83357	3.41837	3.34888	4.3881	4.78734	2.88128	3.28718	8.48472
			3.72512	3.3873	8.22327	2.92483	2.7841	5.08388	3.10838	2.8008	3.27984	3.88087	3.73012	2.7732	3.15871	5.84822	2.8863	5.0856	3.84857	4.8758	5.18895	3.7288	5.45818	3.35418	2.7588	3.27825	4.7482	3.8554	2.85885	3.9008	2.7584	4.48754	5.84814
			3.33227	3.37088	2.88038	3.32587	3.8181	4.88131	8.08281	5.332	4.04834	2.73538	3.93837	2.7734	2.88858	7.15388	5.88205	2.8131	3.34752	3.718	3.15852	5.7887	3.8449	4.04878	2.82483	2.88303	8.81132	4.11218	4.14838	2.8748	2.8817	5.88185	3.77005
			8.71885	5.37135	2.95045	5.01535	3.8403	4.11523	3.17888	3.738	3.72048	3.35183	5.85318	4.5891	8.45878	3.1118	3.51255	3.4274	2.58449	3.1342	2.83733	2.5571	5.48778	4.32831	3.82134	2.58056	3.53548	2.83298	2.83288	8.78354	2.70713	2.58115	3.51417
			3.38455	5.07051	5.25831	8.80482	8.3873	4.44884	2.85874	4.1851	4.24814	3.08512	2.8821	3.0814	3.61318	3.38542	4.82534	3.1103	5.22295	5.3083	3.17228	3.3842	2.83482	2.85181	3.18828	2.88378	4.7418	5.87584	2.85888	8.51818	2.8308	4.88957	5.44488
			4.3048	5.03854	3.33551	2.8005	3.328	3.58715	4.14522	4.2421	3.38108	8.33333	2.82572	3.8082	5.08415	3.87384	3.35778	2.8418	5.78225	2.7487	4.84888	2.8344	2.88843	2.85284	2.85055	2.58838	3.18134	2.78188	3.84888	3.28084	4.72331	4.27452	2.9888
		10	3.88778	8.99803	8.19851	3.13508	8.1847	2.88448	4.38484	2.8883	3.00485	3.83838	2.83358	5.8183	2.88475	5.37248	3.88011	5.4458	2.58102	2.5722	3.34278	3.8834	2.47048	4.43384	8.82557	5.84847	3.14195	3.71412	3.88781	4.51087	2.82808	2.84504	8.58182
			2.86518	3.01835	2.70242	3.8358	2.8882	4.51708	8.82002	5.0738	3.18473	2.54727	6.05318	8.8232	2.87884	8.74348	3.88455	4.4484	3.42227	8.7488	2.84787	3.2821	2.83885	4.44588	4.14188	3.37205	4.38852	3.98703	2.58235	4.58238	3.88708	5.38554	4.24327
			3.27553	3.47835	3.84505	3.48543	4.9213	3.45888	5.25888	4.5753	4.01478	3.72182	5.43872	4.3872	3.18001	3.41857	4.83802	3.4018	4.88283	3.8782	4.5818	3.3134	4.11457	2.7728	4.03314	2.78557	5.8381	4.47835	4.72137	2.88333	4.98838	8.05503	3.78585
			5.217	3.20118	4.48385	8.11182	3.5044	4.00808	3.0885	3.8132	2.78128	4.20278	3.45833	5.2812	3.15821	3.38304	4.00088	4.0207	2.54778	7.5358	2.85158	3.7185	4.15494	4.88388	3.48818	3.88808	3.53851	3.49888	4.20801	2.74885	4.07805	2.87374	5.87708
			4.30814	3.72292	2.8507	3.52731	3.3281	3.87713	2.52842	4.2848	4.77013	3.05734	8.5888	3.5335	4.00547	4.42888	4.21087	3.8878	3.3202	2.5317	3.23222	2.971	5.12283	5.88158	5.2381	2.82105	5.8052	2.72928	3.57015	4.01278	5.75884	4.04208	4.4787
New observations k =			3.53345	3.48145	4.30814	3.57383	7.4873	4.21847	4.50128	3.1077	3.30701	3.88802	4.88855	7.1507	3.1088	5.55581	3.34877	8.377	3.43884	3.1305	3.88874	3.8018	4.18541	5.53522	3.35471	8.00838	4.08314	2.48273	3.88388	3.88844	4.81788	4.74748	4.88125
			3.28005	2.91758	3.87088	2.85884	5.1818	8.82588	2.70878	2.8823	3.4784	4.02185	2.88814	3.5282	3.28741	4.48785	5.2558	3.2582	2.5743	8.8738	4.53388	2.7183	3.31818	2.84248	7.44715	5.71102	2.83823	5.38195	4.38338	5.34888	2.78751	2.58861	2.82135
			8.77387	2.88958	3.73881	4.18452	4.0188	4.7134	8.83842	3.2278	3.28878	3.83888	3.15881	2.7542	2.88788	2.81584	2.88448	4.2297	3.88414	8.5118	7.00837	2.8812	4.28825	4.1217	4.18182	4.11158	3.85213	3.75844	3.78885	2.85381	2.99884	4.88738	3.51843
			3.14728	5.25078	3.87828	5.09124	3.3841	3.84083	3.91487	2.8071	3.94982	3.51081	2.88281	3.8813	5.3754	3.71032	4.8853	4.8218	3.11218	4.8822	8.57304	3.1088	4.27848	3.51583	3.52025	8.81887	5.38544	2.88844	3.52281	2.57492	3.07471	2.81147	8.08173
			8.05418	4.05508	2.58222	4.4488	3.7283	2.82482	3.88883	8.5885	4.90288	4.14482	2.91142	5.3245	8.8884	3.18778	3.13355	3.2322	3.30208	3.7873	2.84387	3.1313	7.43834	3.28338	4.38328	4.48321	8.73788	2.70505	3.21818	2.85893	8.80808	2.83019	2.92785
		20	5.84315	3.53288	3.58355	7.81882	3.588	3.80788	4.21574	3.0747	4.21828	3.15448	2.92048	3.4585	3.28888	5.09528	2.83447	3.4488	3.48087	3.8275	2.88777	4.8883	4.54344	3.51107	2.54857	4.19881	5.58198	4.1072	5.85587	3.72118	3.8182	2.74388	3.14552
			2.8837	2.78331	3.27852	4.78188	3.5738	2.78118	2.87388	3.1803	3.84878	4.15704	2.81188	3.5748	2.77882	4.34488	4.78453	3.2881	4.85737	3.8295	2.81138	4.8257	8.58487	3.88358	2.581	3.48817	8.10287	3.32453	3.74583	2.7588	2.8754	2.88545	3.29584
			3.33781	2.72044	2.82988	4.45015	4.021	8.01212	2.82882	3.7182	5.38748	2.75541	7.80854	2.4731	3.78881	7.08543	2.82834	3.8378	2.82512	3.8887	3.58122	4.3052	3.23833	3.81831	3.02357	3.19833	4.15058	3.30182	3.58888	8.0387	5.48758	3.24281	3.82958
			3.04041	4.92034	8.32721	3.40232	2.833	3.32888	3.20533	4.503	7.00228	2.81488	4.81252	5.8542	4.00534	5.5807	5.81845	2.5788	5.17188	4.525	5.20042	3.0782	4.2811	3.28528	3.48477	2.81188	3.77855	2.87177	3.83705	3.88805	3.12412	3.40904	4.07487
			2.85545	3.59248	3.28875	3.82184	3.1189	5.38147	2.83381	8.7827	5.83382	3.90878	2.57843	7.1823	2.58288	5.23288	4.0888	2.8723	3.0108	4.8358	5.88113	3.8088	8.00783	3.48118	3.28827	5.21348	8.87782	3.88252	8.47403	3.4488	2.78543	2.82882	3.12332
			8.80558	2.79088	3.72588	8.37788	3.5473	2.88423	4.88781	3.884	5.15075	3.98877	5.8873	3.4881	2.58857	2.828	4.83346	2.952	8.74085	4.4823	5.8787	3.0188	4.15148	2.88302	3.88587	8.42043	8.20283	2.5873	2.54188	3.88301	5.98505	2.83708	2.83055
			4.08208	3.30858	3.70858	3.53378	3.3288	4.57474	3.38021	4.7407	3.0798	3.8831	4.08188	5.7034	4.25137	3.31275	3.23057	3.0778	2.53878	2.7848	5.08011	4.8858	3.47107	3.71328	4.24208	4.13403	4.85245	3.38833	2.82852	5.12778	3.42735	5.8348	4.88485
			2.71783	2.78878	3.94747	4.81044	3.5808	7.74312	5.47821	5.474	4.94381	8.0881	4.70258	3.0808	2.88882	5.12751	4.2878	5.8087	3.28378	8.2208	2.8831	3.8788	4.4181	3.18352	8.84588	4.37825	3.48803	2.98888	4.20215	4.0245	2.74871	3.78882	4.02438
			4.20852	8.07338	3.5487	3.19237	4.1332	8.43277	2.72247	2.7308	5.84018	3.74887	5.8308	3.9018	4.80884	3.81351	4.04773	2.7785	8.34848	3.8178	4.82878	3.1383	3.54183	2.98827	4.03153	8.80882	2.83183	3.71843	2.87287	2.54944	2.48888	2.70523	2.78832
			3.50852	4.87352	7.72583	4.88773	2.9817	4.25538	5.20288	3.8878	5.72848	2.81858	4.87788	3.5845	3.18227	3.81028	3.5582	3.9248	2.85888	3.5422	3.78883	5.4898	2.87334	8.2418	3.58888	3.25053	8.7288	7.73083	4.38884	4.18818	4.8148	2.85814	3.11872
		30	3.70328	8.32148	7.80538	3.24988	7.1741	3.81505	8.87828	5.8841	3.32405	2.52185	2.87881	4.5878	2.55381	3.23138	8.87023	8.43	2.5113	3.1011	4.18831	3.3513	4.83449	3.03507	4.13781	3.18858	5.45482	4.08567	3.57232	2.98818	2.88338	3.58338	3.30808
Estimator shape parameter			1.334501	1.530702	2.20484	1.220858	2.190067	1.252713	1.412525	2.18028	1.816023	1.300281	1.445498	1.372530	1.208562	1.189638	1.358338	1.353842	1.209237	1.771836	2.227608	1.384811	1.850809	1.757280	2.029475	1.410885	1.235132	2.038730	1.831853	1.523484	1.494308	1.872758	1.852007
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.3477	1.075101	0.554841	1.288858	0.823287	1.087831	0.883261	0.713055	0.883030	1.127824	0.824845	1.080849	1.393838	1.170102	1.388811	0.874443	1.154447	0.788648	0.851130	0.884783	0.738820	0.623881	0.610193	1.024478	1.241088	0.728090	0.801755	0.881202	1.034337	0.907350	0.703293
Control chart constant d2			1.026102	1.030773	1.006041	1.018809	1.005638	1.019427	1.031780	1.085017	1.053172	1.023408	1.033881	1.028844	1.020785	1.013802	1.027801	1.027552	1.020842	1.051328	1.008844	1.029828	1.058524	1.050887	1.000886	1.032273	1.017884	1.081182	1.05381	1.038827	1.03708	1.048808	1.054841
Control chart constant d3			0.983713	0.952528	0.829184	0.87146	0.829581	0.980158	0.959082	0.829812	0.941186	0.985808	0.857286	0.981387	0.988048	0.873849	0.882247	0.862532	0.888002	0.842802	0.828572	0.880876	0.838403	0.843345	0.834208	0.858881	0.870418	0.933828	0.940835	0.953308	0.954745	0.846862	0.839807
Control chart constant D4			3.901848	3.808048	3.805808	3.982438	3.808865	3.944807	3.863851	3.808038	3.708805	3.9184	3.848785	3.883013	3.938211	3.880388	3.889982	3.892282	3.935848	3.722258	3.80074	3.877083	3.885953	3.727081	3.847108	3.880518	3.854488	3.844738	3.703045	3.814808	3.827176	3.756523	3.890588
Upper contro limit X			6.293399	5.948748	3.739888	6.174443	6.054621	5.080898	4.379201	4.420818	4.874244	4.232482	4.282584	5.13221	6.307987	5.038525	6.457037	4.884883	5.043847	4.887745	5.861313	4.720738	4.889228	3.828878	3.853801	5.204877	5.772461	4.850358	4.535885	4.43480	5.288442	4.848728	4.385572
Lower control limit X			-2.89830	-2.63808	-1.28281	-3.02717	-2.01052	-2.33098	-1.88384	-1.29867	-1.787	-1.3	-1.90787	-2.13778	-2.77185	-2.25253	-2.88181	-2.35878	-2.11341	-2.0878	-2.18832	-1.89323	-1.87507	-1.83825	-1.34083	-2.29558	-2.70521	-1.88728	-1.59858	-1.74883	-2.18804	-1.81315	-1.77832
Upper control limit MR			5.988728	6.668588	3.223888	6.177725	5.188408	4.867787	4.181553	3.888045	4.387618	3.6988	4.112588	4.841071	6.080378	4.901731	6.080344	4.900628	4.782801	4.54282	5.204587	4.487848	4.428551	3.587004	3.349748	4.881888	5.887418	4.085382	3.988834	4.084885	4.85308	4.388147	4.005088
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	0	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	1	0	0	0	1	1	0	1	1	0	0	0	0	0	0	1	1	0	0	1	1	1	0	1	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							242																										
Sub-total MR control charts with at least one false alarm k 30 =							82																										
Normal upper control limit X			5.887353	5.612838	3.80148	5.720108	5.831678	4.724287	4.112043	4.282081	4.750847	3.875988	4.034188	4.813002	5.876492	4.8872	6.051542	4.887551	4.703878	4.881015	5.740187	4.428575	4.858449	3.64171	3.889388	4.888815	5.358861	4.462849	4.334248	4.190423	4.987887	4.608888	4.185108
Normal lower control limit X			-2.28034	-2.30227	-1.1547	-2.57283	-1.78757	-1.87425	-1.61870	-1.14051	-1.54341	-1.04351	-1.84858	-1.81854	-2.34015	-1.88321	-2.27842	-2.02848	-1.77344	-1.83087	-1.8482	-1.70107	-1.7843	-1.44888	-1.1881	-1.87731	-2.28141	-1.49855	-1.38885	-1.50548	-1.88628	-1.57338	-1.57885
Normal upper control limit MR			5.024243	4.862875	2.82212	6.095048	4.881147	4.115477	3.519701	3.318822	3.888988	3.083887	3.482004	4.074318	5.048172	4.024485	5.118585	4.114533	3.878825	3.88851	4.72382	3.785858	3.848032	3.127841	3.001551	4.217088	4.700084	3.883078	3.521088	3.498481	4.228402	3.788344	3.541281
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total false alarm in X.			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	1	0	1	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0
Total false alarm in MR			0	0	1	0	0	1	1	1	0	1	1	1	0	1	0	0	0	1	1	0	0	1	1	1	0	1	1	1	0	0	1
Sub-total normal X control charts with at least one false alarm k 30 =							249																										
Sub-total normal MR control charts with at least one false alarm k 30 =							138																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							35																										
Sub-total MR control charts with at least one false alarm k 1 =							17																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							47																										
Sub-total MR control charts with at least one false alarm k 1 =							28																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							173																										
Sub-total MR control charts with at least one false alarm k 10 =							53																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	1	0	1	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							197																										
Sub-total MR control charts with at least one false alarm k 10 =							75																										

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
CHI-SQUARE (df = 4)		k = 10 obs																															
			3 31	4 94273	1 9423	5 8239	3 36451	1 85942	1 36624	5 777	4 90428	4 39588	6 6262	1 70646	1 9764	4 18772	2 54744	3 2822	1 45633	1 4606	3 75284	1 84021	0 87234	0 4279	3 16017	4 0424	4 0603	4 60221	2 42737	5 54714	4 43006	3 0694	2 5348
			4 6638	3 6985	9 4806	1 8466	2 13666	1 29705	4 20977	2 0408	3 05523	5 34156	1 1755	3 20564	14 0174	2 03932	3 95542	8 9532	6 27879	1 10268	3 81795	3.95912	1 71362	1 9507	1 08601	10 4163	5 6726	3 87147	4 54327	3 84934	5 88927	0 4274	0 6308
			1 8405	6 19336	3 1551	8 5589	4 03856	5 11919	2 78284	5 7035	5 04	4 19724	1 2559	5 09118	3 8383	6.3007	2.9176	5 8531	3 79341	1.9078	4 22429	0 65747	3 88472	0 9802	3 67303	0 6394	2 4304	1 59707	6 27533	4 02035	3.65449	4 2664	1 5266
			8 9402	2 5286	2 8727	3 162	1 07141	2 74301	2 91253	17 7239	4 45146	1 28297	5 1554	2 31687	3 3227	7 78568	1 53901	1 3271	5 18158	3.64595	1.29693	2 1033	5 63206	5.6319	3 86249	4 1778	6 7903	5.21196	3 69698	5 06574	7 33616	5 1419	11 3716
			7 3882	3 95696	4 9326	5 2171	6 03331	9 28896	3 48897	9 4444	6 88701	0 57585	1 1102	2 1277	1 2255	6 62721	6 62274	3 8677	3 74071	5 19488	1 34234	9.80589	1 30324	3 0951	4 69371	6 4079	3 7421	1 91209	6 55985	7 74843	5.34273	3 7309	5.807
			5 2748	4 14199	5 4483	8 0988	0 36183	1 34821	1 23544	1 7021	1 41352	6 39817	11 0896	2.95896	2 5213	3 84549	2.62421	12 0389	4 87894	2 62316	9 78115	4 40724	2 97382	6.8383	4 23157	2 7861	3 3396	9 90777	2 74162	6 31806	3.8483	3 4991	0 4606
			2 8518	1 11728	12 3258	10 2896	7 86643	5 1771	3 75506	3 6174	3 01228	2 00678	2 3192	1.83123	2.9077	2 12606	1 82423	5 261	8 07499	1.86002	0 59941	6.48803	1 27507	1 5927	2 77126	5 0368	0 9705	4 78503	1 03483	1 26956	6 44679	13 3584	2 1
			3 9478	0 74609	4 3006	2 0822	1 07634	4 9567	5 83617	4 1367	0 31727	2 98702	0 9264	5 6105	12.5145	3 12858	1 25477	4 0298	8 70082	1 24985	5 52139	1 02442	1.56899	4 4744	2 56852	5.072	0 4584	5 81965	1 29093	1 82147	1 97026	3 9814	4 0485
			10 1856	3 46572	4 3011	6 0086	5 21809	3 69931	3 2794	4 2234	2 41966	2 97156	1 0393	9.51059	0 9248	2 61267	4 48558	1.8471	1.85024	8 73331	5.37825	3 78694	3 89552	12 118	3 43088	4.2189	12 3734	5 32674	5 54866	2.8805	1 04002	4 3925	6 6319
			5 088	4 54001	0 8035	4 5871	5 81618	2 29725	2 00815	0 8149	7 53644	1 52629	2.3581	1 18615	3.5653	1.57767	3.9774	4.985	3 42477	1.32678	2.6886	2.78001	3.50336	4.2864	7 23331	2 0189	1 1579	1 97928	5 85475	2.92351	4 02141	0 9644	4 6778
Average			5 32907	3 55312	4 95626	5 54768	3 69633	3 77862	3 08746	5 51841	3 90372	3 16833	3 30558	3 53453	4 68139	4.02113	3 17484	5 14451	4.73806	2.91062	3 84032	3 68526	2 66427	4 13956	3 8711	4 48145	4 09955	4 50133	3 99736	4 34441	4.39795	4 28316	3 99896
Moving range average			3 35518	1 75634	3 90251	4 06282	3 97387	3 10624	1 73987	4 59677	2 64937	2 04067	3 89446	2 74567	5.59468	1 78531	2 00168	4 14873	2 61357	2.5872	3.20217	3 47572	1 71894	4 11417	1.38578	3 43134	4 29742	3 10148	2 18157	1 65211	2 4278	3 56387	3 49791
T statistic			8 09512	6 25732	4 18884	7 30187	3 01953	5 38002	10 0158	3 04991	3 74828	4 79519	2 58814	5 048	2.73738	7 51233	8 50629	5 45281	7 34182	4.23472	3.77445	3 67777	6 10721	2.69409	10 4549	4 96801	2 63809	7 03877	8 05395	6 76195	7 90466	3 12428	2.54057
1	0 01	0 01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0 02	0 019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0 03	0 027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0 04	0 036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0 05	0 044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0 06	0 052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0 07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0 08	0 068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0 09	0 076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0 1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0 11	0 09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0 12	0 098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0 13	0 105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0 14	0 112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0 15	0 119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0 16	0 126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0 17	0 133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0 18	0 14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0 19	0 147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0 2	0 153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0 3	0 218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0 4	0 279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0 5	0 338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0 6	0 396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0 7	0 452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0 507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0 9	0 562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0 616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1 1	0 669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1 2	0 722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1 3	0 775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1 4	0 827	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0 879	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1 6	0 931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1 7	0 983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1 8	1 035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1 9	1 086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1 138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	2 1	1 189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	2 2	1.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2 3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2 4	1 342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2 5	1.393	0	0	0	0	0	0	0	0	0	0	1 43795	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 41369
44	2 6	1 444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 49199	0	0	1 46343	0	0	0	0	0	0	0
45	2 7	1 495	0	0	0	0	0	0	0	0	0	0	0	0	1.51407	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	2 9	1 596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1 647	0	0	0	0	1.65696	0	0	1 67245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	3 1	1 698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 71014	0
50	3.2	1 748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3 3	1 799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3 4	1 849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3 5	1 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3 6	1 95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.98966	0	0	0	0	0	0	0	0	0	0	0	0
55	3 7	2 001	0	0	0	0	0	0	0	0	2 02514	0	0	0	0	0	0	0	0	0	2.03823	0	0	0	0	0	0	0	0	0	0	0	0
56	3.8	2 051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	3 9	2 101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2 152	0	0	2 24728	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.27036	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	2.55159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.63884	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	2.678	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	2.84591	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.8824	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.21061	0	0	0	0	0	3.18397	0	0	0	0
69	6.2	3.257	0	3.28566	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.53897	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.67758	0	0	0	0	0
74	7.2	3.759	0	0	0	3.80994	0	0	0	0	0	0	0	0	0	0	0	0	3.82991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	3.91517	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.11133	0	0
78	8	4.159	4.20704	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.41315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	5.16888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.38843	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######	#######
Estimator shape parameter			4.20704	3.28566	2.24726	3.80994	1.65696	2.84591	5.16888	1.67245	2.02514	2.55159	1.43785	2.678	1.51407	3.91517	4.41315	2.8824	3.82991	2.27036	2.03823	1.98986	3.21061	1.49199	5.38843	2.63884	1.46343	3.67758	3.18397	3.53897	4.11133	1.71014	1.41369
Estimator scale parameter			1.2667	1.0814	2.20546	1.45611	2.23199	1.32774	0.59732	3.29959	1.92763	1.24171	2.29861	1.31984	3.09193	1.02707	0.71941	1.7848	1.23712	1.28197	1.88415	1.8522	0.82983	2.77453	0.68129	1.89626	2.80134	1.22399	1.25546	1.22759	1.06971	2.50458	2.82874
Control chart constant d2			1.09445	1.08548	1.06718	1.09107	1.04803	1.07932	1.10057	1.04679	1.06075	1.07406	1.03348	1.07646	1.03827	1.09203	1.09598	1.0799	1.09126	1.06775	1.06117	1.05958	1.08454	1.03693	1.10166	1.07574	1.03514	1.0898	1.08419	1.06837	1.09369	1.04858	1.03185
Control chart constant d3			0.89066	0.90532	0.92805	0.89643	0.94731	0.91398	0.87974	0.94667	0.93434	0.92049	0.95769	0.91761	0.95377	0.89482	0.88797	0.91321	0.89612	0.92743	0.93394	0.93543	0.90072	0.95467	0.87778	0.91849	0.95633	0.89854	0.90722	0.90084	0.89198	0.94516	0.95903
Control chart constant D4			3.40732	3.45612	3.5966	3.42454	3.7623	3.5012	3.38189	3.75663	3.64423	3.54145	3.85221	3.52261	3.81877	3.41942	3.40031	3.49693	3.42353	3.59183	3.64487	3.65754	3.46432	3.82821	3.37802	3.52635	3.84074	3.43165	3.46662	3.44	3.41098	3.74321	3.86341
Upper contro limit X			14.526	8.40724	15.927	18.7188	15.0953	12.4125	7.63013	18.6923	11.3967	8.86823	14.6104	11.1665	20.6468	8.92569	8.65399	16.6699	11.9231	10.1796	12.6931	13.5281	7.41914	18.0425	7.44475	14.0507	18.5541	13.0391	10.0338	8.8983	11.0574	14.4795	14.1688
Lower control limit X			-3.86782	-1.30099	-6.0145	-5.6234	-7.69662	-4.85528	-1.65521	-7.65545	-3.58923	-2.53157	-7.99925	-4.11743	-11.484	-0.88343	-2.30431	-6.38087	-2.44695	-4.3586	-5.21248	-6.15557	-2.09059	-7.76333	-0.10256	-5.08783	-8.35503	-4.03643	-2.03912	-0.20948	-2.26151	-5.91311	-6.17087
Upper control limit MR			11.4322	6.07364	14.0358	13.9133	14.9509	10.8756	5.86406	17.2684	9.6655	7.22695	15.0023	9.67245	21.3646	6.10472	6.80631	14.5078	8.94763	9.29277	11.6715	12.7126	5.95496	15.7499	4.68113	12.107	16.5053	10.6432	7.56266	5.68325	8.28118	13.3403	13.5139
Normal upper control limit X			14.2524	8.22424	15.3353	16.3531	14.2671	12.0399	7.71478	17.7439	10.9499	8.59566	13.6632	10.8368	19.5609	8.76929	8.49845	16.1784	11.689	9.78136	12.3567	12.9292	7.23593	15.0815	7.35663	13.6074	15.5289	12.7499	9.7994	8.73831	10.6549	13.7618	13.3019
Normal lower control limit X			-3.59428	-1.11799	-5.42276	-5.2577	-6.87047	-4.48265	-1.53987	-6.70703	-3.14248	-2.25899	-7.05201	-3.78777	-10.1981	-0.72703	-2.14877	-5.86936	-2.21292	-3.97032	-4.8761	-5.55867	-1.90738	-6.80237	-0.01444	-4.64447	-7.32976	-3.74729	-1.80469	-0.04949	-2.05896	-5.19519	-5.304
Normal upper control limit MR			10.9647	5.73972	12.7534	13.2773	12.9866	10.1512	5.68591	15.0222	8.65814	6.66892	12.7271	8.97284	18.2834	6.63439	6.54148	13.5581	8.54114	8.45496	10.4647	11.3587	5.6175	13.4451	4.52886	11.2136	14.044	10.1356	7.12937	5.39909	7.93404	11.6467	11.4312

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Chi-square (df=4)		k = 10 obs																															
		1	5.2917	1.872	3.65284	4.9702	4.9842	4.7783	2.93292	8.1858	0.743	3.2145	5.0447	4.0802	1.2816	8.405	2.1318	2.33308	8.17378	5.8678	3.8727	1.3568	5.0802	2.4985	1.0834	4.1318	8.02045	1.9474	1.0308	3.0311	3.8809	1.0052	1.44177
			3.8245	4.8218	2.12484	10.1438	0.7839	3.2324	8.14581	5.3878	3.4918	2.1958	8.9481	3.8541	1.5314	3.2828	3.1123	2.00118	0.41542	1.0841	1.0538	3.2008	1.3918	1.3184	3.4478	0.5238	5.8542	4.4878	0.5887	3.8158	0.8874	8.1738	8.34298
			0.5858	3.1875	7.78523	3.8258	2.9212	1.8803	2.8753	8.4383	8.8283	2.725	1.0838	8.8012	5.0058	4.2872	2.114	7.54038	1.82315	0.7842	2.4181	2.7202	5.8287	4.8531	1.3278	1.183	3.72218	8.2888	2.5183	0.5887	3.2813	4.8588	7.87048
			2.8508	2.4457	1.18585	12.017	3.0842	8.7844	3.38781	1.2888	3.7857	2.83	4.8881	0.3814	2.4895	0.2888	10.5483	8.94471	1.82533	1.1083	3.0881	0.7238	3.114	2.1448	1.7841	8.8845	3.41585	1.0307	2.8543	8.8585	0.7188	1.1918	1.83113
			0.8849	5.7283	3.00407	4.2284	0.5117	4.0852	4.31523	0.5823	3.2831	2.1375	1.8031	4.1612	0.4181	13.1622	7.7057	8.72483	2.48024	3.4285	0.8587	8.7714	3.8517	4.0588	2.7823	0.2171	8.28823	2.7828	8.7185	5.8442	0.8814	1.3062	4.41452
			2.807	8.6353	2.45848	2.238	0.6378	8.7349	5.42438	1.3018	2.0718	3.8454	2.0787	0.8758	1.8771	3.8884	11.8862	8.85207	5.11875	1.0082	1.385	0.8508	5.4455	2.3773	8.1878	5.8848	8.073	3.0711	8.28	10.8582	3.3033	3.1422	2.33155
			3.481	0.9808	5.08282	3.331	5.4857	2.8088	7.8458	7.2007	7.1898	3.8741	4.8428	7.2313	5.384	10.8887	1.0073	1.13114	5.2371	1.1558	5.7252	8.4475	7.4418	0.8785	11.8418	1.1158	2.88541	1.5888	0.4782	0.5382	7.485	5.4418	1.74718
			1.5575	1.8101	4.57102	4.0285	2.2448	8.3824	2.84885	1.2144	1.8195	11.8921	2.7887	8.7387	7.2111	1.4188	8.4858	1.78894	2.31704	3.7484	3.2832	4.4881	3.0873	0.8808	0.4874	0.9864	3.58318	2.7433	2.9782	0.4897	1.4288	4.8058	1.88322
			4.5311	3.8358	3.80254	1.0123	4.1717	0.3435	0.76888	2.87	0.5247	10.4282	8.5508	8.8308	2.0823	8.8817	7.7705	4.3815	7.73808	1.7748	3.5058	1.4747	3.1708	7.7048	8.0587	4.8782	2.28183	0.4851	8.5383	1.816	1.4181	1.2081	4.18821
		10	8.0861	3.2845	8.85015	1.3803	8.3848	0.8007	5.34528	5.2015	8.0072	2.8191	0.5815	4.4412	4.2078	4.8807	4.7181	1.88747	3.38285	4.4804	15.8083	7.2041	4.1358	0.4884	2.5427	4.3884	8.58378	8.8408	8.2882	1.2148	3.0881	1.503	3.48578
			2.4277	4.1928	2.43033	3.1553	1.7803	2.7348	0.42881	5.3808	3.5217	3.8888	3.0121	1.1158	7.8302	5.7828	1.1348	2.27833	2.38408	8.8578	0.4537	5.3885	11.1484	5.522	4.8388	3.88	1.72071	1.7722	2.2858	1.2705	3.5238	3.4842	5.78741
			2.5408	1.8207	3.37888	2.5887	1.0084	2.2778	0.43358	3.557	2.0884	1.8188	2.4285	7.0421	3.8808	2.8425	5.5378	1.8402	5.77528	5.84	2.8487	4.0888	1.1837	1.3742	3.0804	2.882	8.85133	2.081	8.7888	1.3085	8.4288	7.8224	5.30854
			8.4288	4.3781	5.84035	2.8282	3.7872	8.0047	1.08088	8.1873	1.8184	1.3232	5.8408	4.3888	2.7482	3.5813	7.8152	2.08408	3.22888	0.2388	1.8585	2.3452	1.0283	1.2538	7.2882	5.8847	8.88173	8.8785	2.3838	0.7883	4.4382	2.8548	1.45888
			3.1482	12.2433	3.588	4.8784	3.8834	1.1188	8.15087	10.8488	4.7331	2.7711	3.381	3.0074	0.2588	7.7087	1.2834	0.78083	5.81111	4.0888	7.3545	1.8545	7.8384	3.1555	4.532	2.2848	3.3738	8.7587	2.884	5.5837	1.4358	2.2183	2.78445
New observations k =			4.8857	3.848	4.48583	5.2884	2.3148	1.541	1.12044	3.8878	3.5824	4.4388	2.2	8.3814	1.8381	2.8348	3.8375	2.82808	1.81888	10.2825	1.2285	8.8188	2.1487	7.8488	0.4834	5.8871	8.18158	8.481	2.3212	1.7177	4.207	1.0152	3.88778
			5.1408	1.8831	3.80085	1.31	2.2708	14.4578	1.01828	0.814	5.2781	1.8088	8.1474	1.4873	5.7024	2.8083	8.1738	5.83248	3.88488	7.071	5.8808	5.7705	8.8577	4.1548	3.1838	1.2122	2.08838	3.878	0.4848	4.3227	8.1742	1.8428	7.23787
			8.385	4.7773	0.42724	8.087	1.1523	2.3704	2.88175	3.0503	1.1887	2.8438	2.7858	1.8778	14.2488	1.8802	3.8072	0.38048	3.16388	8.8825	3.2827	2.3885	1.8802	8.2285	0.8403	8.4882	5.18237	7.5078	8.4888	8.4224	1.5382	3.2353	4.21328
			8.4083	1.475	5.7788	8.8381	1.3384	8.5287	1.2233	2.7788	2.85	7.3015	2.833	11.1888	4.8577	2.8385	2.0358	1.2801	1.83878	8.8343	4.3741	3.8788	3.1015	9.418	8.3875	1.4883	2.88491	2.4008	8.3814	0.1887	0.7847	4.4912	1.402
			5.0284	3.7084	0.52307	6.583	2.888	8.2301	2.84188	1.5858	1.8578	8.3844	11.7838	8.8201	4.8578	8.583	8.088	5.41414	4.02577	5.0328	3.8134	2.2708	4.2803	2.8747	0.8888	2.8585	7.8888	3.2318	10.8872	3.3828	3.8037	2.7252	8.78238
		20	2.311	5.8454	2.88871	0.3848	1.8785	1.0194	2.78877	8.1375	2.8834	8.5313	4.4188	8.0255	0.8115	1.2841	17.4238	7.83707	2.32878	2.4781	8.0552	1.5082	8.8175	3.5147	18.8888	3.8328	5.77853	11.5553	0.423	3.5838	1.7118	3.3742	0.85128
			3.3304	1.4898	8.78828	3.8574	4.7491	2.248	4.84452	1.1885	11.271	1.7838	2.888	2.3712	2.8783	3.57	1.3841	3.8222	2.58231	3.8508	7.8788	5.1737	3.0428	1.8288	7.2718	3.8088	3.81817	1.7078	0.8881	3.7125	5.3228	1.7457	3.07882
			7.8863	1.1358	1.10818	0.8724	4.2888	3.843	2.00507	3.1877	2.1003	3.3058	4.3888	3.8053	8.3181	13.337	2.0287	1.20207	3.83784	8.3228	3.8833	1.1314	5.3088	2.5248	5.5584	2.272	8.88407	2.775	2.8887	3.2588	7.4402	10.8312	2.85738
			6.218	1.012	2.58071	0.8788	1.8881	5.843	4.05257	8.8723	2.0718	3.2028	4.8088	8.8802	5.2812	3.72	2.421	1.88115	5.57881	3.4811	5.384	7.4087	2.2828	1.1728	0.8388	4.8201	2.74838	0.8158	1.3711	3.7402	14.0881	1.2858	1.77008
			8.3587	8.3688	4.58374	1.8875	5.2834	4.5082	3.11854	3.1482	3.9741	5.3001	2.11	4.0838	2.388	3.8858	5.775	2.05288	8.55125	2.8038	1.1478	4.3483	8.213	2.4583	1.3841	2.4584	2.03845	4.878	6.4885	3.4828	4.3858	5.3349	2.45505
			3.8885	4.1888	1.44881	3.1884	2.8118	2.1442	3.22088	8.7888	3.2881	2.5885	8.4871	0.8111	11.7385	1.8357	2.8857	0.32887	4.85283	5.0148	4.8874	17.1818	3.0348	5.0058	2.5478	5.4882	5.80585	4.5104	4.822	4.8884	2.5812	5.2773	1.70858
			4.2827	5.3161	0.43528	8.2488	1.4233	8.0747	3.03237	1.201	2.8018	1.8317	1.4701	1.8248	3.8084	5.0373	0.3347	1.3158	5.08381	1.5311	4.2187	8.8873	2.4387	2.8252	1.4344	10.2134	2.82821	4.8828	1.5781	1.318	5.8201	0.8184	0.88477
			10.2018	2.7752	1.78854	8.2855	1.7548	0.7487	3.10888	3.5808	4.8032	11.1827	2.4515	5.5538	6.1485	1.4288	2.7125	8.24155	0.45408	2.8452	8.8823	2.2588	4.1581	14.0785	3.8858	3.0103	4.01008	11.7087	4.1828	1.8842	10.8058	1.3214	0.23631
			11.0165	5.4777	0.82875	1.812	4.5051	2.7191	5.47648	5.7558	8.0134	0.828	2.488	2.2818	1.4888	3.8504	7.8512	1.40438	1.88708	0.3482	3.7278	5.7883	13.5378	2.2781	5.2812	2.727	3.43184	2.3545	3.7727	15.2837	3.8558	1.7512	4.88313
			1.8708	8.1783	2.25147	2.3344	12.0258	0.2845	0.45285	0.5758	8.0808	8.3258	1.5748	2.5843	4.8487	4.1308	4.0738	2.03743	4.8138	0.848	5.8381	8.8178	1.1114	3.1082	4.2345	0.7817	8.58841	3.8411	3.5183	2.232	5.7834	0.7452	2.48503
		30	0.5701	1.8743	0.74285	7.0757	1.8055	10.8805	0.88528	8.8358	1.4828	5.8383	3.2507	7.8555	8.5182	5.008	15.7038	3.10718	3.38383	2.8707	3.0838	2.3533	1.8448	5.833	1.8843	1.888	1.55858	4.0887	3.4531	1.2551	2.8448	1.5808	1.80178
Estimator shape parameter			4.207037	3.285858	2.247263	3.808838	1.858863	2.845808	5.188882	1.872453	2.025138	2.551584	1.437853	2.878002	1.514088	3.815188	4.413148	2.882404	3.828812	2.270358	2.038228	1.888885	3.210807	1.481888	5.388431	2.838843	1.483427	3.877577	3.183874	3.538874	4.111328	1.710142	1.413881
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.288704	1.081404	2.205485	1.458108	2.231885	1.327738	0.587318	3.288581	1.927628	1.241707	2.288808	1.318837	3.081833	1.027088	0.718405	1.784788	1.237118	1.281885	1.884148	1.852203	0.828836	2.774528	0.881282	1.888283	2.801338	1.223883	1.255482	1.22758	1.088718	2.504578	2.828738
Control chart constant d2			1.08445	1.085475	1.087157	1.081073	1.048035	1.078318	1.100588	1.048783	1.060747	1.074057	1.033484	1.078458	1.03827	1.08203	1.085877	1.078885	1.081258	1.087748	1.081188	1.058581	1.084537	1.038833	1.101858	1.075737	1.035142	1.088788	1.084184	1.088371	1.083882	1.048578	1.031848
Control chart constant d3			0.880857	0.90532	0.828048	0.886433	0.847314	0.913878	0.878737	0.848874	0.834338	0.920488	0.857881	0.817811	0.853787	0.884824	0.887887	0.813212	0.888123	0.827435	0.833844	0.835427	0.808718	0.854888	0.877782	0.818488	0.858335	0.888537	0.807218	0.800841	0.881877	0.945181	0.858027
Control chart constant D4			3.407324	3.45812	3.588588	3.424538	3.782288	3.501201	3.381888	3.758833	3.848225	3.541452	3.852212	3.522808	3.818788	3.418422	3.400308	3.488833	3.423532	3.581833	3.844888	3.857537	3.464317	3.828213	3.37802	3.528348	3.840741	3.431845	3.488817	3.438887	3.410885	3.743205	3.883407
Upper contro limit X			14.52588	8.407237	15.82702	18.71878	15.08528	12.41252	7.830127	18.88227	11.38888	8.888235	14.81041	11.18848	20.84877	8.82588	8.853884	18.88888	11.82308	10.17884	12.88311	13.52888	7.418141	18.04245	7.44475	14.05073	18.55413	13.03808	10.03383	8.888303	11.0574	14.47847	14.18878
Lower control limit X			-3.88782	-1.30088	-8.0145	-5.8234	-7.88862	-4.85528	-1.85521	-7.85545	-3.58823	-2.53157	-7.88825	-4.11743	-11.484	-0.88343	-2.30431	-8.38887	-2.44885	-4.3588	-5.21248	-8.15567	-2.08058	-7.78333	-0.10258	-5.08783	-8.35503	-4.03843	-2.03812	-0.20848	-2.28151	-5.81311	-8.17087
Upper control limit MR			11.43218	8.073835	14.03577	13.81328	14.85087	10.87558	5.884061	17.28837	8.885502	7.228851	15.00227	8.872448	21.38477	8.104721	8.808308	14.58784	8.847828	8.282775	11.87148	12.71257	5.85488	18.74881	4.881128	12.10888	18.50528	10.84318	7.582885	5.883248	8.281177	13.34028	13.51385
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0	1	0	1	0	0	0	0	1	0	0	0
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0
Total false alarm in X			0	1	0	0	0	1	1	0	0	1	0	1	0	1	1	0	0	1	1	1	1	0	1	0	0	0	1	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	1	0	0	0	1	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	0
Total false alarm in MR			0	1	0	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	1	1	1	0	1	0	0	0	1	1	1	0	0
Sub-total X control charts with at least one false alarm k 30 =							119																										
Sub-total MR control charts with at least one false alarm k 30 =							107																										
Normal upper control limit X			14.25242	8.224241	15.33528	18.35308	14.28713	12.03988	7.714783	17.74385	10.84881	8.585858	13.88317	10.83883	18.58085	8.788281	8.488445	18.17838	11.88803	9.781358	12.35873	12.8282	7.235828	15.88148	7.358827	13.80737	15.52888	12.74884	9.788404	8.738314	10.85488	13.78155	13.30182
Normal lower control limit X			-3.58428	-1.11788	-5.42278	-5.2577	-8.87047	-4.48285	-1.53887	-8.70703	-3.14248	-2.25888	-7.05201	-3.78777	-10.1881	-0.72703	-2.14877	-5.88838	-2.21282	-3.87032	-4.8781	-5.55887	-1.88738	-8.80237	-0.01444	-4.84447	-7.32878	-3.74728	-1.88488	-0.04848	-2.05888	-5.18518	-5.304
Normal upper control limit MR			10.98472	5.738718	12.75341	13.2773	12.9888	10.15118	5.88581	15.02223	8.858145	8.888824	12.72708	8.872835	18.28341	5.834388	8.541478	13.55808	8.541138	8.454858	10.4847	11.35885	5.817503	13.4451	4.528884	11.21383	14.04388	10.13583	7.128387	5.388088	7.83404	11.84872	11.43117
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0	1	0	1	0	0	0	0	1	0	0	0
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0
Total false alarm in X			0	1	0	0	0	1	1	0	1	1	0	1	0	1	1	0	0	1	1	1	1	0	1	0	0	0	1	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	1	0	0	0	1	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	0	0
Total false alarm in MR			0	1	0	0	0	1	0	0	1	1	0	1	0	1	1	0	0	0	1	1	1	0	1	0	0	0	1	1	1	0	0
Sub-total X control charts with at least one false alarm k 30 =							120																										
Sub-total MR control charts with at least one false alarm k 30 =							123																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							10																										
Sub-total MR control charts with at least one false alarm k 1 =							14																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							11																										
Sub-total MR control charts with at least one false alarm k 1 =							18																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0	1	0	1	0	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							69																										
Sub-total MR control charts with at least one false alarm k 10 =							71																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	1	0	1	0	1	0	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							72																										
Sub-total MR control charts with at least one false alarm k 10 =							82																										

OBJECTIVE # 3

Chi-square (df=4)   k = 10 obs   Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	8.7784	5.1568	8.2922	5.178	3.8007	4.843	7.4781	12.1422	4.8383	7.903	10.5584	10.2889	3.3354	8.8881	3.3748	4.3382	5.7588	3.8724	3.348	3.1552	4.4438	3.8888	5.8814	7.5841	13.4887	4.588	4.2371	4.8827	4.1731	3.1821	8.4058
			8.54	11.5342	8.081	3.4837	4.7035	8.7523	8.7428	8.8357	4.4878	12.2551	5.5627	5.8577	3.833	4.1078	5.8707	5.0141	11.3888	8.9887	3.2517	4.8588	5.2283	14.9104	5.6118	5.5582	5.8054	5.4803	4.7431	8.4423	5.8784	7.2841	4.2605
			7.0785	5.5738	6.6237	4.9012	4.34	6.0887	5.5533	5.9058	18.803	7.9508	8.3508	5.475	5.2457	4.8988	8.071	5.1238	4.1838	12.8541	3.807	4.3507	3.8404	7.8134	6.8032	8.8028	2.8718	8.8507	12.8354	10.3358	8.2738	3.8148	5.3988
			7.2105	8.6328	8.3051	4.044	7.1827	3.4088	8.9078	4.4885	8.8575	8.4181	9.9124	5.4225	9.5848	7.1458	12.0171	5.3085	4.7848	8.8888	3.8842	3.8078	8.5873	7.3145	7.8528	7.2558	4.4128	8.484	8.2703	7.338	8.3328	13.284	14.3888
			7.2382	8.0757	7.6847	8.1689	4.8845	6.787	7.0881	4.8958	8.0821	4.4821	5.9787	5.8344	4.5815	4.1583	7.4888	18.0513	8.9533	5.9256	5.2088	4.0303	10.154	7.328	4.828	7.2771	9.0308	7.5818	3.8881	10.5245	5.0278	14.8888	8.45
			7.1858	5.7288	7.9047	4.2984	9.1407	5.0557	13.0582	7.8413	13.282	11.5411	4.334	8.1158	7.5727	8.5508	8.4952	4.0115	8.3124	4.2008	4.5782	8.0332	8.8584	8.1311	8.1077	7.1332	8.4333	5.8595	9.2018	4.5431	8.358	8.7872	4.1124
			5.2028	11.2473	3.8903	4.784	3.4371	6.1508	4.335	3.0317	8.5173	5.7782	5.8723	5.8057	5.2058	8.8874	8.3851	3.8895	9.9829	8.312	10.5858	4.8871	8.0221	4.2808	3.8155	11.4838	8.7858	4.8302	11.0701	8.2074	3.1254	3.4188	8.7881
			8.0379	3.6808	5.4873	4.2114	6.1947	9.4138	6.3384	14.208	7.4843	7.8372	2.8828	7.7807	3.588	4.115	5.7575	7.0051	8.9524	5.4308	4.8897	11.1887	4.7521	5.784	3.7878	13.4383	8.5781	5.4532	4.848	9.4123	3.7383	5.4024	11.0282
			4.2988	4.9218	4.8251	4.5317	4.9248	5.8254	7.5147	3.7888	5.0892	4.5078	8.0332	8.8704	3.8388	7.8853	8.0884	5.8958	5.2283	5.7281	8.7187	8.5185	5.454	8.8057	4.1818	18.0382	5.8858	3.7344	21.2834	4.8438	4.338	4.817	17.5778
		10	6.4708	5.0048	9.6348	5.5334	10.4088	5.9101	7.1723	10.3051	8.0828	5.3234	7.7158	4.8202	4.2568	11.7875	3.8338	4.1802	14.7483	8.2843	8.849	4.4081	8.754	12.578	5.5285	7.5852	4.7718	4.4052	7.2828	9.8384	5.4453	18.1148	5.5372
			5.5725	9.0748	7.9531	3.7243	5.4421	7.1002	6.5858	4.8324	5.0107	4.4198	8.4555	8.8582	3.5815	7.4487	3.814	5.7355	13.7788	5.848	8.8101	5.8577	8.2311	5.7083	3.3158	4.3728	8.7204	8.2021	8.8754	5.188	4.7388	4.8283	8.4978
			3.1433	4.2278	4.6483	4.7717	8.2724	7.0118	18.584	3.7893	8.138	5.9048	8.1834	11.0085	3.8014	7.8573	3.3384	7.1743	8.2372	7.8171	8.3447	8.2887	8.848	3.1515	5.3452	3.8054	8.2178	8.3508	8.8182	7.4958	3.8888	10.128	11.4488
			10.8058	4.9451	3.7093	10.2888	8.5752	3.7655	7.1723	4.54	4.4742	6.352	4.8154	8.5082	7.1428	4.871	3.8325	3.3015	4.3278	7.0788	8.51	3.8213	5.1224	18.0383	3.892	7.3224	4.0474	10.0795	3.4482	8.4087	5.3372	8.8803	3.8872
			4.5035	6.1745	7.0353	9.315	4.4818	6.3475	3.8598	8.8478	7.8411	8.1528	8.7885	4.8088	8.5082	5.8835	5.2388	8.7314	7.4154	8.2778	3.2758	5.0752	4.8438	5.1813	7.2732	7.5083	3.8228	8.0884	8.3347	14.2888	8.8288	8.8537	7.7887
			7.7037	8.2435	5.5683	6.8261	3.7342	3.9202	5.9818	7.2517	8.2018	4.8995	5.8404	6.0554	7.8018	8.8105	16.5884	7.8856	5.4085	3.782	10.7488	8.8888	8.2441	4.3281	4.7214	2.8477	8.2318	8.3033	8.887	4.5882	5.748	3.8758	9.3172
New observations k =			5.0821	8.5104	4.223	9.7125	5.9458	3.4081	8.4788	8.0553	4.4175	7.1138	8.804	7.8484	4.4011	8.1735	5.2811	8.5352	6.558	6.1888	8.5811	5.0783	5.4804	5.3842	8.0821	4.551	3.8075	8.7585	5.5381	5.5878	3.8888	5.3302	5.7317
			4.0425	7.4547	10.0348	9.0828	4.3805	8.3895	8.8085	9.2741	8.8883	10.2095	4.5284	7.3383	8.0708	5.8844	3.8318	5.3585	8.8522	5.7483	5.292	10.3448	10.84	5.7838	2.945	7.0311	12.3278	8.1814	4.8481	5.7383	5.0784	9.1548	8.6388
			3.9784	8.3488	12.7823	11.7312	7.1284	8.882	7.838	8.7832	4.3881	8.1278	10.8281	8.8871	8.8025	3.5272	6.1658	5.4185	4.2731	5.8123	4.8881	4.5838	13.7474	8.8888	8.955	8.3257	4.8455	4.5088	3.8874	7.0285	4.8387	4.8378	3.8838
			5.0533	8.9968	7.3827	8.3584	4.4002	12.8315	8.7182	5.524	8.8892	8.9023	10.8841	8.4935	3.8871	7.1478	7.7188	8.9938	8.4422	10.1715	8.8807	9.5858	11.3488	17.1888	8.4547	10.5878	8.488	3.9385	3.8888	5.2287	5.0878	3.0848	8.7588
		20	8.2708	12.5139	15.9837	3.8708	5.7818	3.2014	10.8523	3.8341	7.3282	9.404	10.7842	8.5055	8.0821	13.2251	8.3095	5.8888	8.1258	13.0713	13.4704	5.1833	4.2788	8.2043	10.7573	7.8823	8.8877	11.8322	4.4325	5.0381	8.7088	5.5524	9.4988
			3.8878	5.3871	11.7738	7.8988	7.8838	8.0888	4.9562	8.7587	5.7557	8.8418	7.9083	8.2538	8.5034	7.2343	10.5187	8.8871	5.4884	8.8895	8.7893	5.8544	7.0558	5.8418	5.7735	8.0557	8.8808	5.9538	8.8383	8.8471	11.1348	6.4382	7.3528
			5.7411	4.7284	8.1017	4.9918	10.5868	14.8418	5.287	3.8837	7.5118	12.0227	7.8872	13.778	3.8502	5.8483	2.9752	8.3837	4.3235	4.4882	7.0418	4.8832	6.8885	7.8897	4.4207	3.212	5.7185	7.283	5.9801	7.8885	7.1381	4.8023	5.2752
			3.8164	11.6528	4.832	5.0705	5.358	3.5751	11.1824	9.1525	4.4021	11.1348	8.4934	7.4075	8.1228	11.0381	5.1387	3.8472	8.3043	5.7488	3.8738	8.542	18.118	4.7711	4.0318	6.4882	5.0318	3.1488	4.5044	4.8271	4.4778	5.1143	7.8174
			10.8182	6.1382	9.1088	6.4724	4.5314	7.1834	8.0788	5.521	11.7208	3.8824	9.817	7.3132	8.8143	8.8204	7.8148	10.3798	4.8148	4.0535	3.8883	2.8848	5.8054	13.0328	5.3848	8.3882	7.1285	8.5323	8.0248	8.1353	8.2848	8.874	10.1754
			7.1317	7.3892	4.6955	7.0074	13.1822	5.1249	4.8848	14.5338	4.7895	7.2818	5.029	8.2351	4.851	7.8284	4.7443	5.2188	14.7001	10.788	10.4374	5.0587	3.8588	8.004	7.5735	3.7078	7.2811	5.8018	5.8258	8.7028	10.0888	15.9553	8.1884
			10.7198	6.8304	7.2304	5.1758	8.4088	5.9737	8.4088	18.8257	5.8818	4.8748	11.4173	9.4218	3.8858	8.0717	4.2588	8.7277	4.7448	5.55	8.4084	10.8531	4.0888	3.4288	3.8005	8.8081	8.4888	5.9188	11.9845	4.8422	8.5703	14.802	5.5081
			15.0914	4.7468	5.1518	9.8241	8.9773	4.0532	7.4856	7.4138	3.388	5.7818	4.4152	4.7782	7.553	13.7208	4.8881	8.8877	7.7185	5.2038	5.2584	4.3088	4.5182	10.1417	7.805	17.5877	3.8338	8.8317	5.888	5.7243	3.044	4.354	8.3528
			5.4889	4.0323	8.827	2.9807	8.3029	4.9302	5.4402	11.4571	5.2025	7.2115	5.7281	4.8188	3.87	8.8704	5.0388	4.5524	3.1283	8.261	8.5882	3.1774	5.8388	9.5258	11.9442	4.1582	7.7587	8.8897	8.3572	8.278	3.8524	5.558	5.3824
			3.2365	6.0548	6.9715	4.8801	4.5631	5.3401	5.3382	8.8708	10.752	7.04	8.707	8.3717	8.8782	3.9012	8.4183	4.2274	4.007	8.2348	3.7877	8.0778	14.348	7.1554	5.3815	4.4055	3.0358	8.1331	3.818	8.8032	10.011	7.8887	4.3182
		30	7.4058	4.2538	7.4688	12.8298	7.2552	5.8872	4.178	9.8484	7.3055	8.7788	5.087	11.8708	7.2118	14.1834	7.2588	3.7154	8.2281	4.8183	8.584	5.8838	4.9184	3.1471	5.1864	8.2244	8.8849	8.8851	7.5823	3.138	8.1888	7.7885	8.8488
Estimator shape parameter			4.207037	3.285658	2.247283	3.808938	1.658963	2.845908	5.168882	1.672453	2.025138	2.561584	1.437853	2.678002	1.514088	3.915188	4.413148	2.882404	3.828812	2.270358	2.038228	1.888885	3.210807	1.481888	5.388431	2.838843	1.483427	3.677577	3.183874	3.538874	4.111328	1.710142	1.413881
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.286704	1.081404	2.205465	1.458108	2.231895	1.327738	0.587318	3.288581	1.827629	1.241707	2.288888	1.318837	3.001933	1.027088	0.718405	1.784798	1.237118	1.281885	1.884148	1.852203	0.828836	2.774528	0.881282	1.888283	2.881338	1.223893	1.255482	1.22758	1.088715	2.504578	2.828738
Control chart constant d2			1.09445	1.085475	1.087157	1.081073	1.048035	1.078318	1.100568	1.048793	1.080747	1.074057	1.033484	1.078458	1.03827	1.09203	1.085077	1.078885	1.081258	1.087748	1.061188	1.058581	1.084537	1.038833	1.101058	1.075737	1.035142	1.088798	1.084194	1.088371	1.083882	1.048578	1.031848
Control chart constant d3			0.890057	0.90532	0.928048	0.888433	0.947314	0.913978	0.879737	0.848874	0.934338	0.920488	0.857881	0.917611	0.953787	0.884824	0.887867	0.913212	0.888123	0.927435	0.933844	0.835427	0.908718	0.954888	0.877782	0.918488	0.958335	0.898537	0.907218	0.888841	0.891877	0.945181	0.858027
Control chart constant D4			3.407324	3.45812	3.588588	3.424538	3.782298	3.501201	3.381888	3.758833	3.848225	3.541452	3.852212	3.522808	3.818788	3.419422	3.400308	3.488933	3.423532	3.581833	3.844888	3.857537	3.484317	3.828213	3.37882	3.528348	3.840741	3.431845	3.488817	3.438887	3.410885	3.743205	3.883407
Upper contro limit X			14.52588	8.407237	15.92702	18.71878	15.08528	12.41252	7.830127	18.88227	11.38888	8.888235	14.81041	11.18848	20.84877	8.82588	8.853884	18.88888	11.82388	10.17884	12.88311	13.52888	7.419141	18.04245	7.44475	14.05073	18.55413	13.03988	10.03383	8.888303	11.0574	14.47947	14.18878
Lower control limit X			-3.88782	-1.30088	-8.0145	-5.8234	-7.88862	-4.85528	-1.85521	-7.85545	-3.58823	-2.53157	-7.88825	-4.11743	-11.484	-0.88343	-2.30431	-8.38087	-2.44885	-4.3588	-5.21248	-8.15557	-2.08058	-7.78333	-0.10258	-5.08783	-8.35503	-4.03843	-2.03812	-0.20848	-2.28151	-5.91311	-8.17087
Upper control limit MR			11.43218	8.073835	14.03577	13.81328	14.95087	10.87558	5.884081	17.28837	8.885502	7.228851	16.00227	9.872448	21.38477	8.104721	8.808308	14.50784	8.847828	8.282775	11.87148	12.71257	5.95488	15.74881	4.881128	12.10888	18.50528	10.84318	7.582885	5.883248	8.281177	13.34028	13.51385
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	1	0	1	1	0	0	0	1	1	1	1	1	0	0	1	0	1	1	0	0	1	1	0	1	1
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	1	0	0	1	0	0	0	1	1	0	1	1	1	0	1	1	1	0	0	0	0	1	0	0	0
False alarm in X? (Y=1/N=0)			1	1	0	0	0	1	1	0	1	1	0	1	0	1	1	0	1	1	0	0	1	0	1	1	0	0	1	1	1	1	0
Total false alarm in X			1	1	1	0	0	1	1	0	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	0	0	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	1	0	0	1	0	0	0	1	1	0	1	0	0	0	1	0	1	1	0	0	0	0	1	0	0
Total false alarm in MR			0	1	0	0	0	1	1	0	1	1	0	0	0	1	1	0	1	0	0	0	1	0	1	1	0	0	1	1	1	0	0
Sub-total X control charts with at least one false alarm k 30 =							108																										
Sub-total MR control charts with at least one false alarm k 30 =							115																										
Normal upper control limit X			14.25242	8.224241	15.33528	18.35308	14.28713	12.03988	7.714783	17.74385	10.84881	8.505058	13.88317	10.83883	18.58085	8.708291	8.498445	18.17838	11.88903	9.781358	12.35873	12.8282	7.235828	15.08149	7.358827	13.88737	15.52888	12.74904	8.798404	8.738314	10.85488	13.78155	13.30192
Normal lower control limit X			-3.58428	-1.11788	-5.42278	-5.2577	-8.87047	-4.48285	-1.53887	-8.70703	-3.14248	-2.25888	-7.05201	-3.78777	-10.1881	-0.72703	-2.14877	-5.88938	-2.21282	-3.87032	-4.8781	-5.55867	-1.88738	-8.80237	-0.01444	-4.84447	-7.32878	-3.74728	-1.88488	-0.04848	-2.05898	-5.18518	-5.304
Normal upper control limit MR			10.88472	5.739718	12.75341	13.2773	12.8888	10.15118	5.88581	15.02223	8.858145	8.868924	12.72708	8.872835	18.28341	5.834388	6.541478	13.55808	8.541138	8.454955	10.4847	11.35885	5.817503	13.4451	4.528884	11.21383	14.04398	10.13583	7.128387	5.388088	7.83404	11.84872	11.43117
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	1	0	1	1	0	0	0	1	1	1	1	1	0	0	1	0	1	1	0	0	1	1	0	1	1
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	1	0	0	1	0	1	0	1	1	0	1	1	1	0	1	1	1	0	0	0	1	1	0	0	0
False alarm in X? (Y=1/N=0)			1	1	0	0	0	1	1	0	1	1	0	1	0	1	1	0	1	1	0	0	1	0	1	1	0	0	1	1	1	1	0
Total false alarm in X			1	1	1	0	0	1	1	0	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	0	0	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	1	0	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	1	0	0	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	1	0	0	1	0	0	0	1	1	0	1	0	0	0	1	0	1	1	0	0	0	0	1	0	0
Total false alarm in MR			0	1	0	0	0	1	1	0	1	1	0	1	0	1	1	1	1	0	0	0	1	1	1	1	0	0	1	1	1	1	1
Sub-total X control charts with at least one false alarm k 30 =							101																										
Sub-total MR control charts with at least one false alarm k 30 =							134																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							18																										
Sub-total MR control charts with at least one false alarm k 1 =							20																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							22																										
Sub-total MR control charts with at least one false alarm k 1 =							24																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	1	0	1	1	0	0	0	1	1	1	1	1	0	0	1	0	1	1	0	0	1	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							117																										
Sub-total MR control charts with at least one false alarm k 10 =							67																										
False alarm in X? (Y=1/N=0)			0	1	0	0	0	0	1	0	1	1	0	0	0	1	1	1	1	1	0	0	1	0	1	1	0	0	1	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	1	0	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1	1
Sub-total X control charts with at least one false alarm k 10 =							127																										
Sub-total MR control charts with at least one false alarm k 10 =							87																										

OBJECTIVE # 3

Chi-square (df=4) k = 10 obs Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	8.7400	8.1871	7.0133	8.8898	8.2712	8.8708	7.5834	14.4818	10.0792	11.7121	8.1124	8.5108	12.0751	5.8723	7.9785	17.5812	11.8334	11.984	8.1083	8.5714	8.1501	8.8804	10.5275	10.8863	8.2327	8.3682	12.3287	18.0072	7.9028	8.7398	15.7821
			8.1371	11.9783	10.0834	8.8081	14.2928	11.0007	8.4782	11.0818	14.5043	12.9533	9.9857	8.8848	8.4988	7.5298	11.0582	9.0331	7.0151	14.7182	12.7288	10.1083	11.0822	8.9028	9.8031	8.9018	6.488	7.8871	12.7072	7.7155	13.7488	13.8588	8.1812
			14.4925	8.5878	11.0978	9.3854	15.8898	8.0931	8.1888	8.4451	21.2893	7.8504	7.5813	8.2232	7.8383	7.7258	12.8887	5.8843	13.5478	10.1835	7.8884	10.0823	8.4158	8.0883	7.5872	9.171	6.3523	9.8383	13.1882	7.8481	7.7883	8.924	12.2448
			9.7128	11.4444	9.8342	7.8022	8.8253	9.7912	8.3835	8.4788	9.0524	7.2057	7.5833	7.9312	8.312	7.1854	8.5788	9.9883	7.8705	8.1157	14.484	8.0882	12.1051	8.8282	8.8881	8.805	8.7218	8.1708	7.5585	11.0081	12.0834	13.8388	10.8081
			7.3891	10.2985	14.8553	15.3791	5.8863	8.3082	7.505	8.8405	12.0448	17.7575	8.4149	11.8115	10.1171	8.5188	8.0288	9.0824	14.0875	7.0775	8.4541	10.2023	11.3383	7.2223	7.7023	7.8317	8.3803	9.865	9.5858	9.1025	8.1888	12.2287	11.423
			9.1284	8.7838	10.1274	8.4141	10.3172	13.3481	7.8808	11.2524	9.0833	8.3938	11.0237	8.8228	8.7918	9.1385	10.8801	12.0755	12.0131	15.2588	10.2833	8.3188	8.5158	7.9483	21.0884	12.7883	8.3241	11.2384	7.3578	7.0528	7.7475	9.5128	7.824
			11.1742	8.8257	9.858	8.2028	7.8307	13.8555	8.0531	13.4888	9.482	10.4257	7.2115	8.1878	7.882	8.1884	8.3258	15.2822	10.8813	17.181	12.5445	7.4854	7.3548	8.9848	10.2824	9.4024	12.0888	8.4892	7.2283	7.085	14.3187	7.2081	9.9118
			9.8113	10.287	10.5558	7.8464	7.7872	7.8757	10.5533	18.4585	7.1188	10.8837	12.4389	8.8428	7.3275	10.1803	8.7187	11.8788	12.8328	8.0351	7.7154	8.3588	8.9085	14.3003	8.5157	9.2028	13.783	7.807	10.3858	11.8122	8.2833	8.7774	12.4481
			8.5732	10.8888	9.4525	7.1542	8.3811	11.8863	10.8213	12.8545	8.1888	14.0717	8.4274	7.5424	7.2515	10.2438	10.4228	13.4425	8.8188	9.9078	5.8455	8.8808	8.308	8.393	8.8888	8.9188	8.8717	9.1328	11.1787	8.388	8.8288	12.1812	8.9862
		10	9.0284	7.1118	8.7881	8.2845	9.4575	17.9823	9.815	7.7782	9.8403	8.4775	7.826	6.3463	13.1021	9.1188	15.7475	14.0857	12.3488	7.281	13.3151	10.3252	8.8887	9.4872	11.1444	9.5785	11.7525	11.5235	7.4827	7.8271	7.3181	9.8877	8.9353
			7.7572	9.1157	14.1707	8.0811	8.8474	12.1048	15.3038	10.8378	10.331	11.4118	13.8835	8.3118	11.8558	8.3744	8.8887	12.8588	11.1	8.2857	8.1481	17.5285	9.2353	13.2427	7.0534	8.8548	8.8841	7.882	15.8735	7.0083	7.8824	9.8408	8.4378
			7.4278	11.8422	11.5841	9.0875	8.3721	9.8053	8.3188	12.8345	9.2388	8.9585	14.9807	8.8023	11.8542	12.2885	7.85	9.8214	8.4258	8.3184	8.9882	7.9103	7.88	7.0372	8.8998	7.3887	8.8018	9.8851	20.6871	7.0887	10.583	15.1148	7.8935
			15.1442	9.8138	10.4538	8.944	14.0918	8.9753	13.4822	8.5718	7.2382	13.7171	10.1702	7.8748	8.1718	12.8134	11.2205	9.8918	8.7408	12.8408	8.8884	9.2075	14.8884	9.582	14.1148	8.7248	8.2917	8.87	10.1738	8.7357	13.2881	7.4881	10.5588
			8.933	9.7718	8.3718	9.3721	10.5007	8.8495	5.7982	10.1202	8.9357	7.3504	8.3732	8.8748	7.2554	11.4788	14.7888	8.7108	11.1423	7.4223	8.1821	7.5848	11.1472	21.8428	8.3292	7.8314	14.3188	13.3273	8.98	16.345	8.7118	8.5844	8.818
New observations k =			10.2158	8.3724	7.5258	10.5305	7.0052	8.9884	10.7807	8.8255	5.8789	15.4707	11.2241	8.8284	11.4938	11.3132	13.3053	5.8083	8.0828	8.9287	13.758	10.152	8.531	8.2722	15.9788	7.471	7.8052	10.8052	8.4635	8.0794	9.444	11.527	18.5805
			8.3208	8.4343	10.1308	18.4221	9.777	8.8575	8.7714	10.2845	8.8898	10.7938	7.1802	8.2858	11.8883	8.8432	7.0885	7.1988	8.9718	13.1803	10.8741	5.8185	8.8408	16.1102	7.0508	16.1887	6.371	7.8725	8.4542	7.2728	8.8133	11.9571	8.3752
			7.5213	7.1831	8.7874	7.4458	6.4128	7.0433	18.8138	12.8873	7.0554	11.8572	8.2558	7.2438	9.884	7.8888	10.0877	8.484	13.8844	10.4443	10.4818	7.301	8.4584	8.8818	7.5885	9.881	8.3475	11.0338	8.4478	7.7187	17.2441	9.1842	7.3712
			8.3585	8.7881	8.8773	12.2388	7.0127	15.2588	8.1131	8.8048	7.3812	8.3858	9.0154	8.3085	12.2425	7.8853	12.7283	11.2485	8.8584	8.2888	7.28	8.8407	18.8582	8.7811	8.2122	7.7584	18.8801	8.5584	8.7482	10.8512	7.2158	8.1808	8.5127
			8.0174	8.5853	8.5828	12.3151	9.8171	8.8708	8.294	11.7318	11.8107	8.8828	7.8384	8.8828	9.181	10.8855	10.8254	8.1231	7.4017	8.8084	12.8754	12.2838	12.8345	7.4331	8.854	8.1574	8.2782	7.9078	8.84	8.5813	8.8278	11.2783	8.3158
		20	8.9954	12.4818	8.0025	8.8548	8.5832	12.4187	10.1837	11.7471	8.4213	8.0788	9.9488	18.7318	8.4882	9.7728	14.1107	15.3043	11.4801	8.0824	8.4513	15.2203	14.8523	11.0748	12.857	8.1	7.2857	8.4978	5.7928	5.8214	12.4183	7.845	7.4848
			9.3407	7.0331	25.1831	12.1307	10.418	8.4884	7.7085	7.9103	8.4578	8.8883	9.1428	7.1783	8.3582	18.8107	15.8485	8.3058	8.8828	8.8031	10.7757	8.7344	12.1701	8.7733	10.4705	13.5838	8.2831	10.3288	9.8845	8.2814	10.888	9.8018	10.2805
			7.8008	8.7303	9.4814	10.5577	8.3838	8.3504	8.5947	11.3878	8.2471	7.2748	8.4817	10.4316	8.838	10.7102	10.5118	8.4713	7.9218	8.883	8.7374	7.3334	8.8884	10.2585	13.5878	9.4778	12.1718	7.8118	7.8785	6.5802	8.8218	11.0832	9.1811
			7.5435	7.0478	11.8158	8.3583	10.8188	7.4788	8.2088	7.8834	7.8012	9.4033	7.8284	17.5347	8.8183	12.4882	8.8325	13.1581	9.3288	7.4858	13.3815	11.3254	11.3042	9.8771	21.7884	12.7072	9.758	8.0868	8.8721	7.4804	8.3261	17.8737	11.9848
			8.9895	10.7288	8.0588	14.1512	8.5338	13.5801	12.5484	8.4352	10.7033	8.878	8.4037	12.004	7.2585	13.1883	5.8132	8.81	17.2402	12.8883	10.581	8.5888	11.8415	10.7714	11.0514	11.5213	7.5778	7.382	7.4388	8.0808	10.25	9.1481	12.4818
			13.4108	9.8448	13.5773	13.2717	9.8382	8.8849	8.7813	8.7242	9.0542	10.0213	8.8731	8.7928	10.5848	7.433	8.3888	7.0403	7.8177	8.8884	10.1835	8.1224	7.2188	7.728	13.3287	18.3572	10.2484	7.2408	10.7835	10.888	18.2024	8.0581	6.7801
			7.229	11.2988	8.8783	9.1485	10.7501	13.105	8.8144	8.5055	12.3804	8.8188	11.3728	8.5932	10.7282	8.4578	7.1881	10.3385	7.5514	8.8882	18.2582	11.0741	7.4752	8.1111	8.5884	8.4024	7.7295	7.8314	13.4028	12.8821	18.9818	9.458	7.5284
			7.983	13.7018	8.8827	10.4578	14.5418	13.1507	13.5113	13.4575	9.3244	14.8143	15.8752	10.0288	8.8803	8.9288	7.2385	7.8288	7.5704	8.3114	8.7818	11.24	8.7388	6.3884	12.712	10.9888	7.8013	8.0883	10.3477	12.077	13.8853	14.3585	12.451
			14.1122	11.3244	7.0248	7.4789	8.7001	8.5751	8.884	12.722	8.283	12.1214	8.5545	8.3458	8.8583	8.3573	7.1578	7.8773	7.7775	10.8161	8.9281	8.0808	10.8587	10.7785	12.0023	7.1388	10.2318	11.9111	8.8783	6.1365	13.178	9.3252	7.842
			12.3885	7.3298	7.2758	9.1383	8.5308	7.98	8.8031	8.515	8.5785	8.8141	12.8485	8.0181	8.1524	10.8233	8.8255	10.2171	17.4438	8.8872	10.0271	20.8185	8.4451	18.4323	6.1883	15.7417	12.8501	7.8715	8.2528	11.1428	9.5741	7.0714	11.0805
		30	13.3887	8.8857	11.0275	7.7174	8.8172	9.2827	15.2012	8.1181	9.8887	8.7447	14.8808	10.3138	8.1111	8.7723	7.1874	11.3188	8.2278	14.5787	8.8887	8.8511	8.1851	8.8088	13.813	8.0538	5.9857	8.185	8.5183	8.8088	11.8458	8.4257	8.845
Estimator shape parameter			4.207037	3.285050	2.247263	3.800830	1.850863	2.845806	5.180882	1.872453	2.025138	2.561594	1.437853	2.878002	1.514080	3.815186	4.413148	2.882404	3.829812	2.270358	2.038228	1.909805	3.210807	1.401808	6.308431	2.838843	1.463427	3.877577	3.183874	3.538874	4.111328	1.710142	1.413881
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.288704	1.081404	2.205465	1.456108	2.231085	1.327738	0.587318	3.290501	1.027828	1.241707	2.288808	1.318837	3.081933	1.027088	0.718405	1.784798	1.237118	1.281865	1.884148	1.852203	0.828835	2.774528	0.881282	1.888283	2.881338	1.223803	1.255482	1.22758	1.088715	2.504578	2.828738
Control chart constant d2			1.09445	1.085475	1.087157	1.081073	1.048035	1.079318	1.100588	1.048783	1.080747	1.074067	1.033484	1.076458	1.03827	1.08203	1.095877	1.078895	1.081258	1.087748	1.081188	1.058581	1.084537	1.038833	1.101058	1.075737	1.035142	1.089798	1.084184	1.088371	1.083882	1.048578	1.031848
Control chart constant d3			0.890857	0.90532	0.828048	0.898433	0.947314	0.913878	0.879737	0.948874	0.834338	0.828488	0.957881	0.817611	0.853787	0.884824	0.887987	0.913212	0.888123	0.827435	0.833944	0.835427	0.908718	0.854888	0.877782	0.918488	0.958336	0.898537	0.907218	0.900841	0.881977	0.845181	0.858827
Control chart constant D4			3.407324	3.45812	3.508580	3.424538	3.782298	3.501201	3.381888	3.758833	3.848225	3.541452	3.852212	3.522808	3.818788	3.418422	3.400308	3.498933	3.423532	3.581833	3.844868	3.857537	3.484317	3.828213	3.37802	3.528348	3.840741	3.431845	3.488817	3.438887	3.410885	3.743205	3.883407
Upper contro limit X			14.52598	8.407237	15.82702	18.71878	15.08528	12.41252	7.830127	18.88227	11.30888	8.808235	14.81041	11.18849	20.84877	8.82588	8.853884	16.88888	11.82308	10.17884	12.88311	13.52808	7.419141	16.04245	7.44475	14.05073	18.55413	13.03808	10.03383	8.888303	11.0574	14.47847	14.18878
Lower control limit X			-3.88782	-1.30089	-8.0145	-5.8234	-7.88882	-4.85528	-1.85521	-7.85545	-3.58823	-2.53157	-7.88825	-4.11743	-11.484	-8.88343	-2.30431	-6.38087	-2.44885	-4.3588	-5.21248	-8.15557	-2.08058	-7.76333	-0.10258	-5.08783	-8.35503	-4.03843	-2.03812	-0.20848	-2.28151	-5.81311	-8.17087
Upper control limit MR			11.43218	8.073835	14.03577	13.81328	14.85087	10.87558	5.884081	17.28837	9.885502	7.228951	15.00227	8.872448	21.38477	8.104721	8.808308	14.50784	8.847828	9.282775	11.87148	12.71287	5.85488	15.74981	4.881128	12.10888	18.50528	10.84318	7.582885	5.883248	8.281177	13.34028	13.51385
False alarm in X? (Y=1/N=0)			0	1	0	0	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	0	1	0	1	0	0	0	1	1	1	0	1
False alarm in X? (Y=1/N=0)			1	1	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			0	1	1	0	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0
Total false alarm in X			1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	1	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	1	0	0	0
Total false alarm in MR			0	0	1	0	0	0	1	0	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	0	0	0	1	1	1	0	0
Sub-total X control charts with at least one false alarm k 30 =							218																										
Sub-total MR control charts with at least one false alarm k 30 =							115																										
Normal upper control limit X			14.25242	8.224241	15.33520	18.35306	14.28713	12.03080	7.714783	17.74385	10.94001	8.595050	13.08317	10.83083	10.56085	8.700291	8.498445	18.17830	11.00903	8.781350	12.35673	12.9292	7.235020	15.08149	7.350627	13.00737	15.52880	12.74904	8.780404	8.738314	10.85400	13.76155	13.30182
Normal lower control limit X			-3.59428	-1.11790	-5.42270	-5.2577	-8.87047	-4.48285	-1.53987	-8.70703	-3.14248	-2.25800	-7.05201	-3.76777	-10.1981	-0.72703	-2.14877	-5.88938	-2.21292	-3.87032	-4.8781	-5.55867	-1.90738	-8.80237	-0.01444	-4.84447	-7.32978	-3.74729	-1.80409	-0.04849	-2.05896	-5.10518	-5.304
Normal upper control limit MR			10.98472	5.730718	12.75341	13.2773	12.9886	10.15118	5.88591	15.02223	8.658145	8.888924	12.72708	8.872835	18.28341	6.834386	6.541476	13.55806	8.541138	8.454955	10.4847	11.35885	5.817503	13.4451	4.528864	11.21363	14.04308	10.13583	7.120367	5.390088	7.03404	11.84872	11.43117
False alarm in X? (Y=1/N=0)			1	1	0	0	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	0	1	0	1	0	0	0	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	0	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			0	1	1	0	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0
Total false alarm in X			1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	1	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	1	0	0	0
Total false alarm in MR			0	1	1	0	0	0	1	0	1	1	0	1	0	1	1	0	1	1	1	1	1	0	1	0	0	0	1	1	1	0	0
Sub-total X control charts with at least one false alarm k 30 =							228																										
Sub-total MR control charts with at least one false alarm k 30 =							134																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	1	1	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							67																										
Sub-total MR control charts with at least one false alarm k 1 =							39																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	1	1	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							78																										
Sub-total MR control charts with at least one false alarm k 1 =							43																										
False alarm in X? (Y=1/N=0)			0	1	0	0	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	0	1	0	1	0	0	0	1	1	1	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							175																										
Sub-total MR control charts with at least one false alarm k 10 =							72																										
False alarm in X? (Y=1/N=0)			1	1	0	0	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	0	1	0	1	0	0	0	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	1	1	0	0
Sub-total X control charts with at least one false alarm k 10 =							185																										
Sub-total MR control charts with at least one false alarm k 10 =							84																										

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
CHI-SQUARE (df = 4)		k = 30 obs																															
			1.7374	4.52784	2.34521	1.97848	3.2154	1.80483	1.04482	2.88715	1.8412	2.2493	3.528	8.7534	6.7282	8.3542	1.4022	5.1727	6.8301	7.0808	2.2488	2.1781	7.81	8.3843	2.5181	1.52086	1.2502	2.8808	3.8898	1.7724	8.73581	1.80448	3.00523
			2.1456	3.60888	0.56065	4.13388	1.8451	4.7028	3.8383	7.50777	9.4831	0.8704	6.3359	1.6701	4.1873	2.4583	4.4194	4.83282	0.554	4.2588	1.8048	4.2805	2.1842	8.3228	4.2823	2.88228	1.7231	6.6343	8.34783	1.4344	1.57738	1.11211	4.82231
			3.6072	1.64386	0.43573	7.05483	2.3338	2.89758	0.61574	4.78812	1.388	2.2138	7.8378	0.7218	0.7832	1.0134	5.7207	0.38418	2.6148	5.1885	2.0712	8.7407	8.0215	0.4912	4.85	7.85757	4.7245	1.8001	1.3858	5.3131	5.42538	2.11877	3.29812
			1.6745	6.87173	1.42848	3.98848	8.1275	2.57845	3.13503	3.14088	2.1785	0.8854	2.1031	1.5105	4.8221	5.7817	4.8847	2.43283	11.4421	1.7808	0.7738	3.4184	1.885	3.5883	8.3886	4.37778	0.4853	7.8437	3.81242	1.8111	4.53838	3.74986	2.8024
			1.8063	5.7621	1.96431	0.68371	3.8455	8.8801	2.95628	4.82312	3.882	10.6474	8.8012	4.5781	2.8503	6.7751	3.4047	8.71076	1.9887	1.4027	5.0201	0.4225	5.4001	6.6721	3.443	2.35383	7.5105	2.5584	1.87801	5.8805	1.83351	0.78118	8.97677
			3.2082	2.0713	3.82158	3.27132	7.2315	2.44453	8.70492	6.89812	4.0857	3.5855	12.8278	0.7802	0.4585	2.8288	8.5248	5.25828	1.1367	3.0137	5.7803	5.4149	4.885	5.8383	2.9075	1.8115	2.8598	5.0082	2.74587	1.4784	7.70488	9.89504	1.50198
			4.1083	3.12773	2.8524	1.34803	3.8015	1.85897	2.88791	7.89308	1.8375	2.887	3.2388	3.317	5.8808	11.201	4.3824	3.14873	1.8877	2.2338	4.8585	10.4288	10.5278	3.8888	2.8108	2.81125	2.3118	1.4738	5.58432	6.2718	0.6373	4.57298	8.42538
			5.7098	1.19002	3.27513	5.2338	2.0008	3.70043	3.10044	2.88218	1.1256	8.2188	1.113	1.4588	3.8458	3.1478	2.2151	3.83274	1.7783	0.8888	0.7733	0.7315	5.047	9.2842	3.1748	1.33375	1.5802	0.8488	0.80853	3.2788	7.22081	2.74532	0.80898
			1.3821	7.11811	2.81642	8.93188	4.0548	5.84354	2.58441	1.30814	0.57	6.5	4.874	4.1888	2.8513	3.7435	8.1814	1.4872	2.7587	1.0884	7.5788	4.378	3.1418	4.1808	3.3115	3.8878	5.185	1.3827	2.45708	2.0412	5.48815	2.75884	0.84858
			2.8284	2.54747	0.87418	4.79537	1.9815	8.33	0.37475	5.78177	2.0508	0.3135	0.2248	0.4777	2.3448	8.2811	0.9802	7.29808	4.0288	2.1274	8.2815	4.4137	1.2887	9.3842	1.5516	3.80574	11.7237	7.1488	4.78808	3.8172	4.34188	4.8405	2.87081
			3.075	2.85328	2.11302	2.84728	1.054	3.10197	6.18083	4.21433	3.2182	3.8853	3.062	3.7611	3.3753	8.4468	3.3948	2.30398	2.001	2.7108	10.3528	8.5212	1.2731	2.8205	6.5731	0.87344	1.9185	2.8847	4.82543	4.4241	1.81833	7.64928	1.03287
			1.4084	7.42137	5.87711	4.32838	1.0818	1.71087	2.71072	1.20277	0.5625	8.62	2.6278	1.1167	4.9837	2.2025	8.8851	3.81227	9.4833	8.3243	4.7855	1.7787	5.808	5.7982	2.3828	3.78575	1.2872	12.2828	4.00588	2.3883	1.08818	7.58831	8.22874
			3.813	6.49834	3.86878	4.72588	2.9026	2.58195	2.25748	5.8201	5.2885	7.3348	8.0323	2.2833	5.2875	2.8851	2.708	2.71367	4.9878	17.2088	0.7814	0.8872	1.8778	5.554	2.8833	3.83851	0.2217	2.5338	0.85111	2.8878	2.54458	4.22513	7.08841
			2.0878	3.32436	1.02577	1.37298	1.884	6.38791	4.31114	3.85487	3.7817	8.8617	3.0795	2.3888	5.4811	2.1671	6.4338	2.0713	5.6822	8.88	3.0818	1.2581	2.477	3.4881	2.8853	1.41985	1.0148	3.3088	8.51348	2.34	2.80888	1.54384	8.38895
			3.8161	4.88178	0.74784	3.3015	3.7167	8.04714	2.20438	2.84442	1.638	0.4318	2.3012	1.9104	1.1888	11.7285	8.7131	1.34027	1.6488	4.1251	0.3473	8.8888	5.9587	5.9888	1.349	1.02142	0.4055	5.8054	5.70281	0.8243	2.13488	1.79011	1.00281
			6.3153	0.83068	4.73627	2.80428	1.481	5.75788	3.37248	1.31448	4.8173	3.8171	1.0474	8.2483	3.1391	3.7008	5.4158	7.43007	8.3424	5.5287	7.1849	5.1718	1.5884	12.1787	8.0289	6.77148	1.4873	8.3392	1.97004	1.0123	5.48382	3.22444	2.81195
			3.2453	2.08844	6.78787	2.31502	2.4845	3.48084	4.45145	3.38726	2.4385	7.3333	4.1425	2.4257	1.4578	6.0883	2.8338	1.95288	2.6388	2.8118	1.3031	3.0555	4.3588	1.6488	8.5873	5.52878	6.8128	1.7195	2.3714	5.0288	1.29724	3.58328	8.84174
			4.2345	2.03531	1.74117	3.77445	4.0887	7.7008	4.1438	2.45044	13.0161	8.8742	7.7086	12.8081	5.5893	1.9025	2.4503	1.19188	0.5862	6.4885	1.1805	2.1518	3.4831	5.2282	5.1588	3.7438	2.4728	0.8214	0.78883	2.1828	1.24274	3.28595	4.08421
			2.8818	0.0336	0.56875	1.20091	11.0878	2.27885	4.30317	4.18885	5.3358	3.8888	1.7785	0.8574	8.8013	2.0345	10.8413	2.051	7.8084	4.2188	3.3081	4.4878	5.5333	2.3471	2.4388	2.58158	3.0472	3.8682	5.51188	7.2537	3.53508	2.58846	7.21823
			10.2327	0.08575	2.63884	1.80314	3.7532	2.10858	0.45882	5.41882	4.2488	0.1738	3.0471	4.3877	8.3784	13.7478	2.5484	2.24182	1.7272	3.7888	2.8228	1.1028	4.5535	3.3883	10.7838	5.08862	3.8172	0.8814	8.15388	3.3435	0.70228	2.11327	3.45189
			1.7826	2.01821	0.78827	4.81228	5.2485	4.50878	2.12038	1.38887	3.4188	2.1888	13.0134	0.0857	5.5858	4.5787	7.9187	3.74504	0.2885	2.1384	4.8434	3.1302	4.7854	8.0837	10.7273	2.83378	3.3825	5.8292	4.52148	6.8755	1.30888	5.58877	3.18384
			3.7841	2.30066	5.18856	0.88818	3.8483	4.88243	2.40048	2.11288	0.4428	3.7507	8.487	2.7686	3.1884	1.1558	1.9802	1.56232	2.0836	5.8121	10.5847	5.3874	3.0281	9.2577	0.5276	2.54437	0.8713	1.8278	2.80537	2.3888	7.10578	3.32028	0.88537
			2.8834	2.32925	7.82384	3.11587	2.5878	3.75184	3.48521	7.37741	1.8843	2.4845	2.5023	3.3041	1.0156	4.508	0.811	3.72382	4.288	1.8481	1.2548	1.8588	2.7853	2.4043	5.074	2.58814	7.1275	1.8858	2.75862	0.5374	5.33743	7.80842	2.7581
			4.725	1.54798	1.86828	5.75888	4.2914	2.08235	1.83398	4.88853	2.1417	2.0882	7.3806	6.2422	5.4786	0.3834	6.1098	0.48237	0.8285	4.8512	5.2181	3.2212	3.1884	7.257	3.2285	8.10288	6.8713	6.4033	2.12057	1.8107	3.46298	3.16488	5.58031
			1.7145	5.55083	0.81782	6.23878	4.4003	0.83856	6.47227	2.31285	6.3194	6.15	1.1333	0.1878	5.7852	2.0782	6.8885	1.2611	1.6218	14.7758	7.5113	10.8888	3.7478	3.8488	7.0375	7.52482	2.5298	6.8257	0.48182	0.888	8.03758	1.18187	0.51538
			2.2055	1.74745	3.3553	7.83528	4.0753	4.34388	5.12882	1.385	1.9188	12.8213	2.8498	3.2328	18.0385	0.8436	4.4182	1.88388	5.7138	2.318	2.0078	1.362	1.0158	2.8148	4.4878	5.23512	5.5455	2.1584	3.11583	14.8474	3.8384	4.04728	4.72732
			0.5145	3.85413	2.88288	4.6307	1.5483	8.88283	2.80845	8.82878	4.0828	2.1578	1.8454	3.7764	6.8825	0.8125	2.2878	5.78282	8.1873	2.2418	10.887	1.827	2.0132	0.7844	0.7883	1.78844	3.7358	8.4788	2.58383	2.8103	8.21281	1.8578	1.47453
			2.5486	3.25857	3.88838	1.15888	8.218	2.28321	1.81358	5.18433	2.8855	4.758	5.0473	4.4408	8.8588	1.247	4.5834	2.78805	3.4873	4.6307	8.0872	5.785	1.7038	8.3288	3.2828	0.41848	7.2348	4.7335	5.27287	1.7837	2.25748	3.00482	0.88875
			6.1703	0.75331	2.55327	3.81883	2.9388	2.24249	2.3588	2.12148	7.0717	1.3512	4.8854	1.5873	2.4878	3.8813	4.0577	6.10828	4.816	7.3284	7.8745	0.035	2.2187	4.1118	2.5032	1.44985	3.1884	2.7884	5.82588	1.0848	8.04021	1.13225	1.18038
			3.3387	4.84388	4.17282	4.28148	2.0588	3.87154	5.38224	2.35881	4.7088	1.2503	2.2148	1.8888	4.5788	6.7783	4.7838	0.83854	1.8358	6.1253	2.3815	0.588	8.7774	11.818	1.6287	3.80049	1.7856	3.8268	0.85127	5.5828	0.88588	5.38032	2.33841
Average			3.32424	3.427257	2.848111	3.742075	3.848813	4.18988	3.250858	3.988817	3.575173	4.114767	4.522083	3.108807	4.49497	4.258143	4.781253	3.191862	3.705123	4.71855	4.408153	4.0207	3.88858	5.477577	4.24701	3.448284	3.488283	4.053283	3.885312	3.428287	3.82493	3.814387	3.850318
Moving range average			2.109859	2.498774	2.885358	2.250354	2.322893	2.854148	2.117435	2.58815	2.900507	3.270007	3.888807	3.178478	2.888534	3.584845	3.581228	2.474131	3.362707	3.170021	3.528883	3.811887	2.33	4.883821	2.770821	2.072115	2.888878	3.538583	2.771783	3.184338	3.353476	2.271187	3.105855
T statistic			6.881626	3.438548	3.72872	5.823542	6.748818	8.28884	4.988528	6.410761	3.050073	2.534123	3.420254	2.437098	4.50904	3.235808	5.578802	4.307081	3.054249	4.288884	2.881572	3.188882	8.228838	4.817874	4.548815	4.575381	2.881891	4.088623	3.824725	3.828284	3.727247	5.351403	3.120035
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.279	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.879	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1.8	1.035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1.9	1.086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1.138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	2.1	1.189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	2.2	1.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2.4	1.342	0	0	0	0	0	0	0	0	0	0	0	1.380910	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2.5	1.393	0	0	0	0	0	0	0	0	0	1.410403	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.501845	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.642702	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.074887	0	0	0	0	0	0	0	0	0	0	0	0	0

49	3.1	1.698	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.747841	0	0	0	0	0	0	0	0	0	0	1.711017
50	3.2	1.748	0	0	0	0	0	0	0	0	0	0	0	0	0	1.786262	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	3.3	1.798	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52	3.4	1.849	0	1.86917	0	0	0	0	0	0	0	0	1.863409	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	0	0	1.979054	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.984925	0	0	0
55	3.7	2.001	0	0	2.01536	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.014823	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.063382	0	0	0	0
57	3.9	2.101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.200795	0	0	0	0	0
59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.30853	0	2.301492	0	0	0	0	0	0	0	0	0	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	2.408085	0	0	0	0	0	0	0	0	0	2.428152	2.441572	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	0	0	0	0	0	0	2.838098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.813528	0	0	0	0	0	0	0	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.831504	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.945451	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	2.987888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	3.30142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.270488	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	3.382434	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	3.498813	0	0	0	3.53246	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.758	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.858	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.958	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator shape parameter			3.498813	1.86917	2.01536	2.987888	3.53246	3.30142	2.838098	3.382434	1.979054	1.410403	1.863409	1.380910	2.408065	1.786262	2.945451	2.30853	1.674887	2.301492	1.842702	1.747841	3.270488	2.813528	2.428152	2.441572	1.591945	2.200795	2.063382	1.984925	2.014823	2.831504	1.711017
Estimator scale parameter			0.950105	1.833572	1.483317	1.280854	1.03325	1.203087	1.232275	1.177981	1.808504	2.817441	2.420789	2.282948	1.898831	2.410822	1.628882	1.38388	2.212454	2.049344	2.08228	2.300249	1.182876	2.085857	1.749071	1.412735	2.173828	1.841727	1.788071	1.745251	1.84822	1.278484	2.13342
Control chart constant d2			1.087937	1.055268	1.08043	1.081198	1.088301	1.085887	1.075723	1.086395	1.059224	1.031823	1.055048	1.028082	1.071027	1.051088	1.080863	1.088649	1.0488	1.088526	1.045323	1.050288	1.085288	1.075281	1.071473	1.071767	1.042882	1.085029	1.081054	1.058742	1.080406	1.078084	1.048818
Control chart constant d3			0.901527	0.938344	0.934838	0.911458	0.900851	0.905031	0.918505	0.903825	0.935758	0.950211	0.93854	0.902091	0.923828	0.94301	0.911812	0.928492	0.948583	0.928622	0.947812	0.943888	0.9056	0.918082	0.923435	0.923108	0.950118	0.928297	0.933185	0.936203	0.934858	0.91428	0.945128
Control chart constant D4			3.442808	3.69185	3.65078	3.487478	3.440415	3.456871	3.528458	3.452195	3.680384	3.864945	3.683383	3.888092	3.565491	3.724088	3.488888	3.584577	3.755831	3.565572	3.767588	3.730222	3.458341	3.532041	3.561827	3.550584	3.787018	3.608511	3.638541	3.684221	3.650852	3.502928	3.742888
Upper contro limit X			9.141648	10.53381	8.849677	8.986132	10.05097	11.50413	9.158006	11.11088	11.78042	13.85024	14.95421	12.38178	12.0537	14.48841	14.75892	10.13755	13.34131	13.81873	14.5275	14.33788	10.30924	16.87179	12.02123	9.249388	11.71404	14.01244	11.51557	12.48081	13.41227	9.928806	12.53631
Lower control limit X			-2.49317	-3.87829	-2.95045	-2.50198	-2.75115	-3.18417	-2.85429	-3.18883	-4.84007	-5.42071	-5.81009	-6.18798	-3.06378	-5.97312	-5.17841	-3.75363	-5.93108	-4.18383	-5.7152	-6.29848	-2.57212	-5.91884	-3.52721	-2.3508	-4.79345	-5.90591	-4.14495	-5.62203	-5.58241	-2.89881	-5.23488
Upper control limit MR			7.282731	8.228283	7.813143	7.848058	7.888983	8.175052	7.471277	8.838251	10.6173	12.87318	13.55031	12.38013	8.821589	13.34957	12.53298	8.888712	12.82076	11.38834	13.28712	13.47355	8.080285	14.42458	8.880121	7.375887	10.98373	12.78187	10.08528	11.70478	12.24338	7.9558	11.82415
Normal upper control limit X			8.935034	10.07558	9.495277	8.727058	9.825893	11.22888	8.882335	10.84885	11.28853	12.83553	14.27853	11.58031	11.87192	13.78177	14.34238	9.772087	12.84848	13.14748	13.78588	13.82707	10.08537	16.33907	11.83184	8.980238	11.08975	13.48442	11.0571	11.92487	12.84375	9.854788	11.91004
Normal lower control limit X			-2.28855	-3.22108	-2.98705	-2.24281	-2.52587	-2.88893	-2.38882	-2.82612	-4.13818	-4.808	-5.2364	-5.3485	-2.88188	-5.27548	-4.75888	-3.38817	-5.23825	-3.71438	-4.87336	-5.58567	-2.32825	-5.38381	-3.13782	-2.08185	-4.18818	-6.35788	-3.68848	-5.08828	-4.98388	-2.42588	-4.8084
Normal upper control limit MR			8.884384	8.188283	8.814851	7.354156	7.5886	8.87376	8.918778	8.481341	9.47915	10.71578	11.88888	10.38727	8.818811	11.71482	11.73813	8.08548	10.88833	10.35883	11.52523	11.804	7.81444	13.34825	8.073888	8.771871	8.374833	11.58412	8.058221	10.4381	10.85818	7.42224	10.14828

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Chi-square (df=4)			k = 30 obs																														
		1	5.2017	1.672	3.65284	4.9702	4.8842	4.7783	2.93292	8.1858	0.743	3.2145	5.0447	4.0802	1.2818	8.405	2.1319	2.33308	8.17378	5.8879	3.8727	1.3568	5.0802	2.4985	1.0834	4.1318	8.02045	1.8474	1.0308	3.0311	3.8809	1.0052	1.44177
			3.8245	4.8219	2.12484	10.1438	0.7839	3.2324	8.14581	5.3878	3.4918	2.1858	8.8481	3.8541	1.5314	3.2828	3.1123	2.00118	0.41542	1.0841	1.0539	3.2008	1.3918	1.3184	3.4478	0.5238	5.8542	4.4878	0.5867	3.8158	0.8874	8.1738	8.34298
			0.5858	3.1875	7.78523	3.9258	2.9212	1.6803	2.9753	8.4383	8.8283	2.725	1.0838	8.0012	5.0058	4.2872	2.114	7.54038	1.82315	0.7842	2.4181	2.7202	6.6287	4.8531	1.3278	1.183	3.72218	8.2888	2.5183	0.5887	3.2813	4.8588	7.87048
			2.8508	2.4457	1.18585	12.017	3.0842	8.7844	3.38781	1.2888	3.7957	2.83	4.8881	0.3814	2.4885	0.2888	10.5483	8.94471	1.82533	1.1083	3.0881	0.7238	3.114	2.1448	1.7841	8.8845	3.41585	1.0307	2.8543	8.8585	0.7188	1.1918	1.83113
			0.8848	5.7283	3.00407	4.2284	0.5117	4.0852	4.31523	0.5823	3.2831	2.1375	1.8831	4.1812	0.4181	13.1822	7.7057	8.72483	2.48024	3.4285	0.8587	8.7714	3.8517	4.0588	2.7823	0.2171	8.28823	2.7828	8.7185	5.8442	0.8814	1.3082	4.41452
			2.807	8.6353	2.45848	2.238	0.8379	8.7348	5.42438	1.3018	2.0718	3.8454	2.0787	0.8758	1.8771	3.8884	11.8882	8.85207	5.11875	1.0082	1.385	0.8508	5.4455	2.3773	8.1878	5.8848	8.073	3.0711	8.28	10.8582	3.3033	3.1422	2.33155
			3.481	0.8808	5.88282	3.331	5.4857	2.8088	7.8458	7.2007	7.1889	3.8741	4.8428	7.2313	5.384	10.8887	1.0073	1.13114	5.2371	1.1558	5.7252	8.4475	7.4418	0.8785	11.8418	1.1158	2.88541	1.5888	0.4782	0.5382	7.485	5.4418	1.74718
			1.5575	1.8101	4.57102	4.0285	2.2448	8.3824	2.84885	1.2144	1.8195	11.8821	2.7887	8.7387	7.2111	1.4188	8.4859	1.78884	2.31704	3.7484	3.2832	4.4881	3.0873	0.8809	0.4874	0.8864	3.58318	2.7433	2.8782	0.4807	1.4288	4.8058	1.88322
			4.5311	3.8358	3.80254	1.0123	4.1717	0.3435	0.78888	2.67	0.5247	10.4282	8.5508	8.6308	2.0823	8.8817	7.7708	4.3815	7.73888	1.7748	3.5058	1.4747	3.1708	7.7049	8.0587	4.8782	2.28183	0.4851	8.5383	1.818	1.4181	1.2081	4.18821
		10	8.0881	3.2845	8.85015	1.3803	8.3848	0.8007	5.34528	5.2015	8.0072	2.8181	0.5815	4.4412	4.2078	4.8807	4.7181	1.88747	3.38285	4.4804	15.8083	7.2041	4.1358	0.4884	2.5427	4.3884	8.58378	8.8488	6.2882	1.2148	3.0881	1.503	3.48578
			2.4277	4.1828	2.43033	3.1553	1.7803	2.7348	0.42881	5.3808	3.5217	3.8888	3.0121	1.1158	7.8302	5.7828	1.1348	2.27833	2.38488	8.8579	0.4537	5.3885	11.1484	5.522	4.8388	3.88	1.72071	1.7722	2.2858	1.2705	3.5238	3.4842	5.78741
			2.5408	1.8207	3.37888	2.5887	1.0084	2.2778	0.43359	3.557	2.0884	1.8188	2.4285	7.0421	3.8808	2.8425	5.5378	1.8402	5.77528	5.84	2.8487	4.0888	1.1937	1.3742	3.0804	2.882	8.85133	2.081	8.7888	1.3085	8.4288	7.8224	5.38854
			8.4288	4.3781	5.84035	2.8282	3.7872	8.0047	1.88088	8.1873	1.8184	1.3232	5.8408	4.3888	2.7482	3.5813	7.8152	2.88408	3.22888	0.2308	1.8585	2.3452	1.0283	1.2538	7.2882	5.8847	8.88173	8.8785	2.3838	0.7883	4.4382	2.8548	1.45888
			3.1482	12.2433	3.588	4.8784	3.8834	1.1188	8.15087	10.8488	4.7331	2.7711	3.381	3.0074	0.2588	7.7087	1.2834	0.78083	5.81111	4.0088	7.3545	1.8545	7.8384	3.1555	4.532	2.2848	3.3738	8.7587	2.884	5.5837	1.4358	2.2183	2.78445
New observations k =			4.8857	3.848	4.48583	5.2884	2.3148	1.541	1.12044	3.8878	3.5824	4.4388	2.2	8.3814	1.8381	2.8348	3.8375	2.82808	1.81888	10.2825	1.2285	8.8188	2.1487	7.8488	0.4834	5.8871	8.18158	8.481	2.3212	1.7177	4.207	1.0152	3.88778
			5.1408	1.8831	3.80085	1.31	2.2708	14.4578	1.01828	0.814	5.2781	1.9088	8.1474	1.4873	5.7024	2.8083	8.1738	5.83248	3.88488	7.071	5.8808	5.7705	8.8577	4.1548	3.1838	1.2122	2.08838	3.878	0.4848	4.3227	8.1742	1.8428	7.23797
			8.385	4.7773	0.42724	8.087	1.1523	2.3704	2.88175	3.0503	1.1887	2.8438	2.7858	1.8778	14.2488	1.8802	3.8072	0.38048	3.18388	8.8825	3.2827	2.3885	1.8892	8.2285	0.8403	8.4882	5.18237	7.5078	8.4888	8.4224	1.5302	3.2353	4.21328
			8.4083	1.475	5.7788	8.8381	1.3384	8.5287	1.2233	2.7788	2.85	7.3015	2.833	11.1888	4.8577	2.8385	2.0358	1.2801	1.83878	8.8343	4.3741	3.8788	3.1015	8.418	8.3875	1.4883	2.88481	2.4008	8.3814	0.1887	0.7847	4.4812	1.402
			6.0284	3.7084	0.52307	8.583	2.888	8.2301	2.84188	1.5858	1.8578	8.3844	11.7838	5.8201	4.8578	8.583	8.088	5.41414	4.02577	5.0328	3.8134	2.2708	4.2803	2.8747	0.8888	2.8585	7.8888	3.2318	10.8872	3.3828	3.8037	2.7252	8.78238
		20	2.311	5.8454	2.88071	0.3848	1.8705	1.0184	2.78877	8.1378	2.8834	8.5313	4.4188	8.0255	0.8115	1.2841	17.4238	7.83707	2.32878	2.4781	8.0552	1.5082	8.8178	3.5147	18.8888	3.8328	5.77853	11.5553	0.423	3.5838	1.7118	3.3742	0.85128
			3.3304	1.4888	8.78828	3.8574	4.7481	2.248	4.84452	1.1885	11.271	1.7838	2.888	2.3712	2.8783	3.57	1.3841	3.8222	2.58231	3.8508	7.8788	5.1737	3.0428	1.8288	7.2718	3.8088	3.81817	1.7078	0.8881	3.7125	5.3228	1.7457	3.07882
			7.8883	1.1358	1.10818	0.8724	4.2888	3.843	2.00507	3.1877	2.1083	3.3058	4.3888	3.8053	8.3181	13.337	2.0287	1.20207	3.83784	8.3228	3.8833	1.1314	5.3088	2.5248	5.5584	2.272	8.80407	2.775	2.8887	3.2588	7.4402	10.8312	2.85738
			8.218	1.012	2.58071	0.8788	1.8881	5.843	4.05257	8.8723	2.0718	3.2028	4.8088	8.8802	5.2812	3.72	2.421	1.88115	5.57881	3.4811	5.384	7.4087	2.2828	1.1728	0.8388	4.8201	2.74838	0.8158	1.3711	3.7402	14.0881	1.2858	1.77008
			8.3587	8.3898	4.58374	1.8875	5.2834	4.5082	3.11854	3.1482	3.5741	5.3001	2.11	4.0838	2.388	3.8858	5.778	2.05288	8.55125	2.8038	1.1478	4.3483	8.213	2.4583	1.3841	2.4584	2.03845	4.878	8.4885	3.4828	4.3858	5.3348	2.45505
			3.8865	4.1888	1.44881	3.1884	2.8118	2.1442	3.22088	8.7888	3.2801	2.5885	8.4871	0.8111	11.7385	1.8357	2.8857	0.32887	4.85283	5.0148	4.8874	17.1818	3.0348	5.0058	2.5478	5.4882	8.80505	4.5104	4.822	4.8864	2.5812	5.2773	1.70858
			4.2827	5.3181	0.43528	8.2488	1.4233	8.0747	3.03237	1.201	2.8018	1.8317	1.4701	1.8248	3.8884	6.0373	0.3347	1.3158	5.08381	1.5311	4.2187	8.8873	2.4387	2.8252	1.4344	10.2134	2.82821	4.8828	1.5781	1.319	5.8201	0.8184	0.08477
			10.2018	2.7752	1.78854	8.2855	1.7548	0.7487	3.10888	3.5808	4.8032	11.1827	2.4515	5.5538	8.1485	1.4288	2.7125	8.24155	0.45408	2.8452	8.8823	2.2588	4.1581	14.0785	3.8858	3.0103	4.01008	11.7087	4.1828	1.8842	18.8058	1.3214	0.23831
			11.0165	5.4777	0.82875	1.812	4.5051	2.7181	5.47848	5.7558	8.0134	0.828	2.488	2.2818	1.4888	3.8504	7.8512	1.40438	1.88708	0.3482	3.7278	5.7883	13.5378	2.2781	5.2812	2.727	3.43184	2.3545	3.7727	15.2837	3.8558	1.7512	4.88313
			1.8708	8.1783	2.25147	2.3344	12.0258	0.2845	0.45285	0.5758	8.0808	8.3258	1.5748	2.5843	4.8487	4.1308	4.0738	2.03743	4.8138	0.848	5.8381	8.8178	1.1114	3.1082	4.2345	0.7817	8.58841	3.8411	3.5183	2.232	5.7834	0.7452	2.48503
		30	0.5701	1.8743	0.74285	7.0757	1.8055	10.8805	0.88528	8.8358	1.4828	5.8383	3.2507	7.8555	8.5182	5.008	18.7038	3.10715	3.38383	2.8707	3.8838	2.3533	1.8448	5.833	1.8843	1.888	1.55858	4.0887	3.4531	1.2551	2.8448	1.5808	1.80178
Estimator shape parameter			3.490813	1.86917	2.01536	2.007800	3.53246	3.30142	2.638096	3.382434	1.979056	1.410403	1.863400	1.360019	2.400085	1.700282	2.045451	2.30853	1.874087	2.301482	1.642702	1.747941	3.270400	2.613520	2.428152	2.441572	1.501945	2.200785	2.083362	1.984825	2.014823	2.831504	1.711017
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.850105	1.833572	1.463317	1.280854	1.03325	1.283087	1.232275	1.177881	1.808504	2.017441	2.428700	2.282948	1.808831	2.410822	1.628062	1.38388	2.212454	2.048344	2.08220	2.300249	1.182878	2.085857	1.748071	1.412735	2.173626	1.841727	1.788071	1.745251	1.84822	1.276484	2.13342
Control chart constant d2			1.087037	1.055280	1.08043	1.081198	1.088301	1.085087	1.075723	1.088305	1.059724	1.031823	1.055048	1.028092	1.071027	1.051086	1.080863	1.088849	1.0488	1.088525	1.045323	1.050288	1.085288	1.075281	1.071473	1.071787	1.042882	1.085828	1.081954	1.058742	1.080408	1.079084	1.048818
Control chart constant d3			0.881527	0.939344	0.934838	0.811458	0.900851	0.805031	0.818505	0.803825	0.935758	0.950211	0.83854	0.862081	0.823828	0.84301	0.811812	0.828482	0.848583	0.828822	0.847812	0.843888	0.8858	0.818082	0.923435	0.823108	0.850118	0.828287	0.833195	0.838203	0.834858	0.81428	0.845128
Control chart constant D4			3.442800	3.88185	3.85078	3.487478	3.440415	3.458871	3.528458	3.452185	3.880384	3.884945	3.883383	3.888892	3.585481	3.724099	3.488888	3.584577	3.755831	3.585672	3.767588	3.730222	3.458341	3.532041	3.581827	3.558584	3.787018	3.808511	3.838541	3.884221	3.850852	3.502828	3.742888
Upper control limit X			9.141848	10.53381	8.848877	8.888132	10.05087	11.50413	8.158008	11.11088	11.78042	13.05024	14.85421	12.38178	12.0537	14.48841	14.75882	10.13755	13.34131	13.81873	14.5275	14.33788	10.30824	16.87178	12.82123	8.248388	11.71404	14.01244	11.51557	12.48081	13.41227	8.928808	12.53531
Lower control limit X			-2.48317	-3.67828	-2.85045	-2.50198	-2.75115	-3.18417	-2.85429	-3.18883	-4.84007	-5.42071	-5.91808	-6.16788	-3.08378	-5.87312	-5.17841	-3.75383	-5.83108	-4.18383	-5.7152	-6.28848	-2.57212	-5.91884	-3.52721	-2.3508	-4.78345	-5.80581	-4.14486	-5.82203	-5.58241	-2.89981	-5.23488
Upper control limit MR			7.262731	8.228293	7.613143	7.848058	7.988063	9.175052	7.471277	8.838251	10.8173	12.87318	13.55031	12.38013	9.621598	13.34857	12.53288	8.888712	12.62876	11.38834	13.28712	13.47365	8.060285	14.42458	8.880121	7.375087	10.88373	12.78187	10.08528	11.70476	12.24338	7.9558	11.62415
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	1	1	1	0
Total false alarm in X			1	1	0	1	1	1	0	0	0	0	0	0	1	0	1	0	0	0	1	1	1	0	1	1	0	0	0	1	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	1	1	0
Total false alarm in MR			1	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	1	1	0	0	1	1	1	1	0
Sub-total X control charts with at least one false alarm k 30 =							103																										
Sub-total MR control charts with at least one false alarm k 30 =							94																										
Normal upper control limit X			8.935034	10.07550	8.485277	8.727058	8.825893	11.22880	8.882335	10.84695	11.28853	12.83553	14.27853	11.56031	11.87182	13.78177	14.34230	9.772097	12.84848	13.14748	13.78568	13.82707	10.08537	16.33887	11.83184	8.980230	11.08875	13.48442	11.0571	11.82487	12.84375	8.854788	11.81004
Normal lower control limit X			-2.28855	-3.22108	-2.58705	-2.24291	-2.52587	-2.88893	-2.38082	-2.82512	-4.13818	-4.808	-5.2354	-5.3485	-2.88198	-5.27548	-4.75888	-3.38817	-5.23825	-3.71438	-4.87335	-5.58567	-2.32825	-5.38381	-3.13782	-2.08185	-4.18818	-5.35788	-3.88848	-5.08828	-4.88388	-2.42588	-4.8894
Normal upper control limit MR			6.894384	8.188263	6.814851	7.354158	7.5888	8.67378	6.818778	8.461341	8.47815	10.71578	11.88888	10.38727	8.818811	11.71482	11.73613	8.08548	10.88833	10.35863	11.52523	11.804	7.81444	13.34825	8.073888	8.771871	8.374833	11.58412	9.058221	10.4381	10.95818	7.42224	10.14928
False alarm in X? (Y=1/N=0)			1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	0	0	1	0	0	0	1	1	1	0
Total false alarm in X			1	1	0	1	1	1	0	0	0	0	0	0	1	0	1	0	0	0	1	1	1	0	1	1	0	0	0	1	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	0	1	1	0	0	0	1	1	1	0
Total false alarm in MR			1	1	0	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	1	1	1	0	1	1	0	0	1	1	1	1	0
Sub-total normal X control charts with at least one false alarm k 30 =							113																										
Sub-total normal MR control charts with at least one false alarm k 30 =							120																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							6																										
Sub-total MR control charts with at least one false alarm k 1 =							5																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							8																										
Sub-total MR control charts with at least one false alarm k 1 =							7																										
False alarm in X? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							45																										
Sub-total MR control charts with at least one false alarm k 10 =							44																										
False alarm in X? (Y=1/N=0)			1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							55																										
Sub-total MR control charts with at least one false alarm k 10 =							57																										

OBJECTIVE # 3

Chi-square (df=4) k = 30 obs Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	6.7784	5.1568	8.2922	5.178	3.8007	4.843	7.4781	12.1422	4.8383	7.803	10.5584	10.2008	3.3354	8.8881	3.3748	4.3302	5.7588	3.8724	3.348	3.1552	4.4438	3.8888	5.8814	7.5841	13.4887	4.588	4.2371	4.8827	4.1731	3.1821	6.4058
			8.54	11.5342	8.081	3.4837	4.7035	8.7523	8.7429	6.6357	4.4878	12.2551	5.5827	5.8577	3.833	4.1078	5.8707	5.0141	11.3888	8.8887	3.2517	4.8588	5.2283	14.9104	5.8118	5.5592	5.8054	5.4803	4.7431	8.4423	5.8784	7.2841	4.2805
			7.8785	5.5738	6.6237	4.8012	4.34	6.0887	5.5533	5.9058	16.803	7.8508	6.3508	5.475	5.2457	4.8988	8.071	5.1238	4.1838	12.8541	3.887	4.3507	3.8404	7.8134	8.8032	8.8028	2.8718	8.6507	12.9354	10.3358	8.2738	3.9148	5.3888
			7.2105	8.8328	8.3051	4.044	7.1827	3.4088	8.8078	4.4885	8.6575	6.4181	8.8124	5.4225	8.5848	7.1458	12.0171	5.3085	4.7848	8.8888	3.8842	3.8078	8.5873	7.3145	7.8528	7.2558	4.4128	8.484	8.2703	7.338	8.3328	13.294	14.3888
			7.2382	8.0757	7.8647	8.1898	4.8845	8.787	7.0891	4.8958	6.0821	4.4821	5.8787	5.6344	4.5815	4.1583	7.4888	18.0513	8.9533	5.9255	5.2088	4.0303	10.154	7.328	4.828	7.2771	8.0308	7.5818	3.8881	10.5245	5.0278	14.8868	8.45
			7.1858	5.7268	7.8067	4.2984	8.1407	5.0557	13.0582	7.8413	13.292	11.5411	4.334	6.1158	7.5727	6.5508	8.4952	4.0115	6.3124	4.2008	4.5782	8.0332	8.8594	8.1311	8.1077	7.1332	8.4333	5.9595	8.2018	4.5431	8.358	8.7872	4.1124
			5.2029	11.2473	3.8803	4.784	3.4371	8.1508	4.335	3.0317	6.5173	5.7782	5.8723	5.6057	5.2058	6.9874	8.3851	3.8895	8.8828	8.312	10.5858	4.8871	8.0221	4.2808	3.8155	11.4938	8.7858	4.8302	11.0701	8.2074	3.1254	3.4188	8.7861
			8.0378	3.8808	5.4673	4.2114	8.1847	8.4138	6.3384	14.208	7.4843	7.6372	2.8828	7.7807	3.588	4.115	5.7575	7.0051	5.8524	5.4308	4.8887	11.1087	4.7521	5.784	3.7878	13.4383	6.5781	5.4532	4.848	9.4123	3.7383	5.4024	11.0282
			4.2088	4.8218	4.8251	4.5317	4.9248	5.8254	7.5147	3.7888	5.0882	4.5078	8.0332	8.6704	3.9388	7.8853	8.0884	5.9858	5.2283	5.7281	8.7187	8.5185	5.454	8.8057	4.1818	18.0382	5.8858	3.7344	21.2834	4.8438	4.338	4.817	17.5778
		10	5.4700	5.0048	8.6348	5.5334	10.4086	5.9101	7.1723	10.3051	8.0828	5.3234	7.7158	4.8202	4.2588	11.7875	3.8338	4.1802	14.7483	8.2843	8.948	4.4081	8.754	12.578	5.5285	7.5852	4.7718	4.4052	7.2828	9.8384	5.4453	18.1148	5.5372
			8.5725	8.0748	7.5531	3.7243	8.4421	7.1002	8.5858	4.8324	5.0107	4.4188	8.4555	8.8582	3.5815	7.4487	3.814	5.7355	13.7788	5.848	8.8101	5.8577	8.2311	5.7083	3.3158	4.3728	8.7204	8.2021	8.8754	5.188	4.7388	4.8263	8.4878
			3.1433	4.2278	4.8483	4.7717	8.2724	7.0118	18.584	3.7893	6.138	5.8048	8.1834	11.0095	3.8014	7.8573	3.3384	7.1743	8.2372	7.8171	8.3447	8.2087	9.848	3.1515	5.3452	3.8054	8.2178	8.3508	8.8192	7.4858	3.8888	10.128	11.4488
			10.8058	4.9451	3.7083	10.2888	8.5752	3.7055	7.1723	4.54	4.4742	8.352	4.8154	8.5082	7.1428	4.871	3.8325	3.3015	4.3278	7.0788	8.81	3.8213	5.1224	18.0383	3.882	7.3224	4.0474	10.0795	3.4482	8.4087	5.3372	8.8803	3.8872
			4.5035	8.1745	7.0353	8.315	4.4818	6.3475	3.8588	6.8478	7.8411	8.1528	8.7985	4.8088	8.5082	5.8835	5.2388	8.7314	7.4154	8.2778	3.2758	5.0752	4.8438	5.1813	7.2732	7.5083	3.8228	8.0884	8.3347	14.2889	8.8288	9.8537	7.7887
New observations k =			7.7037	8.2435	5.5883	6.8281	3.7342	3.9202	5.8618	7.2517	8.2018	4.8995	5.8404	8.0554	7.8018	8.8105	18.5884	7.8958	5.4095	3.782	10.7488	8.8888	8.2441	4.3281	4.7214	2.8477	8.2315	8.3033	9.887	4.5892	5.748	3.8758	8.3172
			5.0821	8.5104	4.223	8.7125	5.8458	3.4081	8.4788	8.0553	4.4175	7.1138	8.864	7.8484	4.4011	8.1735	5.2911	8.5352	8.558	8.1888	8.5011	5.0783	5.4804	5.3842	8.0821	4.551	3.8075	8.7585	5.5391	5.5878	3.8008	5.3302	5.7317
			4.0425	7.4547	10.0348	8.8828	4.3805	8.3995	8.8085	9.2741	8.8983	10.2095	4.5284	7.3383	8.0708	5.8844	3.8318	6.3585	8.8522	5.7403	5.282	10.3448	10.84	5.7838	2.845	7.0311	12.3278	8.1614	4.8481	5.7383	5.0784	9.1548	8.8388
			3.8784	6.3488	12.7823	11.7312	7.1284	8.882	7.838	6.7832	4.3881	8.1278	10.8281	8.8871	8.8025	3.8272	8.1858	5.4185	4.2731	6.8123	4.8881	4.5838	13.7474	8.8808	8.855	8.3257	4.8455	4.5098	3.8874	7.0285	4.8387	4.8378	3.8838
			5.0533	8.9068	7.3827	8.3584	4.4002	12.8315	8.7182	5.524	8.8982	8.8023	10.8841	8.4835	3.8871	7.1478	7.7188	6.9838	8.4422	10.1715	8.8807	8.5858	11.3488	17.1888	9.4547	10.5878	8.488	3.9385	3.8888	5.2287	5.0878	3.0848	8.7588
		20	6.2708	12.5138	15.9837	3.8708	5.7818	3.2014	10.8523	3.8341	7.3282	9.404	10.7842	8.5055	8.0821	13.2251	8.3085	5.8888	8.1258	13.0713	13.4704	5.1833	4.2788	8.2043	10.7573	7.8823	8.8877	11.8322	4.4325	5.0381	8.7088	5.5524	9.4888
			3.8678	5.3871	11.7738	7.8888	7.8838	8.0988	4.9582	8.7587	5.7557	6.8418	7.8083	8.2538	8.5034	7.2343	10.5187	8.8871	5.4884	8.8885	8.7883	5.8544	7.0558	5.8418	5.7738	8.0557	8.8808	5.9538	8.8383	5.8471	11.1348	8.4382	7.3528
			5.7411	4.7284	8.1017	4.9818	10.5888	14.8418	5.287	3.9837	7.5115	12.0227	7.8872	13.778	3.8502	5.9483	2.8752	8.3837	4.3235	4.4802	7.0418	4.8832	8.8885	7.8887	4.4207	3.212	5.7185	7.283	5.9801	7.8895	7.1381	4.9023	5.2752
			3.8184	11.8528	4.832	5.0705	5.358	3.5751	11.1824	8.1525	4.4021	11.1348	8.4834	7.4075	8.1228	11.0081	5.1387	3.8472	8.3043	5.7488	3.8735	8.542	10.118	4.7711	4.0318	8.4882	5.0318	3.1488	4.5044	4.8271	4.4778	5.1143	7.8174
			10.8182	6.1382	9.1088	8.4724	4.5314	7.1834	8.0788	5.521	11.7208	3.6824	8.817	7.3132	8.8143	8.6204	7.8148	10.3788	4.8148	4.0535	3.9883	2.8848	5.8054	13.0328	5.3848	8.3882	7.1295	8.5323	9.0248	8.1353	8.2848	8.874	10.1754
			7.1317	7.3882	4.8955	7.0074	13.1822	5.1248	4.8848	14.5338	4.7895	7.2818	5.028	8.2351	4.851	7.9284	4.7443	5.2108	14.7081	10.788	10.4374	5.8587	3.8508	8.004	7.5735	3.7078	7.2811	5.8018	5.6258	8.7028	10.0888	15.9553	8.1804
			10.7198	5.8304	7.2304	5.1758	8.4088	5.8737	8.4088	18.8257	5.8818	4.8749	11.4173	8.4218	3.8858	8.0717	4.2588	8.7277	4.7448	5.55	8.4084	10.8531	4.0888	3.4288	3.8005	8.8081	8.4888	5.9188	11.8845	4.9422	8.5703	14.802	5.5881
			15.0914	4.7488	5.1518	8.8241	8.8773	4.0532	7.4858	7.4138	3.388	5.7818	4.4152	4.7782	7.553	13.7208	4.9881	8.8877	7.7185	6.2038	5.2584	4.3088	4.5182	10.1417	7.805	17.5877	3.8338	8.6317	5.888	5.7243	3.044	4.354	8.3528
			8.4888	4.0323	8.827	2.9807	9.3028	4.9302	8.4402	11.4571	5.2025	7.2115	5.7281	4.8188	3.87	8.8704	5.0308	4.5524	3.1283	8.281	8.5882	3.1774	5.8388	8.5258	11.9442	4.1582	7.7587	8.8807	8.3572	8.278	3.8524	5.558	5.3824
			3.2365	8.0546	8.8715	4.8801	4.5831	5.3401	8.3382	8.8708	10.752	7.04	8.707	8.3717	8.8782	3.8012	8.4183	4.2274	4.007	8.2348	3.7877	8.8778	14.348	7.1554	8.3815	4.4055	3.0358	8.1331	3.818	8.8032	16.011	7.8887	4.3182
		30	7.4058	4.2538	7.4888	12.8298	7.2552	8.8872	4.178	9.8484	7.3055	6.7788	5.087	11.8708	7.2118	14.1834	7.2508	3.7154	8.2281	4.8183	8.584	5.8838	4.9184	3.1471	5.1884	8.2244	8.0848	8.8851	7.5823	3.138	8.1888	7.7885	8.8498
Estimator shape parameter			3.498813	1.88817	2.01538	2.987880	3.53248	3.30142	2.838086	3.362434	1.978058	1.410403	1.883400	1.380818	2.400085	1.788262	2.945451	2.30853	1.874887	2.301492	1.842702	1.747841	3.270488	2.813528	2.420152	2.441572	1.581845	2.200785	2.083382	1.884825	2.014823	2.831504	1.711017
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.850105	1.833572	1.483317	1.280854	1.03325	1.283087	1.232275	1.177881	1.808504	2.917441	2.420788	2.282848	1.888831	2.410822	1.828882	1.38388	2.212454	2.048344	2.88228	2.300248	1.182878	2.085857	1.748071	1.412735	2.173828	1.841727	1.788071	1.745251	1.84822	1.278484	2.13342
Control chart constant d2			1.087837	1.055268	1.08043	1.081198	1.088301	1.085887	1.075723	1.088385	1.058224	1.031623	1.055048	1.028082	1.071027	1.051088	1.080883	1.088849	1.0488	1.088525	1.045323	1.060288	1.085288	1.075281	1.071473	1.071787	1.042882	1.085928	1.081854	1.058742	1.080408	1.078084	1.048818
Control chart constant d3			0.881527	0.838344	0.834838	0.811458	0.800851	0.805031	0.818505	0.803825	0.835758	0.858211	0.83854	0.882081	0.823828	0.84301	0.811812	0.828482	0.848583	0.828822	0.847812	0.843888	0.8858	0.818882	0.823435	0.823108	0.850118	0.828287	0.833195	0.838203	0.834858	0.81428	0.845128
Control chart constant D4			3.442809	3.68185	3.85078	3.487478	3.440415	3.458871	3.528458	3.452185	3.880384	3.884845	3.883383	3.888892	3.585481	3.724888	3.488888	3.584577	3.755831	3.585572	3.787588	3.730222	3.458341	3.532041	3.581827	3.550584	3.787018	3.808511	3.838541	3.884221	3.850852	3.502828	3.742888
Upper contro limit X			8.141848	10.53381	8.848877	8.888132	10.05087	11.50413	8.158888	11.11088	11.78042	13.85024	14.85421	12.38178	12.0537	14.48841	14.75882	10.13755	13.34131	13.81873	14.5275	14.33788	10.30824	16.87178	12.02123	8.248388	11.71404	14.01244	11.51557	12.48881	13.41227	8.828888	12.53531
Lower control limit X			-2.49317	-3.67828	-2.85045	-2.50188	-2.75115	-3.18417	-2.85428	-3.18883	-4.84007	-5.42071	-5.81008	-8.16788	-3.06378	-5.87312	-5.17841	-3.75383	-5.83108	-4.18383	-5.7152	-8.29848	-2.57212	-5.81884	-3.52721	-2.3508	-4.78345	-5.80581	-4.14485	-5.82203	-5.58241	-2.88881	-5.23488
Upper control limit MR			7.262731	8.228293	7.613143	7.848050	7.988963	8.175052	7.471277	8.838251	10.8173	12.87318	13.55031	12.38013	8.821580	13.34957	12.53298	8.888712	12.82978	11.38834	13.28712	13.47356	8.080285	14.42458	8.880121	7.375887	10.88373	12.76187	10.08528	11.70478	12.24338	7.8558	11.82415
False alarm in X? (Y=1/N=0)			0	1	1	0	1	0	1	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	1	0	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	0	1	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	0	1	1	0	0	1	0	1	0
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	0	0	1	0	1	1	0
Total false alarm in X			1	1	1	1	1	1	1	1	1	0	0	1	0	0	1	1	1	0	0	0	1	1	0	1	1	0	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
Total false alarm in MR			1	0	1	0	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0	1	1	0	1	0	0	1	1
Sub-total X control charts with at least one false alarm k 30 =							187																										
Sub-total MR control charts with at least one false alarm k 30 =							99																										
Normal upper control limit X			8.935034	10.07558	8.485277	9.727058	9.825893	11.22888	8.882335	10.84885	11.28953	12.83553	14.27853	11.58031	11.67182	13.78177	14.34238	8.772087	12.84848	13.14748	13.78588	13.82707	10.08537	18.33887	11.83184	8.980238	11.08875	13.48442	11.0571	11.82487	12.84375	8.654788	11.81004
Normal lower control limit X			-2.28855	-3.22108	-2.58705	-2.24281	-2.52587	-2.88893	-2.38082	-2.92512	-4.13818	-4.808	-5.2354	-5.3485	-2.88198	-5.27548	-4.75888	-3.38817	-5.23825	-3.71438	-4.87335	-5.58587	-2.32825	-5.38381	-3.13782	-2.08185	-4.18818	-5.35788	-3.88848	-5.08828	-4.88388	-2.42588	-4.8094
Normal upper control limit MR			8.894384	8.188283	8.814851	7.354158	7.5888	8.87378	8.818778	8.481341	8.47815	10.71578	11.98888	10.38727	8.818811	11.71482	11.73813	8.08548	10.98833	10.35883	11.52523	11.804	7.81444	13.34825	8.073888	8.771871	8.374833	11.58412	8.058221	10.4381	10.85818	7.42224	10.14828
False alarm in X? (Y=1/N=0)			0	1	1	0	1	0	1	1	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	1	1	0	1	0	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	0	1	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	1	0	1	1	0	0	1	0	1	0
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1	0	0	0	1	0	1	1	0	0	1	0	1	1	0
Total false alarm in X			1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	1	0	0	0	1	1	1	1	1	0	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0
Total false alarm in MR			1	0	1	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	1	0	1	1	0	1	0	1	1	1
Sub-total normal X control charts with at least one false alarm k 30 =							194																										
Sub-total normal MR control charts with at least one false alarm k 30 =							131																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							20																										
Sub-total MR control charts with at least one false alarm k 1 =							11																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							23																										
Sub-total MR control charts with at least one false alarm k 1 =							15																										
False alarm in X? (Y=1/N=0)			0	1	1	0	1	0	1	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	0	1	1
Sub-total X control charts with at least one false alarm k 10 =							111																										
Sub-total MR control charts with at least one false alarm k 10 =							49																										
False alarm in X? (Y=1/N=0)			0	1	1	0	1	0	1	1	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	1	1	0	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	1	0	0	1	1
Sub-total X control charts with at least one false alarm k 10 =							130																										
Sub-total MR control charts with at least one false alarm k 10 =							70																										

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Chi-square (df=4)		k = 30 obs		Shift 2 process standard deviation																													
		1	8.7408	8.1871	7.0133	8.8898	8.2712	8.6709	7.5834	14.4818	10.0792	11.7121	6.1124	8.5108	12.0751	5.9723	7.9785	17.5812	11.8334	11.984	9.1083	8.5714	6.1501	9.8804	10.5275	10.8883	9.2327	9.3882	12.3287	18.0072	7.8026	8.7398	15.7821
			8.1371	11.9783	10.0834	8.8081	14.2928	11.0007	8.4792	11.0818	14.5043	12.8533	8.8857	8.6848	8.4866	7.5298	11.0582	9.0331	7.0151	14.7182	12.7289	10.1083	11.0822	9.8029	9.6831	8.9018	6.488	7.8971	12.7072	7.7155	13.7488	13.8588	6.1812
			14.4825	8.5678	11.0078	9.3854	15.8899	9.0831	8.1686	8.4451	21.2893	7.8504	7.5813	8.2232	7.8363	7.7258	12.8087	5.8843	13.5478	10.1935	7.8804	10.0823	8.4158	8.0893	7.5872	8.171	6.3523	8.8383	13.1982	7.9481	7.7893	8.924	12.2448
			8.7128	11.4444	8.6342	7.8022	8.8253	9.7812	8.3835	9.4788	8.0524	7.2057	7.5833	7.8312	8.312	7.1854	9.5788	8.8983	7.8705	8.1157	14.484	6.0862	12.1051	8.8292	9.8891	8.805	8.7219	8.1708	7.5585	11.0081	12.0834	13.8389	10.8081
			7.3891	10.2985	14.8553	15.3781	5.8863	8.3082	7.585	8.8405	12.0449	17.7575	8.4148	11.6115	10.1171	9.5189	8.0288	8.0924	14.0875	7.0775	6.4541	10.2023	11.3383	7.2223	7.7023	7.6317	8.3803	9.885	8.5858	9.1025	8.1886	12.2287	11.423
			8.1284	6.7638	10.1274	6.4141	10.3172	13.3481	7.6888	11.2524	9.0833	8.3838	11.0237	8.9228	9.7818	8.1385	10.8801	12.8755	12.0131	15.2508	10.2833	8.3188	8.5158	7.9483	21.0864	12.7863	8.3241	11.2384	7.3578	7.0528	7.7475	9.5128	7.624
			11.1742	6.8257	9.858	8.2028	7.6307	13.6555	6.0531	13.4898	9.482	10.4257	7.2115	8.1878	7.882	8.1884	6.3258	15.2822	10.8813	17.181	12.5445	7.4854	7.3548	8.9848	10.2824	9.4024	12.0888	9.4882	7.2283	7.885	14.3187	7.2881	8.9118
			8.8113	10.267	10.5558	7.8484	7.7972	7.8757	10.5533	16.4595	7.1188	10.8937	12.4398	8.8428	7.3275	10.1883	8.7187	11.9788	12.9329	9.0351	7.7154	8.3588	8.8085	14.3003	8.5157	9.2028	13.783	7.887	10.3858	11.8122	8.2833	8.7774	12.4481
			8.5732	10.8888	8.4525	7.1542	8.3811	11.8963	10.8213	12.8545	9.1888	14.0717	8.4274	7.5424	7.2515	10.2438	10.4228	13.4425	9.9188	9.8078	5.8455	8.9808	9.308	8.383	8.0888	8.8188	8.8717	9.1328	11.1787	8.388	8.8288	12.1812	8.8862
		10	8.0284	7.1118	9.7881	8.2845	9.4575	17.8823	9.815	7.7782	9.8403	8.4775	7.628	8.3483	13.1021	8.1188	15.7475	14.0857	12.3488	7.281	13.3151	10.3252	6.8887	9.4872	11.1444	8.5785	11.7525	11.5235	7.4827	7.6271	7.3181	8.8877	8.8353
			7.7572	8.1157	14.1707	6.0811	8.8474	12.1048	15.3038	10.8378	10.331	11.4118	13.8835	8.3118	11.8558	8.3744	8.8887	12.8588	11.1	8.2857	9.1481	17.5285	9.2353	13.2427	7.0534	8.8548	8.8941	7.882	15.8735	7.0083	7.8824	8.6408	8.4378
			7.4278	11.8422	11.5841	9.0875	9.3721	8.8053	9.3188	12.8345	9.2388	8.9585	14.8807	8.9023	11.8542	12.2885	7.85	9.6214	9.4258	8.3184	8.9862	7.8103	7.88	7.0372	8.8888	7.3887	9.8018	8.8951	20.8871	7.0887	10.583	15.1148	7.8835
			15.1442	9.8138	10.4538	8.944	14.0918	8.8753	13.4622	8.5718	7.2392	13.7171	10.1702	7.9748	8.1718	12.8134	11.2205	9.8919	9.7408	12.9408	8.8864	9.2075	14.9084	9.562	14.1148	9.7248	8.2917	8.67	10.1738	8.7357	13.2881	7.4881	10.5588
			8.933	9.7718	8.3718	8.3721	10.5007	8.8485	5.7882	10.1202	8.8357	7.3504	8.3732	9.6748	7.2554	11.4788	14.7888	9.7108	11.1423	7.4223	8.1821	7.5848	11.1472	21.8428	8.3292	7.8314	14.3188	13.3273	8.98	18.345	8.7118	8.5844	8.819
New observations k =			10.2158	6.3724	7.5258	10.5305	7.0052	8.9884	10.7807	8.6255	5.8789	15.4707	11.2241	8.8284	11.4838	11.3132	13.3053	5.8893	8.0828	8.9287	13.756	10.152	8.531	8.2722	15.8788	7.471	7.8052	10.9052	8.4835	8.0794	9.444	11.527	18.5885
			9.3208	8.4343	10.1308	19.4221	9.777	8.6575	8.7714	10.2845	8.8898	10.7838	7.1802	6.2858	11.8883	8.8432	7.0885	7.1888	8.8718	13.1003	10.8741	5.8105	8.6408	18.1102	7.0508	18.1887	6.371	7.8725	8.4542	7.2728	8.8133	11.9571	8.3752
			7.5213	7.1831	8.7874	7.4458	6.4128	7.0433	18.8138	12.8873	7.0554	11.8572	9.2558	7.2438	9.884	7.8888	10.0877	8.484	13.9844	10.4443	10.4818	7.301	8.4584	8.8818	7.5885	8.881	6.3475	11.0338	8.4478	7.7187	17.2441	9.1842	7.3712
			8.3585	6.7881	8.8773	12.2388	7.0127	15.2588	8.1131	6.8048	7.3812	8.3858	8.0154	8.3085	12.2425	7.8853	12.7283	11.2485	8.9584	9.2868	7.28	8.8407	18.9582	8.7811	9.2122	7.7584	18.9801	8.5584	8.7482	10.8512	7.2158	8.1808	8.5127
			8.0174	6.5853	8.5828	12.3151	8.8171	8.8708	8.284	11.7318	11.8107	8.8828	7.8384	8.9828	9.181	10.8855	10.8254	9.1231	7.4017	8.8084	12.8754	12.2838	12.8345	7.4331	8.854	9.1574	8.2782	7.8078	6.84	9.5813	8.8278	11.2783	6.3158
		20	8.8954	12.4818	6.0025	6.8548	8.5832	12.4187	10.1837	11.7471	8.4213	8.0788	9.8498	10.7318	9.4882	8.7728	14.1107	15.3043	11.4901	8.8824	8.4513	15.2203	14.8523	11.0749	12.857	8.1	7.2857	8.4978	5.7828	5.8214	12.4183	7.845	7.4848
			9.3407	7.0331	25.1831	12.1307	10.416	8.4864	7.7085	7.8103	6.4578	8.6893	9.1428	7.1783	8.3582	18.8107	15.8485	8.3058	8.8828	8.8031	10.7757	8.7344	12.1781	8.7733	10.4705	13.5838	9.2831	10.3288	9.8845	8.2814	10.888	9.8018	10.2805
			7.8008	6.7303	8.4814	10.5577	8.3838	8.3504	6.5847	11.3878	6.2471	7.2748	9.4817	10.4318	8.838	10.7102	10.5118	8.4713	7.8218	8.883	6.7374	7.3334	9.8864	10.2585	13.5878	9.4778	12.1718	7.8118	7.9785	6.5802	8.0218	11.0832	9.1811
			7.5435	7.0478	11.8158	8.3583	10.8188	7.4788	8.2088	7.8834	7.8012	8.4033	7.8284	17.5347	8.6183	12.4882	8.8325	13.1581	9.3288	7.4858	13.3815	11.3254	11.3042	9.8771	21.7884	12.7072	8.758	8.0868	8.8721	7.4804	9.3281	17.8737	11.8848
			8.9695	10.7288	6.0588	14.1512	8.5338	13.5801	12.5484	8.4352	10.7033	8.878	8.4037	12.004	7.2585	13.1883	5.8132	6.81	17.2402	12.8883	10.581	8.5808	11.8415	10.7714	11.0514	11.5213	7.5776	7.392	7.4388	8.0808	10.25	8.1481	12.4818
			13.4108	8.8448	13.5773	13.2717	8.8382	8.8848	8.7813	8.7242	9.0542	10.0213	8.9731	8.7828	10.5848	7.433	9.3888	7.0403	7.9177	6.8894	10.1835	9.1224	7.2188	7.728	13.3267	16.3572	10.2484	7.2408	10.7835	10.888	18.2024	8.0581	6.7901
			7.228	11.2988	8.8783	9.1485	10.7601	13.105	5.8144	8.5055	12.3804	9.8188	11.3728	8.5032	10.7282	8.4578	7.1881	10.3385	7.5514	6.8092	18.2582	11.0741	7.4752	8.1111	8.5884	6.4024	7.7285	7.8314	13.4028	12.8821	18.9818	9.458	7.5284
			7.983	13.7018	6.8827	10.4578	14.5418	13.1507	13.5113	13.4575	8.3244	14.6143	15.9752	10.0288	6.8803	8.8288	7.2385	7.8288	7.5704	8.3114	8.7818	11.24	8.7388	6.3884	12.712	10.8888	7.8013	6.0083	10.3477	12.077	13.9853	14.3595	12.451
			14.1122	11.3244	7.0248	7.4788	6.7001	8.5751	8.884	12.722	8.283	12.1214	8.5545	6.3458	8.8583	8.3573	7.1578	7.6773	7.7775	10.8181	6.8261	8.0808	10.6587	10.7795	12.0023	7.1388	10.2318	11.8111	8.8783	8.1385	13.178	9.3252	7.842
			12.3895	7.3298	7.2758	9.1383	6.5308	7.88	6.8031	8.515	8.5785	8.8141	12.6485	8.0181	6.1524	10.8233	8.8255	10.2171	17.4438	8.8872	10.0271	20.8185	9.4451	16.4323	8.1863	15.7417	12.8501	7.8715	8.2528	11.1428	8.5741	7.0714	11.0805
		30	13.3897	6.8857	11.0275	7.7174	8.8172	9.2827	15.2012	6.1181	8.8887	6.7447	14.8808	10.3138	6.1111	8.7723	7.1874	11.3198	6.2278	14.5787	8.9887	8.8511	8.1851	9.8088	13.813	8.0538	5.9857	6.185	6.5183	8.8088	11.8459	8.4257	6.845
Estimator shape parameter			3.498813	1.88817	2.81536	2.887888	3.53248	3.30142	2.838098	3.362434	1.979056	1.410403	1.883409	1.380818	2.408085	1.768282	2.845451	2.30853	1.874887	2.301482	1.842702	1.747841	3.270489	2.813528	2.428152	2.441572	1.581845	2.200795	2.083382	1.884925	2.014823	2.831504	1.711017
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			0.950105	1.833572	1.483317	1.280854	1.03325	1.283087	1.232275	1.177891	1.808504	2.817441	2.426788	2.282848	1.868831	2.410822	1.828882	1.38388	2.212454	2.048344	2.88228	2.300248	1.182878	2.085857	1.748071	1.412735	2.173828	1.841727	1.788071	1.745251	1.94822	1.278494	2.13342
Control chart constant d2			1.087937	1.055288	1.08043	1.081188	1.088301	1.085867	1.075723	1.088395	1.059224	1.031823	1.055048	1.028092	1.071027	1.051088	1.080883	1.088849	1.0488	1.088525	1.045323	1.050288	1.085288	1.075281	1.071473	1.071787	1.042882	1.085828	1.081854	1.058742	1.080408	1.078084	1.048818
Control chart constant d3			0.901527	0.938344	0.934836	0.911456	0.900951	0.905031	0.918505	0.903825	0.935758	0.858211	0.93854	0.862081	0.823828	0.84301	0.811812	0.928482	0.948583	0.828822	0.847812	0.843888	0.9058	0.818882	0.923435	0.823108	0.858118	0.929287	0.933185	0.938203	0.834858	0.91428	0.945128
Control chart constant D4			3.442808	3.88185	3.85078	3.487478	3.440415	3.458871	3.528458	3.452185	3.880384	3.864845	3.803383	3.888892	3.585481	3.724088	3.488888	3.584577	3.755831	3.585572	3.787588	3.730222	3.459341	3.532041	3.581827	3.558584	3.787018	3.808511	3.838541	3.884221	3.850852	3.502828	3.742888
Upper contro limit X			8.141848	10.53381	8.848877	8.986132	10.05097	11.50413	8.158008	11.11088	11.78042	13.85024	14.85421	12.38178	12.0537	14.48841	14.75882	10.13755	13.34131	13.81873	14.5275	14.33788	10.30824	18.87178	12.02123	8.248388	11.71404	14.01244	11.51557	12.48081	13.41227	9.828808	12.53531
Lower control limit X			-2.49317	-3.87829	-2.85045	-2.50188	-2.75115	-3.18417	-2.85428	-3.18883	-4.84007	-5.42071	-5.91008	-6.16798	-3.08378	-5.87312	-5.17841	-3.75383	-5.83108	-4.18383	-5.7152	-6.28848	-2.57212	-5.81884	-3.52721	-2.3508	-4.78345	-5.80581	-4.14485	-5.82203	-5.58241	-2.89881	-5.23488
Upper control limit MR			7.282731	8.228293	7.813143	7.848058	7.888983	9.175052	7.471277	8.838251	10.8173	12.87318	13.55031	12.38013	8.821588	13.34857	12.53298	8.888712	12.82878	11.38834	13.28712	13.47355	8.080285	14.42458	8.880121	7.375887	10.88373	12.78187	10.08528	11.70478	12.24338	7.9558	11.82415
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	0	1	1	1	1	1	1	0	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1
False alarm in MR? (Y=1/N=0)			1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0
Total false alarm in MR			1	0	1	1	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0	1	1	1	0	1	0	0	1	1
Sub-total X control charts with at least one false alarm k 30 =							235																										
Sub-total MR control charts with at least one false alarm k 30 =							97																										
Normal upper control limit X			8.935034	10.07559	8.495277	8.727058	9.825683	11.22889	8.882335	10.84895	11.28953	12.83553	14.27053	11.56031	11.67102	13.79177	14.34230	8.772097	12.84849	13.14748	13.78566	13.82707	10.08537	16.33907	11.83184	8.980238	11.08875	13.46442	11.0571	11.92487	12.84375	9.654789	11.81004
Normal lower control limit X			-2.28655	-3.22108	-2.59705	-2.24291	-2.52587	-2.88893	-2.38082	-2.92512	-4.13818	-4.808	-5.2354	-5.3485	-2.88198	-5.27548	-4.75088	-3.38817	-5.23825	-3.71438	-4.97335	-5.58587	-2.32825	-5.38391	-3.13782	-2.08185	-4.18818	-5.35788	-3.88848	-5.08829	-4.98389	-2.42589	-4.8084
Normal upper control limit MR			6.894384	8.189283	8.814951	7.354156	7.5886	8.87376	6.919778	8.481341	9.47815	10.71578	11.98968	10.38727	8.818811	11.71482	11.73813	8.08548	10.98833	10.35983	11.52523	11.884	7.81444	13.34825	9.073988	8.771871	9.374833	11.58412	9.058221	10.4391	10.85818	7.42224	10.14828
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	1	1	1	1	1	0	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1
False alarm in MR? (Y=1/N=0)			1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	1	0	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0	1	0
Total false alarm in MR			1	0	1	1	1	0	1	1	1	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1	1	0	1	0	0	1	1
Sub-total normal X control charts with at least one false alarm k 30 =							239																										
Sub-total normal MR control charts with at least one false alarm k 30 =							125																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Sub-total X control charts with at least one false alarm k 1 =							43																										
Sub-total MR control charts with at least one false alarm k 1 =							25																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1
Sub-total X control charts with at least one false alarm k 1 =							48																										
Sub-total MR control charts with at least one false alarm k 1 =							32																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							188																										
Sub-total MR control charts with at least one false alarm k 10 =							53																										
False alarm in X? (Y=1/N=0)			1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							201																										
Sub-total MR control charts with at least one false alarm k 10 =							86																										

OBJECTIVE # 3

CHI-SQUARE (df = 4) k = 60 obs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			6.03	2.037	7.2864	6.1858	2.3148	1.0726	7.319	4.8078	3.8758	0.72151	5.8051	1.063	3.7332	1.4819	4.4168	4.2811	1.2802	1.4933	1.639	4.7814	3.6282	4.934	4.0048	10.027	2.3803	2.73675	4.8005	2.46443	6.1061	6.33	2.8037
			1.6406	1.37	6.8263	6.6328	4.6938	4.3026	3.689	1.3067	1.7689	7.43766	6.6737	6.2132	6.0294	3.1006	3.0187	3.2608	7.1036	1.3813	4.6387	4.0822	0.4365	1.9595	4.0962	4.3306	3.6268	4.25066	2.4879	6.0214	3.3006	6.6042	1.0896
			1.4657	0.7031	6.0463	3.2284	0.9043	2.103	2.9953	3.8074	4.7773	4.0371	0.6858	0.7007	7.1616	2.4384	4.0076	2.2237	4.7733	7.0009	0.0017	3.0126	3.6024	1.6601	7.1301	1.0032	2.728	0.30004	2.0318	3.30428	1.1246	3.4072	1.1013
			5.1014	0.3809	7.4788	13.3472	4.6681	6.3608	10.3806	2.3821	1.4138	3.46028	2.1146	13.1247	4.5026	2.68	1.4638	2.0301	1.0303	12.2232	0.8817	0.3068	3.0014	6.264	3.0056	4.0326	1.1082	3.05436	2.408	0.07214	0.0158	6.1080	3.7222
			2.6633	4.0823	6.0061	1.0093	4.6548	0.0394	2.2027	3.2836	6.0783	4.60066	0.7449	4.0007	3.618	3.7168	3.9008	2.4247	4.2007	6.0032	1.4838	2.0026	16.3001	1.3307	6.7098	3.7411	0.0000	3.70062	0.7392	0.77409	2.0636	0.1073	2.6484
			2.0878	11.6414	1.1812	0.3807	2.3472	1.0233	0.0425	0.6782	3.4037	4.40061	2.0641	1.7098	4.0899	10.0449	7.0413	1.1282	0.0194	12.9476	2.1028	7.0877	2.9718	4.0021	2.1418	2.1942	2.6187	4.06244	3.4004	0.70076	7.4684	1.6621	6.2960
			2.7077	6.3417	2.5288	1.3137	7.7224	6.0098	0.9814	1.7038	7.0026	6.91003	0.0437	7.3688	4.106	6.6944	1.0018	3.3268	4.4049	2.0683	3.0363	2.1728	7.0508	0.9678	2.7687	3.4168	2.0004	2.40728	1.203	2.73000	1.7213	6.6042	1.1632
			2.3708	2.9803	2.4722	2.0683	0.3181	3.0303	2.1386	0.8387	2.0138	3.07604	10.6606	6.0802	3.9246	3.144	2.9048	2.2067	3.6263	3.2142	0.4448	1.2482	2.2362	6.3008	0.3089	6.4636	2.2142	4.28562	1.2012	3.60102	4.33	1.4443	0.6118
			2.9634	3.0462	3.8068	4.1408	4.307	1.6178	3.6748	8.7606	4.0526	3.11048	10.3738	4.6621	11.7741	2.018	16.2067	4.1834	3.0008	2.2444	11.4308	0.8587	4.6644	0.0308	2.6478	2.6613	2.7748	2.731	0.769	2.00234	2.6381	6.4333	6.4374
			3.1006	0.0967	3.9031	1.6086	7.0874	3.106	2.6953	0.787	4.3401	2.03432	1.0038	1.0600	6.006	6.3593	6.0060	0.2167	0.6008	6.7362	1.4984	0.9028	1.7618	2.0000	1.0408	1.0308	0.5028	2.02014	1.6406	0.0061	3.2074	0.0376	1.846
			2.7281	0.2183	1.4427	1.082	2.0521	2.0006	4.0118	0.0047	2.4067	3.71668	4.1703	3.6608	3.678	1.6071	2.9004	7.0701	1.0221	3.0091	2.0696	0.6104	0.7717	0.9204	1.7324	0.3762	3.6358	0.4074	7.0206	2.04064	1.361	2.3768	13.3309
			3.0758	6.0639	4.0476	2.0847	4.2697	6.1049	3.2141	6.2704	4.0448	6.60813	2.5638	11.0787	0.592	6.0026	2.1049	10.4464	0.318	6.4300	2.0782	6.2022	2.6011	3.7498	12.0126	0.1483	2.2041	1.02556	1.4738	6.00957	2.0227	1.0042	0.0132
			3.0611	1.1843	0.836	1.1677	2.4213	10.0638	2.7406	2.1068	4.0234	0.03048	1.4941	2.6732	4.6117	4.731	2.7042	4.0049	2.075	2.4409	1.1008	1.3703	4.0364	3.1028	0.3648	3.3106	0.348	3.62344	3.0096	7.54426	3.0300	2.1441	3.6304
			1.2011	1.0022	7.1147	1.0261	4.3417	4.5076	3.7808	0.4622	0.0084	2.61938	3.3741	3.6088	6.9032	2.2046	6.7143	0.0008	11.6476	1.0033	2.0066	3.1363	3.0208	2.0654	0.0007	1.0328	4.2971	1.34588	4.1078	2.02030	6.0108	11.6053	0.1304
			12.2773	3.0638	0.8133	4.7697	0.0148	1.1638	1.0914	2.0238	6.3428	3.8212	4.3326	0.6418	1.4322	3.1207	3.4046	6.2302	7.6008	6.0064	1.0004	2.1718	2.0048	1.4298	4.7781	0.9634	4.6384	6.47008	1.0408	1.30300	0.716	10.417	3.1700
			13.0728	1.0624	2.6091	4.6801	12.0017	6.064	1.0938	0.7018	6.0087	0.65409	0.0006	6.6708	2.0013	4.5428	0.4166	4.3083	0.1906	3.346	10.7813	2.0000	2.3161	0.7078	0.0626	0.4613	7.4079	6.30704	3.7276	0.00214	7.1072	2.4118	1.0572
			2.3801	6.7244	1.3083	1.7033	4.0448	7.2828	7.2103	0.79	3.02	1.67061	1.4008	6.2698	6.8367	2.7903	0.1652	3.0202	2.6006	10.4417	3.4024	1.0731	6.6438	2.3694	3.0000	1.2417	2.2321	2.20616	0.0570	6.12702	2.2772	2.0640	0.3047
			3.0771	2.6808	2.2328	10.0302	1.6033	11.1433	1.1033	3.5137	1.4771	3.80365	6.5636	0.703	0.064	3.0666	2.3061	1.0714	7.1108	2.0000	3.068	0.1038	0.262	4.148	0.0026	0.9006	3.4707	1.03701	0.0347	3.62006	10.6031	2.1021	6.7493
			2.4921	3.018	6.053	0.4377	4.6531	0.428	4.2207	0.1676	1.7163	1.1021	1.7308	4.0778	1.0012	3.6074	0.9042	6.7108	0.0006	1.7208	1.1267	4.2382	6.4208	2.7706	6.0100	0.3444	1.0183	1.64258	4.167	2.00606	0.0905	1.4788	1.3407
			0.1461	3.0343	10.9007	3.3473	2.4846	6.2078	2.7731	1.7783	1.1362	3.46641	0.0024	1.4008	3.0070	0.608	6.004	3.2228	0.6707	2.0274	7.1658	6.0078	3.6673	4.4677	3.0008	4.0418	0.0204	3.70365	3.0071	3.00332	0.57	2.0003	2.1904
			3.9622	1.2024	2.4834	6.1061	2.6998	10.4363	0.7314	4.0126	4.2083	2.61208	6.0031	2.3031	6.0118	9.0003	0.5606	4.0424	0.3067	4.714	2.2006	1.0703	6.7902	1.7703	3.1446	1.7687	3.2001	3.63003	1.4682	2.07065	7.2690	3.1278	0.748
			1.0514	4.7777	2.3082	3.0008	1.0411	0.4028	0.9822	7.144	0.2021	1.01031	7.1696	6.2711	0.6400	6.3102	0.478	0.3308	3.604	1.0304	1.1687	2.2028	0.0007	1.0073	3.0503	0.0033	2.1104	0.60656	2.006	7.02108	1.7156	10.1356	4.1060
			3.4288	4.0046	1.3874	6.3673	3.4012	2.7372	0.2355	0.3241	3.0113	3.65706	3.004	1.6008	0.0300	6.368	1.0007	3.0111	3.3038	2.4302	1.7606	0.8383	3.1006	2.2297	2.2107	1.6602	4.0042	6.03038	1.0037	1.24164	1.6342	0.0606	3.0032
			2.0008	1.2273	1.7628	3.0217	6.9208	2.4063	2.0495	6.608	7.7072	0.99247	6.3001	3.4603	0.7274	1.68	2.2713	3.4028	4.5108	0.000	2.3283	1.0403	3.0362	3.2768	1.2261	0.7763	2.4001	2.60690	0.6207	2.10494	4.7074	3.0768	2.0201
			1.1281	0.3738	0.068	0.6818	6.667	1.9638	12.0994	0.7011	4.1041	0.71663	7.7876	6.6393	7.7301	2.0442	17.3462	0.7626	3.3067	3.7667	0.0083	0.1104	2.4076	4.7108	2.2061	2.3422	0.101	3.64683	1.2403	0.24030	2.702	3.908	6.0053
			1.3167	0.0636	2.6474	3.3708	4.3007	10.4081	2.6148	1.3338	0.6238	4.71636	3.4536	10.4204	1.0300	3.1678	0.4362	4.0022	13.2628	6.1328	10.3968	10.0156	4.4007	6.6048	3.0100	6.1601	1.3016	6.32147	2.0304	2.6411	2.6054	1.0106	7.066
			2.0671	7.0002	14.717	6.8733	1.7438	0.9048	2.4254	6.0614	4.7386	6.03366	0.061	0.4711	1.0707	2.0004	1.0609	1.4468	4.4818	3.0378	13.6137	2.2608	0.7081	0.7168	6.1101	0.0786	3.0238	6.3078	0.078	1.16402	7.6238	4.0024	1.636
			6.438	0.6073	2.4314	1.7632	3.0167	9.0046	6.9254	0.0388	2.4008	2.03165	4.3008	4.418	0.0606	1.0003	2.3311	0.3078	0.634	2.7768	2.2078	2.1066	3.0000	7.7282	6.6268	6.308	3.0482	3.10367	3.0090	1.10677	7.00	0.0052	1.3312
			2.0736	3.7603	3.8463	2.7871	1.3028	3.7367	1.0482	10.0358	2.0218	0.06749	2.1106	0.4368	3.4678	3.0977	2.7043	1.2137	1.1928	1.5089	3.3061	1.2081	1.2681	2.0412	7.3081	7.3418	4.7087	0.06006	2.361	0.62006	6.7647	4.2668	7.2154
			0.2438	4.0004	0.838	4.0407	0.7048	7.7178	6.1082	6.7378	10.1703	4.97108	4.3208	1.2008	3.006	0.7008	1.3706	1.3308	7.0292	4.7016	2.408	7.081	6.7208	10.768	2.2306	3.2484	2.0348	6.13033	1.9764	2.20000	4.3248	4.172	1.7278
			4.7	2.7653	7.0306	2.1718	1.2014	0.3036	4.1128	5.7094	6.132	0.08483	1.23	1.0063	3.3036	14.1003	0.4028	2.6608	6.0392	3.3264	1.3606	11.0063	3.0018	0.0092	0.3062	2.9687	3.4834	0.21	4.0107	0.16728	2.0048	0.3626	4.909
			0.284	4.6304	1.284	7.3274	0.9328	1.0056	7.0783	2.9831	1.0046	4.20628	0.648	11.0071	1.4264	1.2708	2.9703	1.0437	0.0178	0.1408	3.3416	7.0218	0.0629	11.3604	2.7008	3.0328	12.4487	3.27317	1.4088	7.70413	2.0276	1.646	1.0730
			6.3003	2.0964	2.828	3.7462	0.18	7.4224	2.1768	3.3071	1.1063	4.06007	6.5117	7.2708	0.7701	2.0772	6.6017	1.3721	7.4027	2.1078	0.0666	2.6448	0.238	1.6043	3.0208	1.1206	2.0043	1.12747	2.0604	3.3721	6.044	3.000	0.064
			4.5271	13.2121	11.0308	0.0008	0.9672	3.0403	0.4088	0.0602	0.800	6.43708	4.0601	1.0738	2.674	1.0633	2.0300	6.413	3.1007	6.3146	4.4337	0.0074	0.7703	1.0006	0.1318	0.118	7.0046	2.26676	6.4637	3.62006	2.5353	3.2043	2.2026
			3.1090	2.1798	0.4088	2.0806	0.7678	10.3087	2.2403	1.302	2.0673	7.47082	4.431	1.78	7.0001	13.426	2.1	10.0261	0.7408	4.1004	1.343	1.0132	4.0007	12.0378	2.4706	6.0107	2.7060	1.30307	4.2077	0.70715	0.1218	1.7080	6.0401
			1.9657	3.6084	3.6085	0.0704	0.9008	2.4049	1.063	6.9032	10.4724	4.06903	6.1006	2.6402	0.2141	10.7107	1.2006	3.0048	0.0268	6.0613	1.9067	0.9016	1.0300	3.3703	3.6361	4.7602	3.1043	3.67062	6.1766	0.00404	0.3643	0.3328	1.9013
			2.3458	0.2238	4.7641	1.0252	11.2786	2.0408	4.0184	2.9803	7.2163	3.04644	4.3703	7.2143	10.2006	2.0268	4.1302	4.037	1.0106	6.2406	6.7812	7.0906	0.0348	2.2074	7.6898	0.6113	3.0034	1.64428	0.7808	1.94432	7.4012	6.7628	4.0024
			2.3818	0.706	1.063	1.3067	3.0308	6.6059	0.2269	1.0182	3.3043	2.30487	4.3232	2.1218	0.0048	3.2764	1.6702	6.4903	0.2718	0.4208	4.0608	4.0900	7.0218	0.7078	1.6617	3.0024	0.0122	2.1463	4.0103	4.37248	7.0056	0.0264	1.4726
			0.4367	1.1601	1.132	3.2083	4.068	14.0001	4.6978	0.0748	6.0622	1.00043	3.7033	3.0118	2.0301	3.6641	2.1026	4.0306	6.223	2.442	6.0634	7.1061	6.606	6.0331	1.6061	0.7127	0.3617	4.00020	1.9104	3.60332	6.0901	0.3714	2.624
			2.3618	6.8172	1.0862	1.428	3.0181	1.563	3.0842	6.7061	6.6608	0.34377	0.0017	1.0278	0.0074	6.0002	0.0026	16.0423	0.9602	2.2182	4.1017	3.012	1.2000	0.9840	3.6772	0.2013	1.0344	0.6708	1.0006	4.20313	14.0441	3.3323	0.4672
			2.3961	1.6081	1.4874	1.0313	1.7003	3.9082	7.7878	4.6734	4.0016	3.7607	2.4728	1.3308	4.0732	0.6462	2.4063	3.3134	1.3344	1.2432	0.081	1.0348	0.3178	4.771	2.0001	4.4116	1.1366	4.00007	4.0263	0.10000	6.6472	6.942	0.6016
			6.0128	6.1394	1.3187	2.0467	4.2768	4.0477	0.0656	3.1078	0.6248	4.76761	0.6626	7.0427	4.0063	0.2941	2.006	0.7267	2.4123	3.6022	6.6054	6.2548	1.0447	3.0364	3.2406	6.2076	1.6702	0.07043	3.006	3.07304	0.3414	1.4070	2.4538
			1.788	6.7032	6.9316	10.7023	2.3672	6.006	16.058	6.712	2.2644	1.63021	14.0421	1.303	1.0256	1.4378	2.3000	0.4606	6.1006	1.268	3.1013	0.0932	12.900	0.363	1.7428	4.6062	2.9023	2.6437	1.1778	2.01138	1.0046	11.0018	1.0707
			9.058	7.0487	3.1101	0.862	1.0482	3.6106	6.5961	0.6221	7.7424	3.40009	0.7146	2.1713	3.360	4.4378	2.6702	4.628	1.2674	4.4463	3.2338	2.1036	7.2168	0.4601	3.2041	2.3027	6.2333	2.4082	3.403	1.00178	4.7762	3.0007	2.2358
			2.0762	0.3123	1.0003	7.9728	0.3817	1.6006	3.9074	0.1464	12.3297	0.30208	0.1412	3.638	2.3043	1.0738	4.0045	3.2733	1.1046	1.6477	1.7049	4.2701	6.1103	2.7961	0.0314	6.4332	1.007	0.06618	3.2163	1.20764	2.3072	6.0002	4.0062
			0.9844	2.6018	0.4081	10.4358	1.0073	4.0016	0.7728	2.63	2.6001	4.06642	3.0628	2.7067	10.2229	1.0428	0.7701	16.3108	3.1050	7.0601	6.1966	2.2273	3.0432	2.4364	2.2302	1.6363	2.073	2.1687	2.7076	6.26347	1.0000	1.2082	2.7763
			2.3286	1.0442	2.6108	1.2328	1.2301	3.3706	2.0778	0.0106	1.34	0.35308	3.6347	3.4406	1.6621	2.0334	1.1646	6.6073	0.2316	3.0408	1.0461	0.6103	1.0477	4.0941	2.0012	3.6263	1.6334	3.11904	2.1407	6.0704	0.1838	2.1318	4.478
			2.678	0.2411	6.31	1.1794	3.0078	7.2138	0.0080	6.1304	4.1064	4.20001	0.3268	0.0083	3.7073	1.073	3.0072	6.218	0.7417	0.4467	7.7408	3.4648	1.4482	0.9208	1.4024	1.2001	7.2068	1.26046	12.3716	1.02061	3.0030	0.483	2.0034
			1.0424	0.3336	0.7849	0.0176	3.0223	12.478	12.789	4.6714	2.0041	6.00011	2.3	0.0107	6.6704	1.0061	2.0260	1.6763	3.7628	3.2447	6.3448	3.6782	1.0318	0.7818	6.4044	4.6741	13.0046	0.23313	1.7273	1.303	3.4402	2.2041	4.4717
			2.0886	6.072	2.6848	1.7031	4.1667	8.6432	3.1066	2.0446	6.4811	7.18301	6.7966	2.0648	3.7017	4.2214	2.4232	0.4368	3.077	6.4908	6.1122	1.3127	1.0601	1.4332	0.2003	1.0760	6.026	6.20121	0.387	1.00620	2.1277	3.4600	6.3028
Average			3.82408	4.00006	3.86707	4.34601	3.87009	6.54163	4.88723	4.58302	4.11061	3.8408	4.49150	4.17000	4.2001	4.10086	3.53246	4.01008	4.21368	4.10246	3.04007	4.10743	4.42302	3.06003	3.00748	3.20671	3.70747	3.40070	3.33022	3.67676	4.00170	4.01111	3.29006
Moving range average			2.4852	3.18018	3.64249	4.11603	3.13117	3.81678	4.18562	3.40400	2.09364	2.2826	3.35676	3.06007	3.20226	2.06070	3.10702	3.49144	3.07131	3.24300	3.32180	3.27100	3.75600	3.23436	2.72418	2.26706	2.72020	2.61000	2.7007	2.66054	3.00004	2.00221	2.73600
T statistic			4.03174	2.01907	3.10638	2.04712	3.78061	4.02212	3.61971	3.96700	3.00433	4.04167	3.20000	3.15017	3.00331	3.06363	2.02374	3.00653	3.10033	4.27266	3.22763	3.6000	3.74341	3.0611	3.00774	2.00671	3.60027	4.32021	4.36076	3.37413	4.02067	3.04200	3.26772
1	0.01	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0.02	0.019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0.03	0.027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0.04	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0.05	0.044	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0.06	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0.07	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0.08	0.068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0.09	0.076	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.1	0.083	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0.11	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0.12	0.098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0.13	0.106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0.14	0.112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.15	0.119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0.16	0.126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0.17	0.133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0.18	0.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0.19	0.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0.2	0.153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0.3	0.216	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0.4	0.278	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0.5	0.336	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0.6	0.396	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0.7	0.452	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0.8	0.507	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0.9	0.562	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0.616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1.1	0.669	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1.2	0.722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1.3	0.775	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1.4	0.827	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1.5	0.878	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1.6	0.931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1.7	0.983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1.8	1.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1.9	1.086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	2	1.138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

39	2.1	1.189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	2.2	1.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	2.3	1.291	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	2.4	1.342	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	2.5	1.393	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	2.6	1.444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	2.7	1.495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	2.8	1.546	0	1.56663	0	1.56966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.57886	0	0	0	0	0	0	0
47	2.9	1.596	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.60011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	3	1.647	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.68348	0	0	0	0	0	0	0	0	0
49	3.1	1.698	0	0	1.74119	0	0	0	0	0	0	0	0	1.72808	0	0	0	0	1.72818	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	3.2	1.749	0	0	0	0	0	0	0	0	0	0	1.78374	0	0	0	0	0	0	0	1.76208	0	0	0	0	0	0	0	0	0	0	0	1.78254
51	3.3	1.799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.83606	0	0	0
52	3.4	1.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	3.5	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.94984	0	0	0	0	0	0
54	3.6	1.95	0	0	0	0	0	0	1.96954	0	0	0	0	0	0	0	0	0	0	0	0	1.95506	0	0	1.98475	0	0	0	0	0	0	0	0
55	3.7	2.001	0	0	0	0	2.0443	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.02271	0	0	0	0	0	0	0	0	0	0
56	3.8	2.051	0	0	0	0	0	0	0	0	2.06316	0	0	0	2.09786	2.08282	0	2.09377	0	0	0	0	0	0	0	0	0	0	0	0	0	2.07234	0
57	3.9	2.101	0	0	0	0	0	0	0	2.1362	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	4	2.152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	4.2	2.253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.29032	0	0	0	0	0	0	0	2.3161	2.32837	0	0	0	0
60	4.4	2.353	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	4.6	2.454	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	4.8	2.554	2.62063	0	0	0	0	2.61567	0	0	0	2.57604	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.61494	0	0
63	5	2.655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	5.2	2.755	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	5.4	2.856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	5.6	2.956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	5.8	3.057	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	6	3.157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	6.2	3.257	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	6.4	3.357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	6.6	3.458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	6.8	3.558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	7	3.658	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	7.2	3.758	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	7.4	3.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	7.6	3.959	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	7.8	4.059	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	8	4.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	8.2	4.26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	8.4	4.36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	8.6	4.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	8.8	4.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	9	4.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	9.2	4.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	9.4	4.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	9.6	4.961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	9.8	5.061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	10	5.161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	10.5	5.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	11	5.661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	11.5	5.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	12	6.162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	12.5	6.412	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	13	6.662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	13.5	6.912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	14	7.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	14.5	7.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	15	7.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	15.5	7.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	16	8.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	16.5	8.413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	17	8.663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	17.5	8.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	18	9.163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	18.5	9.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	19	9.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	19.5	9.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	20	10.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	20.5	10.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	21	10.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	21.5	10.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	22	11.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	22.5	11.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	23	11.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	23.5	11.914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	24	12.164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	24.5	12.414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	25	12.664	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	30	15.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	35	17.666	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	40	20.165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	45	22.665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	50	25.166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator shape parameter			2.62063	1.56663	1.74119	1.56966	2.0443	2.61567	1.96954	2.1362	2.06316	2.57604	1.78374	1.72808	2.09786	2.08282	1.60011	2.09377	1.72818	2.29032	1.76208	1.95506	2.02271	1.68348	1.98475	1.57886	1.94984	2.3161	2.32837	1.83606	2.61494	2.07234	1.78254
Estimator scale parameter			1.45929	2.57716	2.21519	2.76997	1.89702	2.11959	2.38201	2.16109	2.00942	1.53341	2.50404	2.41996	2.03618	1.97327	2.19886	2.29734	2.43819	1.8182	2.24107	2.14186	2.18709	2.35299	1.83657	2.03104	1.90182	1.50632	1.43371	2.00198	1.89689	1.93664	1.85086
Control chart constant d2			1.07539	1.04068	1.04998	1.04148	1.06136	1.0753	1.05956	1.0641	1.06104	1.07462	1.06226	1.04931	1.083	1.06266	1.04364	1.06299	1.0494	1.06922	1.06091	1.0584	1.06067	1.0478	1.06076	1.04197	1.05821	1.06999	1.06918	1.05399	1.07529	1.06723	1.05178
Control chart constant d3			0.9109	0.96178	0.94396	0.96113	0.93378	0.91901	0.93637	0.93112	0.9336	0.91894	0.942	0.94454	0.93218	0.93262	0.9494	0.9323	0.94448	0.92694	0.94317	0.93652	0.93441	0.94562	0.93627	0.96071	0.93969	0.92626	0.92593	0.94049	0.91903	0.93293	0.94241
Control chart constant D4			3.53101	3.80156	3.73261	3.7959	3.64333	3.53173	3.6657	3.62127	3.64109	3.53782	3.71612	3.73787	3.63015	3.63375	3.78073	3.63109	3.73696	3.608	3.72648	3.66993	3.64995	3.74909	3.65618	3.78218	3.66943	3.5627	3.60031	3.70174	3.53183	3.63632	3.71876
Upper contro limit X			10.757	13.1198	13.9799	16.2021	12.7299	16.499	16.5495	14.4179	12.2994	10.2954	14.0599	15.2032	13.5905	12.2125	12.7233	14.9947	12.9839	13.2729	13.4313	13.4609	15.047	13.2113	11.3792	8.70993	11.4449	10.8369	11.1911	10.9583	13.4939	11.6148	11.1023
Lower control limit X			-3.10993	-5.10113	-6.26446	-7.61031	-4.97239	-6.38594	-7.17501	-6.23187	-4.0674	-2.38819	-6.07576	-6.84942	-6.0223	-3.99259	-6.05843	-6.04459	-4.66669	-4.84795	-5.63339	-6.00696	-8.19937	-6.30959	-4.04427	-3.20341	-4.02997	-3.85929	-4.51464	-3.60879	3.73035	-3.59234	-4.80486
Upper control limit MR			8.77527	12.0138	13.2224	15.6236	11.4079	13.833	15.3432	12.6197	10.636	9.00434	12.497	14.4149	11.9613	10.4281	12.0871	12.6777	11.4774	11.6394	12.3749	11.9999	13.7047	12.1269	9.9901	8.68142	10.0122	9.37978	10.0202	9.47107	10.9022	9.79972	10.174
Normal upper control limit X			10.4337	12.4138	13.2799	16.2926	12.2067	15.9596	15.8192	13.9613	11.8164	9.89599	13.4195	14.434	13.0251	11.7424	12.0352	14.0969	12.382	12.7901	12.7932	12.9998	14.4129	12.6629	10.8129	9.21109	10.9962	10.4518	10.7818	10.4804	13.0918	11.1712	10.9791
Normal lower control limit X			-2.7956	-4.39599	-5.58444	-6.90071	-4.4495	-4.97543	-6.44473	-4.0783	-3.57833	-2.0987	-4.4333	-6.0902	-4.49997	-3.62248	-4.97027	-4.47595	-3.9649	-4.40516	-4.9963	-4.51379	-6.84629	-4.06117	-3.57709	-2.78797	-3.56127	-3.47418	-4.10614	-3.12999	-3.3278	3.14802	-3.87739
Normal upper control limit MR			9.12164	10.3275	11.8799	13.4509	10.2327	12.9	13.9799	11.3999	9.4584	7.39399	10.9999	12.0038	10.7561	9.37944	10.4479	11.41	10.0371	10.9013	10.9563	10.9019	12.2743	10.5699	8.90282	7.37799	9.9193	8.55697	9.14618	8.38132	10.0878	9.79914	8.94079

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
OBJECTIVE # 3																																	
Chi-square (df=4)			k = 50 obs																														
		1	5.2917	1.872	3.85204	4.9702	4.8842	4.7763	2.93292	9.1858	0.743	3.2145	5.0447	4.0802	1.2816	8.405	2.1319	2.33306	8.17376	5.8870	3.8727	1.3569	5.0802	2.4905	1.0034	4.1318	9.02045	1.8474	1.0308	3.0311	3.8808	1.0052	1.44177
			3.6245	4.8218	2.12484	10.1438	0.7630	3.2324	8.14591	5.3870	3.4918	2.1856	8.8481	3.8541	1.5314	3.2828	3.1123	2.00118	0.41542	1.0841	1.0538	3.2008	1.3016	1.3184	3.4479	0.5238	5.8542	4.4878	0.5867	3.8158	0.8874	8.1738	8.34290
			0.5858	3.1875	7.78523	3.9258	2.8212	1.8803	2.9753	6.4383	8.8283	2.725	1.0838	8.8012	5.0058	4.2872	2.114	7.54038	1.82315	0.7842	2.4181	2.7202	5.6287	4.6531	1.3278	1.103	3.72218	8.2889	2.5183	0.5887	3.2813	4.9588	7.97048
			2.8508	2.4457	1.18585	12.017	3.0842	6.7844	3.38761	1.2888	3.7857	2.83	4.8981	0.3814	2.4895	0.2889	10.5483	8.84471	1.82533	1.1063	3.0881	0.7238	3.114	2.1448	1.7841	8.9845	3.41585	1.0307	2.9543	8.8585	0.7198	1.1818	1.93113
			0.8849	5.7283	3.00407	4.2284	0.5117	4.0852	4.31523	0.5823	3.2831	2.1375	1.9831	4.1612	0.4181	13.1822	7.7857	8.72483	2.48024	3.4285	0.9587	8.7714	3.8517	4.0588	2.7823	0.2171	8.29823	2.7828	8.7195	5.6442	0.8614	1.3062	4.41452
			2.607	8.6353	2.45648	2.238	0.6378	8.7348	5.42438	1.3018	2.0718	3.8454	2.0787	0.8758	1.8771	3.9894	11.8882	8.85207	5.11875	1.0082	1.385	0.8508	5.4455	2.3773	8.1878	5.8649	8.073	3.0711	8.28	10.8562	3.3033	3.1422	2.33155
			3.481	0.9908	5.08282	3.331	5.4857	2.8068	7.6458	7.2007	7.1889	3.8741	4.9428	7.2313	5.384	10.9887	1.0073	1.13114	5.2371	1.1558	5.7252	8.4475	7.4418	0.8785	11.8418	1.1159	2.98541	1.5898	0.4782	0.5382	7.485	5.4418	1.74718
			1.5575	1.9101	4.57102	4.0285	2.2449	8.3824	2.84895	1.2144	1.8185	11.8821	2.7897	6.7367	7.2111	1.4188	8.4858	1.78984	2.31704	3.7484	3.2832	4.4881	3.0873	0.8888	0.4974	0.9864	3.58318	2.7433	2.9782	0.4997	1.4288	4.8058	1.98322
			4.5311	3.6358	3.90254	1.0123	4.1717	0.3435	0.76888	2.87	0.5247	10.4282	8.5588	8.8308	2.0823	8.9817	7.7705	4.3815	7.73888	1.7748	3.5058	1.4747	3.1708	7.7048	8.0587	4.6782	2.28183	0.4851	8.5383	1.818	1.4181	1.2881	4.18821
		10	8.0981	3.2645	8.85015	1.3803	8.3848	0.8007	5.34528	5.2015	8.0072	2.6181	0.5815	4.4412	4.2078	4.8807	4.7181	1.88747	3.38285	4.4804	15.8893	7.2041	4.1358	0.4884	2.5427	4.3864	6.58378	8.9408	6.2862	1.2148	3.0881	1.503	3.48578
			2.4277	4.1828	2.43033	3.1553	1.7803	2.7348	0.42881	5.3808	3.5217	3.8888	3.0121	1.1158	7.8302	5.7828	1.1349	2.27633	2.38408	8.8578	0.4537	5.3885	11.1484	5.522	4.9388	3.88	1.72071	1.7722	2.2858	1.2785	3.5238	3.4842	5.78741
			2.5408	1.8207	3.37888	2.5867	1.0064	2.2778	0.43358	3.557	2.0884	1.8188	2.4285	7.0421	3.6808	2.8425	5.5378	1.8402	5.77528	5.84	2.8487	4.0899	1.1937	1.3742	3.0804	2.882	8.85133	2.081	8.7698	1.3085	8.4288	7.8224	5.30854
			8.4268	4.3781	5.84035	2.8282	3.7872	6.0047	1.08098	8.1873	1.9184	1.3232	5.8408	4.3888	2.7482	3.5813	7.9152	2.08408	3.22888	0.2386	1.8595	2.3452	1.0283	1.2538	7.2882	5.9847	8.88173	8.8785	2.3838	0.7893	4.4302	2.8548	1.45868
			3.1492	12.2433	3.588	4.8784	3.9834	1.1198	8.15087	10.8488	4.7331	2.7711	3.381	3.0074	0.2588	7.7887	1.2834	0.78883	5.81111	4.0888	7.3545	1.8545	7.9384	3.1555	4.532	2.2848	3.3738	8.7587	2.884	5.8637	1.4358	2.2183	2.79445
New observations k =			4.8857	3.848	4.48563	5.2884	2.3148	1.541	1.12044	3.8878	3.5824	4.4388	2.2	8.3814	1.8381	2.8348	3.9375	2.92988	1.81888	10.2925	1.2285	9.8188	2.1497	7.8488	0.4834	5.8871	6.18158	8.481	2.3212	1.7177	4.207	1.0152	3.88778
			5.1409	1.8831	3.80065	1.31	2.2708	14.4578	1.01828	0.814	5.2781	1.8086	6.1474	1.4873	5.7024	2.8083	8.1738	5.83248	3.88488	7.071	5.8888	5.7705	8.8577	4.1548	3.1838	1.2122	2.08839	3.878	0.4848	4.3227	8.1742	1.8428	7.23787
			8.385	4.7773	0.42724	8.087	1.1523	2.3784	2.98175	3.0503	1.1887	2.8438	2.7858	1.8778	14.2488	1.8882	3.8072	0.38048	3.16388	9.8825	3.2827	2.3885	1.8882	9.2285	0.8403	8.4882	5.18237	7.5078	8.4988	8.4224	1.5302	3.2353	4.21328
			8.4093	1.475	5.7798	8.8381	1.3384	8.5287	1.2233	2.7788	2.95	7.3015	2.833	11.1988	4.8577	2.8385	2.0358	1.2881	1.83878	8.8343	4.3741	3.9798	3.1015	9.418	8.3875	1.4883	2.88481	2.4008	8.3814	0.1887	0.7847	4.4912	1.402
			5.0284	3.7084	0.52307	8.583	2.988	8.2301	2.84188	1.5858	1.8578	8.3844	11.7838	5.9201	4.8578	8.583	8.898	5.41414	4.02577	5.0328	3.8134	2.2708	4.2803	2.8747	0.8888	2.8585	7.8868	3.2318	10.8872	3.3828	3.8037	2.7252	8.78238
		20	2.311	5.8454	2.98871	0.3848	1.8785	1.0184	2.78877	8.1375	2.8834	8.5313	4.4188	8.0255	0.6115	1.2841	17.4238	7.93787	2.32878	2.4781	8.0552	1.5082	8.8175	3.5147	10.8888	3.8328	5.77853	11.5553	0.423	3.5938	1.7118	3.3742	0.85128
			3.3304	1.4898	6.78828	3.8574	4.7481	2.248	4.84452	1.1885	11.271	1.7838	2.888	2.3712	2.8783	3.57	1.3841	3.8222	2.58231	3.8588	7.8788	5.1737	3.0428	1.8288	7.2718	3.8098	3.81917	1.7078	0.8881	3.7125	5.3228	1.7457	3.07882
			7.9863	1.1358	1.18818	0.8724	4.2889	3.843	2.00507	3.1877	2.1083	3.3858	4.3888	3.8053	8.3181	13.337	2.0287	1.20287	3.83784	8.3228	3.8833	1.1314	5.3888	2.5248	5.5584	2.272	8.88487	2.775	2.8887	3.2588	7.4402	10.9312	2.85738
			8.218	1.012	2.58871	0.6788	1.9881	5.943	4.05257	9.8723	2.0718	3.2828	4.8888	8.8802	5.2812	3.72	2.421	1.88115	6.57881	3.4811	5.384	7.4087	2.2928	1.1728	0.6388	4.8281	2.74838	0.8158	1.3711	3.7482	14.0881	1.2858	1.77888
			6.3587	8.3898	4.58374	1.8675	5.2834	4.5882	3.11854	3.1482	3.5741	5.3881	2.11	4.0038	2.388	3.8858	5.775	2.05288	6.55125	2.8038	1.1478	4.3483	8.213	2.4583	1.3841	2.4584	2.03845	4.878	8.4885	3.4928	4.3858	5.3348	2.45585
			3.6865	4.1898	1.44881	3.1884	2.6118	2.1442	3.22088	6.7988	3.2881	2.5885	8.4871	0.8111	11.7385	1.8357	2.9857	0.32887	4.85283	5.0148	4.8874	17.1818	3.0348	5.0058	2.5478	5.4882	5.88585	4.5104	4.822	4.8864	2.5812	5.2773	1.78858
			4.2827	5.3181	0.43528	6.2489	1.4233	8.0747	3.03237	1.201	2.8018	1.8317	1.4701	1.8248	3.9884	5.0373	0.3347	1.3158	5.88381	1.5311	4.2187	6.8873	2.4387	2.8252	1.4344	10.2134	2.62821	4.9828	1.5781	1.318	5.8281	0.9184	0.88477
			10.2818	2.7752	1.78854	8.2855	1.7548	0.7487	3.10888	3.5808	4.8032	11.1827	2.4515	8.5538	8.1485	1.4288	2.7125	9.24155	0.45488	2.8452	8.8823	2.2588	4.1581	14.0785	3.9858	3.0103	4.01888	11.7887	4.1828	1.8842	18.8058	1.3214	0.23831
			11.0165	5.4777	0.92875	1.812	4.5051	2.7181	5.47848	5.7558	8.0134	0.828	2.488	2.2818	1.4888	3.8584	7.8512	1.40438	1.88708	0.3462	3.7278	5.7883	13.5378	2.2781	5.2812	2.727	3.43184	2.3545	3.7727	15.2937	3.8558	1.7512	4.98313
			1.6709	8.1793	2.25147	2.3344	12.0258	0.2845	0.45285	0.5758	8.0808	8.3258	1.5748	2.5843	4.8487	4.1308	4.0738	2.03743	4.8138	0.848	5.8381	5.9178	1.1114	3.1882	4.2345	0.7817	8.58841	3.8411	3.5183	2.232	5.7834	0.7452	2.49583
		30	0.5701	1.8743	0.74285	7.0757	1.8855	10.9805	0.88528	8.8358	1.4828	5.9383	3.2587	7.8555	8.5182	6.888	15.7038	3.10715	3.38383	2.8787	3.0838	2.3533	1.8448	5.833	1.8843	1.888	1.55858	4.8867	3.4531	1.2551	2.8448	1.5888	1.88178
Estimator shape parameter			2.620531	1.555534	1.74118	1.588559	2.044303	2.815888	1.95854	2.135202	2.053185	2.575043	1.703742	1.728088	2.087655	2.082817	1.80811	2.083788	1.728184	2.288324	1.76208	1.85505	2.022708	1.88348	1.984747	1.578854	1.848835	2.318185	2.328374	1.838863	2.814837	2.072344	1.782537
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.458278	2.577153	2.215181	2.788874	1.887022	2.118592	2.382008	2.151082	2.00842	1.53341	2.504038	2.418863	2.035178	1.873288	2.188648	2.287338	2.438181	1.8182	2.241071	2.141852	2.187078	2.332884	1.83857	2.031038	1.80182	1.50832	1.433715	2.001878	1.888888	1.835543	1.850847
Control chart constant d2			1.075394	1.040878	1.048987	1.04148	1.081358	1.075302	1.058558	1.0841	1.081837	1.07452	1.052253	1.048308	1.082888	1.082551	1.043542	1.082881	1.048402	1.088224	1.050905	1.058401	1.080888	1.047798	1.058751	1.041972	1.058212	1.088882	1.088178	1.053878	1.075288	1.062231	1.051782
Control chart constant d3			0.918903	0.951782	0.943858	0.951133	0.833782	0.818014	0.938373	0.831118	0.833487	0.918845	0.841888	0.844537	0.932182	0.832823	0.848402	0.932305	0.844457	0.828938	0.843188	0.838516	0.834413	0.845823	0.83527	0.850708	0.838888	0.828245	0.825831	0.840487	0.91803	0.83293	0.842407
Control chart constant D4			3.531011	3.801562	3.732508	3.795898	3.843325	3.531725	3.885898	3.821273	3.64108	3.537825	3.715115	3.737871	3.830148	3.833748	3.780725	3.831087	3.738856	3.587987	3.725484	3.888834	3.848854	3.748088	3.858183	3.782188	3.888433	3.582897	3.580314	3.701738	3.531833	3.838318	3.718748
Upper contro limit X			10.75898	13.11883	13.97858	16.20214	12.72858	18.48901	18.54948	14.4178	12.29842	10.28538	14.05885	15.2032	13.5885	12.21248	12.72333	14.88472	12.88378	13.27284	13.43133	13.48882	15.047	13.21125	11.37924	8.708832	11.4448	10.83887	11.18108	10.95828	13.49384	11.81458	11.10234
Lower control limit X			-3.10883	-5.10113	-8.28445	-7.51031	-4.97238	-5.38594	-7.17501	-5.23187	-4.0574	-2.38818	-8.07578	-8.84842	-5.0223	-3.88258	-5.85843	-5.04456	-4.58858	-4.84795	-5.53338	-5.08588	-8.19837	-8.30858	-4.04427	-3.28341	-4.02897	-3.85828	-4.51464	-3.80879	-3.73035	-3.58234	-4.50485
Upper control limit MR			8.775275	12.01362	13.22235	15.82385	11.40788	13.83298	15.34321	12.81972	10.53598	8.004338	12.48703	14.41495	11.85135	10.42887	12.08708	12.87771	11.47737	11.8384	12.37488	11.88884	13.7047	12.12587	8.980898	8.581422	10.01218	9.378777	10.02024	8.471088	10.80222	8.78972	10.17387
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	1	0	1	0	1	0	1	1	0	0
Total false alarm in X			1	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	1	1	0	1	1	1	0	1	0	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0	1	1	0	0
Total false alarm in MR			1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	1	0	0	1	1	0	1	1	1	1	0	0
Sub-total X control charts with at least one false alarm k 30 =							97																										
Sub-total MR control charts with at least one false alarm k 30 =							89																										
Normal upper control limit X			10.43386	12.41358	13.27857	15.28253	12.20588	15.9585	15.8192	13.98133	11.81536	9.985882	13.41848	14.43398	13.02508	11.74238	12.03517	14.09582	12.38188	12.78008	12.78324	12.88884	14.41288	12.55283	10.91284	8.211082	10.9862	10.45178	10.78158	10.48038	13.09148	11.17124	10.57507
Normal lower control limit X			-2.7855	-4.39588	-5.58444	-8.80071	-4.4485	-4.87543	-8.44473	-4.8753	-3.57833	-2.0887	-4.4333	-8.0802	-4.48887	-3.52248	-4.97027	-4.47585	-3.9548	-4.48518	-4.8853	-4.51378	-5.58526	-4.85117	-3.57788	-2.78787	-3.55127	-3.47418	-4.10514	-3.12889	-3.3278	-3.14902	-3.97738
Normal upper control limit MR			8.12184	10.32747	11.57884	13.45085	10.23267	12.80003	13.8788	11.38881	9.458405	7.383858	10.98882	12.60358	10.75808	9.37848	10.44787	11.41002	10.03788	10.80133	10.85527	10.88177	12.27425	10.58888	8.902819	7.37798	8.918298	8.555875	9.148185	8.381325	10.08781	8.798138	8.940788
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	1	0	1	0	1	0	1	1	0	0
Total false alarm in X			1	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	1	1	0	1	1	1	0	1	0	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	1	1	1	0	0	1	0	1	1	1	0
Total false alarm in MR			1	0	0	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	1	1	1	1	1	1	0	1	1	1	1	1	0
Sub-total normal X control charts with at least one false alarm k 30 =							110																										
Sub-total normal MR control charts with at least one false alarm k 30 =							122																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							5																										
Sub-total MR control charts with at least one false alarm k 1 =							8																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							8																										
Sub-total MR control charts with at least one false alarm k 1 =							10																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							40																										
Sub-total MR control charts with at least one false alarm k 10 =							39																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							49																										
Sub-total MR control charts with at least one false alarm k 10 =							59																										

OBJECTIVE # 3

Chi-square (df=4) k = 50 obs Shift 1 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12
		1	6.7704	5.1560	6.2922	5.179	3.8007	4.843	7.4791	12.1422	4.6363
			8.54	11.5342	8.081	3.4837	4.7035	6.7523	8.7429	6.8357	4.4876
			7.9705	5.5736	6.6237	4.9012	4.34	8.0687	5.5533	5.9058	10.803
			7.2105	8.8326	8.3051	4.044	7.1027	3.4086	8.9078	4.4085	6.6575
			7.2382	8.0757	7.9647	6.1099	4.8845	6.787	7.0891	4.9058	6.0821
			7.1059	5.7260	7.8087	4.2964	8.1407	5.0557	13.0582	7.8413	13.292
			5.2020	11.2473	3.8903	4.784	3.4371	6.1500	4.335	3.0317	9.5173
			8.0379	3.6606	5.4873	4.2114	6.1947	9.4130	6.3394	14.209	7.4843
			4.2069	4.9210	4.8251	4.5317	4.9248	5.8254	7.5147	3.7868	5.0482
		10	5.4700	5.0040	8.6348	5.5334	10.4098	5.9101	7.1723	10.3051	9.0926
			5.5725	9.0740	7.5531	3.7243	5.4421	7.1002	8.5858	4.8324	5.0107
			3.1433	4.2276	4.6463	4.7717	8.2724	7.0118	10.584	3.7983	6.139
			10.8056	4.9451	3.7083	10.2980	8.5752	3.7855	7.1723	4.54	4.4742
			4.5035	6.1745	7.0353	9.315	4.4818	6.3475	3.8590	6.8478	7.8411
New observations k =			7.7037	9.2435	5.5603	6.8261	3.7342	3.9202	5.9816	7.2517	8.2016
			5.0821	8.5104	4.223	9.7125	5.9458	3.4081	9.4789	6.0553	4.4175
			4.0425	7.4547	10.0346	9.0628	4.3905	6.3995	6.6085	9.2741	9.9083
			3.9764	6.3486	12.7823	11.7312	7.1264	8.662	7.838	8.7832	4.3881
			5.0533	8.9968	7.3827	8.3594	4.4002	12.6315	6.7102	5.524	6.8982
		20	6.2708	12.5130	15.9837	3.6708	5.7618	3.2014	10.8523	3.8341	7.3282
			3.8678	5.3871	11.7738	7.8986	7.8639	9.0989	4.9562	6.7597	5.7557
			5.7411	4.7264	6.1017	4.9918	10.5966	14.6418	5.287	3.9837	7.5115
			3.8164	11.6526	4.832	6.0705	5.359	3.5751	11.1824	9.1525	4.4021
			10.6162	5.1302	9.1086	8.4724	4.5314	7.1834	9.0709	5.521	11.7206
			7.1317	7.3892	4.6955	7.0074	13.1822	5.1249	4.6846	14.5338	4.7895
			10.7196	5.6304	7.2304	5.1758	6.4098	5.9737	8.4098	10.8257	5.8810
			15.0914	4.7466	5.1516	8.8241	9.9773	4.0532	7.4856	7.4136	3.386
			5.4889	4.0323	6.827	2.8807	9.3029	4.9302	5.4402	11.4571	9.2025
			3.2385	6.0546	8.9715	4.0801	4.5631	5.3401	8.3382	8.6709	10.752
		30	7.4059	4.2536	7.4800	12.8298	7.2552	5.6072	4.178	8.6494	7.3055
Estimator shape parameter			2.620531	1.555534	1.74119	1.509559	2.044303	2.615668	1.95954	2.135202	2.053185
			0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.450276	2.577153	2.215191	2.700874	1.897022	2.118592	2.392008	2.151082	2.00842
Control chart constant d2			1.075394	1.040676	1.049087	1.04148	1.081358	1.075302	1.058558	1.0841	1.081637
Control chart constant d3			0.918903	0.951782	0.943856	0.951133	0.933782	0.919014	0.938373	0.931118	0.933487
Control chart constant D4			3.531011	3.801562	3.732506	3.705808	3.643325	3.531725	3.685408	3.621273	3.64109
Upper contro limit X			10.75898	13.11883	13.87858	16.20214	12.72856	16.46801	16.54848	14.4178	12.29842
Lower control limit X			-3.10883	-5.10113	-6.20445	-7.51031	-4.97238	-5.38594	-7.17501	-6.23187	-4.0574
Upper control limit MR			8.776275	12.01382	13.22236	15.62385	11.40788	13.83298	15.34321	12.81872	10.53598
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	1
False alarm in X? (Y=1/N=0)			1	0	1	0	0	0	1	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	0	1	0
Total false alarm in X			1	0	1	0	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	0	0
Total false alarm in MR			1	0	0	0	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 30 =							178				
Sub-total MR control charts with at least one false alarm k 30 =							87				
Normal upper control limit X			10.43388	12.41358	13.27857	15.28253	12.20568	15.9585	15.8192	13.08133	11.81535
Normal lower control limit X			-2.7855	-4.30588	-5.58444	-6.80071	-4.4495	-4.87543	-6.44473	-4.8753	-3.57833
Normal upper control limit MR			8.12184	10.32747	11.57884	13.45085	10.23287	12.80003	13.6788	11.38861	9.456405
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	1
False alarm in X? (Y=1/N=0)			1	1	1	0	0	0	1	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	0	1	0
Total false alarm in X			1	1	1	0	1	0	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	0	0	0	0	0
Total false alarm in MR			1	0	0	0	0	0	0	0	1
Sub-total normal X control charts with at least one false alarm k 30 =							193				
Sub-total normal MR control charts with at least one false alarm k 30 =							121				
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							14				
Sub-total MR control charts with at least one false alarm k 1 =							8				
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							16				
Sub-total MR control charts with at least one false alarm k 1 =							10				
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							108				
Sub-total MR control charts with at least one false alarm k 10 =							44				
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							117				
Sub-total MR control charts with at least one false alarm k 10 =							80				

1	2	3	13	14	15	16	17	18	19	20	21	22	23
		1	7.903	10.5594	10.2009	3.3354	6.8881	3.3748	4.3382	5.7569	3.8724	3.348	3.1552
			12.2551	5.5827	5.8577	3.633	4.1076	5.8707	5.0141	11.3896	6.8667	3.2517	4.6500
			7.8508	8.3508	5.475	5.2457	4.8866	9.071	5.1239	4.1838	12.6541	3.807	4.3507
			6.4181	8.8124	5.4225	8.5649	7.1456	12.0171	5.3085	4.7948	9.8886	3.6842	3.6079
			4.4821	5.8787	5.8344	4.5015	4.1583	7.4686	10.0513	8.9533	5.6255	5.2086	4.0303
			11.5411	4.334	8.1156	7.5727	6.5509	8.4952	4.0115	6.3124	4.2008	4.5762	8.0332
			5.7782	5.8723	5.8057	5.2058	6.8874	6.3651	3.8885	9.9029	8.312	10.5856	4.8871
			7.8372	2.8828	7.7807	3.590	4.115	5.7575	7.0051	5.9524	5.4306	4.9897	11.1087
			4.5078	8.0332	6.6704	3.9388	7.6953	8.0994	5.9958	5.2283	5.7281	6.7167	6.5105
		10	5.3234	7.7159	4.9202	4.2588	11.7975	3.8336	4.1802	14.7463	6.2943	6.948	4.4081
			4.4189	8.4556	6.8562	3.5015	7.4487	3.814	5.7355	13.7789	5.648	8.6101	5.6577
			5.9048	6.1834	11.0085	3.8014	7.6573	3.3384	7.1743	8.2372	7.8171	8.3447	8.2087
			8.352	4.6154	6.5082	7.1429	4.871	3.8325	3.3015	4.3279	7.0788	9.51	3.6213
			8.1529	6.7985	4.8088	6.5082	5.8935	5.2389	8.7314	7.4154	9.2778	3.2758	5.0752
New observations k =			4.6805	5.8404	6.0554	7.8018	8.6105	16.5884	7.8954	5.4095	3.782	10.7488	8.6088
			7.1130	6.884	7.6484	4.4011	6.1735	5.2811	8.5352	6.558	6.1889	8.5011	5.0793
			10.2085	4.5284	7.3383	8.0708	5.8844	3.8318	5.3565	8.8522	5.7403	5.292	10.3448
			6.1278	10.6281	9.8871	6.8025	3.5272	6.1858	5.4165	4.2731	5.8123	4.6881	4.5836
			6.9023	10.8841	8.4835	3.6871	7.1478	7.7189	6.9838	8.4422	10.1715	6.8807	6.5058
		20	9.404	10.7842	8.5055	6.0921	13.2251	6.3095	5.6889	8.1259	13.0713	13.4704	5.1833
			6.8418	7.8083	8.2538	8.5034	7.2343	10.5187	8.6871	5.4894	6.9895	6.7883	5.8544
			12.0227	7.8872	13.779	3.8502	5.8483	2.8752	6.3837	4.3235	4.4892	7.0418	4.8832
			11.1348	8.4834	7.4075	8.1220	11.0381	5.1387	3.8472	8.3043	5.7489	3.9735	8.542
			3.8824	9.817	7.3132	6.8143	8.8204	7.8148	10.3799	4.6149	4.0535	3.8883	2.9848
			7.2816	5.028	8.2351	4.851	7.9264	4.7443	5.2109	14.7001	10.789	10.4374	5.0587
			4.8748	11.4173	9.4216	3.8859	6.0717	4.2598	8.7277	4.7449	5.55	8.4064	10.6531
			5.7818	4.4152	4.7782	7.553	13.7209	4.8891	6.6877	7.7165	5.2038	5.2564	4.3089
			7.2115	5.7281	4.9198	3.67	8.9704	8.0308	4.5524	3.1283	6.281	8.5882	3.1774
			7.04	8.707	9.3717	6.8782	3.8012	8.4183	4.2274	4.007	8.2348	3.7877	9.8779
		30	6.7798	5.087	11.8708	7.2119	14.1834	7.2508	3.7154	8.2281	4.8183	8.584	5.6839
Estimator shape parameter			2.575043	1.703742	1.720086	2.007655	2.082817	1.80811	2.093766	1.728164	2.280324	1.76209	1.95505
			0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.53341	2.504036	2.419883	2.035179	1.873208	2.188848	2.297338	2.438181	1.8182	2.241071	2.141852
Control chart constant d2			1.07452	1.052253	1.049308	1.082908	1.082551	1.043542	1.082881	1.049402	1.088224	1.050805	1.058401
Control chart constant d3			0.918845	0.941888	0.944537	0.932182	0.932823	0.949402	0.932305	0.944457	0.928938	0.943188	0.938518
Control chart constant D4			3.537825	3.715115	3.737871	3.630149	3.633748	3.780725	3.631087	3.738858	3.587807	3.725484	3.668834
Upper contro limit X			10.20538	14.05885	15.2032	13.5805	12.21248	12.72333	14.66472	12.98378	13.27284	13.43133	13.46882
Lower control limit X			-2.38818	-5.07578	-6.84942	-5.0223	-3.88258	-5.65843	-6.04458	-4.58858	-4.84795	-5.53338	-5.08588
Upper control limit MR			8.004338	12.48703	14.41485	11.85135	10.42807	12.08708	12.67771	11.47737	11.8384	12.37488	11.88894
False alarm in X? (Y=1/N=0)			1	0	0	0	0	0	1	1	0	0	0
False alarm in X? (Y=1/N=0)			0	0	0	0	1	1	0	1	0	1	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	0	1	0	0	0
Total false alarm in X			1	0	0	0	1	1	1	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
Total false alarm in MR			0	0	0	0	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 30 =													
Sub-total MR control charts with at least one false alarm k 30 =													
Normal upper control limit X			9.865892	13.41648	14.43388	13.02588	11.74236	12.03517	14.09582	12.38198	12.78008	12.78324	12.88864
Normal lower control limit X			-2.0887	-4.4333	-6.0802	-4.40887	-3.52248	-4.87027	-4.47585	-3.9548	-4.48516	-4.8853	-4.51378
Normal upper control limit MR			7.393858	10.86862	12.80358	10.75808	9.37846	10.44787	11.41002	10.03708	10.80133	10.85527	10.89177
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	1	1	1	0	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	1	0	1	1	1	0
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	0	1	0	0	0
Total false alarm in X			1	0	0	0	1	1	1	1	1	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	1	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			1	0	0	0	1	0	0	1	0	0	0
Total false alarm in MR			1	0	0	0	1	1	1	1	0	0	0
Sub-total normal X control charts with at least one false alarm k 30 =													
Sub-total normal MR control charts with at least one false alarm k 30 =													
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =													
Sub-total MR control charts with at least one false alarm k 1 =													
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =													
Sub-total MR control charts with at least one false alarm k 1 =													
False alarm in X? (Y=1/N=0)			1	0	0	0	0	0	1	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =													
Sub-total MR control charts with at least one false alarm k 10 =													
False alarm in X? (Y=1/N=0)			1	0	0	0	1	0	1	1	1	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	1	0	0	0	0
Sub-total X control charts with at least one false alarm k 10 =													
Sub-total MR control charts with at least one false alarm k 10 =													

1	2	3	24	25	26	27	28	29	30	31	32	33	34
		1	4.4430	3.6898	5.6814	7.5841	13.4897	4.588	4.2371	4.6827	4.1731	3.1821	8.4058
			5.2293	14.8104	5.8118	5.5592	5.8054	5.4803	4.7431	6.4423	5.8784	7.2641	4.2805
			3.8404	7.6134	6.6032	6.6029	2.8718	8.6507	12.9354	10.3358	6.2738	3.9148	5.3966
			8.5873	7.3145	7.6528	7.2559	4.4129	8.484	8.2703	7.338	8.3328	13.294	14.3898
			10.154	7.328	4.828	7.2771	9.0309	7.5619	3.8891	10.5245	5.0278	14.8868	8.45
			6.6594	6.1311	8.1077	7.1332	8.4333	5.8595	9.2018	4.5431	8.358	9.7872	4.1124
			6.0221	4.2806	3.8155	11.4039	6.7858	4.9302	11.0701	8.2074	3.1254	3.4189	6.7881
			4.7521	5.784	3.7879	13.4383	6.5761	5.4532	4.648	9.4123	3.7383	5.4024	11.0262
			5.454	8.8057	4.1818	10.0392	5.8658	3.7344	21.2834	4.9438	4.336	4.917	17.5778
		10	8.754	12.578	5.5285	7.5852	4.7718	4.4052	7.2828	9.8394	5.4453	10.1148	5.5372
			6.2311	5.7083	3.3158	4.3729	6.7204	8.2021	9.8754	5.186	4.7398	4.9283	9.4978
			9.649	3.1515	5.3452	3.6054	9.2178	8.3509	6.6192	7.4058	3.8899	10.126	11.4486
			5.1224	18.0363	3.882	7.3224	4.0474	10.0795	3.4462	6.4087	5.3372	6.8803	3.8872
			4.8436	5.1813	7.2732	7.5083	3.6228	6.0864	6.3347	14.2809	6.6288	9.8537	7.7887
New observations k =			6.2441	4.3281	4.7214	2.9477	6.2315	9.3033	9.897	4.5892	5.749	3.8758	9.3172
			5.4604	5.3642	6.0821	4.551	3.6075	6.7585	5.5381	5.5876	3.8009	5.3302	5.7317
			10.84	5.7639	2.945	7.0311	12.3278	9.1614	4.6481	5.7383	5.0784	9.1548	8.6386
			13.7474	6.6808	8.955	8.3257	4.6455	4.5086	3.8874	7.0295	4.6387	4.9378	3.6939
			11.3498	17.1868	8.4547	10.5878	8.486	3.9385	3.8898	5.2287	5.0876	3.8848	6.7569
		20	4.2786	8.2043	10.7573	7.8823	6.6877	11.8322	4.4325	5.0381	9.7088	6.5524	8.4988
			7.0556	5.9418	5.7735	6.0557	6.9808	5.9536	8.8383	5.6471	11.1348	6.4392	7.3529
			6.8885	7.8807	4.4207	3.212	5.7165	7.283	5.8801	7.9885	7.1381	4.9023	5.2752
			18.118	4.7711	4.0316	5.4892	5.0318	3.1486	4.5044	4.8271	4.4776	5.1143	7.6174
			5.6054	13.0328	5.3846	6.3862	7.1295	8.5323	6.0248	6.1353	8.2848	8.874	10.1754
			3.8509	8.004	7.5735	3.7078	7.2811	5.8018	5.6258	6.7028	10.0888	15.9553	6.1804
			4.0988	3.4288	3.9005	8.6081	8.4968	5.9189	11.8845	4.9422	8.5703	14.902	5.5681
			4.5182	10.1417	7.805	17.5877	3.6336	6.6317	5.889	5.7243	3.044	4.354	9.3528
			6.8386	8.5258	11.9442	4.1582	7.7587	6.8987	8.3572	9.278	3.8524	5.559	5.3624
			14.349	7.1554	5.3815	4.4055	3.0358	6.1331	3.818	8.6032	10.011	7.8987	4.3182
		30	4.9184	3.1471	5.1864	6.2244	6.6849	6.8851	7.5823	3.138	8.1888	7.7805	8.6498
Estimator shape parameter			2.022706	1.80346	1.904747	1.570854	1.849835	2.318105	2.328374	1.836083	2.014937	2.072344	1.702537
			0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			2.187078	2.332884	1.83857	2.031038	1.90182	1.50832	1.433715	2.001878	1.888888	1.835543	1.850847
Control chart constant d2			1.080868	1.047788	1.059751	1.041872	1.058212	1.088882	1.089178	1.053878	1.075288	1.062231	1.051782
Control chart constant d3			0.934413	0.945823	0.93527	0.950708	0.938888	0.926245	0.925831	0.940487	0.91803	0.93293	0.942407
Control chart constant D4			3.648854	3.749088	3.658183	3.782188	3.688433	3.582887	3.580314	3.701738	3.531833	3.638318	3.718748
Upper contro limit X			15.047	13.21125	11.37824	8.708832	11.4449	10.83887	11.19108	10.95828	13.48384	11.81458	11.10234
Lower control limit X			-6.19037	-5.30858	-4.04427	-3.28341	-4.02997	-3.85928	-4.51484	-3.80878	-3.73035	-3.59234	-4.50485
Upper control limit MR			13.7047	12.12587	9.860888	8.581422	10.01218	9.378777	10.02024	9.471088	10.98222	9.78872	10.17387
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	1	0	0	1	1
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	0	1	0	0	1
False alarm in X? (Y=1/N=0)			1	0	1	1	0	0	1	0	1	1	0
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			0	0	0	1	0	0	0	0	1	1	0
Total false alarm in MR			0	1	0	1	0	0	1	1	1	1	1
Sub-total X control charts with at least one false alarm k 30 =													
Sub-total MR control charts with at least one false alarm k 30 =													
Normal upper control limit X			14.41288	12.55283	10.91284	9.211082	10.8682	10.45178	10.78159	10.48038	13.08149	11.17124	10.57507
Normal lower control limit X			-5.58526	-4.85117	-3.57788	-2.78787	-3.55127	-3.47418	-4.10514	-3.12888	-3.3278	-3.14902	-3.87738
Normal upper control limit MR			12.27425	10.58888	8.802819	7.37788	8.918288	8.555875	9.148185	8.361325	10.08781	9.798136	8.940788
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	1	1	0	1	1
False alarm in X? (Y=1/N=0)			0	1	0	1	1	1	0	1	0	0	1
False alarm in X? (Y=1/N=0)			1	1	1	1	0	0	1	0	1	1	0
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	0	0	0	0	1	0	1	0
False alarm in MR? (Y=1/N=0)			1	0	0	1	0	0	0	0	1	1	0
Total false alarm in MR			1	1	0	1	0	0	1	1	1	1	1
Sub-total normal X control charts with at least one false alarm k 30 =													
Sub-total normal MR control charts with at least one false alarm k 30 =													
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =													
Sub-total MR control charts with at least one false alarm k 1 =													
False alarm in X? (Y=1/N=0)			0	0	0	0	1	0	0	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0
Sub-total X control charts with at least one false alarm k 1 =													
Sub-total MR control charts with at least one false alarm k 1 =													
False alarm in X? (Y=1/N=0)			0	0	1	0	1	1	0	1	0	0	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	1	0	0	1	0	0	1	1
Sub-total X control charts with at least one false alarm k 10 =													
Sub-total MR control charts with at least one false alarm k 10 =													
False alarm in X? (Y=1/N=0)			0	1	0	1	1	0	1	1	0	1	1
False alarm in MR? (Y=1/N=0)			0	1	0	1	0	0	1	0	0	1	1
Sub-total X control charts with at least one false alarm k 10 =													
Sub-total MR control charts with at least one false alarm k 10 =													

OBJECTIVE # 3

Chi-square (df=4)   k = 50 obs   Shift 2 process standard deviation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
		1	8.7409	6.1871	7.0133	8.8898	8.2712	8.8709	7.5834	14.4818	10.0792	11.7121	8.1124	8.5108	12.0751	5.9723	7.9785	17.5812	11.9334	11.984	8.1083	8.5714	8.1501	9.8804	10.5275	10.8883	8.2327	9.3882	12.3287	18.0072	7.9028	8.7388	15.7821
			8.1371	11.8783	10.0834	8.8081	14.2928	11.0007	8.4782	11.0818	14.5043	12.9533	8.9857	8.8848	8.4988	7.5288	11.0582	9.0331	7.0151	14.7182	12.7288	10.1083	11.0822	9.8029	9.6831	8.9018	8.488	7.8871	12.7072	7.7155	13.7488	13.8588	6.1812
			14.4925	8.5678	11.0978	8.3854	15.8899	9.0931	8.1888	8.4451	21.2893	7.8504	7.5813	8.2232	7.8383	7.7258	12.8887	5.8843	13.5478	10.1935	7.8884	10.0823	8.4158	9.0893	7.5872	8.171	8.3523	9.8383	13.1862	7.9491	7.7883	8.824	12.2448
			8.7129	11.4444	8.8342	7.8022	8.8253	9.7912	8.3835	8.4788	9.0524	7.2057	7.5833	7.8312	8.312	7.1854	8.5788	9.8893	7.8705	8.1157	14.484	8.0882	12.1051	8.8292	8.8881	8.805	9.7218	8.1788	7.5585	11.0081	12.0834	13.8388	10.8081
			7.3991	10.2895	14.8553	15.3791	5.8863	9.3082	7.595	8.8405	12.0449	17.7575	8.4149	11.8115	10.1171	8.5188	8.0288	9.0924	14.0875	7.0775	8.4541	10.2023	11.3383	7.2223	7.7023	7.8317	8.3803	9.885	9.5858	9.1025	9.1888	12.2287	11.423
			8.1264	8.7638	10.1274	8.4141	10.3172	13.3481	7.8808	11.2524	9.0833	8.3938	11.0237	8.9228	9.7918	9.1395	10.8801	12.8755	12.0131	15.2508	10.2833	9.3188	8.5158	7.9483	21.0884	12.7883	9.3241	11.2384	7.3579	7.0528	7.7475	9.5128	7.824
			11.1742	8.8257	9.858	8.2028	7.8307	13.8555	8.0531	13.4898	9.462	10.4257	7.2115	9.1878	7.882	8.1984	8.3258	15.2822	10.8813	17.181	12.5445	7.4854	7.3548	8.8848	10.2824	8.4024	12.0888	8.4882	7.2293	7.085	14.3187	7.2881	9.9118
			8.8113	10.287	10.5558	7.8484	7.7872	7.8757	10.5533	10.4595	7.1188	10.8937	12.4389	8.8428	7.3275	10.1883	9.7187	11.9788	12.9328	9.0351	7.7154	8.3588	8.8085	14.3003	8.5157	9.2028	13.783	7.887	10.3858	11.8122	6.2933	8.7774	12.4481
			8.5732	10.8888	9.4525	7.1542	8.3611	11.8983	10.8213	12.8545	9.1888	14.0717	8.4274	7.5424	7.2515	10.2438	10.4228	13.4425	9.8188	9.8078	5.9455	8.9808	8.308	8.383	6.6888	9.8188	8.8717	9.1328	11.1787	8.389	9.8288	12.1812	6.9882
		10	9.0284	7.1118	9.7891	8.2845	9.4575	17.9823	9.815	7.7792	9.8403	8.4775	7.828	8.3483	13.1021	9.1188	15.7475	14.0857	12.3488	7.281	13.3151	10.3252	8.8887	8.4872	11.1444	9.5785	11.7525	11.5235	7.4827	7.8271	7.3181	9.8877	6.8353
			7.7572	9.1157	14.1707	8.0811	8.9474	12.1048	15.3038	10.9378	10.331	11.4118	13.8935	8.3119	11.8558	8.3744	6.8887	12.8588	11.1	9.2957	8.1481	17.5285	9.2353	13.2427	7.0524	8.8548	8.8841	7.882	15.9735	7.0083	7.8824	9.6408	6.4378
			7.4278	11.8422	11.5841	9.0875	9.3721	8.8053	9.3188	12.9345	9.2388	8.9585	14.9807	8.8023	11.8542	12.2885	7.85	9.8214	8.4258	8.3194	8.9862	7.9103	7.68	7.0372	8.8988	7.3887	8.8016	9.8951	20.8871	7.0887	10.583	15.1148	7.8835
			15.1442	8.8138	10.4538	8.944	14.0919	8.9753	13.4822	8.5718	7.2382	13.7171	10.1702	7.8749	8.1718	12.8134	11.2205	9.8819	8.7408	12.9408	8.8884	9.2075	14.9884	9.562	14.1148	8.7249	8.2817	8.87	10.1738	8.7357	13.2801	7.4901	10.5588
			8.933	8.7718	8.3718	9.3721	10.5007	8.8495	5.7982	10.1202	9.9357	7.3504	8.3732	8.8749	7.2554	11.4788	14.7888	9.7108	11.1423	7.4223	8.1821	7.5849	11.1472	21.8429	8.3292	7.8314	14.3188	13.3273	8.98	18.345	8.7119	9.5844	8.818
New observations k =			10.2158	8.3724	7.5258	10.5305	7.0052	8.9884	10.7807	8.8255	5.9789	15.4707	11.2241	8.8284	11.4938	11.3132	13.3053	5.8893	8.0828	9.8287	13.758	10.152	9.531	8.2722	15.8788	7.471	7.8052	10.9052	8.4835	9.0794	8.444	11.527	18.5805
			9.3209	8.4343	10.1308	10.4221	9.777	8.8575	8.7714	10.2845	8.8898	10.7938	7.1802	8.2859	11.9883	8.8432	7.0885	7.1988	6.9719	13.1003	10.9741	5.8185	8.8408	10.1102	7.0508	18.1887	8.371	7.8725	9.4542	7.2729	8.8133	11.9571	8.3752
			7.5213	7.1831	8.7874	7.4458	8.4129	7.0433	10.8138	12.9873	7.0554	11.8572	8.2558	7.2439	8.884	7.8888	10.0877	8.484	13.9844	10.4443	10.4818	7.301	8.4584	8.8918	7.5885	9.881	8.3475	11.0338	8.4478	7.7187	17.2441	8.1842	7.3712
			8.3585	8.7881	8.8773	12.2398	7.0127	15.2588	8.1131	8.8048	7.3812	8.3858	8.0154	8.3085	12.2425	7.8853	12.7283	11.2485	8.9584	9.2888	7.28	8.8407	10.9582	8.7611	8.2122	7.7584	18.9901	8.5584	8.7482	10.8512	7.2158	8.1809	8.5127
			8.0174	8.5853	8.5628	12.3151	9.8171	8.8708	8.284	11.7318	11.8107	8.8828	7.6394	8.9828	9.181	10.8855	10.9254	8.1231	7.4017	8.8094	12.8754	12.2838	12.8345	7.4331	8.854	9.1574	8.2782	7.9078	8.84	8.5913	8.8278	11.2783	8.3158
		20	8.8954	12.4918	8.0025	8.6548	8.5832	12.4187	10.1837	11.7471	9.4213	8.0788	9.9498	18.7318	9.4982	8.7728	14.1107	15.3043	11.4901	9.0824	8.4513	15.2203	14.8523	11.0748	12.857	8.1	7.2857	8.4878	5.7929	5.8214	12.4183	7.845	7.4848
			9.3407	7.0331	25.1831	12.1307	10.416	8.4884	7.7085	7.9103	8.4578	8.6893	8.1428	7.1783	8.3582	10.9107	15.8485	8.3058	8.8826	8.8031	10.7757	8.7344	12.1701	8.7733	10.4785	13.5838	8.2631	10.3288	9.8845	8.2814	10.888	9.9018	10.2905
			7.8008	8.7303	9.4814	10.5577	8.3838	8.3504	8.5947	11.3878	9.2471	7.2748	8.4817	10.4318	6.838	10.7102	10.5118	8.4713	7.9218	8.883	8.7374	7.3334	8.8884	10.2585	13.5978	8.4778	12.1718	7.8118	7.9785	8.5802	8.6218	11.0932	9.1911
			7.5435	7.0478	11.8158	8.3563	10.8188	7.4798	8.2088	7.9834	7.8012	8.4033	7.8284	17.5347	8.8183	12.4882	8.8325	13.1581	9.3288	7.4858	13.3815	11.3254	11.3042	9.8771	21.7884	12.7072	8.758	9.0868	9.9721	7.4804	8.3281	17.8737	11.8848
			8.9095	10.7288	8.0586	14.1512	8.5338	13.5801	12.5484	8.4352	10.7033	8.678	8.4037	12.004	7.2585	13.1883	5.9132	8.81	17.2402	12.8083	10.581	8.5888	11.8415	10.7714	11.0514	11.5213	7.5778	7.392	7.4388	8.0808	10.25	9.1481	12.4818
			13.4108	9.8448	13.5773	13.2717	9.8382	8.8848	8.7813	8.7242	9.0542	10.0213	9.9731	8.7828	10.5848	7.433	8.3888	7.0403	7.9177	8.8884	10.1935	9.1224	7.2188	7.729	13.3287	18.3572	10.2484	7.2408	10.7835	10.899	18.2024	9.0561	8.7801
			7.229	11.2898	8.8783	8.1485	10.7501	13.105	5.8144	8.5055	12.3904	9.8188	11.3729	8.5832	10.7282	8.4578	7.1881	10.3395	7.5514	8.8892	16.2582	11.0741	7.4752	8.1111	8.5884	9.4024	7.7295	7.9314	13.4029	12.8821	18.8618	8.458	7.5284
			7.983	13.7019	8.8827	10.4578	14.5418	13.1507	13.5113	13.4575	9.3944	14.8143	15.8752	10.0298	8.8803	9.9298	7.2385	7.8208	7.5704	9.3114	8.7819	11.24	8.7308	8.3884	12.712	10.8888	7.8013	8.0083	10.3477	12.077	13.8853	14.3595	12.451
			14.1122	11.3244	7.0248	7.4788	8.7001	9.5751	8.884	12.722	6.283	12.1214	8.5545	8.3458	8.8583	9.3573	7.1578	7.8773	7.7775	10.9181	8.9281	8.0808	10.8587	10.7795	12.0023	7.1398	10.2318	11.9111	9.8783	8.1385	13.176	8.3252	7.942
			12.3895	7.3298	7.2758	9.1383	8.5308	7.98	8.8031	8.515	8.5795	8.8141	12.8485	8.0181	8.1524	10.8233	8.8255	10.2171	17.4438	8.8872	10.0271	20.8185	9.4451	18.4323	8.1883	15.7417	12.8501	7.8715	9.2526	11.1429	8.5741	7.0714	11.0805
		30	13.3987	8.8957	11.0275	7.7174	8.8172	9.2827	15.2012	8.1191	9.8887	8.7447	14.8808	10.3138	8.1111	8.7723	7.1874	11.3198	8.2278	14.5787	8.9887	8.8511	9.1651	9.8088	13.813	8.0538	5.9857	8.185	8.5183	8.8088	11.8458	8.4257	8.945
Estimator shape parameter			2.620531	1.555534	1.74118	1.580558	2.044303	2.815808	1.95954	2.135202	2.053185	2.575043	1.793742	1.728088	2.087855	2.082817	1.80811	2.093788	1.728184	2.288324	1.78208	1.85505	2.022708	1.88348	1.984747	1.578854	1.849835	2.318105	2.328374	1.838883	2.814837	2.072344	1.782537
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimator scale parameter			1.459278	2.577153	2.215181	2.788874	1.897022	2.118582	2.392008	2.151092	2.00842	1.53341	2.604038	2.419883	2.035178	1.873288	2.108848	2.287338	2.438181	1.8182	2.241071	2.141852	2.187078	2.332984	1.83857	2.031038	1.90182	1.50832	1.433715	2.001978	1.888888	1.835543	1.850847
Control chart constant d2			1.075394	1.040878	1.048887	1.04148	1.081358	1.075302	1.058556	1.0841	1.081837	1.07452	1.052253	1.049308	1.082988	1.082551	1.043542	1.082881	1.049402	1.088224	1.050905	1.058401	1.080888	1.047798	1.058751	1.041872	1.058212	1.088882	1.080178	1.053878	1.075288	1.062231	1.051782
Control chart constant d3			0.918903	0.951782	0.943958	0.951133	0.933782	0.918014	0.938373	0.931118	0.933497	0.918945	0.941988	0.944537	0.932182	0.932823	0.948402	0.932305	0.944457	0.928938	0.943188	0.938518	0.934413	0.945823	0.93527	0.950708	0.938889	0.928245	0.925831	0.940487	0.91803	0.93293	0.942407
Control chart constant D4			3.531011	3.801582	3.732508	3.785898	3.843325	3.531725	3.885898	3.821273	3.84108	3.537825	3.715115	3.737871	3.830149	3.833748	3.780725	3.831087	3.738858	3.587897	3.725484	3.888934	3.848854	3.748088	3.858183	3.792188	3.888433	3.582897	3.580314	3.701738	3.531833	3.838318	3.718749
Upper contro limit X			10.75898	13.11883	13.97858	18.20214	12.72858	18.48801	18.54848	14.4178	12.28842	10.28538	14.05895	15.2032	13.5805	12.21248	12.72333	14.88472	12.98378	13.27284	13.43133	13.48082	15.047	13.21125	11.37924	8.708832	11.4449	10.83887	11.19108	10.85829	13.48384	11.81458	11.10234
Lower control limit X			-3.10883	-5.10113	-8.28445	-7.51031	-4.87238	-5.38594	-7.17501	-5.23187	-4.0574	-2.38818	-5.07578	-8.84842	-5.0223	-3.88258	-5.85843	-5.04458	-4.58858	-4.84785	-5.53338	-5.08588	-8.18837	-5.30858	-4.04427	-3.29341	-4.02887	-3.85828	-4.51484	-3.88878	-3.73035	-3.58234	-4.50485
Upper control limit MR			8.775278	12.01382	13.22235	15.82385	11.40788	13.83298	15.34321	12.81872	10.53589	8.004338	12.48703	14.41485	11.85135	10.42807	12.08708	12.87771	11.47737	11.8384	12.37488	11.88884	13.7047	12.12587	8.980089	8.581422	10.01219	9.379777	10.02024	8.471088	10.80222	8.78872	10.17387
False alarm in X? (Y=1/N=0)			1	0	1	0	1	1	0	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	0	1	1	1	0	1	0	0	1	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	0	1	0	0	0	1	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0
Total false alarm in MR			0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	0	1	1	0	0	0
Sub-total X control charts with at least one false alarm k 30 =							235																										
Sub-total MR control charts with at least one false alarm k 30 =							95																										
Normal upper control limit X			10.43388	12.41358	13.27857	15.29253	12.20588	15.9585	15.8192	13.86133	11.81535	9.885892	13.41849	14.43398	13.02508	11.74238	12.03517	14.08582	12.38198	12.78008	12.78324	12.88884	14.41288	12.55283	10.91284	9.211092	10.8862	10.45178	10.78158	10.48038	13.09148	11.17124	10.57507
Normal lower control limit X			-2.7855	-4.39588	-5.58444	-8.80071	-4.4495	-4.87543	-8.44473	-4.8753	-3.57833	-2.0887	-4.4333	-8.0802	-4.48887	-3.52248	-4.87027	-4.47585	-3.9548	-4.48518	-4.8853	-4.51378	-5.58528	-4.85117	-3.57788	-2.78787	-3.55127	-3.47418	-4.10514	-3.12888	-3.3278	-3.14902	-3.97738
Normal upper control limit MR			8.12184	10.32747	11.57884	13.45085	10.23287	12.80003	13.8788	11.38881	9.458405	7.393858	10.88882	12.80358	10.75808	9.37848	10.44787	11.41002	10.03708	10.80133	10.85527	10.88177	12.27425	10.58888	8.802818	7.37789	8.819288	8.555875	9.148185	8.381325	10.08781	8.798138	8.940788
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	0	1	1	1	0	0	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	1	1	0	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in X? (Y=1/N=0)			1	1	1	0	1	0	0	0	1	1	1	1	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
Total false alarm in X			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0
Total false alarm in MR			0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	1	1	0	1	1	1	1	0	1	1	0	0	1
Sub-total normal X control charts with at least one false alarm k 30 =							243																										
Sub-total normal MR control charts with at least one false alarm k 30 =							117																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 1 =							40																										
Sub-total MR control charts with at least one false alarm k 1 =							20																										
False alarm in X? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1
Sub-total X control charts with at least one false alarm k 1 =							45																										
Sub-total MR control charts with at least one false alarm k 1 =							29																										
False alarm in X? (Y=1/N=0)			1	0	1	0	1	1	0	1	1	1	0	0	0	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0
Sub-total X control charts with at least one false alarm k 10 =							181																										
Sub-total MR control charts with at least one false alarm k 10 =							44																										
False alarm in X? (Y=1/N=0)			1	0	1	1	1	1	0	1	1	1	0	0	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1
False alarm in MR? (Y=1/N=0)			0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1
Sub-total X control charts with at least one false alarm k 10 =							202																										
Sub-total MR control charts with at least one false alarm k 10 =							82																										

APPENDIX J

TABLE "T" STATISTIC

TABLE 6.19

$\hat{\alpha}$ as a function of T, gamma distribution

T	$\hat{\alpha}$	T	$\hat{\alpha}$	T	$\hat{\alpha}$	T	$\hat{\alpha}$
0.01	0.010	1.40	0.827	5.00	2.655	13.00	6.662
0.02	0.019	1.50	0.879	5.20	2.755	13.50	6.912
0.03	0.027	1.60	0.931	5.40	2.856	14.00	7.163
0.04	0.036	1.70	0.983	5.60	2.956	14.50	7.413
0.05	0.044	1.80	1.035	5.80	3.057	15.00	7.663
0.06	0.052	1.90	1.086	6.00	3.157	15.50	7.913
0.07	0.060	2.00	1.138	6.20	3.257	16.00	8.163
0.08	0.068	2.10	1.189	6.40	3.357	16.50	8.413
0.09	0.076	2.20	1.240	6.60	3.458	17.00	8.663
0.10	0.083	2.30	1.291	6.80	3.558	17.50	8.913
0.11	0.090	2.40	1.342	7.00	3.658	18.00	9.163
0.12	0.098	2.50	1.393	7.20	3.759	18.50	9.414
0.13	0.105	2.60	1.444	7.40	3.859	19.00	9.664
0.14	0.112	2.70	1.495	7.60	3.959	19.50	9.914
0.15	0.119	2.80	1.546	7.80	4.059	20.00	10.164
0.16	0.126	2.90	1.596	8.00	4.159	20.50	10.414
0.17	0.133	3.00	1.647	8.20	4.260	21.00	10.664
0.18	0.140	3.10	1.698	8.40	4.360	21.50	10.914
0.19	0.147	3.20	1.748	8.60	4.460	22.00	11.164
0.20	0.153	3.30	1.799	8.80	4.560	22.50	11.414
0.30	0.218	3.40	1.849	9.00	4.660	23.00	11.664
0.40	0.279	3.50	1.900	9.20	4.760	23.50	11.914
0.50	0.338	3.60	1.950	9.40	4.860	24.00	12.164
0.60	0.396	3.70	2.001	9.60	4.961	24.50	12.414
0.70	0.452	3.80	2.051	9.80	5.061	25.00	12.664
0.80	0.507	3.90	2.101	10.00	5.161	30.00	15.165
0.90	0.562	4.00	2.152	10.50	5.411	35.00	17.665
1.00	0.616	4.20	2.253	11.00	5.661	40.00	20.165
1.10	0.669	4.40	2.353	11.50	5.912	45.00	22.665
1.20	0.722	4.60	2.454	12.00	6.162	50.00	25.166
1.30	0.775	4.80	2.554	12.50	6.412		

VITA

Jose R. Oyon

Candidate for the Degree of

Master of Science

Thesis: EFFECTS OF SKEWED DISTRIBUTIONS IN INDIVIDUAL MEASUREMENT X AND MOVING RANGE (n=2) MR CONTROL CHARTS.

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