

Exam Questions ICBB

IASSC Certified Lean Six Sigma Black Belt

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NEW QUESTION 1

Which Element of Waste best describes "the unnecessary movement of materials and goods"?

- A. Overprocessing
- B. Inventory
- C. Motion
- D. Conveyance

Answer: D

NEW QUESTION 2

Which of these graphs demonstrates conditions which would be sufficient to enable OCAP for the process?

- A. Xbar Chart
- B. Time Series Chart
- C. Neither
- D. Both

Answer: A

NEW QUESTION 3

When we gather information for the Voice of the Business we are primarily interested in information concerning the _____ of the business.

- A. Advertising budget
- B. Market share
- C. Profitability
- D. Ownership

Answer: C

NEW QUESTION 4

A Full Factorial experiment using a 3 level 3 factor approach has been proposed to test the viability of an extrusion machine experiment. How many treatment combinations will this approach involve?

- A. 6
- B. 9
- C. 27
- D. 54

Answer: C

NEW QUESTION 5

When variation is removed from the output of a process then the process customer can have more confidence in the experience that results from the process.

- A. True
- B. False

Answer: A

NEW QUESTION 6

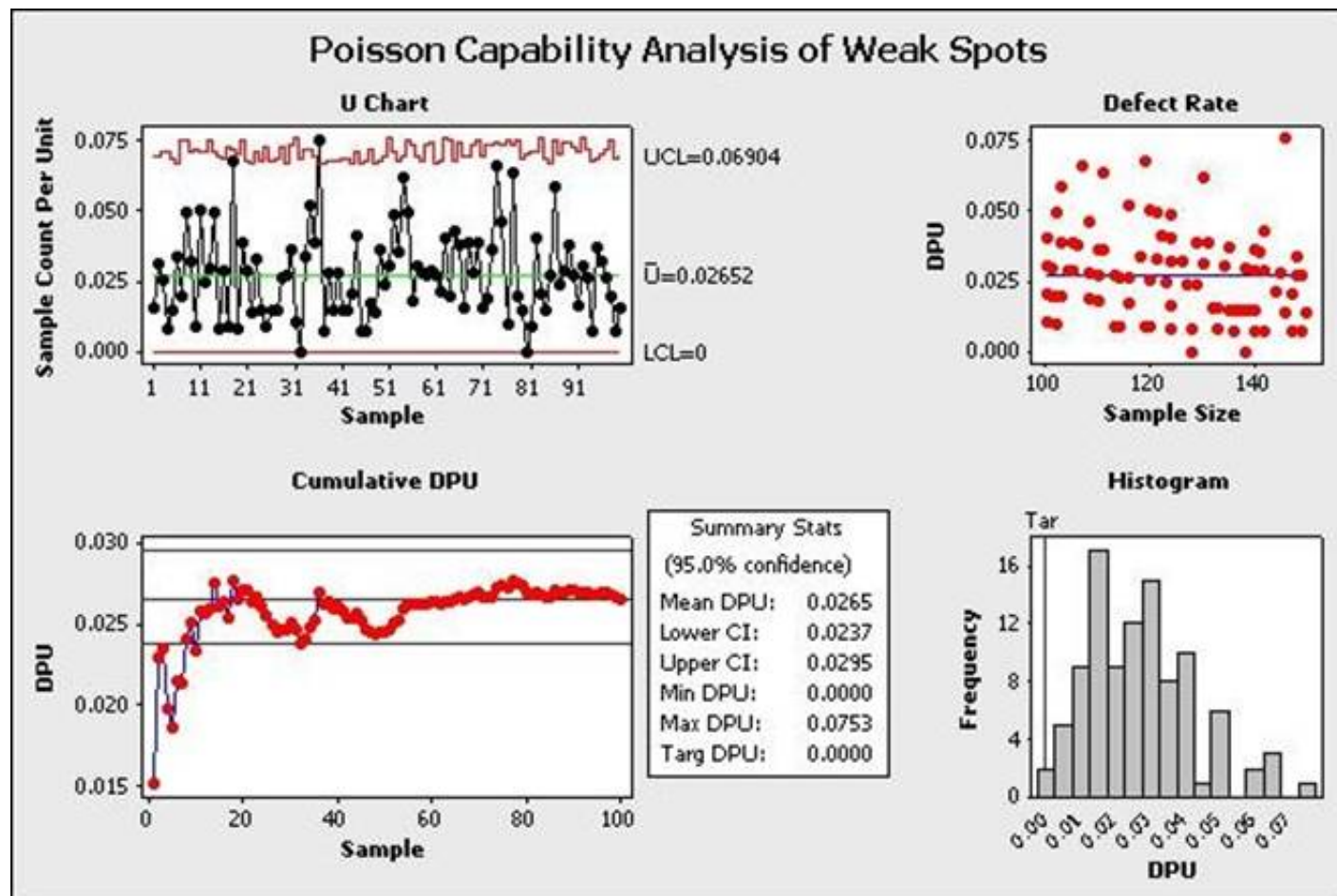
Control Charts were developed by Dr. Shewhart to track data over time. To detect Special Cause variation the Control Charts use which of these?

- A. Data shift analysis
- B. Outlier analysis methods
- C. Center Line and Control Limits
- D. None of the above

Answer: C

NEW QUESTION 7

Which statements are correct about the advanced Capability Analysis shown here?



(Note: There are 3 correct answers).

- A. This is a Poisson Capability Analysis.
- B. The average DPU with 95% confidence is between 0.024 and 0.0295.
- C. The DPU does not seem to vary depending on sample size.
- D. The process shows only one instance of being out of control statistically so we have confidence in the estimated DPU of this process.
- E. The maximum DPU in one observation was nearly 0.0753.

Answer: BCE

NEW QUESTION 8

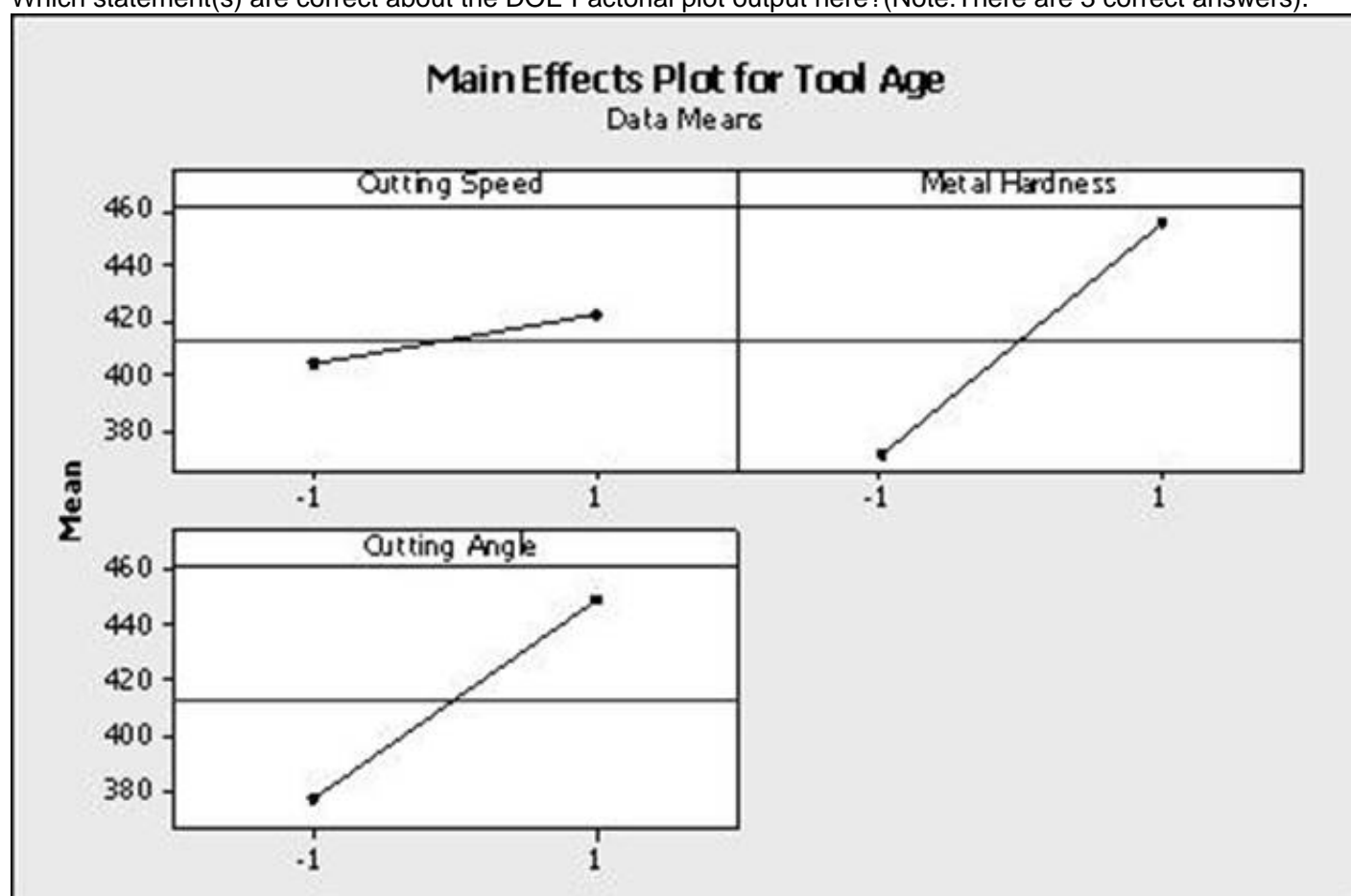
One of the primary deliverables from performing a SIPOC is to begin to understand which inputs have the greatest affect on the _____ outputs.

- A. Management's desired
- B. Supplier delivered
- C. Process operator
- D. Customer most valued

Answer: D

NEW QUESTION 9

Which statement(s) are correct about the DOE Factorial plot output here? (Note: There are 3 correct answers).



- A. Two factors were operated at 3 levels each
- B. The highest tool age was achieved with metal hardness at high level while keeping the cutting speed at the low level

- C. The design indicated above is a 32 factorial design
- D. The cutting speed and cutting angle are at the low level for the least tool age achieved
- E. All factors had 2 levels in the experiment

Answer: BCE

NEW QUESTION 10

A Belt working in a supply chain environment has to make a decision to change suppliers of critical raw materials for a new product upgrade. The purchasing manager is depending on the Belt's effort requiring that the average cost of an internal critical raw material component be less than or equal to \$3,600 in order to stay within budget. Using a sample of 42 first article components, a Mean of the new product upgrade price of \$3,200 and a Standard Deviation of \$180 was estimated. Based on the data provided, the Z value for the data assuming a Normal Distribution is?

- A. 1.11
- B. 2.22
- C. 4.30
- D. 5.42

Answer: B

NEW QUESTION 10

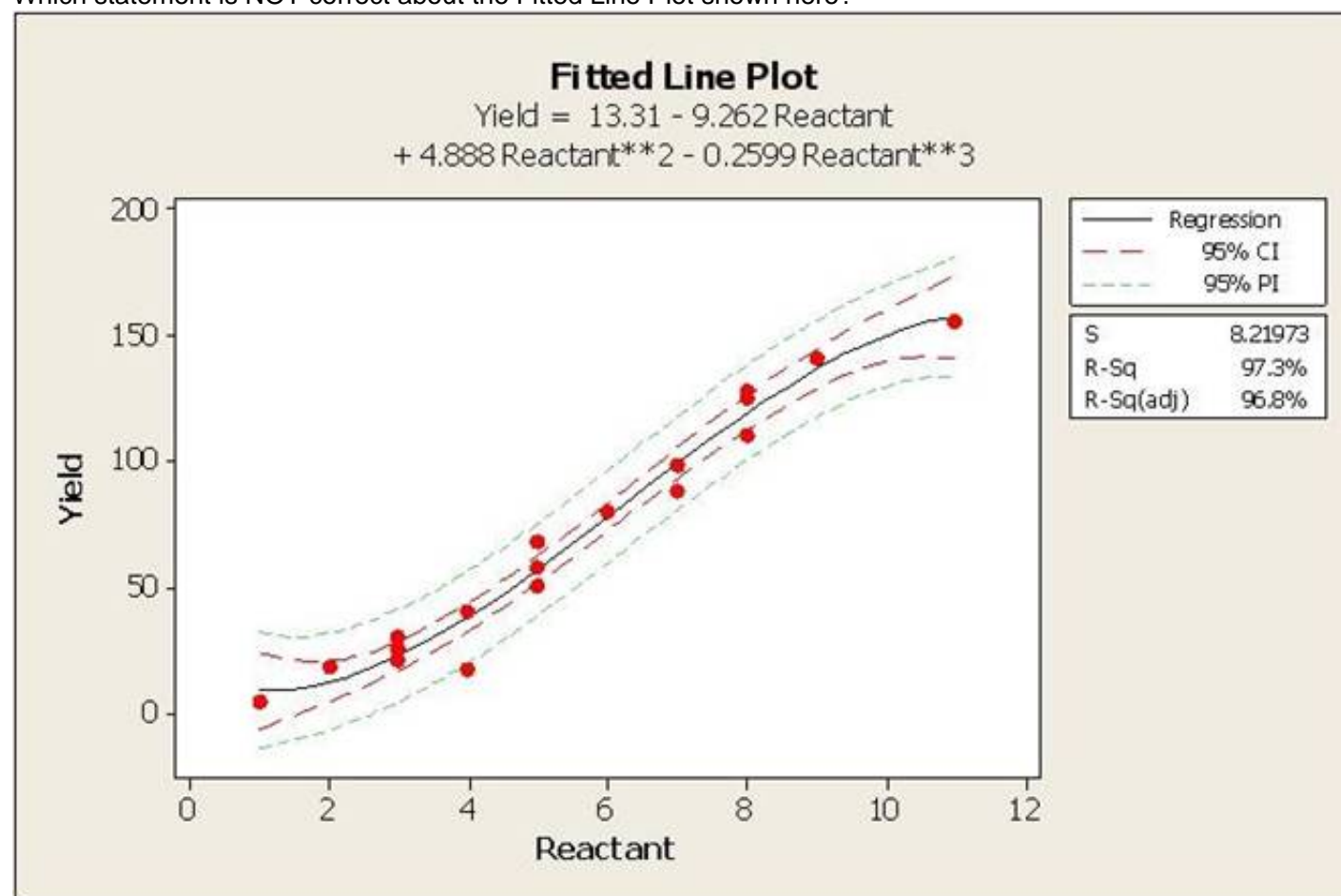
A(n) _____ is best used to compare a Machine 1 average quality characteristic to the same quality characteristic of Machine 2.

- A. 1-Sample t-test
- B. 2-Sample t-test
- C. F test
- D. ANOVA test

Answer: B

NEW QUESTION 13

Which statement is NOT correct about the Fitted Line Plot shown here?



- A. The independent variable is the reactant
- B. If the reactant was 6 units, with 95 % confidence we would expect a minimum yield of 100 units
- C. With at least 95% confidence, we can expect less than 10 units of Yield when the reactant is at a value of 1
- D. A reactant value between 2 and 4 units yields around 20 to 40
- E. When the reactant increases, the expected yield would increase

Answer: D

NEW QUESTION 18

When a Belt creates a Process Map she will use a _____ to depict a decision point requiring a Yes or No decision.

- A. Circle
- B. Square
- C. Diamond
- D. Rectangle

Answer: C

NEW QUESTION 20

For a batch manufacturing process, while assessing short term process variation, which variation category(ies) should one need to focus on?(Note:There are 2 correct answers).

- A. Variation within consecutive pieces
- B. Variation among consecutive batches
- C. Variation among groups of pieces
- D. Variation among the completed product

Answer: AB

NEW QUESTION 22

A valuable tool to use during the Measure Phase to show material and information flow throughout an entire process is the _____ .

- A. Value Stream Map
- B. FMEA
- C. Pareto Chart
- D. Standard Operating Procedure

Answer: A

NEW QUESTION 25

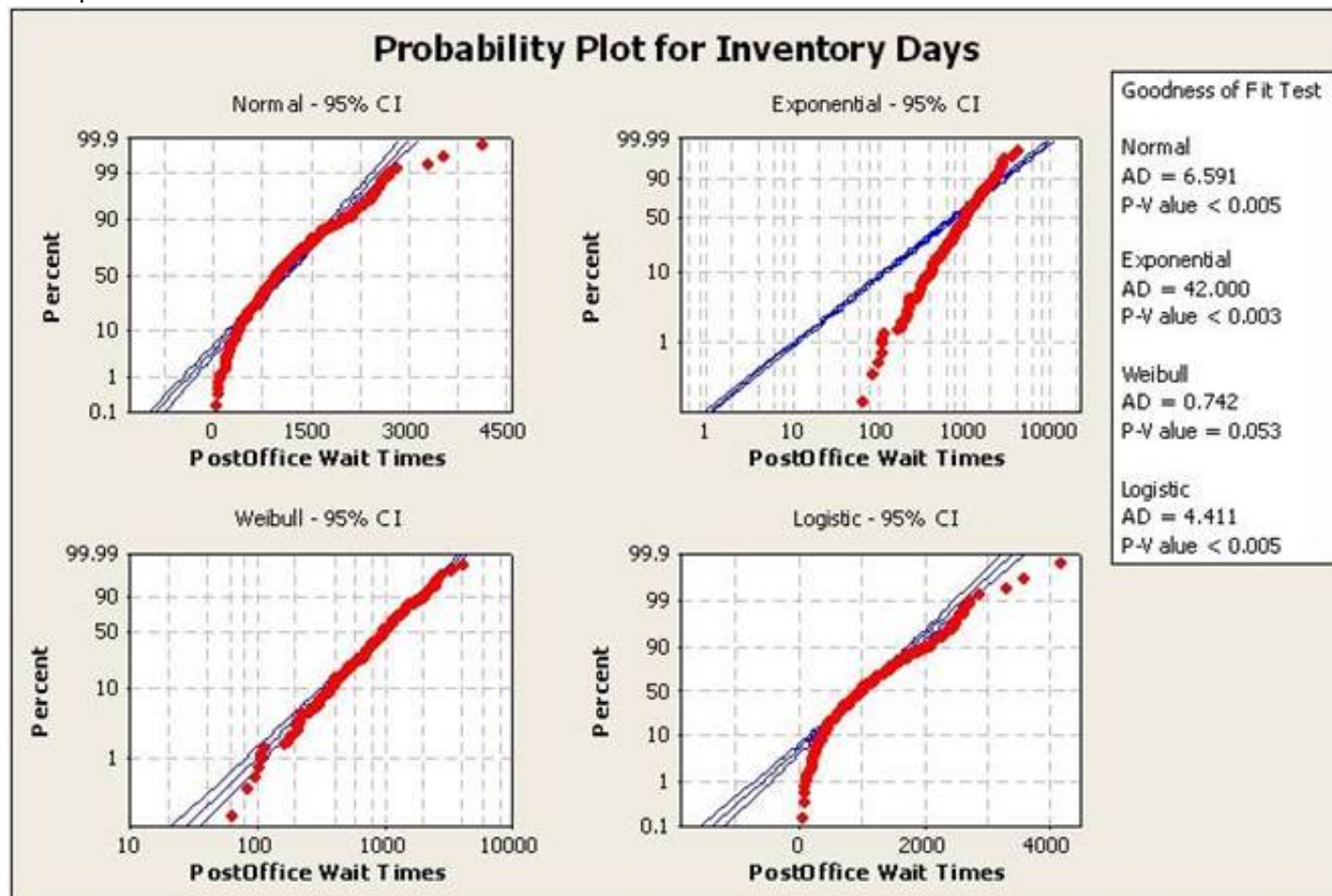
Kanban establishes a means of monitoring production, conveyance and delivery information such that efficient flow is established. The method used by Kanban is to require a _____ before anything moves.

- A. Sign-off
- B. Signal
- C. Bell to ring
- D. Work order

Answer: B

NEW QUESTION 28

A Lean Six Sigma project is attempting to reduce inventory days. The Process Capability will be monitored as part of the Control Phase to track the sustainability of the improvement.



Which distribution type is best used for performing the Capability Analysis?

- A. Weibull Distribution
- B. Normal Distribution
- C. Exponential Distribution
- D. Logistic Distribution
- E. Gaussian Distribution

Answer: A

NEW QUESTION 32

When a Belt conducts a Linear Correlation Analysis and finds that as an X increases the Y also increase then he has proven a _____ correlation.

- A. Negative
- B. Positive
- C. Monomial

D. Single alignment

Answer: B

NEW QUESTION 35

Those people who have a interest in the outputs of a process are known as _____ .

- A. Stakeholders
- B. Senior management
- C. Co-workers
- D. Process owners

Answer: A

NEW QUESTION 36

The most appropriate type of FMEA for a product before going into manufacturing is a _____ FMEA.

- A. Design
- B. Consumer
- C. Survey
- D. Test Process

Answer: A

NEW QUESTION 41

In a Fishbone Diagram the 6M's stand for Methods, _____ , Machine, Man, Mother Nature and Materials.

- A. Measurements
- B. Merger
- C. Management
- D. Medical

Answer: A

NEW QUESTION 46

An operator is measuring the distance between two points. Which is most likely to be influenced by the operator?

- A. Precision of the measurement
- B. Accuracy of the measurement
- C. Calibration of the instrument
- D. All of these answers are correct

Answer: D

NEW QUESTION 48

Which Experimental Design typically is most associated with the fewest number of input variables or factors in the design?

- A. Fractional Factorial design
- B. Full Factorial design
- C. Simple Linear Regression
- D. Response Surface Design

Answer: D

NEW QUESTION 53

An ANOVA used across many dependent variables could increase the Beta risk.

- A. True
- B. False

Answer: B

NEW QUESTION 56

Two of the key deliverables for the Measure Phase are a robust description of the process and its flow and an assessment of the Management System.

- A. True
- B. False

Answer: B

NEW QUESTION 58

Range Charts are the technique used to determine if _____ are occurring within the subgroups of the SPC Charts.

- A. Common Causes

- B. Special inspections
- C. Unnatural forces
- D. Special Causes

Answer: D

NEW QUESTION 62

Which of these items are not part of what is necessary for successful Kaizens?

- A. Good lighting
- B. Management support
- C. Operator support
- D. Analysis tools

Answer: A

NEW QUESTION 67

What conclusion is most correct about the Experimental Design shown here with the response in the far right column?

Adv	Bev	Des	Crux	Response
-1	-1	-1	-1	20
1	-1	-1	1	14
-1	1	-1	1	17
1	1	-1	-1	10
-1	-1	1	1	19
1	-1	1	-1	13
-1	1	1	-1	14
1	1	1	1	10

- A. No factor has enough statistical confidence greater than 95% to have an impact on the response rate
- B. Constant, Adv and Bev are the only factors statistically affecting the response rate with 95% confidence or more
- C. If the Adv is increased from the low level to the high level, the response rate increases
- D. The response level is statistically concluded to only need the Adv and Bev factors set at the low level to get the largest response rate
- E. This design does not have enough experimental runs to conclude anything as evidenced by the lack of P-values in the MINITABTM output

Answer: D

NEW QUESTION 71

Accuracy can be assessed in several ways and a fairly accurate means of measurement is visual comparison.

- A. True
- B. False

Answer: B

NEW QUESTION 74

The validity of the decision made with Hypothesis Testing is dependent upon all of these except _____ .

- A. Beta risk
- B. Alpha risk
- C. Range of data
- D. Sample size

Answer: C

NEW QUESTION 76

Which one of these tools is frequently used to help drill down to possible causes once a Fishbone Diagram is constructed?

- A. 3 When Analysis
- B. 5 Why Analysis
- C. Ishikawa Diagram
- D. Skeleton Diagnostic

Answer: B

NEW QUESTION 78

What dollar amount of savings would a project show if it reduced your outstanding Accounts Receivable by \$0.9 million dollars to \$3.5 million total and your organization's marginal cost of capital was 5.7%?

- A. \$49,250

- B. \$51,300
- C. \$117,500
- D. \$202,424

Answer: B

NEW QUESTION 79

When conducting a Hypothesis Test using Continuous Data the proper sample size is influenced only by the extent to which we need to assess a Difference to be detected but not the inherent variation in the process.

- A. True
- B. False

Answer: B

NEW QUESTION 81

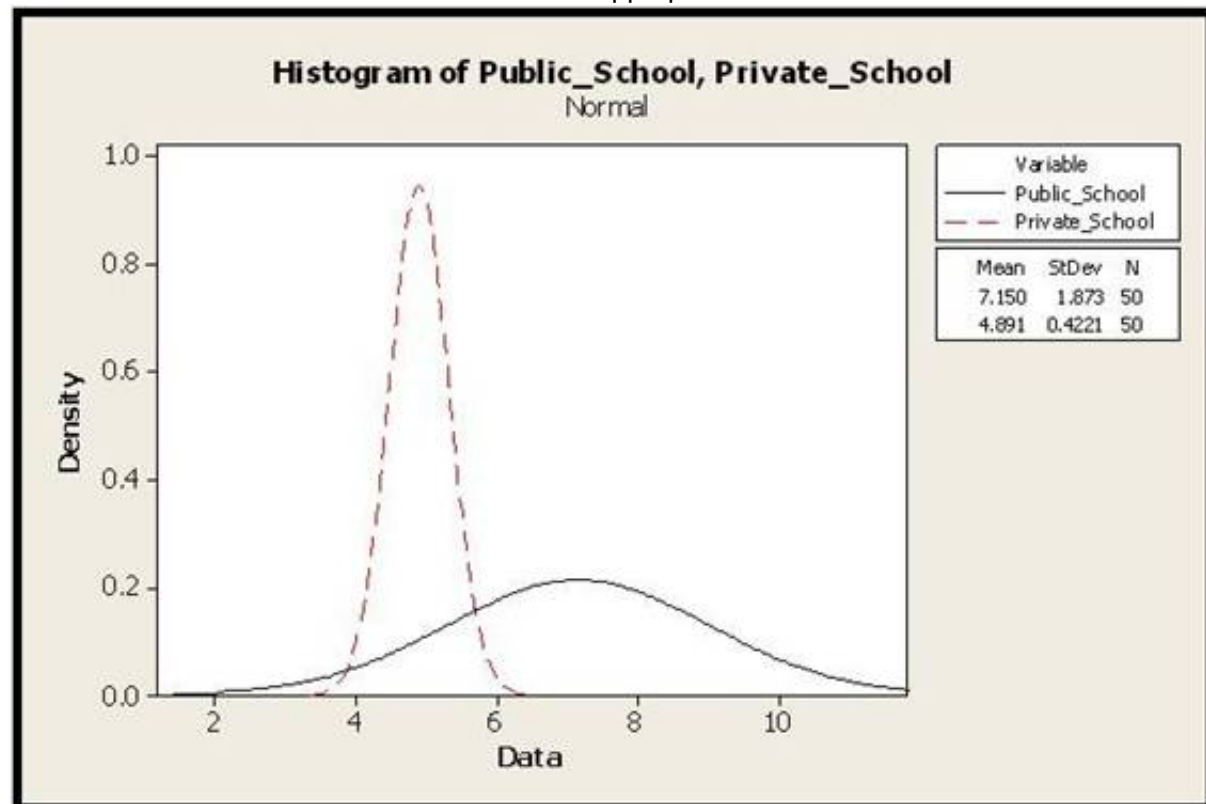
Which of these elements are not included in Implementation plans?

- A. Work breakdown structure
- B. Risk management plans
- C. Cost/Benefit ratios
- D. Planned audits of work completion

Answer: C

NEW QUESTION 83

The class score distribution of schools in a metropolitan area is shown here along with an analysis output. Comment on the statistical significance between the Means of the two distributions. Select the most appropriate statement.



Two-sample t for Private_School vs Public_School

	N	Mean	StDev	SE Mean
Private_School	50	4.891	0.422	0.060
Public_School	50	7.15	1.87	0.26

Difference = μ (Private_School) - μ (Public_School)

Estimate for difference: -2.259

99% CI for difference: (-2.985, -1.534)

T-Test of difference = 0 (vs not =): T-Value = -8.32 p-Value = 0.000 DF = 53

- A. The two class Means are statistically different from each other
- B. The two class Means statistically not different from each other
- C. Inadequate information on class Means to make any statistical conclusions
- D. A visual comparison shows that class Means are not statistically different
- E. A visual comparison shows that class Means are statistically different

Answer: A

NEW QUESTION 84

Which Element of Waste best describes "the unnecessary movement of materials and goods"?

- A. Overprocessing
- B. Inventory
- C. Motion
- D. Conveyance

Answer: D

NEW QUESTION 88

A Non-parametric Test should be used if just one distribution is not Normal out of the two or more gathered.

- A. True
- B. False

Answer: A

NEW QUESTION 90

The Mann-Whitney test is a powerful test and is unique to situations from which of the choices listed?(Note:There are 2 correct answers).

- A. Testing the identity of two populations
- B. Focuses on equality of the Median of the two populations
- C. Less powerful than the traditional "t-test"
- D. More widely applicable than the traditional "t-test"

Answer: BD

NEW QUESTION 93

A Belt working in a supply chain environment has to make a decision to change suppliers of critical raw materials for a new product upgrade. The purchasing manager is depending on the Belt's effort requiring that the average cost of an internal critical raw material component be less than or equal to \$4,200 in order to stay within budget. Using a sample of 35 first article components, a Mean of the new product upgrade price of \$4,060, and a Standard Deviation of \$98 was estimated. Select the answer that best states the Practical Problem.

- A. If the average cost per component is \$4,200 or less, then the purchase manager will introduce the new product upgrade with new components.
- B. If the average cost per component is greater than \$4,200, then the purchase manager will introduce the new product upgrade with new components.
- C. Only if the average cost per product upgrade is \$4,060, will the purchase manager introduce new product upgrades with new components.
- D. If the average cost per new product upgrade is less than \$180, then the purchase manager will introduce the new product upgrade with new components.

Answer: C

NEW QUESTION 95

If a Six Sigma project was to reduce changeover times and the team found the project success was decreasing over time since changeover times began to creep back up, which Lean tools should be considered in the Control Phase to reestablish and sustain the project success?

- A. Improve the lighting to assure adequate visibility
- B. Confirm a Visual Factory exists to assure proper communication of status of machines
- C. Implement Kanbans to assure enough inventory for the process step
- D. Reword the standardized work instructions to use active verbs and not passive phrases

Answer: B

NEW QUESTION 97

In a good Measurement System the most variation will be with part-to-part measurements. What should you do if the majority of variation is associated with the Gage R&R assuming the gage is technically capable?

- A. Focus on fixing the Repeatability and Reproducibility of the measurement device
- B. Purchase a new machine
- C. Focus on trimming the Part-to-Part variation
- D. Run another MSA test with the machine

Answer: A

NEW QUESTION 102

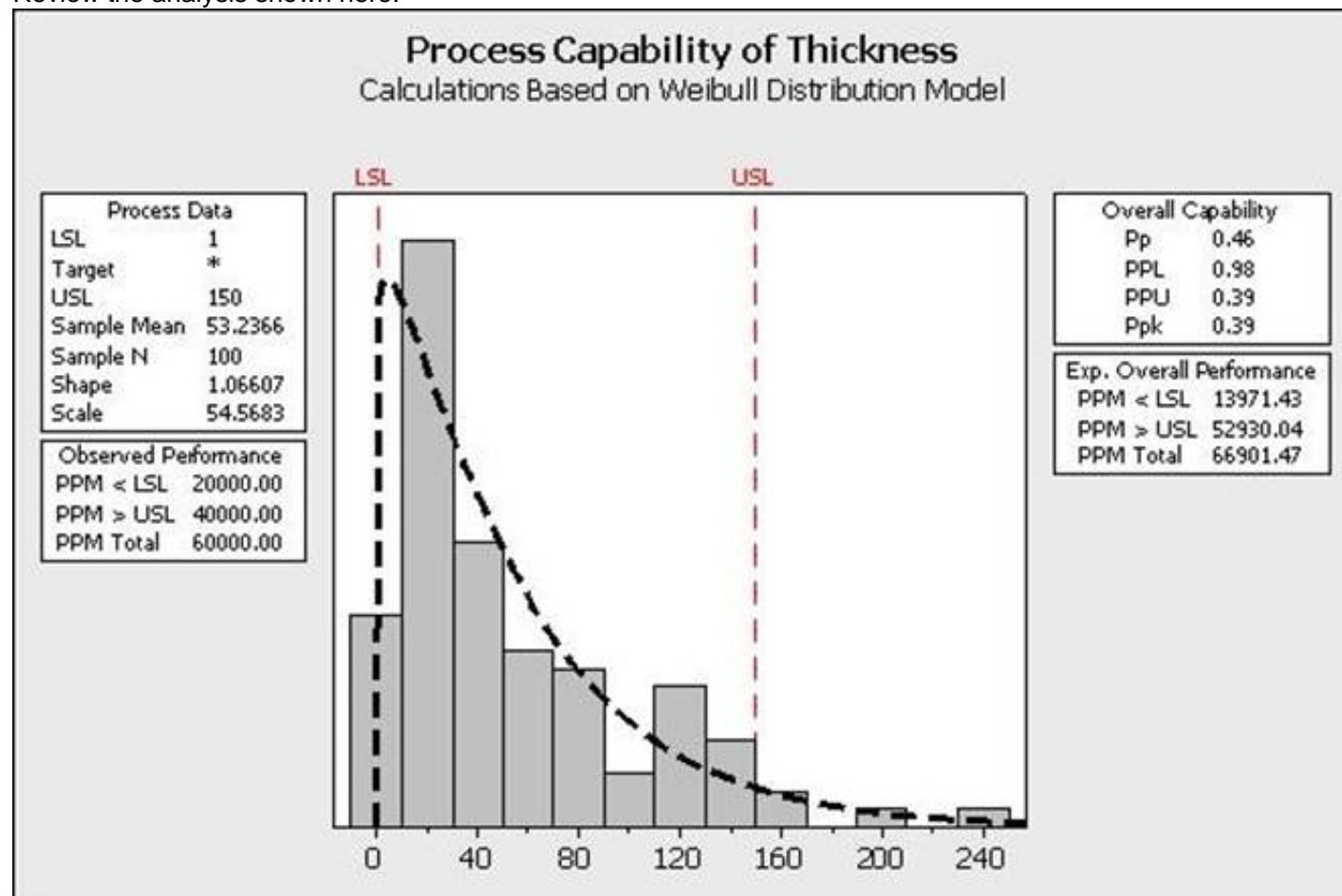
Handling of warranty returns, process improvement team meetings and rework to meet customer expectations are all examples of business costs that are classified as_____.

- A. Nuisance
- B. Non-value Add
- C. Necessary
- D. Unavoidable

Answer: B

NEW QUESTION 103

Review the analysis shown here.



Which statements are true about the process?(Note:There are 3 correct answers).

- A. The initial focus for this project would be to determine why the thicknesses are so frequently too low.
- B. The majority of the process is closer to the lower specification limit.
- C. This process is described with the Weibull Distribution.
- D. The process has more problems with Variation than Centering.
- E. The process follows a non-normal distribution with the given data.

Answer: BDE

NEW QUESTION 107

During the _____ phase of 5S is when we might implement a Red Tag program.

- A. Straightening
- B. Standardizing
- C. Shining
- D. Sorting

Answer: D

NEW QUESTION 109

Early in a project a Belt will want to begin to identify and evaluate risk factors for the subject process and will therefore begin building a(n) _____.

- A. FMEA
- B. SIPOC
- C. X-Y Diagram
- D. Team Charter

Answer: A

NEW QUESTION 113

The Japanese born function of a Kanban event utilizes a specific, step-by-step approach meant to bring about major changes to a process.

- A. True
- B. False

Answer: B

NEW QUESTION 118

If the results from a Hypothesis Test are located in the "Region of Doubt" area, what can be concluded?

- A. Rejection of the Alpha
- B. We fail to reject the Null Hypothesis
- C. The test was conducted improperly
- D. We reject the Null Hypothesis

Answer: D

NEW QUESTION 119

Six Sigma is a business improvement discipline whose fundamental view is based on a _____ oriented approach of the business.

- A. Profit
- B. Performance
- C. Process
- D. Predatory

Answer: B

NEW QUESTION 122

Situations where standardized work needs to be incorporated include all of these except _____.

- A. Machines continually operating to reduce the labor cost per piece
- B. Lack of a system to assure proper inventory levels at repair stations
- C. Changeover instructions incomplete
- D. Process flow for the same product assembly taking various cycle time for completion

Answer: A

NEW QUESTION 125

If a Six Sigma project was to reduce repair station inventory and the team found the inventory was creeping up over time which Lean tools should be considered in the Control Phase to reestablish and sustain the project success?

- A. Review the Visual Factory to assure inventory in excess of desired visible
- B. Improve the lighting to assure adequate visibility
- C. Analyze data from supplier deliveries
- D. Reword the standardized work instructions to use active verbs and not passive phrases

Answer: A

NEW QUESTION 130

A(n) _____ has occurred when two inputs have a greater impact on a change in the output than either of the inputs has by itself.

- A. Dependency
- B. Bimodal reaction
- C. Interaction
- D. Amplified effect

Answer: C

NEW QUESTION 134

Measurement _____ is defined as the difference between the observed and the expected values for a given set of data.

- A. Bias
- B. Linearity
- C. Range
- D. Breadth

Answer: A

NEW QUESTION 139

It would be more likely than not for a Belt conducting a Regression Analysis to find that the_____.

- A. r^2 value is smaller than the absolute value of r
- B. Correlation Coefficient equals r^2
- C. Coefficient of Determination is less than r^2
- D. Correlation Coefficient equals r divided by 2

Answer: A

NEW QUESTION 143

It would be more likely than not for a Belt conducting a Regression Analysis to find that the_____.

- A. r^2 value is smaller than the absolute value of r
- B. Correlation Coefficient equals r^2
- C. Coefficient of Determination is less than r^2
- D. Correlation Coefficient equals r divided by 2

Answer: A

NEW QUESTION 144

Kaizens or Kaikakus and Six Sigma projects are intended to create breakthrough, significant process improvement versus minor, incremental improvements.

- A. True
- B. False

Answer: A

NEW QUESTION 145

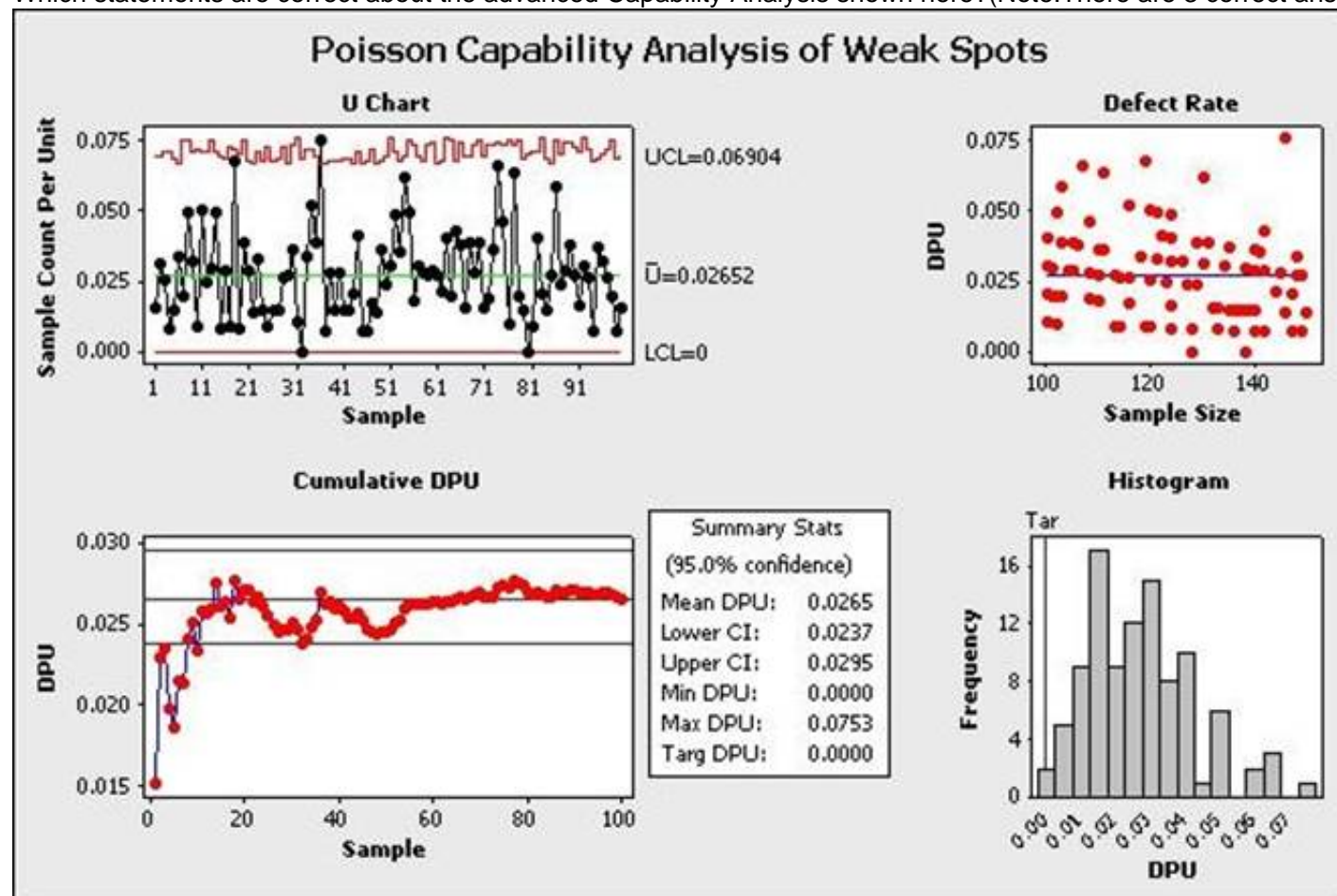
A _____ problem in the Measurement System suggests that there is a lack of consistency in the measurement over time.

- A. Linearity
- B. Bias
- C. Stability
- D. Magnitude

Answer: C

NEW QUESTION 147

Which statements are correct about the advanced Capability Analysis shown here?(Note:There are 3 correct answers).



- A. This is a Poisson Capability Analysis
- B. The average DPU with 95% confidence is between 0.024 and 0.0295
- C. The DPU does not seem to vary depending on sample size
- D. The process shows only one instance of being out of control statistically so we have confidence in the estimated DPU of this process
- E. The maximum DPU in one observation was nearly 0.0753

Answer: BCE

NEW QUESTION 151

Sally and Sara sell flower pots at their garage sale. Sally motivates Sara mentioning that they will sell a minimum of 15 pots per day if the outside temperature exceeds 60o F. From a sample, whose population is assumed to follow a Normal Distribution, taken for 30 days at 60 degrees or more an average of 13.6 pots per day were sold with a Standard Deviation of 0.7 pots. The statistical Degrees of Freedom for this example are?

- A. 1
- B. 29
- C. 30
- D. 31
- E. 2

Answer: B

NEW QUESTION 154

An ANOVA used across many dependent variables could increase the Beta risk.

- A. True
- B. False

Answer: B

NEW QUESTION 157

With Measurement System Analysis we are concerned with two issues that impact the potential variability of the data. They are _____ and Accuracy.

- A. Spread
- B. Reliability

- C. Precision
- D. Deflection

Answer: C

NEW QUESTION 162

If the production is for higher volume and monitoring and the Mean and variability is to be monitored for four machines producing product and the characteristic to be monitored is Variable Data, which SPC Chart is best to be selected?

- A. Xbar-R Chart
- B. Individual-MR Chart
- C. NP Chart
- D. CUSUM Chart

Answer: A

NEW QUESTION 164

A Belt working in a supply chain environment has to make a decision to change suppliers of critical raw materials for a new product upgrade. The purchasing manager is depending on the Belt's effort requiring that the average cost of an internal critical raw material component be less than or equal to \$3,800 in order to stay within budget. Using a sample of 38 first article components, a Mean of the new product upgrade price of \$3,680, and a Standard Deviation of \$120 was estimated. In order to increase the Long Term Z value to 5, what is the maximum long term variation in pricing the Belt can accept for his upgraded critical raw material component?

- A. \$6
- B. \$12
- C. \$24
- D. \$48

Answer: C

NEW QUESTION 169

Cost of Poor Quality (COPQ) can be classified as Visible Costs and Hidden Costs. All these items are Hidden Cost except _____.

- A. Lost Customer Loyalty
- B. Returns
- C. Time Value of Money
- D. Late Delivery

Answer: B

NEW QUESTION 170

A Belt is analyzing data and upon creation of the graphical analysis sees multiple modes. One of the primary reasons this could occur is because the process has experienced a _____.

- A. Significant change from one shift to another
- B. Sizable Measurement System error
- C. Catastrophic failure of some sort
- D. Any one of these

Answer: D

NEW QUESTION 175

Which item(s) listed would impact the Process Capability for a process with a continuous output?(Note:There are 4 correct answers).

- A. Shape of process data distribution (e.
- B. Normal Distribution)
- C. Process Technology
- D. Process Standard Deviation
- E. Presence of Special Causes or solely Common Causes
- F. Seasonal variation in process

Answer: ACDE

NEW QUESTION 176

Which one of the listed tools is frequently used to help drill down to possible causes once a Fishbone Diagram is constructed?

- A. 3 When Analysis
- B. Skeleton Diagnostic
- C. Ishikawa Diagram
- D. 5 Why Analysis

Answer: D

NEW QUESTION 179

From this list select the items that define what an X-Y Diagram is.(Note:There are 4 correct answers).

- A. Created for every project
- B. Based on team's collective opinions
- C. Updated whenever a parameter is changed
- D. Used to show each step in a process
- E. A living document throughout project lifecycle

Answer: ABCE

NEW QUESTION 182

A(n) _____ is best used to compare a Machine 1 average quality characteristic to the same quality characteristic of Machine 2.

- A. F test
- B. 1-Sample t-test
- C. 2-Sample t-test
- D. ANOVA test

Answer: C

NEW QUESTION 187

Some of the sources for different types of error that can be quantified using Statistical Analysis are _____.

- A. Error in sampling
- B. Bias in sampling
- C. Error in measurement
- D. All of these answers are correct

Answer: D

NEW QUESTION 190

Assessing process proportion as opposed to evaluating a process with respect to a set target can be done using which of these?

- A. Process proportion equals some value range
- B. Process proportion equals some desired value
- C. Target is current
- D. Proportion of the tail is equal

Answer: B

NEW QUESTION 191

Some of the sources for different types of error that can be quantified using Statistical Analysis are which of these?

- A. Error in sampling
- B. Bias in sampling
- C. Error in measurement
- D. All of the above

Answer: D

NEW QUESTION 194

The method of Steepest Ascent guides you toward a target inside the original inference space.

- A. True
- B. False

Answer: B

NEW QUESTION 195

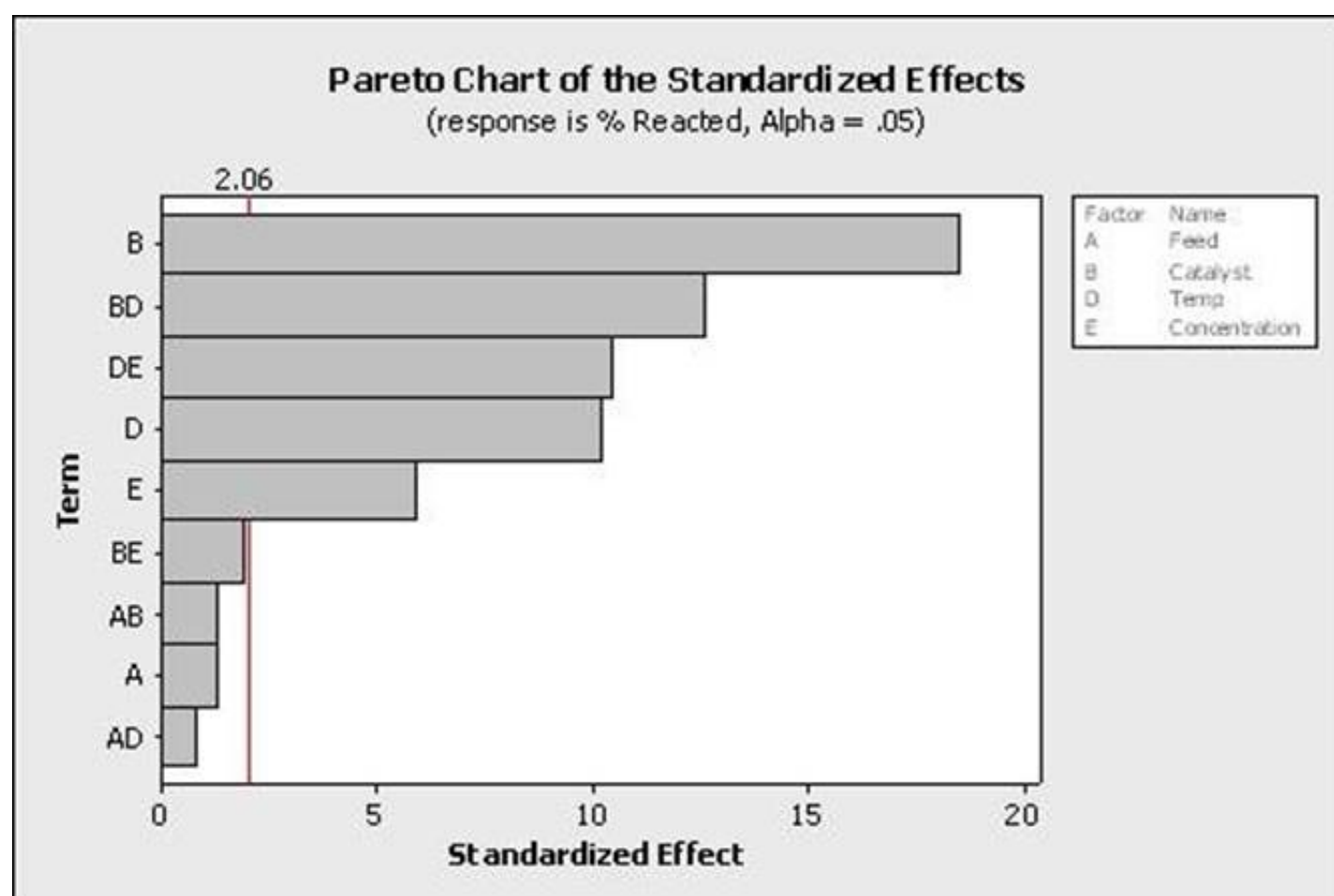
Fractional Factorial, _____ and Response Surface Method are types of planned experiments.

- A. Multi-Vari Analysis
- B. Baldrige Channels
- C. One Factor at a Time or OFAT
- D. Factorial Design

Answer: D

NEW QUESTION 198

Which statement(s) are correct about the Pareto Chart shown here for the DOE analysis?(Note:There are 2 correct answers).



- A. It is unknown from this graph how many factors were in the Experimental Design
B. The factors to keep in the mathematical model are E, D, DE, BD and B with an alpha risk equal to 2.06
C. The effects to keep in the mathematical model are E, D, DE, BD and B with an alpha risk equal to 0.05
D. The factors to keep in the mathematical model with a 5% alpha risk are BE, AB, A and AD

Answer: AC

NEW QUESTION 200

The Control Limits width varies if the sample size varies for which type of chart?

- A. P Charts
B. NP Charts
C. Xbar-R Charts
D. Time Series Charts

Answer: A

NEW QUESTION 204

When a Belt Poka-Yoke's a defect out of the process entirely then she should track the activity with a robust SPC system on the characteristic of interest in the defect as an early warning system.

- A. True
B. False

Answer: B

NEW QUESTION 208

When we compare short-term and long-term Capability which of these is true?

- A. Cp is better for the short term
B. Both short-term and long-term performance are alike
C. Performance tends to improve over time
D. Cp is better for the long-term

Answer: A

NEW QUESTION 210

At the very initiation of a project a Belt must develop a concise_____ that states at a high level the area of concern and why it is important this issue be improved.

- A. Business Case
B. Project Doctrine
C. Management Justification
D. Process Owner Disclosure

Answer: C

NEW QUESTION 214

Sally and Sara sell flower pots at their garage sale. Sally motivates Sara mentioning that they will sell a minimum of 15 pots per day if the outside temperature

exceeds 60°F. From a sample, whose population is assumed to follow a Normal Distribution, taken for 30 days at 60 degrees or more an average of 13.6 pots per day were sold with a Standard Deviation of 0.7 pots. For the sales accomplished above, what test would validate if they met their requirements?

- A. F Test
- B. Test for Equal Variance
- C. Chi Square Test
- D. One-Sample t-Test

Answer: D

NEW QUESTION 218

Common and Special Cause _____ are the focus of Statistical Process Control.

- A. Prediction
- B. Ideation
- C. Capability
- D. Variation

Answer: D

NEW QUESTION 220

Which of these are examples of business metrics or Key Performance Indicators commonly referred to as KPI's?

- A. Cycle Time
- B. Defects
- C. N
- D. of Units Reworked
- E. Labor Hours
- F. All of these answers are correct

Answer: E

NEW QUESTION 221

Much of the Six Sigma methodology is used to identify and remove causes for _____.

- A. Process Variation
- B. Material Costs
- C. Excess Inventory
- D. Lost Sales

Answer: A

NEW QUESTION 225

A statistical test or Hypothesis Test is performed to reject or fail to reject a stated hypothesis and it converts the Practical Problem into a Statistical Problem.

- A. True
- B. False

Answer: A

NEW QUESTION 230

Relative to a Design of Experiments the term Collinear refers to variables being a _____ of each other.

- A. Linear combination
- B. Directly parallel
- C. Mirror image
- D. None of the above

Answer: A

NEW QUESTION 233

What is the Ppk of a process with a spread of 24 units, an average of 68, an upper limit of 82 and a lower limit of 54?

- A. 1.68
- B. 2.00
- C. 4.00
- D. 4.42

Answer: C

NEW QUESTION 234

What aspects of Measurement Systems Analysis (MSA) studies are applicable when the process used to measure does not damage the part?

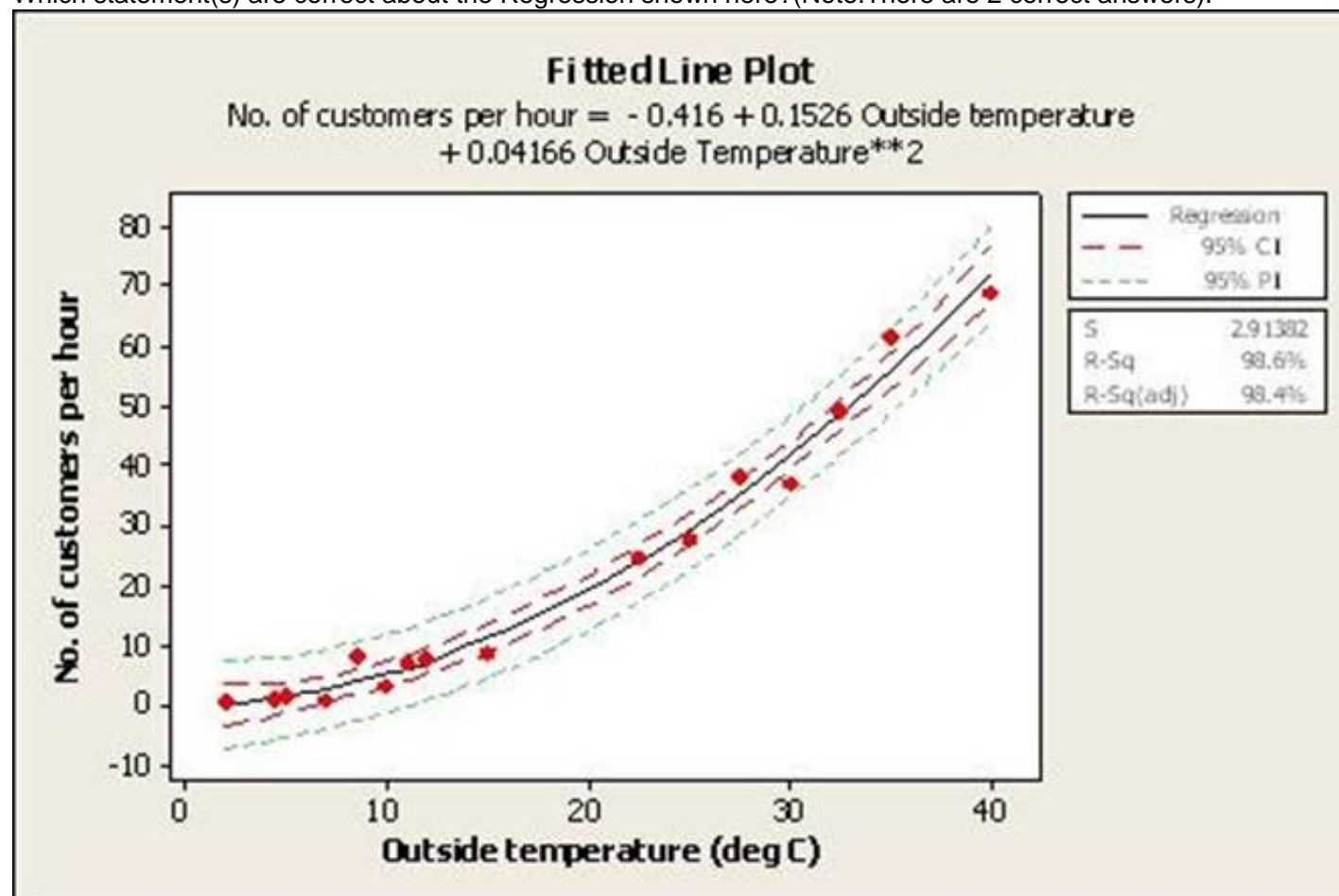
- A. Destructive variable gage R&R and Crossed Study
- B. Destructive variable gage R&R and Nested Study

- C. Nondestructive variable gage R&R and Crossed Study
D. Nondestructive variable gage R&R and Nested Study

Answer: D

NEW QUESTION 239

Which statement(s) are correct about the Regression shown here?(Note:There are 2 correct answers).



- A. The dependent variable is the outside temperature
B. The relationship between outside temperature and number of customers per hour is a Linear Regression
C. The dashed lines indicate with 95% confidence where all of the process data should fall between
D. The dashed lines indicate with 95% confidence the estimate for the Quadratic Regression Line
E. The predicted number of customers per hour is close to 5 if the outside temperature is 10 deg C

Answer: DE

NEW QUESTION 243

If an experiment has 5 factors and no replicates for a 2-level Experimental Design with 16 experimental runs which statement(s) are correct?(Note:There are 3 correct answers).

- A. The Main Effects for the 5 factors are not aliased or confounded but the 2-way interactions are confounded with the 3-way interactions
B. The Main Effects are confounded with only 4-way interactions
C. The Experimental Design is half-fractional
D. The experiment has 8 experimental runs with the first factor at the high level
E. The experiment has only 4 experimental runs with the 5th factor at the high level

Answer: BCD

NEW QUESTION 246

A Factorial Experiment based on a Level 2 Design with 4 factors would require 16 runs to fully assess the interactions.

- A. True
B. False

Answer: A

NEW QUESTION 249

Screening experiments are the proper choice when a Belt is faced with the situation of highly Fractional Factorial Designs.

- A. True
B. False

Answer: A

NEW QUESTION 250

Which of these items contribute to what is necessary for successful Kaizen events?

- A. Analysis tools
B. Management support

- C. Operator support
- D. All of these answers are correct

Answer: D

NEW QUESTION 255

The Hardware Store ordered ten lawn mower from the manufacturer and just before shipping the manufacturer found one to have a motor that wouldn't start. For the manufacturer this would be categorized as what type of cost?

- A. Internal Failure Costs
- B. External Failure Costs
- C. Prevention Costs
- D. Appraisal Costs

Answer: A

NEW QUESTION 260

A Personal Trainer was assessing her workout class participants for their body fat content and had to include data for her analysis. One of the columns listed the range of weight of the people included in the studies. This required plotting a Histogram of the weight of the people assessed for their body fat content. While drawing the Histogram the x-axis contained a certain scale of data. Pick the scale of data that is appropriate for Histograms.

- A. Ordinal Scale Data
- B. Ratio Scale Data
- C. Nominal Scale Data
- D. Interval Scale Data

Answer: D

NEW QUESTION 264

Which statement(s) are incorrect for the Regression Analysis shown here?(Note:There are 2 correct answers).

Regression Analysis: Turbine Output versus Air-Fuel Ratio, % steam, ...

The Regression Equation is

$$\text{TurbineOutput} = 16.5 + 3.21 \text{ Air-Fuel Ratio} + 0.386 \% \text{ methane} + 0.0166 \text{ SteamExitTemp}$$

Predictor	Coef	SE Coef	T	P
Constant	16.488	2.918	5.65	0.000
Air-Fuel Ratio	3.2148	0.2377	13.52	0.000
% methane	0.38637	0.07278	5.31	0.000
SteamExitTemp	0.016576	0.004273	3.88	0.004

S = 0.508616 R-Sq = 98.6% R-Sq(adj) = 98.2%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	3	170.003	56.668	219.06	0.000
Residual Error	9	2.328	0.259		
Total	12	172.331			

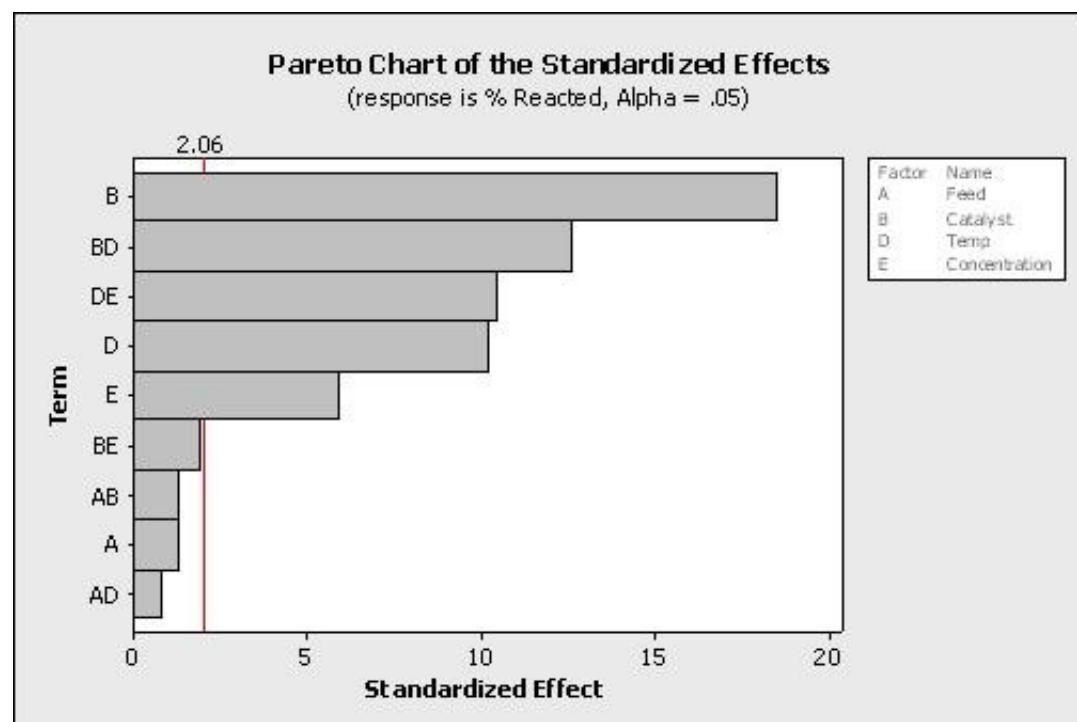
Source	DF	Seq SS
Air-Fuel Ratio	1	159.048
% methane	1	7.062
SteamExitTemp	1	3.892

- A. The air-fuel ratio explains most of the TurbineOutput variation
- B. The Regression explains over 98% of the process variation
- C. This Multiple Linear Regression has three statistically significant independent variables
- D. If the air-fuel ratio increases by 1, the TurbineOutput more than triples
- E. The SteamExitTemp explains the most variation of the TurbineOutput

Answer: DE

NEW QUESTION 266

Which statement(s) are correct about the Pareto Chart shown here for the DOE analysis?(Note:There are 2 correct answers).



- A. It is unknown from this graph how many factors were in the Experimental Design
 B. The factors to keep in the mathematical model are E, D, DE, BD and B with an alpha risk equal to 2.06
 C. The effects to keep in the mathematical model are E, D, DE, BD and B with an alpha risk equal to 0.05
 D. The factors to keep in the mathematical model with a 5% alpha risk are BE, AB, A and AD

Answer: AC

NEW QUESTION 268

If a process has subgroups for Variable data and the process runs for a long period of time, then the best pair of SPC Charts to use would be an Xbar and _____.

- A. NP Chart
 B. Individuals Chart
 C. R Chart
 D. C Chart

Answer: C

NEW QUESTION 273

Time is always the metric on the horizontal scale of a(n) _____ Chart.

- A. Pareto
 B. Xbar
 C. Multi-Vari
 D. NP

Answer: C

NEW QUESTION 276

Choose those characteristics of a Simple Linear Regression (SLR) Analysis that are applicable.(Note:There are 3 correct answers).

- A. The Correlation Coefficient is always greater than the Regression Coefficient in a SLR
 B. General Regression Analysis deals only with Continuous Data
 C. Non-linear Regressions can explain curvature when with more statistical confidence than Linear Regressions
 D. SLR can help quantify the significance of variation in X that influences the variation in Y via a mathematical equation
 E. A Correlation does not explain causation but a Regression Analysis with a statistically valid mathematical equation does explain causation

Answer: ADE

NEW QUESTION 281

When a Belt decides to use written procedures and visual controls to improve the consistency of the tasks that must occur in the process he is improving he has utilized the _____ activity of 5S.

- A. Sustaining
 B. Sorting
 C. Standardizing
 D. Straightening

Answer: C

NEW QUESTION 286

Which Experimental Design typically is most associated with the fewest number of input variables or factors in the design?

- A. Response Surface design
 B. Full Factorial design
 C. Simple Linear Regression

D. Fractional Factorial design

Answer: A

NEW QUESTION 288

Kaizens or Kaikakus and Six Sigma projects are intended to create incremental process improvements versus breakthrough, significant improvements.

- A. True
- B. False

Answer: B

NEW QUESTION 290

What conclusion is most correct about the Experimental Design shown here with the response in the far right column?

Adv	Bev	Des	Crux	Response
-1	-1	-1	-1	20
1	-1	-1	1	14
-1	1	-1	1	17
1	1	-1	-1	10
-1	-1	1	1	19
1	-1	1	-1	13
-1	1	1	-1	14
1	1	1	1	10

- A. No factor has enough statistical confidence greater than 95% to have an impact on the response rate
- B. Constant, Adv and Bev are the only factors statistically affecting the response rate with 95% confidence or more
- C. If the Adv is increased from the low level to the high level, the response rate increases
- D. The response level is statistically concluded to only need the Adv and Bev factors set at the low level to get the largest response rate
- E. This design does not have enough experimental runs to conclude anything as evidenced by the lack of P-values in the MINITABTM output

Answer: D

NEW QUESTION 291

Relative to a Design of Experiments the term _____ refers to variables being a linear combination of each other.

- A. Mirror Image
- B. Directly Parallel
- C. Collinear
- D. None of the above

Answer: C

NEW QUESTION 295

A Non-parametric Test should be used if just one distribution is not Normal out of the two or more gathered.

- A. True
- B. False

Answer: A

NEW QUESTION 300

On a _____ one can see a pattern from the graphed points such that conclusions can be drawn about the largest family of Variation.

- A. Multi-Vari Chart
- B. Weighted Scale
- C. X-Y Matrix
- D. Poisson Chart

Answer: A

NEW QUESTION 301

Which of the items listed do not define what an X-Y Diagram is?

- A. Created for every project
- B. Based on team's collective opinions
- C. Updated whenever a parameter is changed
- D. Used to show each step in a process
- E. A living document throughout project lifecycle

Answer: D

NEW QUESTION 302

The Greek letter "sigma" is used by mathematicians to signify _____.

- A. Curve Width
- B. Numerical Average
- C. Standard Deviation
- D. Data Spread

Answer: C

NEW QUESTION 303

An operator checks that all boxes being packed contain enough products to fill the box. However, each box getting filled has a different number of products in it. This is a Reproducibility problem, not a Repeatability problem.

- A. True
- B. False

Answer: B

NEW QUESTION 307

If in an experiment all possible variable pairs sum to zero the design is Orthogonal.

- A. True
- B. False

Answer: A

NEW QUESTION 308

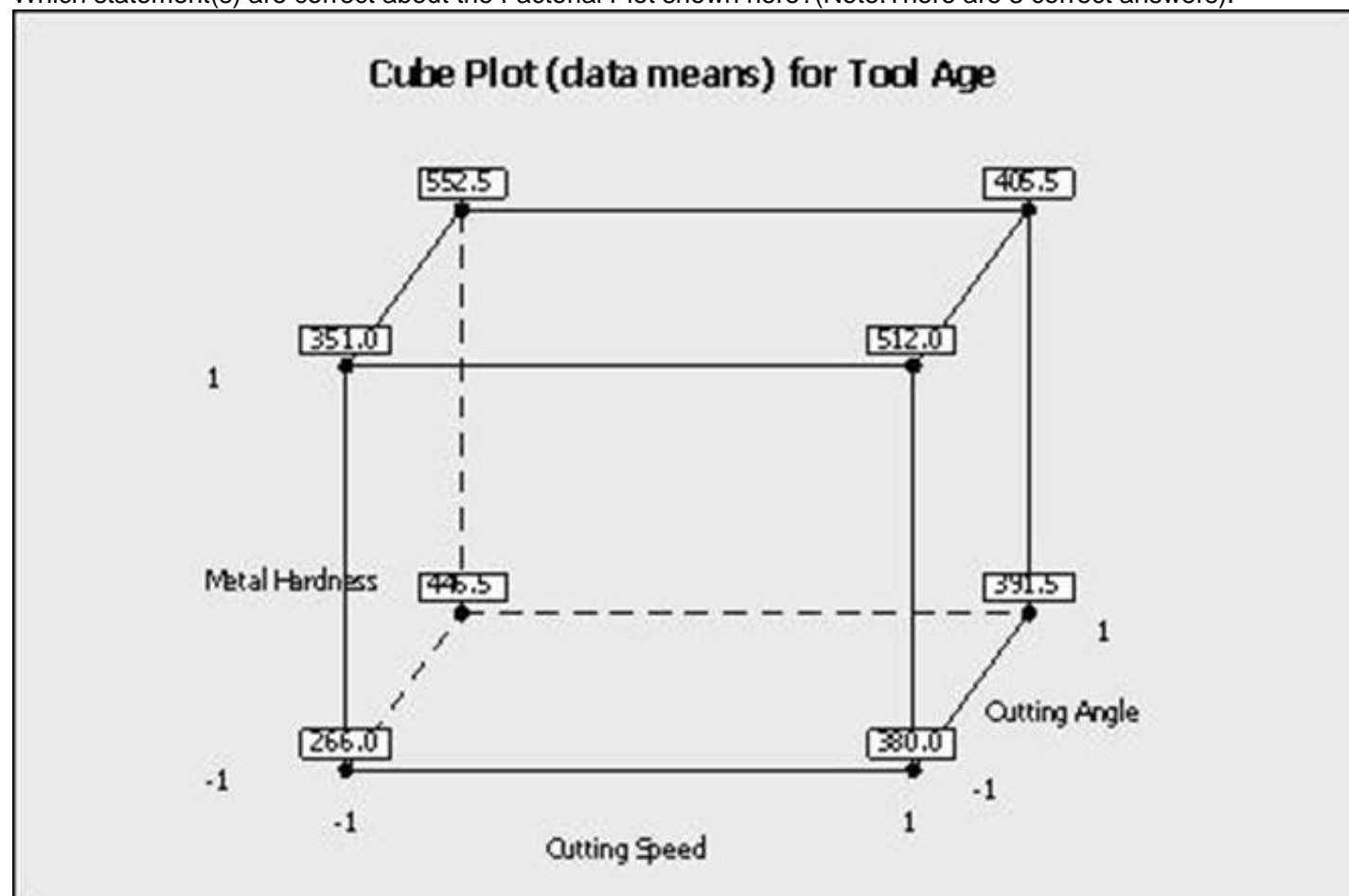
When doing Hypothesis Testing on Non-normal data Belts will use a _____ to compare more than two sample proportions to each other.

- A. Z score Table
- B. Sakami Table
- C. Mean-to-Mode Analysis
- D. Contingency Table

Answer: C

NEW QUESTION 311

Which statement(s) are correct about the Factorial Plot shown here?(Note:There are 3 correct answers).



- A. When the cutting speed increased from low to high level, the tool age increases
- B. The coefficient of the metal hardness is positively related to the output of tool age
- C. The coded coefficient is lower for cutting speed than the cutting angle related to the output of tool age
- D. These plots prove a statistically significance factor with 95% confidence
- E. These plots are an example of interaction plots

Answer: ABC

NEW QUESTION 313

The Normal Distribution is considered to be the most important distribution in statistics and, among other things is defined as having a total area under the curve of 1, is mound and symmetrical and the Mean, Median and Mode are _____.

- A. All evenly divisible by 3
- B. Twice the Standard Deviation
- C. Within 10% of each other
- D. The same number

Answer: D

NEW QUESTION 314

Fractional Factorial Designs are used to analyze factors to model the output as a function of inputs if Hypothesis Testing in the Analyze Phase was inadequate to sufficiently narrow the factors that significantly impact the output(s).

- A. True
- B. False

Answer: A

NEW QUESTION 315

From this list select the best example of Bias in Sampling.

- A. Testing the completeness of cooking a cake but the testers cannot agree on how to measure internal temperature
- B. Testing the sharpness of a razor blade while the sample of 500 are from the same model razor
- C. Testing the weight of participants at a wrestling event and only measuring those who finished second or better
- D. Testing a hand-held GPS models for durability using samples only from Nokia Model P120

Answer: C

NEW QUESTION 316

Which of these are examples of business metrics or Key Performance Indicators commonly referred to as KPI's?

- A. Cycle Time
- B. Defects
- C. N
- D. of Units Reworked
- E. Labor Hours
- F. All of these answers are correct

Answer: E

NEW QUESTION 317

A Belt working in a supply chain environment has to make a decision to change suppliers of critical raw materials for a new product upgrade. The purchasing manager is depending on the Belt's effort requiring that the average cost of an internal critical raw material component be less than or equal to \$4,200 in order to stay within budget. Using a sample of 35 first article components, a Mean of the new product upgrade price of \$4,060, and a Standard Deviation of \$98 was estimated. The Alternative Hypothesis in the above example is?

- A. The Standard Deviation is equal to \$300
- B. The Mean is less than \$4,320
- C. The Mean is equal to \$4,060
- D. The Mean is less than \$4,200
- E. The Mean is greater than \$ 4,200

Answer: E

NEW QUESTION 318

When a Belt implements an improvement that is automated thus requiring no particular understanding for use he has applied which Lean tool?

- A. Mistake Proofing
- B. Kaizen Event
- C. 5S
- D. None of the above

Answer: A

NEW QUESTION 323

Which of these is not a primary cause for Non-normal Data?

- A. Skewness
- B. Mixed Distributions
- C. Kurtosis
- D. Formulosis
- E. Granularity

Answer:

D

NEW QUESTION 327

The reported Cpk for a process with an average of 104 units, a spread of 18 units and upper and lower specification limits of 122 and 96 units would be?

- A. 0.5
- B. 0.89
- C. 1.00
- D. 2.00

Answer: B

NEW QUESTION 329

A Belt has determined that the inventory of repair parts at a rework station can be reduced by 45%. According to Cost of Poor Quality (COPQ) definitions inventory reduction would be considered _____.

- A. Soft Savings
- B. COPQ efficiency
- C. Median Savings
- D. Hard Savings

Answer: D

NEW QUESTION 333

The _____ is the most frequently occurring value in a distribution of data.

- A. Median
- B. Mean
- C. Center Point
- D. Mode

Answer: D

NEW QUESTION 338

The reported Cpk for a process with an average of 98 units, a spread of 16 units and upper and lower specification limits of 115 and 90 units would be?

- A. 0.5
- B. 0.75
- C. 1.00
- D. 1.25

Answer: C

NEW QUESTION 342

One of the foundations of Lean Six Sigma is the concept that the output of a process (Y) is influenced by the process inputs (X's) and is commonly shown as which formula?

- A. $Y = Z(X^2)$
- B. $Y = f(X^3)$
- C. $Y = f(X^n)$
- D. $Y = g(X + 1.5)$

Answer: C

NEW QUESTION 345

A Belt working in a supply chain environment has to make a decision to change suppliers of critical raw materials for a new product upgrade. The purchasing manager is depending on the Belt's effort requiring that the average cost of an internal critical raw material component be less than or equal to \$4,200 in order to stay within budget. Using a sample of 35 first article components, a Mean of the new product upgrade price of \$4,060, and a Standard Deviation of \$98 was estimated. In order to increase the Long Term Z value to 4, what is the maximum long term variation in pricing the Belt can accept for his upgraded critical raw material component?

- A. \$20
- B. \$35
- C. \$70
- D. \$110

Answer: B

NEW QUESTION 350

Which statement(s) are incorrect for the Regression Analysis shown here?(Note: There are 2 correct answers).

Regression Analysis: Turbine Output versus Air-Fuel Ratio, % steam, ...

The Regression Equation is

$$\text{TurbineOutput} = 16.5 + 3.21 \text{ Air-Fuel Ratio} + 0.386 \% \text{ methane} + 0.0166 \text{ SteamExitTemp}$$

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- D. If the air-fuel ratio increases by 1, the TurbineOutput more than triples
- E. The SteamExitTemp explains the most variation of the TurbineOutput

Answer: DE

NEW QUESTION 355

For a Normal Distribution as samples size increases the Range in Mean and Standard Deviation decrease relative to the Mean and Standard Deviation of the population.

- A. True
- B. False

Answer: A

NEW QUESTION 356

Which of these might contribute to similar distributions having Unequal Variance?

- A. Extreme tails
- B. Outliers
- C. Multiple Modes
- D. All of the above

Answer: D

NEW QUESTION 360

The two types of data that can be used in Statistical Analysis are Attribute and Variable.

- A. True
- B. False

Answer: A

NEW QUESTION 363

Which of these elements are not included in Implementation plans?

- A. Work breakdown structure
- B. Cost/Benefit ratios
- C. Risk management plans
- D. Planned audits of work completion

Answer: B

NEW QUESTION 365

Appropriate measures means that measurements are .

- A. Representative
- B. Sufficient
- C. Contextual
- D. Relevant

E. All of these answers are correct

Answer: E

NEW QUESTION 369

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