Lean Six Sigma Green Belt (LSSGB) - LSSGB Simulation IASSC Test Paper 4

Q1. What is the key benefit of multi-vari charting?
SELECT THE CORRECT ANSWER
A. It keeps track of the time when measurements were made
B. It graphically displays the variation in a process
C. It assists in the breakdown of components of variation
D. It is much easier to plot than most control charts

Correct Option:C
EXPLANATION : Option d may or may not be true; this is a distractor choice. Options a, b, and c are true statements. However, the principal reason behind multi-vari charting is to breakdown the variation into components such as positional, cyclical, and temporal so that improvements can be made. So option c is correct.

Q2. Deciding to collect sample from a population is often:
SELECT THE CORRECT ANSWER
A. A Personal decision
B. An Economical decision
C. A Risky decision
D. A Team decision

Correct Option:B
EXPLANATION : A practitioner may decide to sample or a team may decide to do it. Sampling, even at the best of times, is considered risky. But the risk factor can be alleviated using the proper technique. At all times though, people opt for sample because they wish to save time and money. Option b is the correct answer.

Q3. A Six Sigma project had a lot of improvement measures suggested on training people, setting standardized job instructions, getting surveys done from employees, and so on. Who would be the focused audience for whom this project was aimed at?
SELECT THE CORRECT ANSWER
A. External customers
B. Stakeholders
C. Internal customers
D. All of the above

Correct Option:C
EXPLANATION : All the activities suggested here are typically done with employees of a company. This indicates the customer base is internal. So, c is correct.

Q4. Cause and Effect Diagram when used with 5 WHY helps you in understanding the root cause of the problem. In doing so, what does the Six Sigma team wish to know?
SELECT THE CORRECT ANSWER
A. The assignable causes
B. Causes attributable to categories
C. Categories that can be ignored
D. None of the above

Correct Option:A
EXPLANATION : Identification of root cause means you have been able to assign a cause to the cause of variation. It also means that you have been able to identify Assignable causes of variation, as common causes are untraceable to their causes. Option a is correct.

Q5. Which of the below mentioned tools is considered best to inform employees of their work roles, in terms of ease of understanding and implementation?
SELECT THE CORRECT ANSWER
  A. Written Instructions
  B. Job Description
  C. Process Flow Maps
  D. Standardized Work Templates

Correct Option:A
EXPLANATION : Written Instructions are considered the easiest to comprehend by employees, so option a is the correct answer.

Q6. In embracing Six Sigma, what has been the principal motivating factor from the point of view of upper management ?
SELECT THE CORRECT ANSWER
  A. Bottom line results
  B. Market share growth
  C. Defect reductions
  D. Customer focus

Correct Option:A
EXPLANATION : The idea of the question is to distinguish between the answer choices in some manner. Out of the four answer choices, there is one broad scope or strategic goal and three detailed or tactical department goals listed. The strategic goal is answer option a. The other three options are tactical. Thus, option a is the correct answer.

Q7. The purpose of "rolled throughput yield" in Six Sigma would NOT be to:
SELECT THE CORRECT ANSWER
  A. Analyze a process flow for improvement ideas
  B. Spot significant differences in yield
  C. Use the calculation for customer analysis
  D. Provide a baseline metric

Correct Option:C
EXPLANATION : Please note that a negative response is requested. All the answer choices are reasons for using a throughput yield to help analyze a possible problem with the exception of answer choice c . This is a distractor answer that does not apply to this question. So option c is the correct choice.

Q8. A company making rubber tires is evaluated on 5 opportunities per product; in 1000 products manufactured in a month if 100 defects are observed, the Rolled Throughput Yield is:
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% .

Q9. What is Lean philosophy?
SELECT THE CORRECT ANSWER
  A. Provide perfect value to the customer through a perfect value creation process that has zero waste

B. Continuous Improvement
C. Higher output by encouraging people to work hard and have targets
D. Reducing cost and improving purchasing power for the individuals

Correct Option:A
EXPLANATION : Lean philosophy is to provide perfect value to the customer through a perfect value creation process that has zero waste, while cost reduction is not the main focus on Lean

Q10. When samples are drawn out of a population randomly, what is said to be true?
SELECT THE CORRECT ANSWER
A. The sample mean is always the same as population mean
B. The sample standard deviation will be the same as population standard deviation
C. The sampling distribution approaches normality with increase in sample size
D. The sampling distribution would be triangular if population is distributed as triangular distribution

Correct Option:C
EXPLANATION : Although CLT states in one of its clauses that sample mean = population mean, it cannot be said with a degree of confidence at all times. Option b and d are not serious considerations. Thus option c is correct.

Q11. Which of the following tools is most commonly used in the define phase of a project?
SELECT THE CORRECT ANSWER
A. Affinity diagram
B. Control chart
C. Failure mode and effects analysis
D. Data collection checklist

Correct Option:A
EXPLANATION : The Affinity Diagram is designed to invoke creative thinking and organize qualitative information into related topics. It is the easiest and least complex modern quality tool to begin the problem solving journey.

Q12. Which of these is considered a technique to collect data or comments from customers?
SELECT THE CORRECT ANSWER
A. Multivoting
B. Customer needs prioritization
C. Focus Groups
D. Nominal Group Technique

Correct Option:C
EXPLANATION : Focus groups is considered the most efficient and a good technique to collect data. Thus c is correct. Other options are not serious considerations.

Q13. Which of the following cannot be considered as an acceptable reason for deploying a Six Sigma DMAIC project?
SELECT THE CORRECT ANSWER
A. Reduce Cost of Quality
B. Increase Customer Satisfaction
C. Reduce internal problems
D. Improve the Design

Correct Option:D
EXPLANATION : Options a and b are definitely acceptable reasons. Internal problems could be decoded as employee related issues, which may impact end customer quality. Thus the only possible correct option is conceptually improving the design, which is a typical DFSS case.

Q14. Sum Square of Error is equal to:
SELECT THE CORRECT ANSWER
   A. Sum Squares due to Pure Error + Sum Squares due to Lack of Fit
   B. Sum Squares due to Pure Error - Sum Squares due to Lack of Fit
   C. Sum Squares due to Lack of Fit-Sum Squares due to Pure Error
   D. None of the above

Correct Option:A
EXPLANATION : Option A is the only correct answer choice. The Sum Square of Error or SSE is a combination of Sum Square of Pure Error and Sum Square of Lack of Fit. If the model was perfect, which means no lack of fit, only Pure Error would contribute to SSE.

Q15. The p value for Moods Median test is .02 and the level of significane is set at .05, what decision is made?
SELECT THE CORRECT ANSWER
   A. reject null hypothesis
   B. fail to reject null hypothesis
   C. cannot determine
   D. use a different test

Correct Option:A
EXPLANATION : For hypothesis testing if the p value is smaller than the significance level the null hypothesis is rejected

Q16. What type of waste would the following scenario potentially cause? A clothing manufacturing is producing more items than what the customer has ordered.
SELECT THE CORRECT ANSWER
   A. Waiting
   B. Over Production
   C. Transportation
   D. Over Processing

Correct Option:B
EXPLANATION : If the system is processing more than what the customer needs, this would cause unnecessary waste.

Q17. Which of the following variations are identified in control charts?
SELECT THE CORRECT ANSWER
   A. Random and chance
   B. Special and assignable
   C. Normal and Special
   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.

Q18. Which of the following tools helps in visualizing series of causes to an effect?
SELECT THE CORRECT ANSWER
   A. Cause and Effect Matrix
   B. Correlation Diagram
   C. Ishikawa Diagram

D. Value Stream Mapping

Correct Option:C
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.

Q19. 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.

Q20. Standard Deviation in Six Sigma applications is referred to as difference from the:SELECT THE CORRECT ANSWER
    A. Target
    B. Specification limits
    C. Nearest fit value
    D. Mean

Correct Option:D
EXPLANATION :
Standard deviation is always referred to as difference from the mean. Thus Mean is the right answer.

Q21. In a typical DFSS Approach, which of these stages figures in most DFSS approaches?
SELECT THE CORRECT ANSWER
    A. Innovate
    B. Identify
    C. Improve
    D. Control

Correct Option:B
EXPLANATION :
IDOV is a popular DFSS approach, in which the stage is Identify. Thus b is the correct option.

Q22. Which of the following pairs is the most useful in preparing control charts, when used together, for variables data?
SELECT THE CORRECT ANSWER
    A. AQL, p-bar
    B. p, n
    C. X-bar and R
    D. R, sigma

Correct Option:C
EXPLANATION : An X-bar and R chart is represented best by variables data. Options a and b list attribute data quantities. The two values in option d are measures of dispersion and are not used together in control charting. So option c is correct.

Q23. Which of the following activities is NOT non value-added?

SELECT THE CORRECT ANSWER
   A. Setup
   B. Rework
   C. Process
   D. Inspection

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

Q24. Repetition helps 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:A
EXPLANATION : Repetition helps in determining short term variability and Replication helps with long term variability.

Q25. Identify the most accurate method for quantifying gage repeatability and reproducibility.
SELECT THE CORRECT ANSWER
   A. The bias and linearity method
   B. The range method
   C. The average and range method
   D. The ANOVA method

Correct Option:D
EXPLANATION : Answer option a is a distractor choice. If done by hand, the remaining three choices are listed in order of complexity and accuracy. So option d is correct.

Q26. Which of these tools / techniques represent "continuous improvement"?
SELECT THE CORRECT ANSWER
   A. Kaizen
   B. Six Sigma
   C. Lean
   D. Kanban

Correct Option:A
EXPLANATION : The word kaizen means "continuous improvement." It is a system of continuous improvement in quality, technology, processes, company culture, productivity, safety, and leadership. It comes from the Japanese words ("kai") which means "change" or "to correct" and ("zen") which means "good."

Q27. A Six Sigma project can reduce:
SELECT THE CORRECT ANSWER
   A. Internal Failure Cost
   B. External Failure Cost
   C. Total Failure Cost
   D. Non of the above

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

Q28. Why would Six Sigma activities prompt a re-analysis of measuring systems?

SELECT THE CORRECT ANSWER
   A. It's mandated by the MSA (1998) Reference Manual
   B. Variability may be reduced, requiring more precise measurements
   C. Six Sigma is a more quality-conscious control technology
   D. 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.

Q29. Japanese 5S methodology is created and used for:
SELECT THE CORRECT ANSWER
   A. Continuous Improvement
   B. Prevent Defects
   C. Creating a productive work environment
   D. Reduce Variation

Correct Option:C
EXPLANATION : Japanese 5S methodology was created and used for organizing, cleaning, developing, and sustaining a productive work environment.

Q30. What does OEE stands for?
SELECT THE CORRECT ANSWER
   A. Overall Equipment Effectiveness
   B. Overall Estimation Effectiveness
   C. Overall Equipment Estimation
   D. Overall Effective Estimation

Correct Option:A
EXPLANATION : OEE stands for Overall Equipment Effectiveness.

Q31. The house of quality is used to translate customer wants into engineering design variables. The linking or prioritization of customer wants into engineered values occurs in which of the following elements?
SELECT THE CORRECT ANSWER
   A. Competitive analysis
   B. Conflict analysis
   C. Technical review
   D. Relationship matrix

Correct Option:D
EXPLANATION : The translating of customer wants into engineering specifications with a priority (or strength) value is performed in the relationship matrix. So option d is correct.

Q32. What is the name of the condition if you are running a 7-4 fractional experiment? You know factors A, B, C, D, and E are independent of each other, but you suspect factors F and G are not independent. You conducted a small sub-experiment and discovered a high correlation between factors F and G.
SELECT THE CORRECT ANSWER
   A. Collinearity
   B. Confounded
   C. Correlation
   D. Covariates

Correct Option:A

EXPLANATION : Having two variables that are highly correlated in the experimental model will make it difficult or impossible to detect which factor really affects the response. This condition is called collinearity. The correct answer is option a.

Q33. 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.

Q34. If an experiment has an alias, you could say that 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.

Q35. What types of variation does a process have if it is "in control"?
SELECT THE CORRECT ANSWER
    A. Process has assignable causes
    B. Process has assignable and chance causes
    C. Process has random causes only
    D. Process has assignable or chance causes

Correct Option:C
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 c is the correct answer.

Q36. For 4 factors and 3 levels, the DOE setup has 32 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.

Q37. Which of the following techniques used in DOE helps you in identifying pure error?
SELECT THE CORRECT ANSWER
    A. Replication
    B. Blocking
    C. Randomization
    D. Coding

Correct Option:A
EXPLANATION : By conducting replication in an experiment, you can eliminate the errors due to environmental factors and thus option a is the correct answer.

Q38. A combined calculation of repeatability and reproducibility using the average and range method produces a ratio of 7.42% of process tolerance. What can be stated about the 7.42% value?
SELECT THE CORRECT ANSWER
    A. The measurement system is acceptable
    B. The measurement system is marginal
    C. The measurement system is not acceptable
    D. It must be separated into individual R&R values

Correct Option:A
EXPLANATION : The acceptability criteria states that a combined R&R value of less than 10% is considered acceptable. Between 10% and 30% is considered marginal (good but suitable to improvement) and over 30% is considered to be not acceptable. In this case, there is no need to separate repeatability and reproducibility because the combined R&R value is well under 10%. Thus, neither component should be a problem. So answer a is correct.

Q39. In a single factor ANOVA, the assumption of homogeneity of variances applies to:
SELECT THE CORRECT ANSWER
    A. The variances within the treatment groups
    B. The variances of the treatment groups
    C. The total variance
    D. All of the above

Correct Option:A
EXPLANATION : An underlying assumption in any analysis of variance of means that homogeneity of variance applies to the variation within each factor (treatment). Statistical tests exist to test this homogeneity, but in ANOVA, the assumption is that the natural variation within each factor is the same. Answer option a is correct.

Q40. A perfect regression model with all points fitting the regression line has Sum Square of Errors _____
SELECT THE CORRECT ANSWER
    A. >0
    B. <0
    C. equal to 0
    D. equal to 1

Correct Option:C
EXPLANATION : For a regression model to fit, the plot should have sum of square for the errors to be zero.

Q41. 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. Thus d is the right answer.

Q42. What are the six experiments called while performing one experiment with four repetitions?
SELECT THE CORRECT ANSWER

A. Randomization
B. Replications
C. Blocking
D. Sequencing

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.

Q43. If men having high Blood Sugar problems are diagnosed with Diabetes, with the mean blood sugar level to be at 120 and a standard deviation of 9, and any individual having greater than 100 Blood Sugar levels can be diagnosed with Diabetes, what is the probability of committing a Type II Error?
SELECT THE CORRECT ANSWER
A. 0.007
B. 0.0062
C. 0.0139
D. 0.0055

Correct Option:C
EXPLANATION : Z = (120-100)/9 = 20/9 = 2.2 Area under 2.2 corresponds to 0.0139. Thus, the probability of a Type II Error, which is beta, is 1.39%. Option c is the correct answer.

Q44. 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 UCL stand for?
SELECT THE CORRECT ANSWER
A. Upper Cycle Length
B. Upper Control Limit
C. Upper Cycle Limit
D. Upper Control Length

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

Q45. To optimize the response of a process, ideally what sequence of experimentation should one use?
SELECT THE CORRECT ANSWER
A. Use response surface methodologies at all stages
B. Use screening first and then response surface techniques
C. Use charting techniques first and then ANOVA
D. Use experimental designs first and then ANOVA

Correct Option:B
EXPLANATION : Screening will help the analyst to filter variables and determine what is really important in the response model. Response surfaces will then help optimize the model provided that all variables are quantitative. So option b is correct.

Q46. Whichof the following terms describes the situation in which the effects of two factors are correlated while designing experiments?
SELECT THE CORRECT ANSWER
A. Covariate
B. Confounded
C. Interactive

D. Collinear

Correct Option:D
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 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.

Q47. What is the process capability for attribute data?
SELECT THE CORRECT ANSWER
    A. Cannot be determined
    B. Is determined by the control limits on the applicable attribute chart
    C. Is defined as the average proportion of nonconforming product
    D. Is measured by counting the average nonconforming units in 25 or more samples

Correct Option:C
EXPLANATION : The average proportion may be reported on a defects/defectives per million scale by multiplying the average (such as p bar, c bar, u bar, etc.) by 1,000,000. So option c is correct.

Q48. An organization finds that an extra measure of security added to online transactions did not reduce the incidence of identity theft. What is this concept of management referred to?
SELECT THE CORRECT ANSWER
    A. no-value added
    B. no-security added
    C. limited effectiveness model
    D. identity theft model

Correct Option:A
EXPLANATION : This is the case of non-value added activity.

Q49. Which of the following statements are NOT true of control charts?
SELECT THE CORRECT ANSWER
    A. They can detect trends of statistical significance
    B. They provide straightforward, easily interpreted information
    C. They provide an ongoing measure of process capability
    D. They can detect special causes of variation

Correct Option:B
EXPLANATION : Note that a negative response is requested. The advantages of control charts include their ability to detect trends of statistical significance, provide an ongoing measure of process capability, and detect special causes of variation. The disadvantage is that they can be difficult to interpret properly. So answer b is the correct.

Q50. Rolled Throughput Yield best indicates:
SELECT THE CORRECT ANSWER
    A. The quality levels of the process
    B. The need for improvement
    C. The time and effort spent on rework and scrap
    D. The utilization of the process

Correct Option:C
EXPLANATION :

While RTY shows the quality levels of the process, the need for improvement and utilization, it best indicates the amount of time and effort spent in rework and scrap, which in a sense also shows the Hidden Factory. Option c is the correct answer.

Q51. For a full factorial experiment with 23 treatments and 0 replicate, how many runs could you expect?
SELECT THE CORRECT ANSWER
    A. 23
    B. 16
    C. 46
    D. 32

Correct Option:A
EXPLANATION : 23 designs + 0 replicate gives you 23. Since this is full factorial we will include all of these, that is 23.

Q52. What set of basic quality tools would be most applicable for a work team to use when there is a desire to follow procedures and work instructions more closely?
SELECT THE CORRECT ANSWER
    A. Pareto and affinity diagrams
    B. Data sheets and histograms
    C. Checklists and flow charts
    D. Fishbone and control charts

Correct Option:C
EXPLANATION : Histograms, fishbone charts, control charts, Pareto diagrams, and affinity diagrams have no application as memory aids. Data sheets, checklists, and flow charts might offer an advantage. Only answer choice c offers two of these tools. So option c is correct.

Q53. Hypothesis tests on enumerative statistics would NOT involve which of the following distributions?
SELECT THE CORRECT ANSWER
    A. Chi-square
    B. Student's t
    C. Binomial
    D. Poisson

Correct Option:B
EXPLANATION : Please note that a negative response is requested. Enumerative data is data that can be counted. The student's t distribution would not be applicable. So option b is the correct choice.

Q54. One of the purposes of using a fishbone diagram is to:
SELECT THE CORRECT ANSWER
    A. Separate a problem into smaller components
    B. Identify the significant few components of a problem
    C. Define the problem in sequential order
    D. Show the relationship between parameters

Correct Option:A
EXPLANATION : One of the purposes of a fishbone diagram is to identify the potential components of a problem. Option b describes either process flow or work instructions. Option c could be describing a scatter diagram. Option d is more typical of Pareto diagrams.

Q55. 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.

Q56. With which of the following distributions is the term "degrees of freedom" inapplicable?
SELECT THE CORRECT ANSWER
A. F Distribution
B. Poisson
C. Student's t
D. Chi-square

Correct Option:B
EXPLANATION : Please note that a negative response is requested. The F, student's t, and chi-square distributions require known degrees of freedom to determine critical table values. The Poisson table only needs sample size and probability of occurrence. Option b is the correct choice.

Q57. What determines the factors that will receive major attention after constructing a rank order prioritization matrix?
SELECT THE CORRECT ANSWER
A. The relative strength values of the factors
B. Those criteria with the highest numeric values
C. Those criteria at the top of the chart
D. The factors with negative strength values

Correct Option:A
EXPLANATION : In the usual prioritization matrix construction, factors with the highest strength values receive attention. However, the amount of attention depends upon the relative strength values of all factors. So option a is correct.

Q58. Which of the following is an example of a Primary metric for Six Sigma projects?
SELECT THE CORRECT ANSWER
A. Quality
B. Morale of employees
C. Average turnover
D. Customer Satisfaction

Correct Option:A
EXPLANATION : Except for Quality, all the others are secondary metrics. Thus a is the right option.

Q59. What skills and experiences do project improvement team members normally have?
SELECT THE CORRECT ANSWER
A. Narrow skills and experiences
B. Diverse skills and narrow experiences
C. Diverse experience and narrow skills
D. Diverse skills and experiences

Correct Option:D

EXPLANATION : Project teams may have a composite membership of technicians, engineers, supervisors, mechanics, operators, and so on. These individuals would normally have diverse skills and experiences. Option d is correct.

Q60. What type of variation is undesirable when trying to control a process?
SELECT THE CORRECT ANSWER
   A. Special cause variation
   B. Random cause variation
   C. Chance cause variation
   D. Normal variation

Correct Option:A
EXPLANATION : Assignable variation is also called special or non-normal. This type of variation is unpredictable and is therefore not desirable when trying to keep a process in control. So option A is correct.

Q61. 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.

Q62. The difference between strategic quality goals and the strategic business plan is that:
SELECT THE CORRECT ANSWER
   A. Strategic quality goals are often a lower tier than the strategic business plan
   B. They are determined only by top management
   C. They may offer conflicting priorities
   D. They are based on priorities given by all levels of the company

Correct Option:A
EXPLANATION : The key word in this question is "difference." Options b and d are common to both strategic quality goals and the strategic business plan. Option c is incorrect. The strategic business plan forms the higher level with strategic quality goals being a part of it. So answer option a is correct.

Q63. Identify the post-improvement tool which would be most beneficial when generating fresh ideas after the results of an improvement process have been disappointing.
SELECT THE CORRECT ANSWER
   A. A post-improvement capability analysis
   B. A post-improvement brainstorming session
   C. A follow-up FMEA study
   D. A multi-vari re-analysis

Correct Option:B

EXPLANATION : Answer options a, c, and d are ideal for determining the effectiveness of various improvement activities. Brainstorming would be used to generate ideas if improvement results proved to be inadequate. Option B is correct.

Q64. Which of the following errors is typically associated with the notion, "False negative"?
SELECT THE CORRECT ANSWER
    A. Type I error
    B. Type II error
    C. Type III error
    D. Depends on the experiments

Correct Option:B
EXPLANATION : Consider an example of a patient who wished to go for an HIV test. He was actually suffering from the virus, but the tests revealed that he was not. The test declared him negative on HIV, while he had the disease. Thus, False Negative, option b is right.

Q65. When the data has outliers, which of the measures of central tendency should be used?
SELECT THE CORRECT ANSWER
    A. Mean
    B. Median
    C. Mode
    D. None of the above

Correct Option:B
EXPLANATION : Mean is extremely sensitive to outliers and Mode is definitely not an option, thus Median seems to be the logical choice.

Q66. What type of waste is "an accountant going to the first floor to pick up documents from printer"?
SELECT THE CORRECT ANSWER
    A. Overproduction
    B. Motion
    C. Radiation
    D. Underutilization

Correct Option:B
EXPLANATION : When people are moving more than needed to complete a task it is considered as motion waste.

Q67. What is the best choice in the hands of a Six Sigma team to increase the power of the experiments?
SELECT THE CORRECT ANSWER
    A. Reduce Significance level
    B. Reduce Sample Size
    C. Increase Sample Size
    D. All of the above

Correct Option:C
EXPLANATION : Options a and b are not serious considerations, and thus option d can be ruled out. Conceptually, increase in sample size increases the possible accuracy of the experiment, and thus an increase in power. So, option c is the correct answer.

Q68. Which hypothesis test is similar to the 1 sample t-test but is used when the data set is non-normal?
SELECT THE CORRECT ANSWER
    A. Mann-Whitney
    B. Kruskal-Wallis
    C. .1- sample sign
    D. Friedman

Correct Option:C
EXPLANATION :
From the options provided the 1-sample sign test is the only non normal counterpart to the 1 sample t-test

Q69. Which approach talks about equipment 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.

Q70. What is the more appropriate definition of Non-Value-Add Activity?
SELECT THE CORRECT ANSWER
    A. There is no monetary value involved in activity
    B. Any activity that does not add any value to the product
    C. Non-tangible value
    D. The improvement activities cannot be valued by the organization

Correct Option:B
EXPLANATION : It is defined as any activity which clearly creates no value. It can be removed immediately with minimum or no capital investment, and with no detrimental effect on end value.

Q71. Best metric for measuring defectives is:
SELECT THE CORRECT ANSWER
    A. DPMO
    B. DPU
    C. PPM
    D. DPO

Correct Option:C
EXPLANATION : All the other metrics except PPM are used to measure defects. Option c is the correct answer.

Q72. If the Measure stage in a DMAIC approach is all about measuring the data for existing process, what is the main objective in the Measure phase in a DFSS approach?
SELECT THE CORRECT ANSWER
    A. Measure what you can measure
    B. Measure what the customer wants you to measure
    C. Set the key measurement steps and metrics
    D. Define operational metrics

Correct Option:C
EXPLANATION : In the Measure Stage of a DFSS approach DMADV, some practitioners may prefer to define operational metrics, but most practitioners would want to set the key measurement steps and metrics because that allows them to set the measurement system. Option c is correct.

Q73. All the factors that might contribute to a production problem must be discovered. Which among the following problem-solving tools might be the best choice?
SELECT THE CORRECT ANSWER

A. Pareto diagrams
B. Fishbone diagrams
C. Histograms
D. Control charts

Correct Option:B
EXPLANATION : This question requires basic quality tool knowledge. The Pareto diagram is used to prioritize problems and would not be the initial choice. The histogram and control chart are excellent tools but would not be correct choices for discovering all contributing factors. The fishbone diagram is the best tool for the described application. Answer b is correct.

Q74. One thousand units of a product were examined for the possibility of 5 different undesirable characteristics. A total of 80 defects were found. How many defects would be expected in a million opportunities?
SELECT THE CORRECT ANSWER
A. 16000
B. 26666
C. 61458
D. 80000

Correct Option:A
EXPLANATION : A minor two-step calculation is required: DPO = D/TOP and TOP = Units * opportunities DPO = D/(U*O) = 80/(1000*5) = 0.016000 DPMO = DPO*106 = 0.016000*106 = 16000 So option a is correct.

Q75. On a highly automated food processing line, a quality professional wants to chart the weight of packages. The recommended control chart is an X-bar - S chart and not the typical X-bar - R chart, in wide use throughout the facility. Which of the following is the most logical reason for this switch?
SELECT THE CORRECT ANSWER
A. The X-bar control limits will be tighter
B. The supervisor obviously wants some variety in control chart usage
C. Only one control chart will be required
D. The X-bar and S values will come automatically from a weight checker

Correct Option:D
EXPLANATION : This question requires familiarity with X-bar - S charting and automated process equipment. Option c is incorrect. Two charts will still be necessary. Option b is a filler option. Option a may or may not be correct. This answer is dependent upon the sample size. In either event, the plot points and control limits will be proportional (assuming a reasonably small sample size) and is not a logical reason for making the X-bar - S selection. The assumption must be that the supervisor knows that the X-bar - S values can be supplied from an automated weight checker. So option d is correct.

Q76. Variable control chart subgroup sizes are generally 3, 4, 5, or 6 for all of the following reasons EXCEPT:
SELECT THE CORRECT ANSWER
A. They are large enough so that averages of data will follow the normal distribution
B. They fit onto traditional chart paper very well
C. Larger sizes permit an opportunity for process changes within the subgroup
D. They permit a separation of within time from time-to-time variation

Correct Option:B
EXPLANATION : Please note that a negative response is requested. The weakest selection is option b. Control chart paper was developed to support a logical control chart sample size. Sample sizes should not be chosen to fit a handy form. The other items have merit. So option b is the correct choice.

Q77. Which of the following measures of central tendency is prefered when the data does not have outliers?
SELECT THE CORRECT ANSWER
   A. Mean
   B. Mode
   C. Median
   D. None of the above

Correct Option:A
EXPLANATION : Mean is preferred over the other methods when outliers are not present in the data set.

Q78. Poke Yoke is a lean manufacturing concept that is used for what purpose?
SELECT THE CORRECT ANSWER
   A. Process leveling
   B. Mistake proofing
   C. Process visualization
   D. Quick set up

Correct Option:B
EXPLANATION : Poke Yoke is a Lean concept for Error or Mistake Proofing a process.

Q79. Which of the following assumption is necessary to validate the meaning of the standard deviation of measurement variability?
SELECT THE CORRECT ANSWER
   A. Measurement errors are independent
   B. The measurement scale is normally distributed
   C. Measurement errors are independent of the operators involved in the study
   D. Measurement errors are skewed in the direction of normality

Correct Option:A
EXPLANATION : The three valid assumptions for the standard deviation due to measurement variability are: measurement errors are independent, measurement errors are normally distributed, and measurement errors are independent of the magnitude of the measurement. Only answer a refers to a proper assumption. Answer a is correct.

Q80. For many people, changing a single tire can easily take 15 minutes. But, for a NASCAR pit crew, changing four tires takes less than 15 seconds. This represents good use of what tool?
SELECT THE CORRECT ANSWER
   A. SMED (Single-Minute Exchange of Die)
   B. Poka Yoke
   C. Kanban
   D. Six Sigma

Correct Option:A
EXPLANATION : The successful implementation of SMED and quick changeover is the key to a competitive advantage for any Process.

Q81. In a study of probability, an event or outcome that cannot be broken down any further is referred to as:SELECT THE CORRECT ANSWER
   A. A mutually exclusive event
   B. A dependent event
   C. A simple event
   D. An event complement

Correct Option:C

EXPLANATION : No sample points are common with another event in a mutually exclusive event. A dependent event relies on another event occurring. The complement of an event consists of all outcomes in which the event does not occur. A simple event is an outcome or event that cannot be broken down any further. So answer option c is correct.

Q82. As a Green Belt, what should a trainee do when he faces a problem during his projects?
SELECT THE CORRECT ANSWER
    A. Quantify the problem and consult the Black Belt
    B. Consult the Champion
    C. Consult Team Members
    D. Consult MB

Correct Option:A
EXPLANATION : Ideally, the GB is expected to collect data relevant to the problem and consult the BB for the best solution possible. So a is the right option.

Q83. Which of these distributions can be used to make inferences about population variances?
SELECT THE CORRECT ANSWER
    A. T distribution
    B. Z distribution
    C. Chi-Square distribution
    D. Gamma distribution

Correct Option:C
EXPLANATION : Of the four distributions, only Chi-Square is used to make inferences about variances.

Q84. Which of the following is the LEAST likely tool to assist the problem definition stage of Six Sigma?
SELECT THE CORRECT ANSWER
    A. CTQ trees
    B. Pareto analysis
    C. Product yield data
    D. Control charts

Correct Option:D
EXPLANATION : Please note that a negative response is requested. Items like CTQ trees, Pareto, yield data, customer feedback, and so on are useful for project definition. Control charts occur much later in the DMAIC cycle. So answer d is the correct choice.

Q85. For a process working at 5 Sigma level, how many opportunities are considered to lie outside of the specification limits provided by the customer?
SELECT THE CORRECT ANSWER
    A. 233
    B. 6210
    C. 3.4
    D. 66807

Correct Option:A
EXPLANATION : A 5 Sigma process has a total of 233 defects. Thus, option a is correct.

Q86. In a typical Measure Phase, which of the following activities should a Green Belt perform first?
SELECT THE CORRECT ANSWER
    A. Stability
    B. Capability
    C. MSA

D. Normality

Correct Option:C

EXPLANATION : Without validating the Measurement system the other three factors do not make any sense. Thus MSA needs to be done before doing anything in the Measure Phase.

Q87. In a typical MSA GAGE RR study conducted, what should the Six Sigma team determine about the Measurement System first?
SELECT THE CORRECT ANSWER
 A. Accuracy
 B. Stability
 C. Resolution
 D. Linearity

Correct Option:C

EXPLANATION : Without determining Resolution or Discrimination, the team cannot go ahead with the GAGE RR Study. Resolution is the first point to determine in a GAGE RR Study. Option c is correct.

Q88. Which of the following scenarios is best suited to use an X-bar and R chart?
SELECT THE CORRECT ANSWER
 A. A smaller sample size is needed
 B. It is necessary to know when to investigate a process for causes of variation
 C. The machine capability is wider than the specification
 D. An acceptable quality level must be established

Correct Option:B

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

Q89. 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.

Q90. What is one basic assumption of a null hypothesis?
SELECT THE CORRECT ANSWER
 A. That the variables are dependent
 B. That the variables are independent
 C. That the sample size is adequate
 D. That the confidence interval is ± 2 standard deviations

Correct Option:B

EXPLANATION : Option d is a filler option. It is desirable that the sample size be adequate (option c), but sufficient information may not be available to determine an adequate sample size

before testing. One assumption made in the analysis of variance of means is that the variables are independent. So answer b is correct.

Q91.As an experienced experimenter, you have built a predictive model of an experimental data. The difference between the actual response data and the model data are termed as:
SELECT THE CORRECT ANSWER
    A. Confounded data
    B. Nested experiments
    C. Residuals
    D. Efficiency of estimators

Correct Option:C
EXPLANATION : The variables could be confounded, but there is no indication that this is the case. The efficiency of estimators and nested experiments are distractor choices. Residuals are the differences between the experimental responses and predicted models. Option c is correct.

Q92. In the theory of control charts, the distribution of the number of defects per unit follows which of the following distributions?
SELECT THE CORRECT ANSWER
    A. Normal distribution
    B. Binomial distribution
    C. Chi-square distribution
    D. Poisson distribution

Correct Option:D
EXPLANATION : The normal distribution relates to variable data and not attribute data. The chi-square distribution is used to make inferences regarding population variances. The binomial distribution is assumed for defectives. The Poisson distribution is assumed for defects. So option d is correct.

Q93. What type of waste is "Purchasing and storing office supply, sales literature, etc."?
SELECT THE CORRECT ANSWER
    A. Over production
    B. Cost
    C. Inventory
    D. Motion

Correct Option:C
EXPLANATION : Any access purchase and storage of office supply, sales literature, reports, etc. would constitute inventory type of waste.

Q94. For a Six Sigma project done in the Operations department (LOB project), which of the following could be called a stakeholder to the project?
SELECT THE CORRECT ANSWER
    A. IT Department
    B. Administration Department
    C. Human Resources Department
    D. All of the above

Correct Option:D
EXPLANATION : A stakeholder is defined as anyone affected by the process output or process flow, or anyone influencing the end output. Thus, d is the correct answer.

Q95. Which item should not be identified in the Define Phase?
SELECT THE CORRECT ANSWER
    A. Root causes

B. The key problem area
C. Possible financial loss
D. Intangibles

Correct Option:A
EXPLANATION : In the Define Phase, the Six Sigma team should never update root causes in the Project charter. Answer choice a is the right option.

Q96. Distribution that follows principles of an exponential distribution is:
SELECT THE CORRECT ANSWER
A. Poisson
B. Binomial
C. Chi-Square
D. Normal

Correct Option:A
EXPLANATION : The probability distribution of the Poisson distribution contains the exponential function. Option a is the correct answer.

Q97. While considering the stakeholder groups, which of the following terms is closely identified with the term 'community'?
SELECT THE CORRECT ANSWER
A. Society
B. Government
C. External customers
D. Suppliers

Correct Option:A
EXPLANATION : All the options are a part of the local or global community. However, relative to stakeholder groupings, community and society are often used interchangeably. So answer option a is correct.

Q98. Poka-yoke is best defined as:
SELECT THE CORRECT ANSWER
A. capturing the voice of the customer
B. improving machine efficiency
C. reducing field failures to virtually zero
D. preventing controllable defects

Correct Option:D
EXPLANATION : A poka-yoke device is one that prevents incorrect parts from being made or assembled, or easily identifies a flaw or error.

Q99. Which of the following is NOT necessary for the Six Sigma team to update in the Project Charter in the Define Phase?
SELECT THE CORRECT ANSWER
A. Project Name and Description
B. Business need
C. Project purpose
D. Constraints

Correct Option:D
EXPLANATION : Options a, b, and c can and should be updated in the Define Phase. Logically then Constraints is the right answer. Conceptually, in the Define Phase it is very difficult for a Six Sigma team to understand the possible constraints to the project. Option d is the right answer.

Q100. Which of the following distributions describes the ratios of two variances drawn from the same normal population?
SELECT THE CORRECT ANSWER
    A. F statistic
    B. Student's t test
    C. Chi-square
    D. Normal

Correct Option:A
EXPLANATION :
The F statistic is the ratio of two sample variances (two chi-square distributions). The assumption is that the variances are drawn from a normal distribution. Answer option a is correct.