Q

The Billing department of a firm has been keeping an np chart on defective They sample 50 invoices a week and over the past year theiruestion:

The Billing department of a firm has been keeping an np chart on defective invoices. They sample 50 invoices a week and over the past year their average number of defective invoices has been 4.1. In order to save time, they are going to reduce the sample size to 40.

What are the new control limits for the np chart with sample size of 40?

a. 0 and 9.920

b. 2.182 and 6.018

c. 0 and 9.854

d. 0 and 7.936

A

0 and 9.854

Q

Which of the following tools is used extensively in quality function deployment (QFD)?

a. Cause and effect diagram

b. Activity network diagram

c. Affinity diagram

d. Matrix diagram

A

Matrix diagram

Q

Why can items such as bins, floors, benches and racks be used as part of a visual factor?

a. These items can be used to communicate information.
b. The items can be kept clean and orderly.
c. Items such as floors, bins benches and racks can be used for storage.
d. Items such as bins and benches can be arranged by order of operation.

A

These items can be used to communicate information.

Q

The design failure mode and effects analysis should be completed before which of the following?

a. Performance testing

b. Prototype testing

c. Production drawings are released for tooling

d. Severity changes

A

Production drawings are released for tooling

Q

Suppose I have a process in Statistical Control. When I compare the natural process limits to the specification limits I find that there are 10% of the parts above the USL, but none below the LSL.

a. What is the first step I should take to improve the % defective?

b. Reduce the process variability.

c. Nothing. We're screening the defectives out and reworking them later

d. Retarget the process.

e. Talk to engineering about changing the specifications.

A

Retarget the process.

Q

Statistical process control (SPC) is best defined as the use of:

a. inputs to control critical and complex processes
b. statistical methods to identify and remove manufacturing errors
c. statistical methods to understand and control a process
d. Pareto charts to understand and control a process

A

statistical methods to understand and control a process

Q

An automotive parts supplier uses a robotic welding process for metal assemblies. Welded parts are then inspected, and if failed, are subjected to manual welding to correct any welding deficiencies.

This supplier is faced with increased operating costs and diminishing margins, and as a result is in search for cost-cutting measures.

Which of the following can be considered an option for improving the above mentioned process?

a. Research other options for metal assembling that can achieve better energy savings.
b. Increase inspection of the robotic welding step to reduce failure rate.
c. Convert the manual welding into robotic to save on labor costs.
d. Conduct a value stream mapping of the process to eliminate a rework step.
e. Provides relationship between two variables, and provides a visual correlation coefficient.

A

Conduct a value stream mapping of the process to eliminate a rework step.

Q

Provides relationship between two variables, and provides a visual correlation coefficient.

a. Statistical Process Control

b. Pareto Chart

c. Control Chart

d. Scatter Diagram

A

Scatter Diagram

Q

Which of the following situations illustrates the lean concept of “pull”?

a. The upstream operation produces to the schedule provided by the downstream operation.
b. The upstream operation's production is synchronized to provide the downstream operation just-in-time.
c. The upstream operation sets the pace for the downstream operation's production.
d. Nothing is produced by the upstream operation until the downstream operation communicates it is ready.

A

Nothing is produced by the upstream operation until the downstream operation communicates it is ready.

Q

Which six sigma role is most likely to define objectives for an improvement team?

a. Leader

b. Sponsor

c. Facilitator

d. Member

A

Sponsor

Q

The first five measurements taken in sequence from a process are:

10, 14, 12, 13, 21

What is the average moving range?

a. 2.75
b. 3.75
c. -2.75
d. 3

A

3.75

Q

Data coming basically from GO/NO-GO, pass/fail determinations of whether units conform to standards.

a. Attribute Data

b. Variable Data

c. Sample Size

d. Discrete Data

A

Attribute Data

Q

A Green Belt wishes to determine the primary pattern (positional, cyclical or temporal pattern) of variation in a process or product. Which of the following techniques would be most useful?

a. Multi-Vari

b. Full Factorial

c. Orthogonal Array

d. Analysis of Variance

A

Multi-Vari

Q

A point outside the control limits is a signal of the likely occurrence of:

a. A chance cause
b. A trend
c. Common-cause variation
d. Special-cause variation

A

Special-cause variation

Q

If all of the sample sizes are equal, which one of the following charts is the most appropriate to substitute for a u chart?

a. np chart

b. I chart

c. c chart

d. p chart

A

c chart

Q

The degrees of freedom for a contingency table containing 3 rows and 4 columns is:

a. 6

b. 11

c. 7

d. 12

A

6

Q

One of the most common measures of variability in a data set or population.

a. Normal Distribution
b. Alpha Risk
c. Mean
d. Standard Deviation

A

Standard Deviation

Q

Which of the following was one of Shewhart's contributions to the foundation of the Six Sigma methodology and tools?

a. He experimented, identified, and documented the concept of the "Hawthorne effect."
b. He created and used control charts, and he introduced the concept of statistical quality control.
c. He was the first to describe and define the Six Sigma DMAIC approach to continuous improvement.
d. He first promoted the idea that any process variation from a desired target value was a loss to society.

A

He created and used control charts, and he introduced the concept of statistical quality control.

Q

Which distribution listed below is formed by the distribution of sample variances?

a. Student t

b. F

c. Chi-Square

d. Exponential

A

Chi-Square

Q

The right hand side of a completed "house of quality" (HOQ) displays rankings and values for:

a. Customer needs or desires

b. Competitive assessments or comparisons

c. Design feature measurements and importance

d. Design feature interactions

A

Competitive assessments or comparisons

Q

An FMEA is being constructed for the manufacture of a syringe cartridge. The team has developed risk ranking scale criteria for calculating the RPN.

The team has assigned five values for ranking likelihood of occurrence (O), 10 values for ranking the risk associated with severity (S), and five values for ranking the risk associated with detection (D).

Using this method will most likely do which of the following?

a. Ensure all values for O, S, and D are equally represented in RPN.
b. Give severity a disproportionate representation in RPN.
c. Ensure RPN reflects the priority for addressing failure modes.
d. Give occurrence and severity an equal representation in RPN.

A

Give severity a disproportionate representation in RPN.

Q

In contingency tables, the null hypothesis is that the probabilities for each outcome are independent is based on using which of the following measurements?

a. Standard Deviations

b. Means

c. Variances

d. Proportions

A

Proportions

Q

When manufacturing a product, which of the following options is an element of continuous flow?

a. Takt time

b. Mass production

c. Kaizen

d. Muda

A

Takt time

Q

Which of the following is an example of an activity that adds to the Cost of Quality?

a. An inline pH test of milk before final formulation.
b. Regular online updates to anti-virus software.
c. Refining of crude oil to produce high quality unleaded gasoline.
d. Addition of safety relief valve to pressure vessels being produced.

A

An inline pH test of milk before final formulation.

Q

Which of the following is a group of experimental runs conducted under relatively homogeneous conditions?

a. Response variable

b. Experimental error

c. Interaction

d. Block

A

Block

Q

In Analysis of Variance, the F-statistic is a ratio that compares:

a. The variation caused by treatments to total sum of squares.
b. The variation between treatments to variation within treatments.
c. The variation within treatments to variation caused between the treatments.
d. The variation within treatments to total sum of squares.

A

The variation between treatments to variation within treatments.

Q

The statistics that summarize a population are referred to as

a. categorical statistics
b. descriptive statistics
c. probabilistic statistics
d. control statistics

A

descriptive statistics

Q

Customer satisfaction is primarily driven by which of the following?

a. Capturing customer feedback through multiple methods (e.g., surveys, complaints, etc.)
b. The ability of a product or service to meet the needs of a user or purchaser
c. Delivering quality and product features that exceed those provided by competitors
d. Identifying both the stated and unstated needs of customer segments

A

The ability of a product or service to meet the needs of a user or purchaser

Q

If the 6σ spread for a process is equal to six and the process average is equal to sixteen, what should the lower specification limit be set at to ensure less than .135% of the process output is rejected?

a. 30

b. 15

c. 13

d. 12

A

12

Q

A 23 full factorial design with 2 replications per cell requires _____ runs.

a. 2

b. 12

c. 3

d. 16

A

16

Q

Six Sigma Manager is scheduling and tracking the progress of critical project tasks within a project. Which of the following is most likely to be the best tool he can use?

a. Gantt chart

b. PERT chart

c. Project charter

d. Critical Path Method

A

Gantt chart

Q

Which of the following best describes the structure of a response surface design of experiment?

a. Factor settings are viewed at defined points.

b. Factor settings are constrained.

c. Each treatment occurs one in every row.

d. Several factors are investigated.

A

Factor settings are viewed at defined points.

Q

All of the sample sizes are equal. Which of the following charts is the most appropriate to substitute for a p chart?

a. I chart

b. np chart

c. c chart

d. u chart

A

np chart

Q

Which of the following tools is used to translate broad requirements into specific requirements?

a. A quality control plan

b. The theory of constraints (TOC)

c. A critical to quality (CTQ) tree

d. A process flowchart

A

A critical to quality (CTQ) tree

Q

The ANOVA method for analyzing a gage study is preferred over the Average and Range method because it:

a. includes interactions between operators and items being measured
b. uses constant values from lookup tables to estimate variation
c. is more likely to identify inconsistent measurements within the study
d. makes calculations easier to perform by hand

A

includes interactions between operators and items being measured

Q

An operator is expected to assemble certain parts without error. Each assembly may be different depending on the customer order. Which of the following is the best example of error-proofing for this situation?

a. Standardized work instructions are written and posted at the operations. These contain instructions for all the assemblies.
b. Each operator is trained on which parts go into each assembly being made available to customers.
c. When the operator begins putting together an assembly, only the bins containing the parts for that assembly light up.
d. When the operator begins putting together an assembly, he or she is given a list containing only the parts for that assembly.

A

When the operator begins putting together an assembly, only the bins containing the parts for that assembly light up.

Q

If events A and B are mutually exclusive, then how does this impact the occurrence of A and B?

a. $P(A \cap B) = P(A)P(B)$

b. At least one of them will occur.

c. A and B cannot occur simultaneously.

d. $P(A - B) = P(B)$

A

A and B cannot occur simultaneously.

Q

Concerning the values of a variable, as opposed to attribute datA. A dimensional value can be recorded and is only limited in value by the resolution of the measurement system.

a. Factors

b. Elementary Outcomes

c. Variable Data

d. Normal Distribution

A

Variable Data

Q

A Green Belt wishes to sample castings due to some parts being out of tolerance. Which of the following multi-vari sampling techniques would be used for batch to batch sampling?

a. Cyclical

b. DOE

c. Temporal

d. Positional

A

Cyclical

Q

An electronics company is working on the design of a new smart phone. The company collected feedback data from its customers on their requirements and expectations on the new phone.

Which of the following tools can help the company in integrating customer feedback into the design features of the phone?

a. Control charts

b. Quality Function Deployment

c. Design of Experiments

d. Stratification

A

Quality Function Deployment

Q

A branch of applied statistics dealing with planning, conducting, analyzing, and interpreting controlled tests to evaluate the factors that control the value of a parameter or group of parameters.

a. Random Experiment

b. Probability

c. Six Sigma

d. Design of Experiments

A

Design of Experiments

Q

A company is testing a new material it developed and has designed an experiment to determine how temperature and pressure impact the strength of the material. Temperature and pressure have two levels (high and low), and the experiment is set up to be repeated once.

Which comparison will provide the company with an estimate of the experimental error?

a. Difference measured between high pressure and low pressure results
b. Difference measured between high pressure and high temperature results
c. Difference measured across all combinations
d. Difference measured between first and second runs of the same combinations

A

Difference measured between first and second runs of the same combinations

Q

Which of the following is true about short-term process capability?

a. It is generally calculated under controlled conditions with a small number of subgroups (20-30).
b. Cp and Cpk are usually smaller than Pp and Ppk
c. It is represented by Pp and Ppk.
d. It is usually about the same as long-term process capability

A

It is generally calculated under controlled conditions with a small number of subgroups (20-30).

Q

An insurance company is attempting to address minor issues with its claims payment process. If it chooses to use the PDSA cycle popularized by Deming, what would be the correct order of steps to take?

1. Implement the desired changes with a pilot program.
2. Measure the performance of the modified process.
3. Identify what changes to the claims process should be made.
4. Integrate successful results into the existing claims process.

a. 3, 2, 1, 4

b. 4, 3, 1, 2

c. 1, 4, 2, 3

d. 3, 1, 2, 4

A

3, 1, 2, 4

Q

Which of the following statements best describes why companies find implementing lean to be valuable?

a. Lean prevents errors or mistakes from producing waste in the production cycle.
b. Lean translates customer requirements into technical specifications to assure outstanding products or services are produced.
c. Lean creates value for the organization by systematically identifying and eliminating waste.
d. Lean ensures that processes operate so that products or services meet or exceed customer requirements.

A

Lean creates value for the organization by systematically identifying and eliminating waste.

Q

Which diagram depicts the most efficient sequence of events possible for a project?

a. Tree diagram

b. Activity network diagram

c. Affinity diagram

d. Fishbone diagram

A

Activity network diagram

Q

A Six Sigma Green Belt is evaluating the correlation between two variables. She has heard that it is critical to be aware that correlation does not always imply causation.

The best way to determine if there is a causation is to:

a. Plot the variables on a scatter plot
b. Calculate the correlation coefficient, and if over 1, it is causation
c. Make the independent variable the X-Variable
d. Conduct an observational study or a well-designed experiment

A

Conduct an observational study or a well-designed experiment

Q

A process that crosses through multiple departments in a company can present challenges for improvement efforts because:

a. Cross-functional teams dilute the knowledge of the group
b. It slows the progression of normal team-building
c. Two or more areas may think they own the process
d. Management support is more difficult to obtain.

A

Two or more areas may think they own the process