Lean Six Sigma Black Belt (LSSBB) –

LSSBB Full Length Simulation Test 2

​

Q1.Which of the roles does a Black Belt need to perform most of the time?

SELECT THE CORRECT ANSWER

1. Give statistical guidance to the team
2. Lead enterprise wide projects
3. Solve mathematical issues
4. Handle objections

**Correct Option:D**

**EXPLANATION : Correct answer: (D) The key role of a Black Belt is to handle objections that arise in his team, so d is correct.**

Q2.Which of these doesn't symbolize a traditional organization?

SELECT THE CORRECT ANSWER

1. Planning is often short term
2. Decisions are often taken unilateral
3. Performance measures depend on if the customer is satisfied or not
4. None of the above

**Correct Option:C**

**EXPLANATION:Correct answer: C) In a traditional organization, you would find that the customers' needs are not paid as much attention so c is correct.**

Q3.While overcoming resistance to change, which one of the techniques will you use to drive people who refuse to change because they don't agree to the validity of the change efforts?

SELECT THE CORRECT ANSWER

1. Use Force Field Analysis
2. Use Stakeholder analysis
3. Use Benchmarked examples
4. Present benefits to employees

**Correct Option:C**

**EXPLANATIONCorrect answer: C) Telling someone how this change worked with others is a good way to overcome the resistance from people who think the change wouldn't work so c is correct.**

Q4.In a Black Belt's role, what is the degree of importance of Mathematical Skills?

SELECT THE CORRECT ANSWER

1. Most important
2. Somewhat important
3. Not important at all
4. The degree of importance is determined by the complexity of the project

**Correct Option:C**

**EXPLANATION : Correct answer: C) Mathematical skills is the least important for a Black Belt to be successful in his role, so c is correct.**

Q5.Who specifies or underlines value in a Lean organization?

SELECT THE CORRECT ANSWER

1. Customer
2. Stakeholder
3. Process
4. Sponsor

**Correct Option:A**

**EXPLANATION : Correct answer: (A) Value is always specified by the customer in a lean organization, so a is correct.**

Q6.Which of the following Lean concepts indicates a degree of badness?

SELECT THE CORRECT ANSWER

1. Muda
2. Muri
3. Mottainai
4. Warusa Kagen

**Correct Option:D**

**EXPLANATION : Correct answer: (D) Warusa Kagen**

Q7.Which of the following is a popular Lean planning tool?

SELECT THE CORRECT ANSWER

1. Kanban
2. Kaizen
3. Balanced Scorecard
4. Hoshin Kanri

**Correct Option:D**

**EXPLANATION : Correct answer: (D) While Balanced Scorecard can be used by a lot of organizations as a planning tool, Hoshin Kanri is definitely considered the universal Lean planning tool so d is correct.**

Q8.Which of these concepts is the best representative of market demand?

SELECT THE CORRECT ANSWER

1. TAKT Time
2. Throughput time
3. Cycle Time
4. Lead Time

**Correct Option:A**

**EXPLANATION : Correct answer: (A) The formula for TAKT Time is available time / customer demand, so a is correct.**

Q9.Which of these is considered a part of Cycle time?

SELECT THE CORRECT ANSWER

1. Machine time
2. Downtime
3. Setup time
4. Changeover time

**Correct Option:A**

**EXPLANATION : Correct answer: (A) Options b, c and d are not serious considerations. Cycle time is composed of machine cycle time and auto cycle time, so a is correct.**

Q10.As a Black Belt, you are studying the time the raw materials come to you and you finish it as a product Which of the metrics are you studying?

SELECT THE CORRECT ANSWER

1. Throughput time
2. Cycle Time
3. Lead Time
4. Setup time

**Correct Option:A**

**EXPLANATION : Correct answer: (A) Throughput time best defines the condition posed in the question, so a is correct.**

Q11.Calculate the Production Cycle Efficiency of the line if value added work happens for 3 hours and the product is shipped in 5 hours from order receipt time

SELECT THE CORRECT ANSWER

1. 0.2
2. 0.4
3. 0.6
4. 0.8

**Correct Option:C**

**EXPLANATION : Correct answer: C) Using standard formula for Production Cycle Efficiency, c is correct.**

Q12.For a daily demand of 35 units, Available setup time of 80 minutes and Actual Setup time of 80 minutes, calculate the Batch Size.

SELECT THE CORRECT ANSWER

1. 20
2. 30
3. 35
4. 50

**Correct Option:C**

**EXPLANATION :Correct answer: C) Available setup time/Actual setup time = 1, Daily Demand = 35. Batch Size = EPEI \* Daily Demand = 35, so c is correct.**

Q13What is one most important use of Phase gate reviews?

SELECT THE CORRECT ANSWER

1. Identify milestones
2. Track progress
3. Identify slow moving project and eliminate
4. Sponsor review.

**Correct Option:C**

**EXPLANATION : Correct answer: C) While Phase Gate Reviews are used to identify milestones, track the progress of the project and present a chance for Sponsor to review the project, the main goal of reviews is to know if any project is moving slow, and if it look at scrapping them, so c is correct.**

Q14A Black Belt receives comments from his customer. What should be his first action step?

SELECT THE CORRECT ANSWER

1. Analyze VOC Comments
2. Translate the VOC to CTQ Metrics
3. Know that the VOC is random
4. Understand the VOB and VOP

**Correct Option:A**

**EXPLANATION : Correct answer: (A) On receipt of comments and before the Black Belt converts the VOC to CTQ, analysis of customer comments needs to be done, so a is correct.**

Q15.The HOQ is a

SELECT THE CORRECT ANSWER

1. Y Shaped Matrix
2. X Shaped Matrix
3. L Shaped Matrix
4. C Shaped Matrix

**Correct Option:C**

**EXPLANATION : Correct answer: C) L Shaped Matrix**

Q16.What should the BB ensure of while updating the Pugh Matrix and HOQ?

SELECT THE CORRECT ANSWER

1. Presence of Process Expert
2. Update from the perspective of value to the customer
3. Involve Green Belts
4. All of the above

**Correct Option:A**

**EXPLANATION : Correct answer: (A) A Process Expert's presence is always needed in updating technically complex documents like HOQ and Pugh Matrix, so a is correct.**

Q17.A BB starts off his deployment cycle by identifying key area of complaints by customers. Based on these complaints he wishes to identify projects. Which tool must he use?

SELECT THE CORRECT ANSWER

1. QFD
2. VOC
3. Project Prioritization Matrix
4. Solution Prioritization Matrix

**Correct Option:C**

**EXPLANATION : Correct answer: C) Project Prioritization Matrix helps the Black Belt to separate the priority projects so c is correct.**

Q18.If the NPV of a project is $35,000 and the cost of implementation is high, although the benefits are on the higher side with the NPV calculated across 5 years, what would be your assessment?

SELECT THE CORRECT ANSWER

1. The Project can be done
2. The project needs to be on hold
3. The team will take a decision on consensus
4. The Management team will take a decision

**Correct Option:D**

**EXPLANATION : Correct answer: (D) Although the NPV is $35,000 for benefits across 5 years, high cost of implementation may dissuade the management to implement this solution. Thus, d is correct.**

Q19.Which tool can be used interchangeably with the Cause and Effect Matrix, primarily due to its relevance in terms of structure as well as use?

SELECT THE CORRECT ANSWER

1. FMEA
2. QFD
3. cTranslation worksheet
4. None of the above

**Correct Option:B**

**EXPLANATION**

**Correct answer: (B) The Cause and Effect Matrix and the QFD work almost in the same way and in the same principle. Thus, b is correct.**

Q20.If the output variable impacting the key business outcome is delivery hours and if the input variable is Number of resources used for packaging, what does a weighted score of 3 indicate in a Cause and Effect Matrix?

SELECT THE CORRECT ANSWER

1. The degree of impact of Number of resources on Delivery hours is weak
2. The degree of impact of Number of resources on Delivery hours is moderate
3. The degree of impact of Delivery Hours on Number of resources is weak
4. The degree of impact of Delivery Hours on Number of resources is moderate

**Correct Option:B**

**EXPLANATION**

**Correct answer: (B) Delivery Hours is the output and Number of Resources is input. Thus the definition of the question holds good only for option b thus b is correct.**

Q21.Which one of the below mentioned is considered the most important properties of a process?

SELECT THE CORRECT ANSWER

1. It should have a feedback looping
2. It should have a process owner
3. It should have a series of steps that can be done time and again
4. It should have an input, an output and a customer

**Correct Option:A**

**EXPLANATION : Correct answer: (A) Options b, c and d hold good for a process. But the question asks for the most important characteristic. No process can work without a feedback looping mechanism so a is correct.**

Q22.If a SIPOC map shows an uncontrollable level on inputs, what should the Black Belt do?

SELECT THE CORRECT ANSWER

1. Proceed ahead with the SIPOC map
2. Focus on inputs first, as they need to be in controlled conditions
3. The decision depends on corporate dynamics and business needs
4. Validate and calibrate the suppliers

**Correct Option:D**

**EXPLANATION : Correct answer: (D) Two options hold good here, b and d. Option d talks of concrete actions thus d is correct.**

Q23.Which of the below mentioned stakeholders are considered the most important in the definition of Metrics for your process?

SELECT THE CORRECT ANSWER

1. Process Owner
2. Green Belt
3. Black Belt
4. Process Expert

**Correct Option:D**

**EXPLANATION : Correct answer: (D) One can never ignore a process expert from any process centric decisions, so d is correct.**

Q24.For a Nominal Scale of measurement, which measure of central tendency to represent the data?

SELECT THE CORRECT ANSWER

1. Median
2. Mode
3. Mean
4. None of the above

**Correct Option:B**

**EXPLANATION : Correct answer: (B) Mode is always the central tendency measure to be used for Nominal scales so b is correct.**

Q25.Which of the scales is converted to Nominal Scale for ease of measurements?

SELECT THE CORRECT ANSWER

1. Interval
2. Ordinal
3. Ratio
4. None of the above

**Correct Option:B**

**EXPLANATION : Correct answer: (B) Ordinal**

Q26.If your project Y is measured as an Attribute Data, what should the Black Belt do?

SELECT THE CORRECT ANSWER

1. Work with the attribute data
2. Convert attribute to continuous data
3. Convert attribute to discrete data
4. Re-measure the data

**Correct Option:A**

**EXPLANATION : Correct answer: (A) A lot of Black Belts like to work with Continuous Data. That said, having the Project Y as attribute doesn't mean the Black Belt should convert this to any other type. So a is correct.**

Q27.Should the data have unforeseen outliers, whose behaviour you cannot explain during the Measure phase, which of the methods of Central Tendency should you use?

SELECT THE CORRECT ANSWER

1. Median
2. Mode
3. Mean
4. None of the above

**Correct Option:A**

**EXPLANATION : Correct answer: (A) In the event of outliers, use median instead of mean so a is correct.**

Q28.You calculate Æ¡2 for a data set. Which of these did you calculate?

SELECT THE CORRECT ANSWER

1. Variance
2. Standard Deviation
3. Mean Deviation
4. Absolute Deviation

**Correct Option:A**

**EXPLANATION : Correct answer: (A) Variance**

Q29.A data list you are using reports Bi-Modal data. What should a Black Belt do in ideal circumstances?

SELECT THE CORRECT ANSWER

1. The Black Belt should ignore making any inferences now and move ahead
2. The Black Belt should consult his MBB to know the next course
3. Transform the bi-modal data
4. Identify what is causing two modes, fix and move ahead with uni-modal data.

**Correct Option:D**

**EXPLANATION : Correct answer: (D) In the event of having bi-modal data, the Black Belt should identify what is causing two modes, fix and move ahead with uni-modal data, so d is correct.**

Q30.What is the most popular measure you would use in Six Sigma applications to show variation?

SELECT THE CORRECT ANSWER

1. Sample Variance
2. Sample Standard Deviation
3. Population Variance
4. Population Standard Deviation

**Correct Option:B**

**EXPLANATION : Correct answer: (B) A lot of people may want to vote for Population Standard Deviation but finding out the standard deviation of the population turns out to be a gargantuan affair, especially if the reporting is all over the place. So, b is the right answer.**

Q31.A Measurement System Analysis study is done to conduct an assessment of two major Measurement system issues. What are the two major issues?

SELECT THE CORRECT ANSWER

1. Reliability and Precision
2. Repeatability and Reproducibility
3. Noise and Signal
4. Stability and Resolution

**Correct Option:A**

**EXPLANATION : Correct answer: (A) Reliability and Precision**

Q32.Repeatability and Reproducibility are categorized under a broad category of

SELECT THE CORRECT ANSWER

1. Stability
2. Linearity
3. Resolution
4. Precision

**Correct Option:D**

**EXPLANATION : Correct answer: (D) Precision**

Q33.Consistency and predictability of measurements over time refer to which characteristic of a Measurement System

SELECT THE CORRECT ANSWER

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

**Correct Option:A**

**EXPLANATION**

**Correct answer: (A) Linearity, Precision and Repeatability have their own directions to give in a MSA, while stability often refers to consistency and predictability, so a is correct.**

Q34.On calculating Bias of a Measurement system, the Black Belt finds Bias percentage at 2% for a given tolerance for the measurement system. What should the Black Belt infer?

SELECT THE CORRECT ANSWER

1. The Measurement system suffers from 2% linearity error
2. The Measurement system suffers from 2% accuracy error
3. The Measurement system suffers from 2% bias error
4. None of the above

**Correct Option:C**

**EXPLANATION**

**Correct answer: C) Bias percentage refers to Bias error. As simple as that. So c is correct.**

Q35.Measurement system analysis focuses on separating two major types of variation. They are:

SELECT THE CORRECT ANSWER

1. Noise and Reproducibility
2. Repeatability and Signal
3. Noise and Process Variation
4. Gage Variation and process variation

**Correct Option:D**

**EXPLANATION**

**Correct answer: (D) Gage variation and process variation**

Q36.A gage is able to divide the measurement of data into number of discrete categories. Which property of a Measurement system are we referring to?

SELECT THE CORRECT ANSWER

1. Stability
2. Accuracy
3. Discrimination
4. Reliability

**Correct Option:C**

**EXPLANATION**

**Correct answer: C) When the talk is on dividing the data in discrete categories, we refer it to as Resolution or Discrimination so c is correct.**

Q37.Discrimination value is 3 in a typical GAGE study under normal conditions. What should the Black Belt infer?

SELECT THE CORRECT ANSWER

1. Discrimination is not adequate
2. Gage needs replacement
3. Operators need to be trained
4. Discrimination is adequate

**Correct Option:A**

**EXPLANATION : Correct answer: (A) NDC < 5 means the measurement system in the gage study is unable to differentiate between different measurements accurately, thus a is correct**

Q38.Process being stable refers to what of the process?

SELECT THE CORRECT ANSWER

1. Reliable
2. Durable
3. Predictable output
4. Repeatable output

**Correct Option:C**

**EXPLANATION**

**Correct answer: C) Stability is often referred to as a state when process produces consistent and predictable output, so c is correct.**

Q39.Which one of the below points is true when a process is not stable or not in control?

SELECT THE CORRECT ANSWER

1. Special Causes are present
2. There is no variation whatsoever
3. Common causes are present
4. Some times, structural variation are present.

**Correct Option:A**

**EXPLANATION : Correct answer: (A) Options b, c and d are not serious considerations. When a process is not in control, it is because of special causes of variation.**

Q40.Per CLT conditions if the sample size is 33 and the population standard deviation found is 2, what is the sample standard deviation?

SELECT THE CORRECT ANSWER

1. 4
2. 2
3. 2/Square root (33)
4. Cannot determine

**Correct Option:C**

**EXPLANATION**

**Correct answer: C) By applying standard CLT Clauses.**

Q41.Which one of the below points related to Statistical Process Control is not always entirely true?

SELECT THE CORRECT ANSWER

1. A stable process is controlled
2. An unstable process is not in control
3. A stable process doesn't have Special Causes of Variation, mostly
4. A stable process is capable

**Correct Option:D**

**EXPLANATION : Correct answer: (D) You cannot definitively say that a stable process is capable unless you do a check on the capability, so d is correct.**

Q42.As per Walter Shewhart, which one of the following points is not entirely true?

SELECT THE CORRECT ANSWER

1. Most variations in a product resulting in defects are due to Special Causes
2. Variability in a process is due to Common and Special Causes
3. In the short term, one should focus on reducing Common Causes
4. Special Causes result in a process to go unstable

**Correct Option:C**

**EXPLANATION : Correct answer: C) Note negative response is required - As per Walter Shewhart, you should always treat common causes of variations in the long run, so c is correct.**

Q43.What is the most important consideration before calculating Cpk and Ppk for a dataset that is continuous?

SELECT THE CORRECT ANSWER

1. Process needs to follow a normal fit for data
2. Process needs to have two specification limits
3. Process needs to have at least one specification limit
4. Process needs to be stable

**Correct Option:A**

**EXPLANATION : Correct answer: (A) While a lot of us would have thought that stability is the most important condition and thus d is correct, stability is a must for determining Cpk, but not for Ppk. For you to calculate Cpk and Ppk you assume that process is stable in short run, but not in the long run. But, normality is something that needs to be met for both. So, a is correct.**

Q44.What should the first question be, before a Black Belt decides to calculate Process capability?

SELECT THE CORRECT ANSWER

1. Is the dispersion stable
2. Is the mean shifting
3. Is the normal distribution shifting
4. Does the process exhibit special variability

**Correct Option:D**

**EXPLANATION : Correct answer: (D) A Black Belt cannot calculate capability without knowing if the process is free from special causes or not, so d is correct.**

Q45.Assuming mean is centered mid-specifications and data being normal, if Cp is 1, what should the value of Cpk be?

SELECT THE CORRECT ANSWER

1. Can't say
2. 1
3. Slightly less than 1
4. Slightly more than 1

**Correct Option:B**

**EXPLANATION : Correct answer: (B) With the assumptions given, Cpk is equal to Cp thus b is correct.**

Q46.For a process having spec limits at ±4ơ, Cp is

SELECT THE CORRECT ANSWER

1. 1.2
2. 1.33
3. 1.6
4. 2

**Correct Option:B**

**EXPLANATION**

**Correct answer: (B) Using standard formula (USL-LSL)/6 \* Sigma, the answer is 1.33 so b is correct.**

Q47.For a process having spec limits at ±5ơ, Cp is

SELECT THE CORRECT ANSWER

1. 1.66
2. 2
3. Cannot be determined
4. 1

**Correct Option:A**

**EXPLANATION**

**Correct answer: (A) Using standard formula (USL-LSL)/6 \* Sigma, the answer is 1.66 so a is correct.**

Q48.If Cp = 1.2 Cpk = 0.7, what should the Black Belt do first?

SELECT THE CORRECT ANSWER

1. Reduce variations
2. Center the mean
3. Bring the process in statistical control
4. The choice of what to do rests with the Black Belt

**Correct Option:B**

**EXPLANATION : Correct answer: (B) As the difference between Cp and Cpk is relatively large, the Black Belt should look to center the mean, so b is correct.**

Q49.If Cp = 1.3, Cpk = 1.2, what should the Black Belt do first?

SELECT THE CORRECT ANSWER

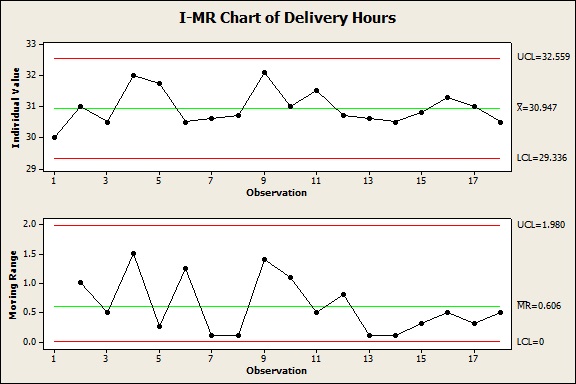
1. Leave the process to chance variations
2. Identify signal and keep looking out for signals
3. Center the mean
4. None of the above

**Correct Option:A**

**EXPLANATION : Correct answer: (A) A Black Belt doesn't have to work on this process at all, as the process is capable and the mean is centred as well, so a is correct.**

Q50.An IMR Chart is shown below. What should a Black Belt when he plots a chart like this

question\_image



SELECT THE CORRECT ANSWER

1. Conclude process is stable
2. Conclude process could be stable, but investigation needs to be done on trends
3. Conclude process is out of control
4. None of the above

**Correct Option:B**

**EXPLANATION : Correct answer: (B) As you can see some up and down trends in the chart. At first sight this may seem like normal and the chart may also show this as random variation, but a small investigation on why these trends are happening should be done so b is correct.**

Q51.A company producing marker pens conducts external audits once production of a lot is completed. Several audits on 50 pens revealed 3 minor non-conformances. What is the probability that the next audit will reveal 0 non-conformances?

SELECT THE CORRECT ANSWER

1. 0.05
2. 0.07
3. 0.1
4. 0.12

**Correct Option:A**

**EXPLANATION : Correct answer: (A) Using Binomial standard distribution formula, a is correct.**

Q52.Which of these is the best indicator of occurrence of a Special Cause of a Variation?

SELECT THE CORRECT ANSWER

1. Cause that happens periodically
2. Cause that comes from outside of the process
3. Cause that can be assigned a reason
4. None of the above

**Correct Option:C**

**EXPLANATION : Correct answer: C) Special causes can be tracked back to a reason and thus c is correct.**

Q53.Which of these tools should be used with Cause and Effect Diagram to learn about a possible root cause affecting a problem?

SELECT THE CORRECT ANSWER

1. Pareto Charts
2. Brainstorming
3. 5 WHY
4. Correlation

**Correct Option:C**

**EXPLANATION: Correct answer: C) 5 WHY is a simple and powerful Root cause Analysis technique, so c is correct.**

Q54.In a Cause and Effect Diagram, what is the most important point a Black Belt should look out for, relating to a specific cause?

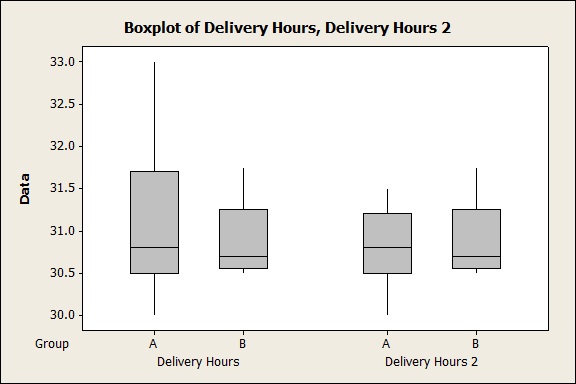
SELECT THE CORRECT ANSWER

1. If the cause happens due to another cause
2. If the cause happens regularly
3. If the cause is measurable
4. If the cause is the root cause

**Correct Option:C**

**EXPLANATION : Correct answer: C) Six Sigma being a statistical approach, the Black Belt should at all times look out for data validation, so c is correct.**

Q55The Box Plot below represents a method of how the Black Belt would have collected his data. The method is question\_image



SELECT THE CORRECT ANSWER

1. Clustering
2. Probability
3. Stratified
4. Systematic

**Correct Option:C**

**EXPLANATION : Correct answer: C) As you can see the Box Plot clearly shows the entire data has been separately collected for each groups, clearly indicating stratification, so c is correct.**

Q56.Which of the below will a Box Plot always be able to show or indicate? i) Central Tendency ii) Shape iii) Location iv) Variability

SELECT THE CORRECT ANSWER

1. and ii)
2. and iii)
3. and iii)
4. and iv)

**Correct Option:C**

**EXPLANATION : Correct answer: C) At all times, the Box Plot will be able to indicate Central Tendency, i.e. median and the variability, so c is correct.**

Q57.Which of the terms below best represent an Output Variable?

SELECT THE CORRECT ANSWER

1. Coded
2. Dummy
3. Response
4. KPI

**Correct Option:C**

**EXPLANATION : Correct answer: C) Response is the technical and operational term for an output variable so c is correct.**

Q58.A Best Subset Regression is performed on a series of Predictors and Output Variable. An important metric is used that compares the precision of the full models to the models resulting from individual predictors

SELECT THE CORRECT ANSWER

1. Mallows Cp
2. Durbin Watson Statistic
3. Lack of Fit Statistic
4. PRESS Statistic

**Correct Option:A**

**EXPLANATION : Correct answer: (A) Mallows Cp is the term used for this purpose, so a is correct.**

Q59.What is the main use of a Durbin Watson Statistic, due to which the Black Belt should select it in regression models?

SELECT THE CORRECT ANSWER

1. Checks how well the data can be predicted
2. Checks the accuracy of residuals
3. Checks the fit of residuals
4. Checks the presence of auto-correlation between residuals

**Correct Option:D**

**EXPLANATION : Correct answer: (D) Durbin Watson statistic checks for auto correlation so d is correct.**

Q60.When a Black Belt performs a Simple Linear Regression and observes the Residuals versus Fits plot, he observes two points shooting way out of the 0 Residual mark. What is the important thing he should infer?

SELECT THE CORRECT ANSWER

1. That the data may be incorrect
2. That the data may suffer from a lack of fit
3. That the data may be an effect of special cause variability
4. That the data needs treatment

**Correct Option:C**

**EXPLANATION : Correct answer: C) Graphical analysis of a residual plot needs all the points close to the 0 mark to show that variation is due chance. Off-shooting the 0 mark indicates special causes, so c is correct.**

Q61.On doing a Multiple Linear Regression Model, the VIF Value is 2.8. What should the Black Belt infer?

SELECT THE CORRECT ANSWER

1. Since VIF > 0, the variables are collinear
2. Since VIF < 5, variables being collinear is not much of an issue
3. High degree of collinearity amongst variables
4. None of the above

**Correct Option:B**

**EXPLANATION : Correct answer: (B) If VIF < 5, it only shows weak to moderate collinearity, which shouldn't be much of a concern, so b is correct.**

Q62.What is one of the most important impacts of VIF on a Regression model, because of which it is recommended to do away with Variables having high VIF?

SELECT THE CORRECT ANSWER

1. Standard errors of coefficients go high
2. Statistical accuracy goes down
3. Variance of the Regression model increases
4. Regression model is unstable

**Correct Option:C**

**EXPLANATION : Correct answer: C) A model having a high VIF will always show slightly higher variance, which is a skewed finding, so c is correct.**

Q63.Which of the following statistic/parameter best describes the average of absolute mean deviations?

SELECT THE CORRECT ANSWER

1. Coefficient of Variance
2. Deviation
3. Mean Deviation
4. Sum of Squares

**Correct Option:C**

**EXPLANATION : Correct answer: C) Mean Deviation is the average of absolute mean deviations, so c is correct.**

Q64.Sample mean computed on a sample size of 64 in a statistical test is 20. Given a confidence level of 95% and a known variance of 4, the confidence intervals are:

SELECT THE CORRECT ANSWER

1. 19,21
2. 18,22
3. 19.5,20.5
4. 18.5,21.5

**Correct Option:C**

**EXPLANATION : Correct answer: C) Using confidence intervals formula, c is correct.**

Q65.If the confidence intervals for a given experiment is (10,12), what is the probability that 8.5 will fall in the range?

SELECT THE CORRECT ANSWER

1. 0.025
2. 0.0025
3. 0.02
4. 0.05

**Correct Option:A**

**EXPLANATION. : Correct answer: (A) Using Chi-Square confidence intervals, the correct answer is a.**

Q66.For determining confidence intervals for Variances, which one of the below distributions would you popularly use?

SELECT THE CORRECT ANSWER

1. Normal Distribution
2. T distribution
3. Chi-Square Distribution
4. Binomial

**Correct Option:C**

**EXPLANATION :Correct answer: C) Chi-Square distribution is typically used for determining confidence intervals for variances, so c is correct.**

Q67.For a class of 60 reporting an approximate Mathematics score of 50%, the confidence intervals for the Mathematics score at 95% level is

SELECT THE CORRECT ANSWER

1. 36%, 64%
2. 32%, 68%
3. 38%, 62%
4. 40%, 60%

**Correct Option:C**

**EXPLANATION**

**Correct answer: C) Using standard confidence intervals formula, c is correct.**

Q68.For a data meeting normality conditions, which of the tests mentioned below would you use to test if the data comes from the population assuming sample size is 25?

SELECT THE CORRECT ANSWER

1. Z test
2. F test
3. T test
4. ANOVA

**Correct Option:C**

**EXPLANATION**

**Correct answer: C) Typically for sample size less than 30, one would use the T test.**

Q69.At a significance level 5%, a Black Belt committed rejected the fact that the data belongs to a normal distribution, when in reality it belonged to the distribution. What did the Black Belt do?

SELECT THE CORRECT ANSWER

1. He committed a Type I error
2. He committed a Type II error
3. He committed a Type III error
4. None of the above

**Correct Option:A**

**EXPLANATION :Correct answer: (A) The condition described in the question best meets the description of a Type I error, so a is correct.**

Q70.If Confidence Level is 90%, what should the Black Belt assume about his statistical test?

SELECT THE CORRECT ANSWER

1. The test will have a high chance of errors
2. The risk in the experiment is low
3. The probability of committing a Type I error is high
4. The risk in the experiment is high

**Correct Option:C**

**EXPLANATION : Correct answer: C) Confidence of 90% means significance is 10%, which means probability of committing a type I error is high, so c is correct.**

Q71.If a Black Belt wishes to study a metric that shows the statistical accuracy of a test, which of these metrics should he choose

SELECT THE CORRECT ANSWER

1. Type III error
2. Type II error
3. Power
4. Type I error

**Correct Option:C**

**EXPLANATION**

**Correct answer: C) Power indicates accuracy of a test, so c is correct.**

Q72.If p-value is 0.103 at an Î± of 0.05 for a 2 Sample test for a two-tailed hypothesis, what should the Black Belt deduce

SELECT THE CORRECT ANSWER

1. The statistic of both the groups don't differ significantly
2. The statistic of both the groups differ significantly
3. The statistic of both the groups are found of a mixed level
4. None of the above

**Correct Option:A**

**EXPLANATION : Correct answer: (A) If p > Î±, the Black Belt cannot reject null, thus a is correct.**

Q73.If p-value of a statistical 2 Sample t test conducted by a Black Belt is 0.032 at a Significance level of 0.05, what is the Degree of confidence with the Black Belt with which he can reject the conclusion that there is no statistically significant difference between the two groups?

SELECT THE CORRECT ANSWER

1. 0.95
2. 0.9
3. 0.968
4. 0.96

**Correct Option:C**

**EXPLANATION : Correct answer: C) P-value of 0.032, 3.2% of risk, which means with 96.8% confidence, the Black Belt can reject the null, so c is correct.**

Q74.In a Paired t test conducted for a sample of 11 data items, what should the Degree of freedom be?

SELECT THE CORRECT ANSWER

1. 20
2. 18
3. 11
4. 10

**Correct Option:D**

**EXPLANATION**

**Correct answer: (D) Degree of freedom for a paired t test is n - 1, so d is correct.**

Q75.Which of these techniques help you to estimate experimental error?

SELECT THE CORRECT ANSWER

1. Blocking
2. Randomization
3. Replication
4. Coding

**Correct Option:C**

**EXPLANATION : Correct answer: C) Replication helps to estimate experimental error so c is correct.**

Q76.When the value of a main effect estimate comes from both the main effect itself and also contamination or bias from higher order interactions, what is believed to have happened?

SELECT THE CORRECT ANSWER

1. The design got randomized
2. The design got blocked
3. The design experienced confounding
4. The design got unbalanced

**Correct Option:C**

**EXPLANATION:Correct answer: C) When main effect comes from higher order interactions, example A + BCD, confounding is said to have occurred, so c is correct.**

Q77.The two types of errors DOE setups are needed to understand are

SELECT THE CORRECT ANSWER

1. Pure error and Lack of Fit error
2. Noise and Reproducibility
3. Common and Special Causes
4. Causal and Lack of Fit error

**Correct Option:A**

**EXPLANATION: Correct answer: (A) DOE setups and coefficients analysis help one to understand the Pure error and lack of fit error of the model, so a is correct.**

Q78.Every level of one factor occurs with every level of another factor in an experiment. The factors are said to be

SELECT THE CORRECT ANSWER

1. Fixed
2. Crossed
3. Nested
4. None of the above

**Correct Option:B**

**EXPLANATION : Correct answer: (B) This type of a condition mentioned in the question can happen only with crossed factors, so b is correct.**

Q79.Using which technique can you separate the experimental error into Pure error and Lack of Fit error

SELECT THE CORRECT ANSWER

1. Blocking
2. Randomization
3. Replication
4. Coding

**Correct Option:C**

**EXPLANATION:Correct answer: C) By replication we can partition the experimental error and get an accurate estimate, so c is correct.**

Q80.Error that occurs due to natural variation in the process is known as

SELECT THE CORRECT ANSWER

1. Pure variation
2. Random variation
3. Lack of fit variation
4. Extraneous variation

**Correct Option:B**

**EXPLANATION : Correct answer: (B) Natural variations in a process is always known as Random variation so b is correct.**

Q81.For conclusions that need to be drawn from an experiment to be treated absolutely valid and non-confusing, which one of the following techniques must be implemented?

SELECT THE CORRECT ANSWER

1. Blocking
2. Randomization
3. Replication
4. Coding

**Correct Option:B**

**EXPLANATION : Correct answer: (B) For the validity of a designed setup, it is important the experiment is randomized and so b is correct.**

Q82.Which of the below mentioned designs are normally considered the best to be used in practical applications for factors greater than 4?

SELECT THE CORRECT ANSWER

1. Full Factorial
2. Half fractional Factorial
3. Resolution V designs
4. Resolution IV Designs

**Correct Option:C**

**EXPLANATION : Correct answer: C) For factors greater than 4, Resolution V designs work best, so c is correct.**

Q83. What is the best statistically validated condition when the Black Belt can accept the fit on the data he has conducted experiments on?

SELECT THE CORRECT ANSWER

1. Goodness of fit p-value is less than 0.05
2. Goodness of fit p-value is more than 0.05
3. Scaled residuals are in the range 0 and -1
4. The Normal Plots are approximately linear

**Correct Option:B**

**EXPLANATION : Correct answer: (B) The best statistically validated conditions can be arrived at conclusions on, by looking at the p-values. If p-value is more than 0.05, goodness of fit is accepted so b is correct.**

Q84.If Factor A affecting response scores at one level are 60,60,61 and 62 and factor A affecting response scores at level two are 60,58,59,60, the main effect is

SELECT THE CORRECT ANSWER

1. Positive
2. Negative
3. Negligible
4. None of the above

**Correct Option:A**

**EXPLANATION : Correct answer: (A) Using standard calculations for main effect, a is correct.**

Q85.If the main effect of Factor A on the response is 2.5, what does it show

SELECT THE CORRECT ANSWER

1. Factor A decreases response by 2.5
2. Factor A increases response by 2.5
3. Response increases factor A by 2.5
4. Response decreases factor A by 2.5

**Correct Option:B**

**EXPLANATION : Correct answer: (B) A main effect showing up as X indicates the impact of the factor on the response, so b is correct.**

Q86.Which of the techniques below helps you to understand and distinguish between within runs variability and between runs variability?

SELECT THE CORRECT ANSWER

1. Replication
2. Randomization
3. Coding
4. Blocking

**Correct Option:A**

**EXPLANATION**

**Correct answer: (A) Replication helps you to understand the difference between the different variances, so a is correct.**

Q87.If the Sum of Squares of treatments is 100, the group size is 25 and number of treatments is five, the Mean Squares of error is

SELECT THE CORRECT ANSWER

1. 20
2. 5
3. 25
4. 15

**Correct Option:B**

**EXPLANATION : Correct answer: (B) Mean Squares = Sum Squares/Degrees of freedom, so b is correct.**

Q88.A fractional factorial experiment is designed at 2 levels for 9 factors with a maximum of only 32 runs possible. This could be a

SELECT THE CORRECT ANSWER

1. Quarter Fractional Factorial Design
2. Screening Design
3. Half fractional Factorial Design
4. Resolution IV design

**Correct Option:D**

**EXPLANATION. : Correct answer: (D) This type of an experimental setting gets classified as a Resolution IV design, so d is correct.**

Q89A fractional factorial experiment is designed at 2 levels for 8 factors with a maximum of only 128 runs possible. This could be a

SELECT THE CORRECT ANSWER

1. Quarter Fractional Factorial Design
2. Screening Design
3. Half fractional Factorial Design
4. Resolution IV design

**Correct Option:C**

**EXPLANATION : Correct answer: C) For 8 factors and 2 levels, full factorial experiment would have resulted in 256 runs, so here with 128 runs c is correct.**

Q90When analysing the Designed experimental setup, the Black Belt notes that the p-value of the model is 0.82. This means

SELECT THE CORRECT ANSWER

1. There is 82% chance the model is significant
2. There is 82% chance the model is non-significant
3. There is 64% chance the model is significant
4. There is 64% chance the model is non-significant

**Correct Option:B**

**EXPLANATION : Correct answer: (B) B is the only logical option to be correct with the other three not being serious considerations.**

Q91.What is the major limitation of running a full factorial experiment on one replicate?

SELECT THE CORRECT ANSWER

1. Curvature effects are not estimated
2. The variable response doesn't follow linearity
3. The model may be exposed to noise
4. Extraneous factors may go undetected

**Correct Option:C**

**EXPLANATION : Correct answer: C) Full factorials on one replicate are very good experiments for interaction, but the only problem is that the model may be too significant to noise, so c is correct.**

Q92.The main effects for a 4 factor 2 level Half fractional factorial design are shown below A - 3.5 B - 2.7 C - 5.2 D - -4.3 What should the Black Belt conclude merely by looking at the main effects?

SELECT THE CORRECT ANSWER

1. Effect C is the most significant for the model
2. Effect D is the least significant for the model
3. Effect A and B can be ignored
4. Any conclusion can only be made after looking at the p-values for the effects

**Correct Option:D**

**EXPLANATION**

**Correct answer: (D) Conclusions on main effects cannot be drawn merely by looking at the effect values. Rejection or acceptance can be done only post looking at the p-values so d is correct.**

Q93.Which of the following statements is NOT true for Split Plot designs?

SELECT THE CORRECT ANSWER

1. Blocks in a Split Plot design serve as experimental units
2. Split plots are the same as completely randomized designs
3. Split plots are randomized twice
4. The randomization in split plots ensure split plot errors are independently distributed

**Correct Option:B**

**EXPLANATION : Correct answer: (B) Options a, c and d hold ground for Split plots, thus logically and conceptually as well b is correct. Split plots and CRDs are different.**

Q94.On doing a Paired t test on Phase I pilot, the Black Belt finds that the p-value between treatment groups is 0.420. What should the Black Belt conclude?

SELECT THE CORRECT ANSWER

1. The change effort has yielded some results
2. The change effort needs to be re-checked
3. The change effort has not yielded positive results
4. The change effort has not changed anything

**Correct Option:D**

**EXPLANATION**

**Correct answer: (D) If p-value is 0.420, it is non-significant, which means nothing much has changed, so d is correct.**

Q95.In a sigma chart, what is the precise reason for calculating Sigma separately for each subgroup rather than calculating grand average for sigma?

SELECT THE CORRECT ANSWER

1. Sub group statistics are important to be represented
2. Sub group sigma is generally more accurate
3. Sub group sigma doesn't introduce unnecessary special cause
4. Range is considered better than Sigma

**Correct Option:C**

**EXPLANATION : Correct answer: C) Sub group sigma doesn't introduce unnecessary special cause - It is this reason why Sigma is calculated for each subgroup rather than calculating the grand sigma.**

Q96.Which of these control charts is known to have varying Control limits all the time?

SELECT THE CORRECT ANSWER

1. Xbar S
2. P chart
3. EWMA Chart

**Correct Option:C**

**EXPLANATION**

**Correct answer:C) An EWMA chart has exponentially varying control limits so c is correct.**

Q97.Assuming all other conditions for plotting control charts to be valid, which condition holds TRUE for plotting I-MR Charts?

SELECT THE CORRECT ANSWER

1. When you can collect only one observation per day
2. When it is not feasible to use averages chart for process control
3. When within-subgroup variation is to small relative to batch-batch variation
4. All of the above

**Correct Option:D**

**EXPLANATION**

**Correct answer: (D) Conditions mentioned in a, b and c are valid for I-MR charts so d is correct.**

Q98.What is the major benefit of using Xbar charts over Individuals charts?

SELECT THE CORRECT ANSWER

1. The Average charts are not sensitive to non-normality
2. The Average charts provide tighter controls
3. Average charts best indicate within and between subgroup variation
4. Average charts show mean shift

**Correct Option:B**

**EXPLANATION**

**Correct answer: (B) The reason why Xbar charts are chosen over Individuals charts is because they offer tighter controls than the latter, so b is correct.**

Q99.The main reason of preferring an Individuals over an Averages charts is

SELECT THE CORRECT ANSWER

1. Need to collect lesser samples
2. Process shifts detected easily
3. Additional sensitivity by averages charts not justified
4. Process drifts detected easily

**Correct Option:C**

**EXPLANATION : Correct answer: C) Individuals charts are not sensitive to special causes, so c is correct.**

Q100.Which of these charts would you normally use to plot the performance of proportion defectives?

SELECT THE CORRECT ANSWER

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

**Correct Option:A**

**EXPLANATION: Correct answer: (A) Use a p chart if you wish to study defectives, so a is correct.**