Lean Six Sigma Black Belt (LSSBB) –

LSSBB Full Length Simulation Test 3

A picture containing bar chart

Description automatically generated

​Q1.The purpose of Six Sigma is to:

SELECT THE CORRECT ANSWER

1. fix defects.
2. reduce variation.
3. perform project management.
4. calculate standard deviation.

**Correct Option:B**

**Answer: (b) The purpose of Six Sigma is to reduce variation from any process and product. As variation is reduced, the quality is increased.**

Q2.What is Six Sigma?

SELECT THE CORRECT ANSWER

1. A business philosophy focusing on improvement
2. A project management model
3. A defects reduction technique that is six times better than average
4. A measurement system

**Correct Option:A**

**Answer: (a) Six Sigma is a business philosophy focused on driving continuous and breakthrough improvement.**

Q3.DMAIC stands for:

SELECT THE CORRECT ANSWER

1. Design, Measure, Analyze, Improve, Control
2. Define, Measure, Analyze, Improve, Control
3. Double Measurement And Instructions Checklist
4. Definition, Measurements, Analysis, Improvements, and Control

**Correct Option:B**

**Answer: (b) DMAIC is a Six Sigma problem solving methodology that stands for Define, Measure, Analyze, Improve, and Control.**

Q4.DFSS stands for:

SELECT THE CORRECT ANSWER

1. Design and Fix using Six Sigma
2. Develop Fast using Six Sigma
3. Define Futuristic Service and Solutions
4. Design For Six Sigma

**Correct Option:D**

**Answer: (d) DFSS is Six Sigma methodology that stands for "Design for Six Sigma" used while designing new processes.**

Q5.Six Sigma Level can be achieved by having:

SELECT THE CORRECT ANSWER

1. less than 3.4 defects per million opportunities.
2. six times better quality than competitors.
3. six levels of testing and validation before release.
4. Six Nines Quality (99.9999%).

**Correct Option:A**

**Answer: (a) If your process is delivering less than 3.4 defects per million opportunities, then you can call your process as performing at Six Sigma level.**

Q6.DMADV stands for :

SELECT THE CORRECT ANSWER

1. Design, Measure, Analyze, Develop, Verify
2. Develop Measurement and Analysis Department for Verification
3. Define, Measure, Analyze, Design, Verify
4. Design, Measure, Analyze, Define, Validate

**Correct Option:C**

**Answer: (c) DMADV is Six Sigma methodology that is used when developing a new process. It stands for "Define, Measure, Analyze, Design, and Verify."**

Q7.The purpose of Toll Gate review is to:

SELECT THE CORRECT ANSWER

1. confirm if the earlier phase was completed successfully.
2. get a formal sign-off from the stakeholders.
3. review progress and kick off the next phase.
4. All of the above

**Correct Option:D**

**Answer: (d) It is all of the above. The purpose of the Tollgate is to ensure plans are completed successfully, acquire formal sign-off from stakeholders and then review the progress and kick off the next phase.**

Q8.What is the primary role of Master Black Belt?

SELECT THE CORRECT ANSWER

1. Provide budget for the projects
2. Coach, mentor, and train Black Belts
3. Be a master in Six Sigma implementation
4. Review projects

**Correct Option:B**

**Answer: (b) The primary role of Master Black Belt is to provide guidance, train, coach, and mentor Black Belts for Six Sigma projects.**

Q9.Which role performs the following responsibilities: "Evangelize Six Sigma, provide resources and resolve any cross-functional issues"?

SELECT THE CORRECT ANSWER

1. Sponsor
2. Senior Executive
3. Master Black Belt
4. Champion

**Correct Option:D**

**Answer: (d) It is the Champion that is responsible for evangelizing Six Sigma and providing resources and support for Six Sigma projects**

Q10.A Black Belt is expected to deliver what types of results from Six Sigma projects?

SELECT THE CORRECT ANSWER

1. At least 200,000 USD as annual benefit
2. Have everybody in the organization trained on Six Sigma
3. Large projects
4. Defects reduction projects

**Correct Option:A**

**Answer: (a) Six Sigma Black Belt level projects are expected to provide returns of more than 200,000 USD annually.**

Q11.The purpose of capturing Voice of Customer is to:

SELECT THE CORRECT ANSWER

1. ensure there is no confusion between the contract and delivery.
2. gather customer feedback.
3. have a sampling exercise.
4. capture stated or unstated customer needs or requirements.

**Correct Option:D**

**Answer: (d) The VOC mechanism is used to capture stated or unstated customer needs or requirements.**

Q12.In which role is a full-time professional to lead large Six Sigma projects?

SELECT THE CORRECT ANSWER

1. Six Sigma Champion
2. Green Belt
3. Master Black Belt
4. Black Belt

Correct Option:D

**Answer: (d) The Black Belt is typically a full-time role that is responsible for leading enterprise-wide large scale projects and mentoring Green Belts.**

Q13.What is the role of Black Belts in dealing with organizational roadblocks?

SELECT THE CORRECT ANSWER

1. Escalating issues to Senior Management
2. Communicating the benefits of Six Sigma, changing efforts and building confidence in the team
3. Asking for help from Master Black Belts to handle a situation
4. Providing Six Sigma training to everybody in the organization

**Correct Option:B**

**: Answer: (b) The Black Belt is expected to work closely with Master Black Belt and Senior Management to communicate the benefits of Six Sigma, change efforts, and build confidence in the team.**

Q14.Why do Black Belts and Master Black Belts conduct closed-looped assessments of Six Sigma implementation?

SELECT THE CORRECT ANSWER

1. To ensure all aspects of Six Sigma have been implemented
2. To assure privacy of the people involved in Six Sigma projects
3. To ensure competitors do not get the information on the improvements achieved
4. To minimize influencing people with the Six Sigma project measurements and avoid any manipulation

**Correct Option:A**

**Answer: (a) The Six Sigma Black Belt and Master Black Belt usually conduct the assessment in a closed loop to make sure that all aspects of Six Sigma have been implemented in the project.**

Q15.What tool did Kaoru Ishikawa develop?

SELECT THE CORRECT ANSWER

1. SWAT Analysis Tool
2. CTQ Diagram
3. Cause and Effect Diagram
4. FMEA Tool

**Correct Option:C**

**Answer: (c) Ishikawa developed the Cause-and-Effect diagram, also known as Ishikawa tool or Fishbone diagram.**

Q16.What is the best mechanism to collect VOC data?

SELECT THE CORRECT ANSWER

1. Complaints Database
2. Customer Support History
3. Industry Reports
4. Surveys and Questionnaire

**Correct Option:D**

**Answer: (d) It is always good to collect data directly from the customer, and surveys and questionnaires are a good way to collect these data.**

Q17.Which of the following Six Sigma tools can be used by a team to prioritize a list of options to improve?

SELECT THE CORRECT ANSWER

1. Brainstorming
2. Nominal Group Technique
3. Cause and Effect Diagram
4. 5 Whys

**Correct Option:B**

**Answer: (b) After the group brainstorms ideas, they can get them prioritized using the Nominal Group technique.**

Q18.What does SWOT stand for?

SELECT THE CORRECT ANSWER

1. Strengths, Weaknesses, Opportunities, Threats
2. Six Work Optimization Techniques
3. Seven Workplace Opportunities for Transformation
4. Strengths, Weaknesses, Opportunities, Techniques

**Correct Option:A**

**Answer: (a) SWOT stands for Strengths, Weakness, Opportunities, and Threats.**

Q19.The primary factor in the successful implementation of Six Sigma is to have:

SELECT THE CORRECT ANSWER

1. Training for everybody in the organization
2. Support from everybody in the organization
3. Experienced Six Sigma practitioners
4. Executive commitment and support

**Correct Option:D**

**Answer: (d) Without executive commitment and support for a Six Sigma project, it would not be possible for anybody with or without Six Sigma experience to implement it successfully.**

Q20.What is Continual Improvement Process?

SELECT THE CORRECT ANSWER

1. The principle of never stopping any improvements
2. Improvements being made while people and machines continue to work
3. Steady effort made to improve existing processes, products, or services
4. Non-stop cyclic process of improvements where one improvement leads to another

**Correct Option:C**

**Answer: (c) Continual Improvement Process or CIP is a steady effort made to improve existing processes, products, or services in continuous, regular intervals or discrete jumps.**

Q21.What type of chart one would typically use for analyzing positional, cyclical, and temporal variations?

SELECT THE CORRECT ANSWER

1. Multi-Vari Charts
2. SPC Charts
3. Cause and Effect Diagram
4. Run Charts

**Correct Option:A**

**Answer: (a) When multiple data points related to positional, cyclical, and temporal variations are to be analyzed, multi-vari charts are most appropriate to be used.**

Q22.If you need to collect data to analyze the symptoms of a problem, what tool will be most appropriate?

SELECT THE CORRECT ANSWER

1. Flow Chart
2. FMEA Tool
3. Force Field Analysis
4. Check Sheet

**Correct Option:D**

**Answer: (d) To collect data related to any process, always start with a Check Sheet. It is a good technique to capture problem symptoms.**

Q23.The purpose of having functional requirements is:

SELECT THE CORRECT ANSWER

1. to describe a single, measurable performance.
2. to provide details on how a product or service needs to operate.
3. to provide specification limits.
4. to build VoC.

**Correct Option:B**

**Answer: (b) The purpose of having functional requirements is to provide details on how a product or service needs to operate.**

Q24.Increasing performance in a Six Sigma project from 3 sigma to 4 sigma would reduce defects per million by a factor of:

SELECT THE CORRECT ANSWER

1. 2
2. 8
3. 10
4. 16

**Correct Option:C**

**Answer: (c) At 3 sigma level Defects per million opportunities are 66,807. Whereas at 4 sigma level it is at 6,210 defects per million. The factor reduction in defect is 10.758 which is rounded to 10.**

Q25.In a Cause and Effect diagram, some of the major cause categories are mother nature, management, measurement systems, and the following four standard causes:

SELECT THE CORRECT ANSWER

1. Marketing, methods, material, machines
2. Man, material, methods, machines
3. Man, manufacturing, methods, material
4. Man, material, medicines, machines

**Correct Option:B**

**Answer: (b) The major cause categories in Cause and Effect diagrams are man, material, methods, and machines, along with mother nature, management, and measurement systems.**

Q26.To monitor the number of defects on different sample sizes, which of the following control charts is most appropriate to use?

SELECT THE CORRECT ANSWER

1. np chart
2. c chart
3. u chart
4. p chart

**Correct Option:C**

**Answer: (c) The control chart "u chart" is most appropriate to monitor the number of defects in different sample sizes.**

Q27.What are the 5 elements of Kaizen?

SELECT THE CORRECT ANSWER

1. Teamwork, Personal Discipline, Improve Morale, Quality Circles, Suggestions for Improvement
2. Define, Measure, Analyze, Improve and Control
3. Define, Measure, Analyze, Design and Validate
4. Identify Value, Map the Value Stream, Create Flow, Establish Pull, Seek Perfection

**Correct Option:A**

**Answer: (a) The 5 elements of Kaizen are Teamwork, Personal Discipline, Improve Morale, Quality Circles, and Suggestions for Improvement**

Q28.What are the 5 Lean principles?

SELECT THE CORRECT ANSWER

1. Identify Value, Map the Value Stream, Create Flow, Establish Pull, Seek Perfection
2. Teamwork, Personal Discipline, Improve Morale, Quality Circles, Suggestions for Improvement
3. Define, Measure, Analyze, Improve, and Control
4. Reduce Waste, Organize, Just-In-Time, optimize, Improve

**Correct Option:A**

**Answer: (a) The 5 principles of Lean are Identify Value, Map the Value Stream, Create Flow, Establish Pull, and Seek Perfection.**

Q29.Measurement accuracy is attained when:

SELECT THE CORRECT ANSWER

1. different people get the same result when measuring the same item or characteristic.
2. the same person taking multiple measurements on the same item or characteristic gets the same results every time.
3. the measured value has little deviation from the actual value.
4. the resolution of the measurement instrument can give at least 5 distinct values in the range being measured.

**Correct Option:C**

**Answer: (c) Repeatability will help reduce variation between different measurements and similarly, reproducibility will help reduce variations across measurements by different people. Both of these will help, and true Measurement Accuracy will be achieved when the difference or deviation between the measured value and actual value is reduced.**

Q30.In a Normal distribution, approximately 68% of the data will occur within:

SELECT THE CORRECT ANSWER

1. +/- 2 standard deviation
2. +/- 1 standard deviation
3. +/- 3 standard deviation
4. Outside the bell-shaped curve

**Correct Option:B**

**Answer: (b) In a normal distribution, the area under +/- 1 standard deviation covers approx. 68% of the data.**

Q31.In FMEA exercise, the Risk Priority Number (RPN) is calculated as:

SELECT THE CORRECT ANSWER

1. severity x occurrence x risk
2. severity x risk x detection
3. occurrence x detection x control
4. everity x occurrence x detection

**Correct Option:D**

**Answer: (d) Risk Priority Number is generate by calculating product of severity x occurrence x detection.**

Q32.Which of the following activities is a value-added activity?

SELECT THE CORRECT ANSWER

1. Testing and Inspection
2. Setup
3. Process
4. Storage

**Correct Option:C**

**Answer: (c) Any time and effort spent on testing, inspection, storage, and setup is a non-value added activity. The only activity that is adding any value to the product is process.**

Q33.What does Lean help you with?

SELECT THE CORRECT ANSWER

1. Reducing weight
2. Eliminating waste and reducing non-value adding activities
3. Achieve higher quality
4. Improving employee morale

**Correct Option:B**

**Answer: (b) Lean helps you understand what are value-add and non-value-add activities and helps you reduce the latter and eliminate waste.**

Q34.We want to test the performance of people before and after training. Which of the following tests can be used if the training improved workers

SELECT THE CORRECT ANSWER

1. performance?
2. 2-sample z test
3. Null hypothesis
4. Paired t test

**Correct Option:D**

**Answer: (d) The Paired t test is used to determine performance before and after training.**

Q35.Which of the following is a chart that depicts the frequencies of measurement data?

SELECT THE CORRECT ANSWER

1. Histogram
2. Run Charts
3. Control charts
4. Pie Chart

**Correct Option:A**

**Answer: (a) The Bar Chart type histogram is typically used to depict the frequency of occurrence of each of the measurement data.**

Q36.The purpose of using control charts is to:

SELECT THE CORRECT ANSWER

1. detect the root causes of defects.
2. validate Measurements System.
3. control the output of a process.
4. evaluate process performance over time.

**Correct Option:D**

**Answer: (d) The purpose of the Control Chart is to show visually the expected performance of any process and set limits. It provides details about process performance over a period of time, which can be evaluated further as needed.**

Q37.Design for Test is a design technique that offers a benefit of:

SELECT THE CORRECT ANSWER

1. Customer Satisfaction Tests
2. Defect Diagnosis
3. Manufacturability
4. Smaller Process Variation

**Correct Option:B**

**Answer: (b) Design for Test as a design technique that aims to introduce a testing capability in the manufacture of electronics. The goal of this technique is to introduce and validate the capability of diagnosing product defects.**

Q38.What does DFMEA stand for?

SELECT THE CORRECT ANSWER

1. Design Failure Mode and Effect Analysis
2. Defect Failure Mode and Effect Analysis
3. Derive Failure Mode and Estimation Analysis
4. Design Failure Mode and Estimation Analysis

**Correct Option:A**

**Answer: (a) DFMEA (Design Failure Mode and Effect Analysis) is the application of the Failure Mode and Effects Analysis (FMEA) method specifically to product/service design.**

Q39.Which chart is used to prioritize the highest overall score received as part of the CE matrix?

SELECT THE CORRECT ANSWER

1. Glaphira Charts
2. Standard Bar Charts
3. Putoro Charts
4. Pareto Charts

**Correct Option:D**

**Answer: (d) A pareto chart is used to graphically summarize and display the relative importance of the differences between groups of data.**

Q40.What of the following is a basic pre-condition for Six Sigma to succeed?

SELECT THE CORRECT ANSWER

1. Qualified resources
2. Well-defined process
3. Trusted suppliers
4. Reliable funds

**Correct Option:B**

**Answer: (b) To begin a Six Sigma project, ensure that you have a well defined process. If such a process does not exist, it is advisable to first document the process and then start the project.**

Q41.What does SIPOC stand for?

SELECT THE CORRECT ANSWER

1. Stakeholders,Inputs,Process,Outputs, and Clients
2. Stakeholders,Inputs,Process,Outputs, and Customers
3. Suppliers,Inputs,Process,Outputs, and Customers
4. Suppliers,Inputs,Purchase,Outputs, and Customers

**Correct Option:C**

**Answer: (c) An SIPOC diagram is a tool used by a team to identify all relevant elements of a process improvement project before work begins. It helps define a complex project that may not be well scoped and is typically employed at the Measure phase of the Six Sigma DMAIC (Define, Measure, Analyze, Improve, Control). methodology.**

Q42.Which question needs to be asked before preparing the SIPOC?

SELECT THE CORRECT ANSWER

1. Who is the stakeholder for the process?
2. What are the inputs?
3. What resources does the process use?
4. All of the above

**Correct Option:D**

**Answer: (d) For preparing SIPOC, we need to have answers to who the supplier, inputs, customers, process, and outputs are.**

Q43.What are the various types of measurement scales?

SELECT THE CORRECT ANSWER

1. Nominal, Ordinal, Interval, and Ratio
2. Nominal, Ordinal, Inverse, and Proportional
3. Direct, Indirect, Inverse, and Proportional
4. Regular, Variance, Inverse, and Proportional

**Correct Option:A**

**Answer: (a) The key measurement scales are Interval, Nominal, Ordinal, and Ratio.**

Q44.What does nominal measurement define or classify?

SELECT THE CORRECT ANSWER

1. Information about inputs from stakeholders
2. Set of mandatory processes
3. Presence or absence of a certain attribute
4. Minimal length of the project

**Correct Option:C**

**Answer: (c) Nominal scales define or classify only the presence or absence of a certain attribute. With nominal scales, you can only count items and the statistics you can use is Percentage, Proportion and Chi-Square tests.**

Q45.Which measurement scale is a comparative scale of management?

SELECT THE CORRECT ANSWER

1. Ratio
2. Interval
3. Variance
4. Ordinal

**Correct Option:D**

**Answer: (d) An ordinal scale defines one item having more or less of the attribute than the other item. In simple words, it is a comparative scale of measurement. Example --- Taste and attractiveness. As statistical measures, Rank order correlation is typically used.**

Q46.What does Ratio Scale define?

SELECT THE CORRECT ANSWER

1. The ratio of supply vs. demand
2. The ratio of supporters vs. resistors
3. All the true zero value points.
4. Only the positive measurements.

**Correct Option:C**

**Answer: (c) The Ratio Scale defines all true zero value points. You can perform addition, subtraction, division and multiplication with such data points. Example --- Elapsed time, distance, etc.**

Q47.Data can be categorized into which of these divisions?

SELECT THE CORRECT ANSWER

1. Continuous or Variable
2. Discrete
3. Attribute
4. All of the above

**Correct Option:D**

**Answer: (d) We can categorize data in three divisions --- Continuous or Variable, Discrete, and Attribute Data.**

Q48.Which is the most popular and most often used measure of Central Tendency in Six Sigma applications?

SELECT THE CORRECT ANSWER

1. Mode
2. Mean
3. Median
4. Variance

**Correct Option:B**

**Answer(: b) Mean is the arithmetic average of all the data points and is popularly known as Arithmetic Mean. This is the most popular and most often used measure of Central Tendency in Six Sigma applications.**

Q49.Which measure of Central Tendency in Six Sigma applications should be used when the data has outliners?

SELECT THE CORRECT ANSWER

1. Mode
2. Mean
3. Median
4. Variance

**Correct Option:C**

**Answer: (c) Median, also known as Positional Mean, is the central location or position of the data list. Mean gets influenced by the outliers. Median doesn,t change much even with the introduction of Outliers.**

Q50.What are the measures of dispersion?

SELECT THE CORRECT ANSWER

1. Mean, Mode, and Median
2. Range , Variation, and Standard Deviation
3. Mode, Medium, and Range
4. Median , Range, and Variation

**Correct Option:B**

**Answer: (b) The measures of dispersion are Range, Variation, and Standard Deviation. Range is the difference between the maximum value and the minimum value. Variance is Average of Squared Mean Differences. Standard Deviation is Square root of Variance.**

Q51.By which tool can measurement system accuracy be verified?

SELECT THE CORRECT ANSWER

1. MSA or GAGE RR
2. CSA or GAGE RR
3. MSA or RAGE RR
4. CSA or RAGE RR

**Correct Option:A**

**Answer: (a) MSA or GAGE RR is a tool that is used to validate the measurement system to see if the measurement system is able to give us data that can be relied on.**

Q52.What are the different categories in which measurement system errors can be classified?

SELECT THE CORRECT ANSWER

1. Accuracy and Precision
2. Clarity, Accuracy, and Precision
3. Resolution, Accuracy, and Precision
4. Clarity and Resolution

**Correct Option:C**

**Answer: (c) Measurement system errors fall into 3 major categories: Resolution: The ability to provide granular readings Accuracy: Difference between observed measurement and actual measurement. Precision: Difference observed when measuring the same part with the same equipment or instrument.**

Q53.What are the 3 components associated with measurement systems accuracy?

SELECT THE CORRECT ANSWER

1. Repeatability, Bias, and Linearity
2. Stability, Bias, and Linearity
3. Repeatability, Reproducibility, and Linearity
4. Stability, Bias, and Reproducibility

**Correct Option:B**

**Answer: (b) Measurement systems accuracy consists of: Stability: Consistency and predictability of measurements over time Bias: Change in the actual value with respect to reference value Linearity: A measure of bias values through a range of measurements**

Q54.What are the 2 components associated with measurement systems precision?

SELECT THE CORRECT ANSWER

1. Stability and Bias
2. Bias and Linearity
3. Repeatability and Reproducibility
4. Stability and Reproducibility

**Correct Option:C, D**

**Answer: (c) Precision deals with repeatability and reproducibility. Repeatability also known as Equipment Variation. Reproducibility also known as Appraiser Variation.**

Q55.Which one of these is not a property of a good measurement system?

SELECT THE CORRECT ANSWER

1. Stability
2. Repeatability
3. Bias
4. Linearity

**Correct Option:C**

**Answer: (c) A good measurement system should possess the following properties or characteristics: Accuracy, Repeatability, Linearity, Reproducibility. and Stability. Bias is not one of the properties.**

Q56.A standard with a known value of 25.4 mm is checked 10 times by one mechanical inspector using a dial caliper with a resolution of 0.025 mm. The readings obtained are:25.425 25.425 25.400 25.400 25.375 25.400 25.425 25.400 25.425 25.375 The tolerance value of this gage is ± 25 mm.Calculate the Bias value and % Bias.

SELECT THE CORRECT ANSWER

1. 0.05, 1%
2. 0.01, 0,2%
3. 0.10, 10%
4. 0.5 , 50%

**Correct Option:A**

**Answer (a) 1)Find the Average of Measurements. In this case, Xbar = 25.405 mm 2)Bias = Average - Reference Value = 25.405 - 25.4 mm = 0.05 mm 3)% Bias = 100 \* (Bias/Tolerance) % = 100 \* (0.05/0.5) % = 1%**

Q57.Which chart indicates Part Variation?

SELECT THE CORRECT ANSWER

1. Puerto Chart
2. Glaphira Chart
3. Pareto Chart
4. Xbar/Averages Chart

**Correct Option:D**

**Answer (d) An Xbar chart is used to observe and evaluate the behavior of a process over time and take corrective action if necessary. The chart plots the average values of a number of small sampled subgroups.**

Q58.What formula is used to measure Total Process Variation(?t) in terms of Gage(?m) and Part(?p) Variation?

SELECT THE CORRECT ANSWER

1. (ơm + ơp)/2
2. Squareroot of (ơm squared+ ơp squared)
3. (ơm + ơp)
4. ((ơm + ơp) \* 2)1/2

**Correct Option:B**

**Answer (b) ơm = Gage Variation ơp = Part Variation ơt (Total Process Variation) = √(ơm2+ ơp2)**

Q59.What is Gage Variation(?m) in terms of Repeatability(?r) and Reproducibility(?o) variation?

SELECT THE CORRECT ANSWER

1. (ơr + ơo)/2
2. (ơr + ơo)
3. (ơr squared+ ơo squared)1/2
4. ((ơr + ơo)/2))1/2

**Correct Option:C**

**Answer (c) ơm = √(ơr2+ ơo2) where ơr = Repeatability or Equipment Variation ơo = Reproducibility or Appraiser Variation**

Q60.What is the percentage threshold for GRR above which the gage needs to be replaced?

SELECT THE CORRECT ANSWER

1. 0.25
2. 0.3
3. 0.35
4. 0.4

**Correct Option:B**

**Answer (b) % GRR = 100 \* ơm /Tolerance % % PV = 100 \* ơp /Tolerance % ndc = 1.41 \* PV/GRR If %GRR > 30%, gage needs to be replaced.**

Q61.While selecting a sample, what rules should govern your choice?

SELECT THE CORRECT ANSWER

1. Any sample size, if randomly selected, can be suitable for analysis. Since it is sampling, it is not expected to have a specific number of samples.
2. 10% of the total
3. One sample every hour
4. Determine sample size using formula and base it on the tolerance and confidence interval expected and standard deviation or the current error rate of the population

**Correct Option:D**

**Answer: (d) The sample size has to be determined statistically using formulas that take into consideration standard deviation or current error rate of the population.**

Q62.Who is the process expert that does the rating of the samples, i.e., as okay, defective, etc.?

SELECT THE CORRECT ANSWER

1. Master Champion
2. Master Appraiser
3. Process Champion
4. Process Appraiser

**Correct Option:B**

**Answer (b) The process expert who does rating of the samples is called a Master Appraiser.**

Q63.What does SPC stand for?

SELECT THE CORRECT ANSWER

1. Statistical Process Control
2. Standard Process Control
3. Statistical Process Chart
4. Standard Process Chart

**Correct Option:A**

**Answer (a) As per SPC or Statistical Process Control, every measurable phenomenon is a statistical distribution, i.e. every set of observed data is a set of effects of unknown common causes.**

Q64.What does SEM stand for?

SELECT THE CORRECT ANSWER

1. Standard Error of Mean
2. Standard Error of Mode
3. Standard Estimation of Mode
4. Standard Estimation of Mean

**Correct Option:A**

**Answer (a) The standard deviation of the averages denoted by SEM or Standard Error of Mean is represented by standard deviation of population divided by square root of sample size.**

Q65.Which of the following is not a capability index for continuous data?

SELECT THE CORRECT ANSWER

1. Process Capability
2. Process Capability Index
3. Process Performance
4. Process Performance Index

**Correct Option:C**

**Answer ( c) Process Performance is not a measurement for capability index for continuous data.**

Q66.What is the formula for calculating Process Capability?

SELECT THE CORRECT ANSWER

1. (USL-LSL)/(6 \* ơ)
2. (USL+LSL)/(6 \* ơ)
3. (USL+LSL)/(ơ)
4. (USL+LSL)/(2\*ơ)

**Correct Option:A**

**Answer ( a) Cp = (USL-LSL)/(6 \* ơ), with USL – LSL representing the Process Tolerance.**

Q67.How do you derive Process Capability Index (Cpk) once you have the Cpl and Cpu values?

SELECT THE CORRECT ANSWER

1. min (Cpl, Cpu)
2. max (Cpl, Cpu)
3. avg (Cpl, Cpu)
4. stddev (Cpl, Cpu)

**Correct Option:A**

**Answer (a) The Process Capability Index Cpk is the minimum of both Cpl and Cpu.**

Q68.When is the Mean not centered?

SELECT THE CORRECT ANSWER

1. Cpk > Cp
2. Cpk = Cp
3. Cpk < Cp
4. None of the above

**Correct Option:C**

**Answer ( c) If Cpk < Cp, mean is not centered. If Cpk = Cp, mean is centered and process is accurate.**

Q69.Which one of these activities should ideally come first in the implementation of a Measure phase?

SELECT THE CORRECT ANSWER

1. Checking Normality
2. Checking Precision
3. Checking Repeatability
4. Checking Resolution

**Correct Option:D**

**Answer (d) Checking Resolution is the first activity in a Measure Stage.**

Q70.In a typical Measurement System Analysis activity, the GRR is 42% and the contribution is split equally among Gage Variation and Part Variation. What would you do?

SELECT THE CORRECT ANSWER

1. Leave the GAGE. It is acceptable.
2. Calibrate the equipment
3. Calibrate the equipment and check operator variation
4. Calibrate the equipment, check operator variation, and identify Part Variation.

**Correct Option:D**

**Answer (d) Presence of Part Variation in the study indicates that it needs to be studied.**

Q71.The tool that you typically use in the Measure stage to scope a project is:

SELECT THE CORRECT ANSWER

1. DFMEA
2. PFMEA
3. CE Matrix
4. SIPOC

**Correct Option:D**

**Answer (d) SIPOC is the best possible scoping tool for the project.**

Q72.Which one of these is the most important precursor for calculating Capability?

SELECT THE CORRECT ANSWER

1. Process Stability
2. Normality
3. No skew in data
4. None of the above

**Correct Option:A**

**Answer (a) Process stability is the most important task to be done before any calculations are done in Measure.**

Q73.Which of these measures would you normally associate with Process Capability of Discrete Data?

SELECT THE CORRECT ANSWER

1. DPMO/PPM
2. DPU
3. Cp
4. Cpk

**Correct Option:A**

**Answer (a) With Discrete Data, DPMO/PPM are the best possible metrics showing capability.**

Q74.Which of the following methods directly helps you determine batch size?

SELECT THE CORRECT ANSWER

1. Setup time
2. Changeover time
3. Cycle time
4. EPEI

**Correct Option:D**

**Answer (d) Every Part Every Interval (EPEI) is the method for determining the batch size.**

Q75.Which type of chart is appropriate when sample size is variable and each sample may contain more than one instance of the targeted condition?

SELECT THE CORRECT ANSWER

1. P chart
2. Autocorrelation chart
3. U chart
4. X-bar chart

**Correct Option:C**

**Answer: (c) A U chart is appropriate when sample size is variable and each sample may contain more than one instance of the targeted condition. These are control charts most appropriate for handling attributes data.**

Q76.What is the purpose of PERT analysis during the Analyze phase of DMAIC?

SELECT THE CORRECT ANSWER

1. To identify the most influential steps in a process
2. To monitor improvements in cycle time
3. To identify the critical path of a process
4. To reduce cycle time

**Correct Option:C**

**Answer: (c) The purpose of program evaluation and review techniques (PERT) analysis during the analyze phase of DMAIC is to identify the critical path of a process.**

Q77.Which form of levelling typically includes the use of heijunka boxes?

SELECT THE CORRECT ANSWER

1. Leveling by volume
2. Leveling by product
3. Demand levelling
4. Customer levelling

**Correct Option:B**

**Answer: (b) Leveling by product typically includes the use of heijunka boxes. A heijunka box is a tool for scheduling in which the tasks to be completed and the estimated times for initiation and completion are listed. The point of leveling by product is to reduce inefficiency by adjusting the mix of products.**

Q78.While performing monthly reviews, in the control chart of one of your production unit, you observe that the last 50 points are very near to the center line. All of them appear to be within about one sigma of the center line. What Interpretation would you derive from this?

SELECT THE CORRECT ANSWER

1. Somebody miscalculated the original calculations of the control limits
2. The process standard deviation has decreased during last month and hence the last 50 data points are showing values much closer to the center line, But, nobody thought to recompute the control limits to reflect the new reality
3. This is an out of control situation. Get a team in place right away and see what the trouble is.
4. The process is in control. The closer the points are to the center line the better control of the process is. No action is needed, process and the control limits to continue as it is

**Correct Option:B**

**Answer: (b) Answer A is obviously incorrect, the control limits would have been set up correctly in the first place. Answer C is incorrect, the process is not out of control. Answer D is partially correct because as the process improves, we need to fix the limits as well. So Answer B is the correct answer.**

Q79.In an analysis of variance, how is the F statistic used?

SELECT THE CORRECT ANSWER

1. To compare the mean square treatment with the mean square error
2. To estimate the process average
3. To find the variation within each subgroup
4. To find the variation between different subgroups

**Correct Option:A**

**Answer: (a) In an analysis of variance, the F statistic is used to compare the mean square treatment with the mean square error. The mean square treatment is the average variation between the subsets, while the mean square error is the sum of the squares of the residuals.**

Q80.Flow of activities that include value-added as well as non- value added activities which take the raw material and deliver the end product to the customer, is called:

SELECT THE CORRECT ANSWER

1. Value Stream Map
2. Process Analysis
3. SIPOC
4. Non Value Add Activities Analysis

**Correct Option:A**

**Answer: (a) A Value Stream have flow of activities that consist of value-added as well as non-value-added activities which take the raw material and deliver the end product to the customer. Value Stream Map is a visual representation of the same.**

Q81.Which of the following are Warusa Kagen conditions?

SELECT THE CORRECT ANSWER

1. Meda, Mera, and Meri
2. Mauda, Maura, and Mauri
3. Muda, Mura, and Muri
4. Moda, Mora, and Mori

**Correct Option:C**

**Answer: (c) Muda, Mura, and Muri are Warusa Kagen conditions.**

Q82.Tremendous resistance can be expected in which Value Stream Analysis Phase(s)?

SELECT THE CORRECT ANSWER

1. Mura
2. Muda
3. Muri
4. All of the above

**Correct Option:B**

**Answer: (b) When analyzing the value stream, the Black Belt needs to first identify the Muda in the system. In typical cases, Muda accounts for 90% of the time spent in operations.**

Q83.What does CLOSEDMITTS stand for?

SELECT THE CORRECT ANSWER

1. Complexity, Labor, Overproduction, Space, Energy, Defects, Materials, Idle Time, Time, Transportation, Safety Hazards
2. Complexity, Labor, Overproduction, Space, energy, Design, Materials, Innovation, Time, Transportation, Safety Hazards
3. Client, Labor, Overproduction, Stakeholders, Energy, Design, Materials, Innovation, Time, Transportation, Safety Hazards
4. Client, Labor, Optimization, Stakeholders, Energy, Design, Materials, Innovation, Time, Transportation, Safety Measures

**Correct Option:A**

**Answer: (a) C - Complexity - Unnecessary steps and excessive documentation L - Labor - Inefficient operations and excess headcount O - Overproduction - Producing more or producing before than customer needs S - Space - Storage space for inventory E - Energy - Wasted human energy D - Defects - Repair or Rework in products M - Materials - Scrap or ordering more than needed I - Idle time - Material sits for time T - Time - Time waste T - Transportation - Movement adding no value S - Safety hazards - Unsafe environments**

Q84.Spaghetti charts graphically depict the movement of \_\_\_\_\_ and \_\_\_\_\_\_\_ in a process.

SELECT THE CORRECT ANSWER

1. products and people
2. resources and labor
3. income and expenses
4. funds and allocations

**Correct Option:A**

**Answer (a) The Spaghetti Chart helps understand the Physical Process Map and not necessarily just the Value Map. These charts graphically depict movement of products and people in a process.**

Q85.What does CE diagram stand for?

SELECT THE CORRECT ANSWER

1. Customer and Engagement
2. Cause and Estimation
3. Client and Expectation
4. Cause and Effect

**Correct Option:D**

**Answer: (d) CE Diagram or Cause and Effect Diagram, also known as the Fishbone Diagram, is a very popular and an important tool that gives you a list of all the issues due to which a problem occurs.**

Q86.Box Plot is also known as:

SELECT THE CORRECT ANSWER

1. Whiskers Plot
2. Candlestick Plot
3. Box and Whiskers Plot
4. All of the above

**Correct Option:D**

**Answer: (d) Box Plot is another useful tool that helps you to know the nature of variability in a process. It is also known as Whiskers Plot, Candlestick Plot, and Box and Whiskers Plot.**

Q87.Which kind of information does Box plot provide?

SELECT THE CORRECT ANSWER

1. Location, spread, and variability of data
2. Distance, relativity, and density of data
3. Location, speed, and density of data
4. Continuity, relativity, and variability of data

**Correct Option:A**

**Answer: (a) These plots are often used in the Analyze phase to understand the process variability. They help you see distribution of values in several groups. Box plots also tell you information about location, spread, and variability of data.**

Q88.What does KPIV stand for?

SELECT THE CORRECT ANSWER

1. Key Process Indicator Value
2. Key Person Indicator Value
3. Key Process Input Value
4. Key Person Input Value

**Correct Option:C**

**Answer: (c) KPIV stands for Key Process Input Value. Typically, Fishbone Diagram would give an insight into the possible KPIVs for model.**

Q89.To design for manufacturability, the following methods are introduced, except:

SELECT THE CORRECT ANSWER

1. standardization and simplification
2. fewer active parts are used
3. design alternative are used
4. product quality is held above simplicity

**Correct Option:D**

**Answer: (d) Design for manufacturability means that products are standardized and simplified so that there are fewer products with defects made in every production cycle. Product quality is held above simplicity is not introduced, hence, this is right choice for the question**

Q90.A limitation in Six Sigma implementation is when management applies the methodology:

SELECT THE CORRECT ANSWER

1. using trained professionals
2. using approved funds
3. only for a certain fixed duration
4. in a few departments within the company.

**Correct Option:D**

**Answer: (d) It is important that the methodology is applied in all the departments of the company and not limited to any specific groups. This is required to ensure that there are no blockages at a later stage and fruitful/positive results are seen as a output across the organization.**

Q91.In a scenario where one response variable and one predictor variable are to be tested, which regression analysis needs to be used?

SELECT THE CORRECT ANSWER

1. Aggregated Linear Regression
2. Single Linear Regression
3. Sample Linear Regression
4. Simple Linear Regression

**Correct Option:D**

**Answer: (d) Simple Linear Regression is to be used when you have one response variable (KPOV) and one predictor variable (KPIV) to test.**

Q92.When is Multiple Linear Regression to be used?

SELECT THE CORRECT ANSWER

1. 1 KPOV and 1 KPIV
2. 1 KPOV and 2 KPIV
3. 2 KPOV and 1 KPIV
4. 2 KPOV and 2 KPIV

**Correct Option:B**

**Answer: (b) Multiple Linear Regression is to be used when you have one response variable (KPOV) and two multiple predictor variables (KPIV) to test.**

Q93.\_\_\_\_\_ shows the extent to which multicollinearity exists between predictors.

SELECT THE CORRECT ANSWER

1. Multiple Linear Regression
2. Variation Inflation Factor
3. Single Linear Regression
4. Statistical Accuracy

**Correct Option:B**

**Answer: (b) VIF (Variance Inflation Factor). VIF shows the extent to which multicollinearity exists amongst predictors.**

Q94.What tests for the presence of auto correlation between residuals?

SELECT THE CORRECT ANSWER

1. Duminy Walker Statistic
2. Durbin Walker Statistic
3. Durbin Watson Statistic
4. Duminy Watson Statistic

**Correct Option:C**

**Answer: (c) Durbin Watson Statistic Tests are used to determine the presence of auto-correlation in residuals.**

Q95.What does PRESS in PRESS Statistic stand for?

SELECT THE CORRECT ANSWER

1. Partial Residuals Sum of Squares
2. Part Regression Six Sigma
3. Predicted Residuals Six Sigma
4. Predicted Residuals Sum of Squares

**Correct Option:D**

**Answer: (d) PRESS stands for Predicted Residuals Sum of Squares in PRESS Statistic.**

Q96.Which regression procedures are used in stepwise regression?

SELECT THE CORRECT ANSWER

1. Standard Stepwise, Forward Selection, and Backward Elimination
2. Standard Stepwise, Forward Estimation, and Backward Estimation
3. Standard Stepwise, Forward Regression, and Backward Regression
4. Standard Stepwise, Forward co-relation, and Backward co-relation

**Correct Option:A**

**Answer: (a) In Stepwise Regression, the most significant variable is added or removed from the regression model. Three common Stepwise Regression procedures are Standard Stepwise, Forward Selection, and Backward Elimination. Use of Mallow's Cp Statistic in Stepwise Regression is popular.**

Q97.What is Confidence Interval?

SELECT THE CORRECT ANSWER

1. Interval between 2 consecutive sets of data population
2. Estimated range of values which is likely to include the parameter of the population
3. Interval between each measurement to gain confidence
4. Interval between the Measure and Analyze phase

**Correct Option:B**

**Answer: (b) Confidence intervals give an estimated range of values, known as Margins or Confidence Interval widths, which are likely to include the parameter of the population.**

Q98.Which factors impact the confidence intervals for a sample data?

SELECT THE CORRECT ANSWER

1. Data Variation and Data Continuity
2. Accuracy and Precision
3. Significance Level and Sample Size
4. Data Relativity

**Correct Option:C**

**Answer (c) Significance level and sample size impact the confidence interval - The choice of ? for the confidence intervals dictates the margin of error or confidence interval width. With increase in sample size at the same significance level, you will find that the confidence intervals width keeps decreasing.**

Q99.Which statistic can be used to determine the probability of variances occurring?

SELECT THE CORRECT ANSWER

1. Binomial Statistic
2. Poisson Statistic
3. Moving Average Statistic
4. Chi-Square Statistic

**Correct Option:D**

**Answer (d) The Chi-Square statistic can be used to determine the probability of variances occurring. χ2 = (n-1)s2/ơ2**

Q100.For a population variance of 1 and sample variance on data collected of 0.6, determine the probability that the sample variance can exceed 0.6. Sample size is 30.

SELECT THE CORRECT ANSWER

1. 15.4
2. 16.4
3. 17.4
4. 18.4

**Correct Option:C**

**Answer (c) χ2 = (n-1)s2/ơ2 = (30-1)0.6/1 = 29 \* 0.6 = 17.4**