Lean Six Sigma Green Belt (LSSGB) - LSSGB Simulation ASQ Test Paper 3

Q1. Which of the following management tools is most similar to the cause-and-effect diagram?
SELECT THE CORRECT ANSWER

A. Prioritization matrices
B. Affinity diagrams
C. Activity network diagrams
D. Tree diagrams

Correct Option:B
EXPLANATION : The affinity diagram is similar to the cause-and-effect diagram as brainstormed ideas are segregated into categories. So option b is correct.

Q2. Most of the modern computer programs can perform an analysis of experimental residuals. Which of the following techniques will NOT be employed?
SELECT THE CORRECT ANSWER

A. Control Charts
B. Histograms
C. Normal probability plots
D. Dot plots

Correct Option:A
EXPLANATION : Note that a negative response is requested. Control charts aren't applicable to this situation. Normal probability and dot plots are widely used. Histograms can be used in some cases. So answer a is the correct choice.

Q3. What is the principle reason that One Factor Experiments are not chosen to work with?
SELECT THE CORRECT ANSWER

A. They can miss interactions
B. They can mislead
C. They can give wrong results
D. They could involve too many experiments

Correct Option:A
EXPLANATION : All the options seem to be correct here, but the main reason why one-factor-at-a-time (OFAT) experiments are not done is because they miss interactions. So option a is the correct answer.

Q4. A value stream map does NOT provide the data on:
SELECT THE CORRECT ANSWER

A. Changeover time
B. Cycle time
C. Work in process inventory
D. Supplier's finished goods inventory

Correct Option:D
EXPLANATION : A value stream map provides data on changeover time, work in process inventory, and cycle time. The value stream map does not usually provide data on a supplier's finished goods inventory. There can be displayed information on internal inventories. Option d is the correct choice.

Q5. Assume the data is from a Normal distribution. Given population variance of 1 and sample size or 30, use the Chi-squared distribution to calculate the Chi-squared statistic for the probability that sample variance can exceed 0.6.

SELECT THE CORRECT ANSWER

A. 15.4
B. 16.4
C. 17.4
D. 18.4

Correct Option:C
EXPLANATION : chi square = (n-1)s2/sigma2 = (30-1)0.6/1 = 29 X 0.6 = 17.4, option c is the correct answer.

Q6. What is 1-Significance level?

SELECT THE CORRECT ANSWER

A. Power
B. Confidence Level
C. Significance Level
D. P-value

Correct Option:B
EXPLANATION : 1-Significance level refers to the Confidence level.

Q7. Given an average of 1.84 defect per 5 units, what should the upper limit of the control chart be?

SELECT THE CORRECT ANSWER

A. 2.944
B. 3.66
C. 3.287
D. 5

Correct Option:B
EXPLANATION : This is a case of u-chart (count defects and sub-group size may not be constant). u-bar = 1.84 n = 5 UCL = u-bar + 3 * SQRT (u-bar/n) UCL = 1.84 + 3 * SQRT (1.84/5) UCL = 1.84 + 3 * 0.60663 UCL = 3.66

Q8. An engineer is considering a fractional factorial instead of a full factorial to analyze a process because of the large number of variables under study. Apart from the possibility of studying a large number of factors with relatively few experiments, what other characteristic will support a decision to use a fractional factorial instead?

SELECT THE CORRECT ANSWER

A. It is suspected that there are many interactions
B. The process is well known and only the main factors are of concern
C. A fractional factorial will determine the main effects curvature
D. Blocking is necessary to account for nuisance factors in this study

Correct Option:B
EXPLANATION : Answer options a and c are conceptually wrong. Options b and d are valid concepts but only option b responds to the question. A good reason to use a fractional factorial is that one knows the process and has no immediate concerns about factor interactions. Answer option b is correct.

Q9. Which of the following best describes machine capability?

SELECT THE CORRECT ANSWER

A. The total variation of all cavities or spindles of a machine
B. The inherent variation of the machine
C. The total variation over a shift

D. The variation in a short run of consecutively produced parts

Correct Option:B
EXPLANATION : Options a and c may or may not be good indicators of machine capability. They could have assignable cause variation. Option d is a good choice, but is not the best definition of machine capability listed. Inherent variation implies that only chance or random variation is present. Thus option b is the best choice.

Q10. Which of the following cannot be considered as a Primary metric for Six Sigma projects?
SELECT THE CORRECT ANSWER
A. Cycle time
B. Defect Rate
C. Throughput
D. Customer Satisfaction

Correct Option:D
EXPLANATION : Customer Satisfaction cannot be considered as a Primary metric for Six Sigma projects.

Q11. Given the resistors are produced in lots of 1000, and the average number of defective resistors per lot is 12.7, what are the upper and lower limits for the control chart appropriate for this process?
SELECT THE CORRECT ANSWER
A. LCL = 2.0 UCL = 23.4
B. LCL = 3.8 UCL = 20.2
C. LCL = 0.031 UCL 0.131
D. LCL = 1.5 UCL = 26.7

Correct Option:A
EXPLANATION : When the sample size is constant, c (count of non-conformances) chart is appropriate for attributes data (good or bad). The control limits for c chart are based on the average number of non-conformances (c-bar). The control limits are calculated using the expression: LCL = 12.7-3(3.56)=2.0 UCL = 12.7+3(3.56)=23.4, so option a is correct.

Q12. Who normally scopes the projects for Six Sigma cases in a typical Six Sigma organization?
SELECT THE CORRECT ANSWER
A. Champions
B. Green Belts
C. Black Belts
D. Master Black Belts

Correct Option:A
EXPLANATION : Champions normally scope the projects for Six Sigma cases in a typical Six Sigma organization.

Q13. Out of which of the following scenarios would an X-bar and R chart be helpful in controlling a process?
SELECT THE CORRECT ANSWER
A. The machine capability is wider than the specification
B. It is necessary to know when to investigate a process for causes of variation
C. A reduced sample size is needed
D. An acceptable quality level must be established

Correct Option:B
EXPLANATION : When the machine capability is wider than the specification, X-bar and R charts are not useful tools. Reducing sample sizes (option c) and establishing acceptable quality

levels (option d) relate to sampling and sampling plans. The X-bar and R chart are good choices if one needs to know when to investigate a process for causes of variation. So option b is correct.

Q14. A company making rubber tires is evaluated on 5 opportunities per product; if 100 defects are observed in 1000 products manufactured in a month, What is the Rolled Throughput Yield?

SELECT THE CORRECT ANSWER

A. 98%
B. 99%
C. 97%
D. 96%

Correct Option:A
EXPLANATION : Total Opportunities = 5000 Total Defects = 100 Defects/Opportunities = 100/5000 Defects/Million Opportunities = 100/5000*10,00,000 = 20,000 Sigma levels using table is approximately 3.6. Substitute 3.6 in RTY table, and the answer is 98% .

Q15. Which of the following is the least acceptable reason for the deployment of Six Sigma projects?

SELECT THE CORRECT ANSWER

A. A focus on cost savings
B. A focus on customer satisfaction
C. A focus on internal problems
D. A focus on design improvements

Correct Option:D
EXPLANATION : It should be recognized that different organizations may have different priorities at different times. However, in general, Six Sigma concepts state that answer options a, b, and c are all valid. Answer choice d is the least acceptable reason.

Q16. Which of the following options would describe Six Sigma at its most fundamental element?

SELECT THE CORRECT ANSWER

A. A business improvement approach
B. A concentrated focus on business outputs
C. An elimination of mistakes and defects
D. A focus on critical customer items

Correct Option:A
EXPLANATION : The best answer is option a, though all answers have some validity. While option b, c, and d can be considered to be subsets of answer choice a, option a is considered as correct.

Q17. Which of the following terms describes the situation in which the effects of two factors are NOT separable while designing experiments?

SELECT THE CORRECT ANSWER

A. Covariate
B. Confounded
C. Interactive
D. Collinear

Correct Option:B
EXPLANATION : Covariates are factors that change during an experiment but were not planned to change. Interactivity occurs when the effect of one input factor on the output depends on the level of another input. Collinearity is a condition in which two variables are completely correlated. To obtain good results, one must be eliminated. Confounded factors have effects which are not separable; interactions are present in their results. Use care to select the best answer because 'Interactive' may initially appear to be the answer. Answer option b is correct.

Q18. What is the inference of “Process is in control” according to Walter Shewhart?
SELECT THE CORRECT ANSWER

A. Process has assignable or chance causes
B. Process has random causes
C. Process has assignable and chance causes
D. Process has assignable causes

Correct Option:B
EXPLANATION : The only time the process is said to be in control is when the common causes of variation contribute to the variability of the process. Option B is the correct answer.

Q19. Which of the following types of variations are noted in control charts?
SELECT THE CORRECT ANSWER

A. Random and chance
B. Special and assignable
C. Chance and assignable
D. Normal and random

Correct Option:C
EXPLANATION : The two types of variations are chance and assignable. Chance variation is also referred to as normal or random (among others). Assignable variation is also called special or non-normal. So answer c is correct.

Q20. Which of the following statistical tests should be used by the Green Belt, for testing the means between two inter-related groups?
SELECT THE CORRECT ANSWER

A. 2 Sample t assuming equal variances
B. 2 Sample t assuming unequal variances
C. Paired t test
D. z test

Correct Option:C
EXPLANATION : Paired t test is the only test that works on related groups. Option c is the correct answer.

Q21. A Six Sigma Green Belt wants to analyze four factors, at two levels each, one factor at a time. What is the impact on the type I error?
SELECT THE CORRECT ANSWER

A. A type I error improves with each individual analysis
B. Interactions are clearly determined
C. A type I error increases with each individual analysis
D. The optimum combination of factors is revealed

Correct Option:C
EXPLANATION : With each single comparison, more errors are introduced. Even if a proper confidence interval is used for every individual test, the total confidence interval decreases, and consequently the type I error increases. So option c is correct.

Q22. What would one expect to find when comparing short-term machine capability indexes to long-term process capability indexes:
SELECT THE CORRECT ANSWER

A. A plus and minus shift of 1.5 standard deviations
B. The machine capability to be a lower number
C. The process capability to be a lower number
D. The machine and process capabilities to be virtually identical

Correct Option:C
EXPLANATION : Capability index is being referred by the question. In such a calculation, a higher number indicates greater capability. The long-term process capability would be expected to be a lower number than short-term machine capability. Answer option c is correct.

Q23. If an experiment has an alias, you could say the two factor effects are:
SELECT THE CORRECT ANSWER
A. Confounded
B. Blocked
C. Misnamed
D. Mixtures

Correct Option:A
EXPLANATION : A design alias implies that the two factor effects are confused or confounded with each other. So option a is correct.

Q24. A small change definitely exists between the existing process and an experimental process. However, insufficient sample size is collected to identify this difference. Which of the following types of errors would be the result?
SELECT THE CORRECT ANSWER
A. A type II error
B. A 1-alpha decision
C. A type I error
D. A 1-beta decision

Correct Option:A
EXPLANATION : 1-alpha and 1-beta errors are correct decisions, which is not the case in this question. When one fails to reject the null hypothesis when it is false, a type II error occurs. So option a is correct.

Q25. Which of the following control charts would best fit a process in which measurement data on a product is easily obtained?
SELECT THE CORRECT ANSWER
A. Run charts
B. Median charts
C. X-bar and R charts
D. p charts

Correct Option:C
EXPLANATION : Option a is incorrect because Run Charts are not control charts. Median charts are not as sensitive to process change as X-bar and R charts. Option b is not the best answer. The p charts (option d) are meant for attributes and not measurements. Option c is correct.

Q26. What is a Primary metric for Six Sigma projects?
SELECT THE CORRECT ANSWER
A. Cycle time
B. Morale of employees
C. Average turnover
D. Customer Satisfaction

Correct Option:A
EXPLANATION : Except for Cycle time, all the others are secondary metrics. Option a is the correct answer.

Q27. The error term in an ANOVA based R&R study is a reflection of:

SELECT THE CORRECT ANSWER

A. Reproducibility
B. Part variation
C. Mathematical errors
D. Repeatability

Correct Option:D
EXPLANATION : The error variance in an R&R study means measurement error or repeatability. Option d is correct.

Q28. A process that is normally distributed will contain which of the given characteristics?
SELECT THE CORRECT ANSWER

A. It is predictable
B. It is truncated
C. It is bimodal
D. It is skewed

Correct Option:A
EXPLANATION : Bimodal means that a distribution has two modes (two peaks on the curve), so it is not normal. If it is skewed, it is not symmetrical and not normal. A truncated distribution is cut off in some way and is not normal. A normal distribution cannot be bimodal, skewed, or truncated. Therefore, options b, c, and d are incorrect. A normally distributed process is predictable in most instances. So option a is correct.

Q29. Which of the following is true about the Critical Path?
SELECT THE CORRECT ANSWER

A. It is the optimized time
B. Should not be optimized further
C. Has zero slack
D. None of the above

Correct Option:C
EXPLANATION : Options a and b are not relevant to the question. A Critical path is known to have zero slack. Option c is the right answer.

Q30. A number of planning activities occur, during a project work breakdown structure. Which of the following activities is NOT included?
SELECT THE CORRECT ANSWER

A. The project objective is defined
B. The work is divided into smaller activities
C. The interrelationships between activities are defined
D. The project schedule is established

Correct Option:A
EXPLANATION : Please note that a negative response is requested. The project objective is defined well before work breakdown begins. Options b, c, and d occur during the work breakdown structures. So answer a is the correct choice.

Q31. Which of the following is a value-added activity?
SELECT THE CORRECT ANSWER

A. Setup
B. Process
C. Storage
D. Inspection

Correct Option:B

EXPLANATION : Process defines the values/culture within any organization.

Q32. Based on the definition of upper and lower control limits, how often should one expect a normally distributed in control process to plot outside the control limits?
SELECT THE CORRECT ANSWER
A. 456 times in 10,000 points
B. 265 times in 10,000 points
C. 27 times in 10,000 points
D. 13 times in 10,000 points

Correct Option:C
EXPLANATION : The upper and lower control limits represent three standard deviations from the mean. A normally distributed process about the mean will have 99.73% of its expected values fall within three standard deviations (the control limits), which is 9,973 out of 10,000 points. By subtraction, one finds that this process expects 27 out of 10,000 points to exceed those limits. If the control limits were set at two standard deviations, one would expect 456 out of 10,000 points to fall outside the control limits. So answer c is correct.

Q33. What would be the risk if the Six Sigma team selects to do a project that has a possible financial benefit of $10,000 per annum, assumed with the probability of success being 0.1 as found by internal team discussions?
SELECT THE CORRECT ANSWER
A. The project will not complete on time
B. Even if completed, the project may not give financial benefits
C. The project may not be successful at the end of the day
D. The Six Sigma team may end up doing DFSS instead of DMAIC

Correct Option:C
EXPLANATION : With such a low probability of success, the Six Sigma team may not even be sure that they would be successful in the project. Option c is the answer.

Q34. As a commonly used problem-solving technique, which of the following would be the best application of a Pareto chart?
SELECT THE CORRECT ANSWER
A. To determine when to make proactive adjustments to a process
B. To differentiate between major and minor problem areas
C. To gather data for the design of controlled changes
D. To identify customers and their needs

Correct Option:B
EXPLANATION : The Pareto diagram is best for the graphical determination and illustration of potential problem areas. So option b is correct.

Q35. For customer defined Upper Tolerance limit of 14 and Target of 12, with process operating mean at 11 and a standard deviation of 2, Cp is:
SELECT THE CORRECT ANSWER
A. 1
B. 0.5
C. 0.3
D. None of the above

Correct Option:D
EXPLANATION : Cp cannot be calculated on uni-tolerance cases, so option d is the right option.

Q36. Determining the lower limit of success at a desired confidence level for n tests with f failures is an application of the:

SELECT THE CORRECT ANSWER

A. Normal distribution
B. Binomial distribution
C. Chi-square distribution
D. Hypergeometric distribution

Correct Option:B
EXPLANATION : If the probability of occurrence of an event of interest (termed as success) includes n trials and f failures, then the number of occurrences follows a binomial distribution. So option b is correct.

Q37. Which of these tools is considered as limited interaction tool?
SELECT THE CORRECT ANSWER

A. Brainstorming
B. Multi-voting
C. NGT
D. Discussions

Correct Option:C
EXPLANATION : In Nominal Group Technique, interaction is deliberately prevented or reduced amongst members to reduce peer pressure thus c is the correct option.

Q38. From the choices below, identify the secondary or consequential customer metrics :
SELECT THE CORRECT ANSWER

A. Conformance quality
B. Color range
C. Average age of receivables
D. Technical support

Correct Option:C
EXPLANATION : Primary metrics categories include quality, color (where applicable) and technical support. An example of a secondary or consequential metrics would be the average age of receivables. Answer c is correct.

Q39. Which approach talks about quipment effectiveness?
SELECT THE CORRECT ANSWER

A. Lean
B. TPM
C. Six Sigma
D. TOC

Correct Option:B
EXPLANATION : TPM for Total Productive Maintenance is focused on Overall Equipment Effectiveness (OEE), which completely focuses on equipment reliability and maintenance. So, option b is the correct answer.

Q40. Repetition and Replication help the Six Sigma team in determining:
SELECT THE CORRECT ANSWER

A. Short term variability
B. Long term variability
C. All of the above
D. None of the above

Correct Option:C

EXPLANATION : Repetition helps in determining short term variability and Replication helps with long term variability. Put together, they help in determining both. Thus, option c is the correct answer.

Q41. Which of the following quality management tools would benefit most from brainstorming activities? I. Tree diagrams II. Matrix diagrams III. Affinity diagrams IV. Interrelationship digraphs
SELECT THE CORRECT ANSWER
A. I and II only
B. II and III only
C. II and IV only
D. III and IV only

Correct Option:D
EXPLANATION : Matrix diagrams require considerable advance subject knowledge. Tree diagrams can benefit from preliminary work using affinity or cause-and-effect diagrams. Interrelationship digraphs and affinity diagrams can utilize brainstorming techniques directly. So answer d is correct.

Q42. Why would Six Sigma activities prompt a re-analysis of measuring systems?
SELECT THE CORRECT ANSWER
1. It's mandated by the MSA (1998) Reference Manual
2. Variability may be reduced, requiring more precise measurements
3. Six Sigma is a more quality-conscious control technology
4. Most six sigma training includes statistical software which requires frequent re-analysis

Correct Option:B
EXPLANATION : Options a and d are distractors. Answer option c may or may not be true, but even if it is true, it doesn't address the question. Option b is correct.

Q43. Which of the following tests would you use to typically test variances in a two-sample setting?
SELECT THE CORRECT ANSWER
1. 2-Sample t test
2. 1-Sample t test
3. F test
4. Z test

Correct Option:C
EXPLANATION : F test is the only test used for testing variances. So c is correct.

Q44. Which of the following tools/techniques is most widely used by a number of automotive manufacturers that help control the flow of materials?
SELECT THE CORRECT ANSWER
1. Kanban
2. Muda
3. Poka-yoke
4. An Andon board

Correct Option:A
EXPLANATION : Kanban system of signals and control is described by this question. Muda (waste) and poka-yoke (mistake proofing) are not relevant to the question. The Andon board is a lighted overhead display showing current status and problems. Answer a is correct.

Q45. A problem-solving technique that attempts to address potential difficulties for a new administrative procedure is called:
SELECT THE CORRECT ANSWER
1. A PDPC chart

2. An affinity diagram
3. A matrix diagram
4. An interrelationship digraph

Correct Option:A
EXPLANATION : Process decision program charts attempt to answer "what if" questions and thereby address potential difficulties in advance. So answer a is correct.

Q46. For Independent events, which of the following statements is true?
SELECT THE CORRECT ANSWER
1. P(B|A) = P(A)
2. P(B|A) = P(B)
3. P(A|B) = P(B)
4. None of the above

Correct Option:B
EXPLANATION : Only P(B|A) = P(B) is valid for independent events. All other options are not serious considerations.

Q47. Type 1 Error is known as:
SELECT THE CORRECT ANSWER
A. False Negative
B. False Positive
C. True Negative
D. True Positive

Correct Option:B
EXPLANATION : Type I Error is said to be committed when you reject the Null Hypothesis when it was actually true. For example, the movie was worth watching, but you came out and said the movie was not worth watching. Option b is the correct answer.

Q48. The concept of Affinity Diagram closely relates to which tool in a real-life Six Sigma application?
SELECT THE CORRECT ANSWER
A. Cause and Effect Matrix
B. Cause and Effect Diagram
C. Tree Diagram
D. None of the above

Correct Option:B
EXPLANATION : Affinity diagram arranges ideas/issues in groups based on their closeness to the group. A Cause and Effect Diagram allows a Green Belt to group causes under 5M and 6M. Option b is the correct answer.

Q49. A p chart ________
SELECT THE CORRECT ANSWER
A. Plots variations in dimensions
B. Can be used for only one type of defect per chart
C. Plots either the fraction or percent defective in order of time
D. Plots the number of defects in a sample

Correct Option:C
EXPLANATION : A p chart does not plot the number of defects in a sample (c or u chart is required). A p chart is an attribute chart and is not used for variables (an X-bar - R chart is required). A p chart plots one defect per chart. The p chart plots either the fraction or percent defective in order of time. Answer c is correct.

Q50. Assuming that repeatability and reproducibility variances are known from an R&R study, what can also be determined?

SELECT THE CORRECT ANSWER

A. Nothing
B. Total variation
C. Part variation
D. Measurement variation

Correct Option:D

EXPLANATION : Repeatability and reproducibility variances can be added to get the variance of measurement. By taking the square root of the combined variances, the standard deviation of measurement can be obtained. Not enough information is provided to determine total variation, since the part variation is unknown. So answer d is correct.

Q51. A production line suffers from a lot of rolled over defects. The Six Sigma team brainstorms for solutions and proposes a ready solution that works on the principle of detecting mistakes automatically. It works on identifying faults, fixing, and moving ahead. Which principle does the Six Sigma team desire to suggest here?

SELECT THE CORRECT ANSWER

A. Hoshin
B. Jidoka
C. Hoshetsu
D. Kaizen

Correct Option:B

EXPLANATION : The principle of Jidoka works on detecting mistakes, identifying faults, fixing them, and moving ahead. Option b is the correct answer.

Q52. What are the two distinct types of variations that are noted down in control charts?

SELECT THE CORRECT ANSWER

A. Special and assignable
B. Random and chance
C. Chance and assignable
D. Normal and random

Correct Option:C

EXPLANATION : Chance and assignable are the two types of variations. Chance variation is also referred to as normal or random (among others). Assignable variation is also called special or non-normal. So option c is correct.

Q53. To state that a model in an experimental design is fixed or established indicates that:

SELECT THE CORRECT ANSWER

A. The levels used for each factor are the only ones of interest
B. The levels were chosen from a fixed population
C. The equipment from which the data are collected must not be moved
D. The factors under consideration are qualitative

Correct Option:A

EXPLANATION : Answer choices b, c, and d are all filler options. Experimental design levels are established (or fixed) based on the best advice of people knowledgeable of the process. A balanced design is then considered only at those levels. Based on analysis, factors may then be adjusted to other fixed levels for subsequent experimentation. The objective is to achieve optimum performance. Option a is correct.

Q54. What is the compliment of {cigar, dog } if sample space S is {rock, book, cigar, guitar, dog}?

SELECT THE CORRECT ANSWER

A. {rock, book, cigar, guitar, dog}
B. {cigar, guitar, dog}
C. {dog}
D. {rock, book, guitar}

Correct Option:D
EXPLANATION : The complement of an event is the set of all elements not in the event. The sample space S contains 5 elements: rock, book, cigar, guitar, and dog. The elements rock, book, and guitar are not in the event {cigar, dog} and thus, form the complement to the event. Answer d is correct.

Q55. A QFD template allows the Six Sigma team to learn which of the following?
SELECT THE CORRECT ANSWER
A. The most important customer requirements
B. The performance of a company versus competitors
C. The core area of focus for efforts
D. All of the above

Correct Option:D
EXPLANATION : QFD is able to show all three options a, b, and c. Therefore, option d is the correct answer.

Q56. A store uses signs at specific points in its storage area to indicate when the products need to be ordered. This practice is an example of:
SELECT THE CORRECT ANSWER
A. kanban
B. poka-yoke
C. checkpoints
D. hoshin

Correct Option:A
EXPLANATION : Kanban is a Japanese term that literally means "sign-board." Kanban is a scheduling system for Lean and Just-In-Time (JIT) production.

Q57. What part of 5S promotes that all work stations for a particular job should be identical?
SELECT THE CORRECT ANSWER
A. Seiketsu (Standardize)
B. Non-Value Add
C. Seiso (Shine)
D. Seiri (Sort)

Correct Option:A
EXPLANATION : Seiketsu (Standardize) is the right answer. All work stations for a particular job should be identical. All employees doing the same job should be able to work in any station with the same tools that are in the same location in every station.

Q58. As the new experimenter for six sigma projects, you have allocated budget funds for preliminary trial runs. The reason(s) for this would be:
SELECT THE CORRECT ANSWER
A. Some practice trials are needed, as this has not been done before
B. The plant manager wants evidence that experimentation will work
C. Planning is critical for success
D. The financial manager wants evidence of possible success

Correct Option:A
EXPLANATION : Some of the answers have an element of truth in them. However, the best answer is that most experiments are new to the plant operating personnel. Some practice may be

needed. As an additional observation, sufficient funds should be available to do the following: trial runs, actual runs, and verification runs. Answer option a is correct.

Q59. Assume that a large lot contains exactly 4% defective items. Using the Poisson distribution, what is the probability that a random sample of 50 items will NOT reflect the true lot quality?

SELECT THE CORRECT ANSWER

A. 0.27
B. 0.73
C. 0.82
D. 0.67

Correct Option:B

EXPLANATION : It is given that the Poisson distribution exists. The true lot quality will be reflected if exactly 2 defective items are found (50 x 0.04). The Poisson table must be used to determine the required answer. In using the Poisson table, np = 2.0. The likelihood of 2 or fewer defects = 0.677 Minus likelihood of 1 or fewer defects = 0.406 Equals likelihood of exactly 2 defects = 0.271. Therefore, the likelihood that the sample will reflect other than the true lot quality is 1 - 0.271 = 0.729. So, answer option b is correct.

Q60. A green belt should consider which of the following when considering a quality characteristic for process capability calculations?

SELECT THE CORRECT ANSWER

A. Choose those characteristics with the highest process capability index ratios
B. Choose a small number of customer-defined CTQ characteristics
C. Choose only normal characteristics to comply with the normality assumption
D. Choose all characteristics defined in the procedures and work instructions

Correct Option:B

EXPLANATION : The chosen characteristic or characteristics should reflect key product or process quality factors. So option b is correct.

Q61. What are the five phases of 5S?

SELECT THE CORRECT ANSWER

A. Shine, Schedule, Sustain, Sort, Standardize
B. Supporter, Supplier, Subordinates, Supervisors, Seniors
C. Sustain, Sort, Standardize, Stock, Shine
D. Sort, Set-in-Order, Shine, Standardize, Sustain

Correct Option:D

EXPLANATION : The five steps in 5S are Sort, Set-in-Order, Shine, Standardize, and Sustain.

Q62. A capability study conducted during a pilot run of 100 units, indicated the upper value to be 1.8 while the lower value was 0.90. The customer requires a minimum value of 1.25. What action should be taken?

SELECT THE CORRECT ANSWER

A. Center the process
B. Reduce the variability
C. Renegotiate the customer specification
D. Inspect 100% until new equipment is available

Correct Option:A

EXPLANATION : This question is subjective. However, the upper and lower Cpk values suggest that process centering should be the first option to be considered. So answer a is correct.

Q63. An engineer has been studying a normally distributed process variable for a long time. The variable 'X' has a mean of 291 and a variance of 900. What is the value of 'x' such that P (306 < X < x) = 0.0507?

SELECT THE CORRECT ANSWER

A. 310.5

B. 876
C. 306
D. 741

Correct Option:A
EXPLANATION : If the expression is re-written in terms of: P ((306-291)/30 < Z< z) = 0.0507. Then: P ((15/30) < Z< z) = 0.0507 or P (0.5 < Z< z) = 0.0507. Extracting Z = 0.5 from the standard normal table yields a value of 0.1915. Adding 0.0507 to 0.1915 equals 0.2422, which is the value of Z = 0.65. Consequently, it can be expressed that P(306 < X < x) = P (0.5 < Z< z) = 0.65. Therefore, Z = 0.65 = ((x - 291)/30). Then, x = 291 + (0.65)(30) = 310.5. So answer a is correct.

Q64. What is the relation between resolution III experiments and confounded responses?
SELECT THE CORRECT ANSWER
A. In resolution III experiments, there are no confounded interactions
B. In resolution III experiments, only interactions are confounded
C. In resolution III experiments, all factors are confounded
D. In resolution III experiments, main effects and two factor interactions are confounded

Correct Option:D
EXPLANATION : The danger of resolution III experiments is that no interactions can be calculated without having them confounded with main effects. Therefore, only main effects can be studied in resolution III experiments. So option d is correct.

Q65. What can you infer out of such a process if Cycle Time of a process is 4.6 minutes as opposed to a TAKT of 4.2 minutes?
SELECT THE CORRECT ANSWER
A. The customer is okay with this
B. The business is okay with this
C. The customer will receive his products on time
D. The customer may have to wait for his products

Correct Option:D
EXPLANATION : When cycle time is greater than TAKT Time, the process is not meeting production targets. In such a scenario, the customer will have to wait for his products. Option d is the correct answer.

Q66. When sample sizes of 25 are taken, distributions of averages approach a normal distribution. This statement applies to:
SELECT THE CORRECT ANSWER
A. Only the normal distribution, according to the central limit theorem
B. Only the triangular distribution, according to the central limit theorem
C. Only the uniform distribution, according to the central limit theorem
D. Almost all distributions, according to the central limit theorem

Correct Option:D
EXPLANATION : No matter what shape the original distribution has, the distribution of means from samples of size n = 25 will follow a normal distribution according to the central limit theorem. Answer d is correct.

Q67. Which of the following is typically used as a pre-emptive tool in Six Sigma projects?
SELECT THE CORRECT ANSWER
A. FMEA
B. Fishbone Diagram
C. Cause and Effect Matrix

D. QFD

Correct Option:A
EXPLANATION : Of all the tools, FMEA is used as a tool to identify potential risks and pitfalls of the process/failure mode, so a is the correct option.

Q68. Which of the following sampling techniques is probable to give the largest sampling error assuming all other conditions to be same and the sample to be homogeneous?
SELECT THE CORRECT ANSWER

A. Probability sampling
B. Random sampling
C. Stratified sampling
D. Quota sampling

Correct Option:B
EXPLANATION : Always Random Sampling is considered to be prone to most sampling errors. Option b is the correct answer.

Q69. What does a Six Sigma project reduce?
SELECT THE CORRECT ANSWER

A. Total Failure Cost
B. Internal Failure Cost
C. External Failure Cost
D. None of the Above

Correct Option:A
EXPLANATION : Since internal failure cost and external failure cost are integral part of total failure cost, option a is the correct answer.

Q70. Which of the following techniques is NOT useful for team facilitators when narrowing a list of potential problem areas to investigate?
SELECT THE CORRECT ANSWER

A. Brainstorming
B. Nominal Group Technique
C. Voting
D. Multivoting

Correct Option:A
EXPLANATION : Note that a negative response is requested. The key question word is "narrowing." Brainstorming is useful in identifying a large number of potential problem sources or problem candidates. NGT, multivoting, and voting are useful in narrowing a list of candidates to work on. Answer a is the correct choice.

Q71. While measuring the distance between two points, which of the following factors is LEAST likely to be influenced by the person taking the measurement?
SELECT THE CORRECT ANSWER

A. Precision of measurement
B. Accuracy of measurement
C. Calibration of the measuring instrument
D. True distance between the two points

Correct Option:D
EXPLANATION : Please note that a negative response is requested. Options a, b, and c can be influenced by the person making the measurement. The true distance between the two points is not influenced by the person making a measurement. So option a is the correct choice.

Q72. Which of the following type(s) of problems are analyzed and solved using the affinity diagram tool?

SELECT THE CORRECT ANSWER

A. Unfamiliar problems
B. Structured problems
C. Mathematical models
D. Establishing project flows

Correct Option:A

EXPLANATION : The affinity diagram is used for unfamiliar, new, or complex problems by discovering or organizing patterns of thought. Structural problems, mathematical problems, and project flows are not included. So answer a is correct.

Q73. What type of waste is "Creating extra reports that no one needs"?

SELECT THE CORRECT ANSWER

A. Defect
B. Motion
C. Inventory
D. Over Production

Correct Option:D

EXPLANATION : Creating more than what is needed is over production type of waste.

Q74. A statistical software program returned a p-value of 0.023. If the desired level of significance is 0.025, then the conclusion is:

SELECT THE CORRECT ANSWER

A. Reject the null hypothesis; there is no statistical difference
B. Reject the null hypothesis; there is a statistical difference
C. Fail to reject the null hypothesis; there is no statistical difference
D. Fail to reject the null hypothesis; there is a statistical difference

Correct Option:B

EXPLANATION : If the p-value is greater than or equal to Î±, the null hypothesis is not rejected. If the p-value is less than Î±, the null hypothesis is rejected. When the null hypothesis is rejected, one concludes that there is a statistical difference. Option b is correct.

Q75.According to the conventional norms of Cost of Quality, which of the following is NOT included?

SELECT THE CORRECT ANSWER

A. Total Failure Cost
B. External Failure Cost
C. Internal Failure Cost
D. Wait Cost

Correct Option:D

EXPLANATION : Of all the costs, only Wait cost is a mismatch. So, option d is the right answer.

Q76. Which of the following graphs are generated from Correlation coefficients?

SELECT THE CORRECT ANSWER

A. Pie Charts
B. Scatter diagrams
C. Pareto diagrams
D. Control charts

Correct Option:B

EXPLANATION : Pie charts show the percentage. Pareto diagrams show the 'vital few' and the 'trivial many'. Control charts are used to statistically control a process. They don't have anything to do with correlation. Scatter diagrams can have a calculated correlation coefficient which measures goodness of fit. Answer b is correct.

Q77. If 6 consecutive samples were taken from a process and precisely measured, you can still expect differences. What type of variation would be the most difficult one to determine?
SELECT THE CORRECT ANSWER

A. Lot-to-lot variation
B. Piece-to-piece variation
C. Inherent process variation
D. Error of measurement

Correct Option:A
EXPLANATION : The small sample size would make it impossible to give a high level of confidence in the results. However, inherent process variation, piece-to-piece variation, and measurement error are obtainable. Lot-to-lot variation would not be detectable unless carefully planned for (which is not indicated in the question). So option a is correct.

Q78. A Six Sigma Green Belt practitioner constructs a control chart to display a process mean and its outer limits. In such a chart, what does LCL stand for?
SELECT THE CORRECT ANSWER

A. Lower Cycle Length
B. Lower Control Limit
C. Lower Cycle Limit
D. Lower Control Length

Correct Option:B
EXPLANATION : LCL is calculated as three standard deviations below the mean of a process. Option b is the correct answer.

Q79. By recognizing the nature of process variability, the process capability target is usually:SELECT THE CORRECT ANSWER

A. The same as product specifications
B. Not related to product specifications
C. Tighter than product specifications
D. Looser than product specifications

Correct Option:C
EXPLANATION : Obviously, the process spread should be tighter than the product specification to allow for some assignable causes of variation. Slight trends or shifts in the process average might, therefore, be corrected before scrap occurs. So option c is correct.

Q80. Data from which of the following tools can be used to construct a histogram?
SELECT THE CORRECT ANSWER

A. Flowcharts
B. Check sheets
C. Cause-and-effect diagrams
D. Pareto charts

Correct Option:B
EXPLANATION : Certain check sheets like recording check sheets and tally sheets can be used to construct histograms. The data must be measurable and continuous. So answer b is correct.

Q81. Which of the sampling techniques should a Green Belt use if he/she wishes to study the effects of Assignable causes?
SELECT THE CORRECT ANSWER

A. Random sampling
B. Probability sampling
C. Stratified sampling
D. Quota sampling

Correct Option:C
EXPLANATION : This is interesting. Random sampling and probability sampling sometimes help to identify if the assignable causes are present. But, Stratified sampling is universally considered as a technique to help point the assignable causes.

Q82. For 5 factors and 2 levels, the DOE setup has 16 runs. What type of experiment is being conducted?
SELECT THE CORRECT ANSWER

A. Half fractional factorial
B. Full factorial
C. Quarter fractional factorial
D. Response Surface

Correct Option:A
EXPLANATION : In this case, half fractional factorial is conducted.

Q83. Hypothetically, in which of the following cases would the Six Sigma team get a negative Process Capability index value?
SELECT THE CORRECT ANSWER

A. When the process mean does not meet target mean
B. When variations are high
C. When target mean is set outside specifications
D. When the process mean lies outside specification limits

Correct Option:D
EXPLANATION : Mathematically, as well, the only possibility to have a negative Cpk value is when the mean lies outside the specified limits. Option d is the answer.

Q84. Hypothetically, in which of the following cases would the Six Sigma team get a negative Process Capability index value?
SELECT THE CORRECT ANSWER

A. When the process mean does not meet target mean
B. When variations are high
C. When target mean is set outside specifications
D. When the process mean lies outside specification limits

Correct Option:D
EXPLANATION : Mathematically, as well, the only possibility to have a negative Cpk value is when the mean lies outside the specified limits. Option d is the answer.

Q85. Where should the "others" category be placed while constructing the Pareto diagram?
SELECT THE CORRECT ANSWER

A. At the beginning as the first category
B. Directly in the center of the chart
C. At the end as the last category
D. Where it falls according to indicated frequency

Correct Option:C
EXPLANATION : The "others" category is a catch-all or miscellaneous category. Since this category will contain multiple known and unknown causes, it is not one that a Six Sigma team should consider in the 80/20 rule and therefore moved to the end of the Pareto chart.

Q86. Given a coefficient of determination of 0.85, which of the following is true?
SELECT THE CORRECT ANSWER

A. There is positive correlation in the data

B. 85% of the variability is explained by the regression model
C. The sum of squares of X is greater than the sum of squares of Y
D. There is a weak data correlation

Correct Option:B
EXPLANATION : The coefficient of determination determines the amount of variability explained by the regression model. The coefficient of determination is the square of the correlation coefficient. Thus, the correlation could be positive or negative. The correlation is very strong. Option b is correct.

Q87. While preparing a project, efforts should be taken to identify and involve different parties affected by the planned changes. These other parties are known as:
SELECT THE CORRECT ANSWER

A. Process owners
B. Champions
C. Team leaders
D. Stakeholders

Correct Option:D
EXPLANATION :
The champion and the team leader are participants in the team. The process owner is required to be in the communications chain. Any party that may be affected by the results can be described as a stakeholder. This includes the process owner. Answer d is correct.

Q88. Which of the following techniques allows you to eliminate errors due to nuisance factors?
SELECT THE CORRECT ANSWER

A. Blocking
B. Coding
C. Transformation
D. Replication

Correct Option:A
EXPLANATION :
In experimental design, blocking is a technique used to deal with nuisance factors that may affect the results of the experiment. The experiment is organized into blocks, where the nuisance factor is maintained at a constant level in each block.

Q89. Which of the following is NOT included per the conventional norms of Cost of Quality?
SELECT THE CORRECT ANSWER

A. Internal Failure Cost
B. Internal Appraisal Cost
C. External Failure Cost
D. Total Failure Cost

Correct Option:B
EXPLANATION : Of all the costs, only Internal Appraisal cost is a mismatch. Option b is the correct choice.

Q90. What type of waste would the following scenario potentially cause? The parts were delivered late by the supplier due to which the production had to be stopped.
SELECT THE CORRECT ANSWER

A. Waiting
B. Over Production
C. Motion
D. Inventory

Correct Option:A
EXPLANATION : Late deliveries or delays that impact the production will be considered as 'waiting' type of waste.

Q91. Which of the following tools helps in visualizing series of causes to an effect?
SELECT THE CORRECT ANSWER

A. Ishikawa Diagram
B. Correlation Diagram
C. Six Sigma
D. Value Stream Mapping

Correct Option:A
EXPLANATION : There are normally a series of root causes stemming from one problem, and they can be visualized in cause and effect manner using Cause-and-Effect diagram. This was developed by Ishikawa and also called as Ishikawa diagram.

Q92. For the data population 64.7, 37.5, 28.9, 55.6, 42.5, the coefficient of variation is:SELECT THE CORRECT ANSWER

A. 0.279
B. 0.312
C. 0.128
D. 0.143

Correct Option:A
EXPLANATION : The mean is 45.84. Since the problem states data population, one must use n and not n-1 in the calculation of the population standard deviation to obtain 12.796. The Coefficient of Variation (COV) is the standard deviation divided by the mean and then multiplied by 100 to reflect a percentage. The COV equals 27.9%. Note, using a sample standard deviation of 14.306, the COV would be 31.2%, but is not the correct answer. Option a is correct.

Q93. Which of the following blocks should a Green Belt start drawing first in a typical SIPOC map setting?
SELECT THE CORRECT ANSWER

A. Process
B. Input
C. Supplier
D. Customers

Correct Option:A
EXPLANATION : The accepted norm of drawing a SIPOC map is to draw the macro-level process first. Option a is the correct answer.

Q94. Define "motion" type of waste.
SELECT THE CORRECT ANSWER

A. Friction caused due to motion would create problems in the machinery and create higher waste
B. Average distance of motion between processes
C. Any Energy consumed by machinery during motion
D. Any movement of people, resources, or machines which do not contribute or add value to the product or service

Correct Option:D
EXPLANATION : The definition of "motion" type of waste is any movement of people, resources, or machines which do not contribute or add value to the product or service.

Q95. Principally, what is the major disadvantage of implementing a Pull mechanism in a company?
SELECT THE CORRECT ANSWER

A. Increased lead time

B. Increased batch size
C. Increased wait time
D. Increased throughput time

Correct Option:C
EXPLANATION : Customers pulling the product and yet getting it on time depends entirely on the state of the Hypermarket. If it meets the customer needs, the customer need not wait, else Pull means an increased waiting time for the customer, so c is correct.

Q96. To permit an X-bar chart to go out of control is sometimes economical when:SELECT THE CORRECT ANSWER

A. The individual range exceeds R-bar
B. The cost of inspection is high
C. The control limits are appreciably less than the specification limitsThe control limits are inside the drawing tolerance limits

Correct Option:C
EXPLANATION : Options a and b are not serious considerations. Since the X-bar control chart represents averaged data, individual readings may be in control and out of tolerance. Only when 6Ã□Æ’ is appreciably less than the specification limits, out of control conditions on the X-bar chart will make economic sense. Option c is correct.

Q97. How is First Pass Yield (FPY) Calculated?
SELECT THE CORRECT ANSWER

A. FPY = (Output in First Pass) / (Total Output)
B. FPY = (Defect Free Output in First Pass) / (Total Input)
C. FPY = (Total output) / (defect free input)
D. FPY = (Defect-Free Output) / (Total Pass)

Correct Option:B
EXPLANATION : The First Pass Yield (FPY) is Calculated as FPY = (Defect Free Output in First Pass) / (Total Input). Any defect fixed in subsequent pass is not counted here.

Q98. What are the six experiments called while performing one experiment with five repetitions" ?""""
SELECT THE CORRECT ANSWER

A. Randomization
B. Replications
C. Planned grouping
D. Sequential

Correct Option:B
EXPLANATION : Repeated trials or replications are often conducted to estimate the pure trial-to-trial experimental error so that lack of fit may be evaluated. Randomization frees an experiment from the environment and other biases. Sequential experiments are conducted one after another, not all at the same time. Adjustments may be made in the experimentation based upon the knowledge obtained. Almost any DOE contains planned grouping. So answer option b is correct.

Q99. Process flow improvement steps normally do NOT include:
SELECT THE CORRECT ANSWER

A. Asking why we do it this way
B. Asking what would make it perfect
C. Analyzing each step in detail
D. The use of Pareto diagrams

Correct Option:D
EXPLANATION : Note that a negative response is requested. Options a, b, and c are typically parts of a process flow review. The use of Pareto diagrams is not part of this technique. So option d is the correct choice.

Q100. Which of the following is NOT a component of the decision making process in business or manufacturing?
SELECT THE CORRECT ANSWER

A. Listing alternative courses of action
B. Evaluating the performance of the last project
C. Listing uncertain events
D. Adopting decision criteria

Correct Option:B
EXPLANATION : Evaluation of last project is done for Root Cause Analysis. This is not done for subsequent decision making.