



IASSC

Exam Questions ICBB

IASSC Certified Lean Six Sigma Black Belt

NEW QUESTION 1

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 _____.

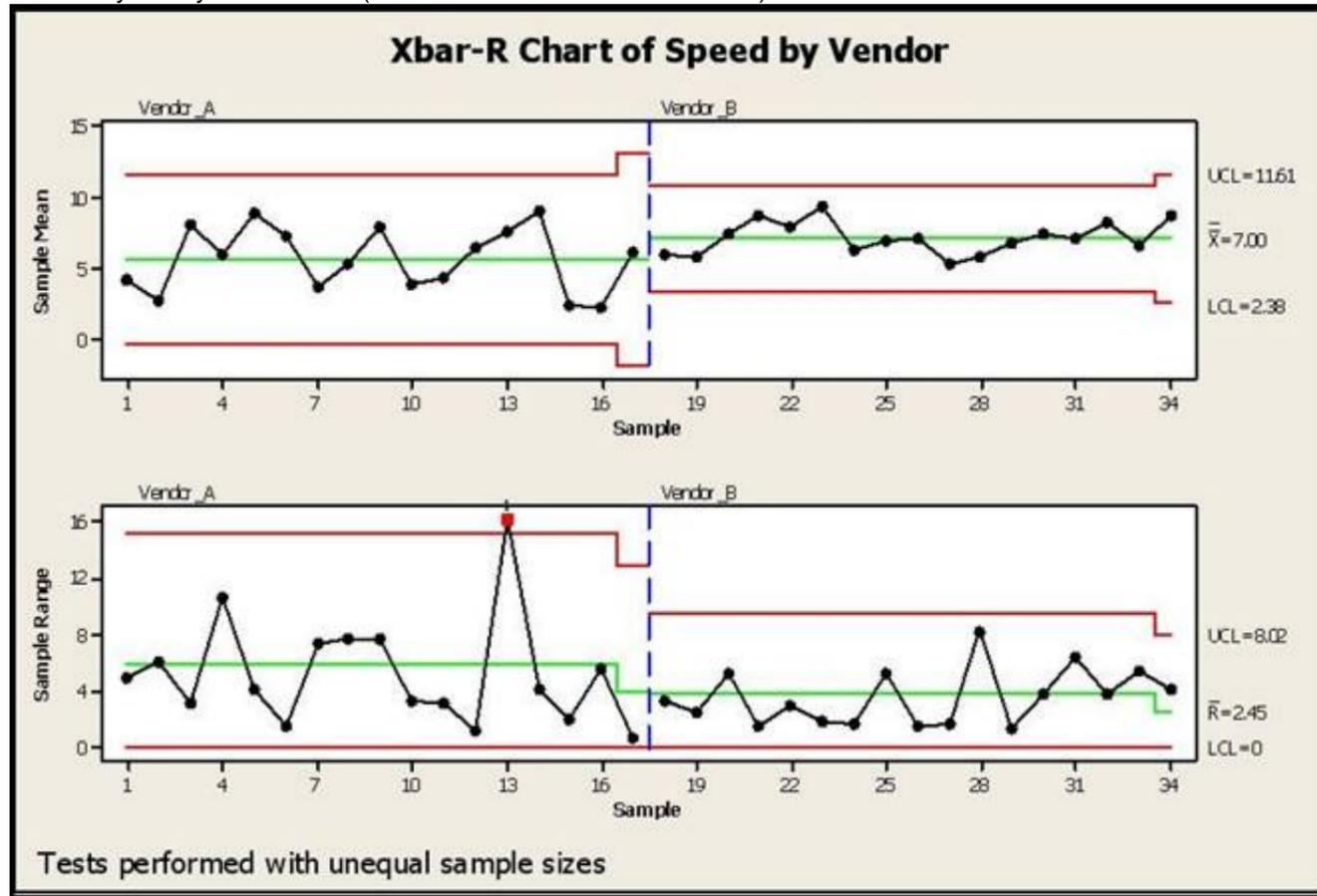
- A. Soft Savings
- B. COPQ efficiency
- C. Median Savings
- D. Hard Savings

Answer: D

NEW QUESTION 2

SPC Charts are used extensively in different business and decision-making environments.

In this example a vendor is being selected based on speed of delivery. Which of the conclusions would help you pick a vendor for your needs regarding lead-time of delivery from your vendors?(Note:There are 4 correct answers).

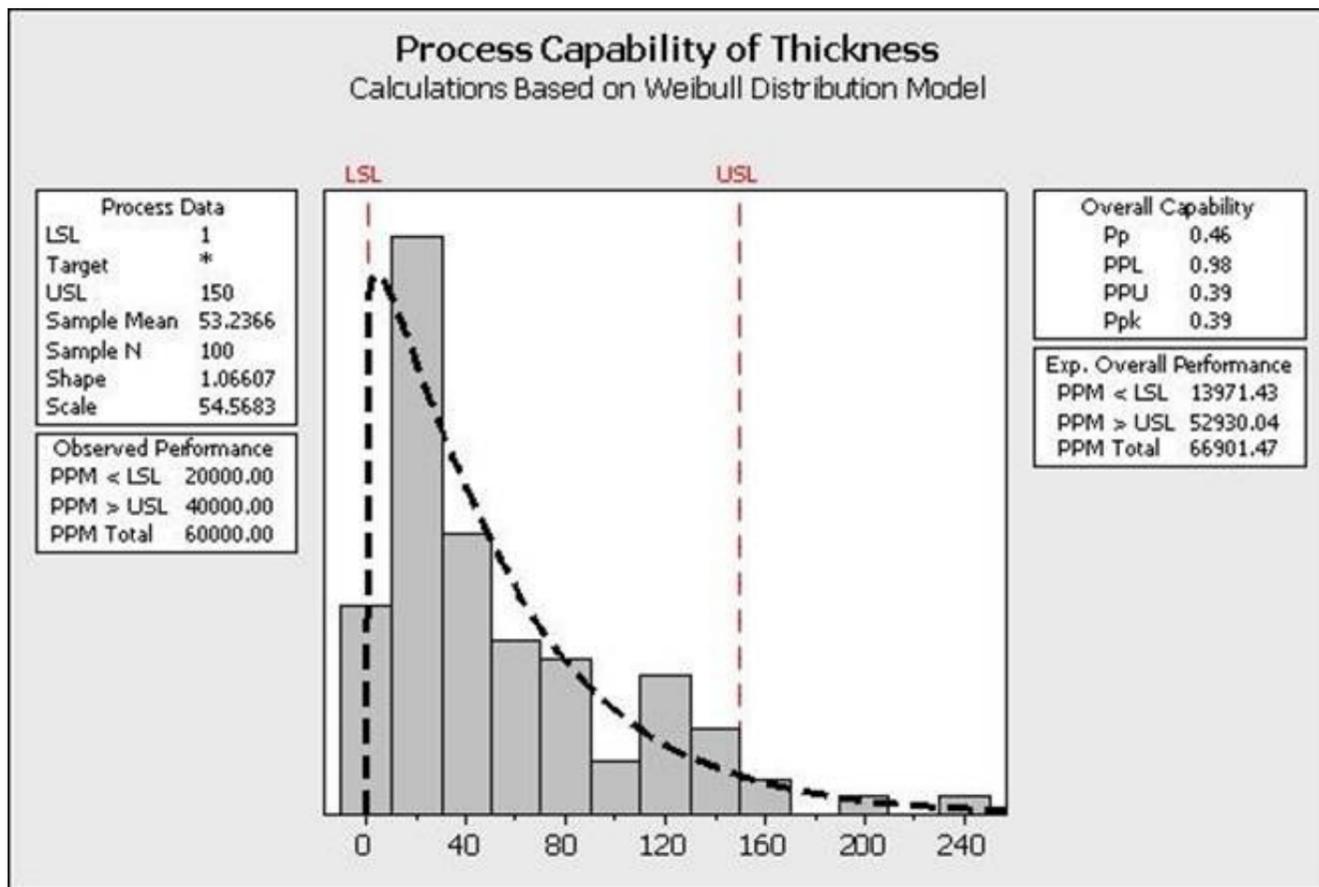


- A. Vendor A with a much shorter lead time in delivery
- B. Vendor B as it has a better consistency (lower variance) on lead time
- C. Vendor B since Vendor A shows a situation out of control as shown in red
- D. Vendor B since the Control Limits are much narrower than Vendor A
- E. Vendor B has higher lead time, but a process with much narrower Control Limits

Answer: BCDE

NEW QUESTION 3

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 4

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 5

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 6

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 7

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 8

A Process Map is created in order that a Belt can _____.

- A. Follow the product to the end
- B. Get the line people's names correct
- C. Capture all the activities comprising the process
- D. Manage the input inventory delivery schedule

Answer: C

NEW QUESTION 9

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 valid Multiple Linear Regression (MLR) is characterized by all of these except?

- A. It is an assumption that the X's (inputs) are not correlated to each other
- B. The X's (inputs) are assumed to be independent of each other
- C. The Residuals from MLR analysis have to be Normally Distributed
- D. MLR is conducted based on a deliberate form of experimentation
- E. It is not possible to evaluate interactions in a MLR analysis

Answer: D

NEW QUESTION 10

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 12

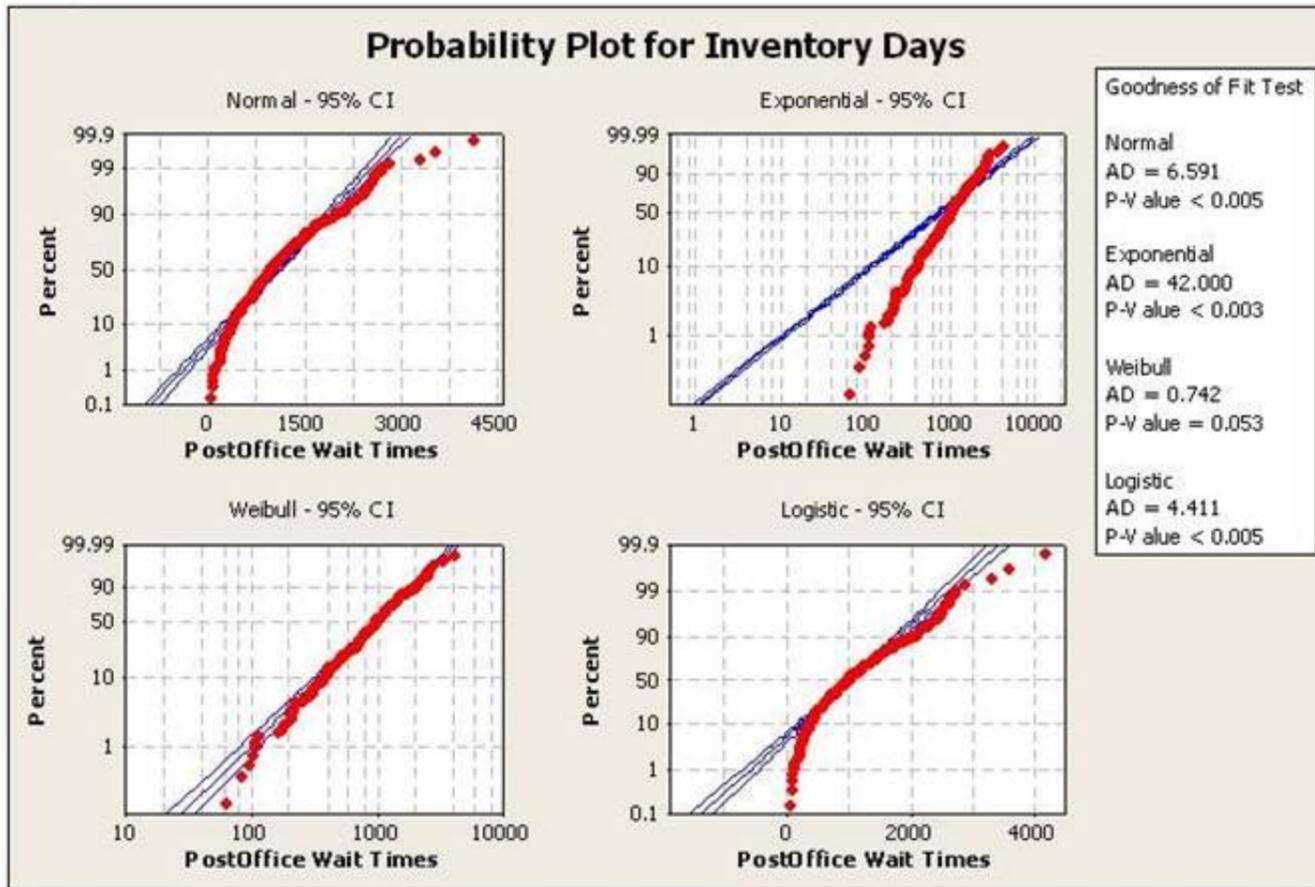
When the Inputs, X's, for your process are Normally Distributed about the Mean, the Outputs, Y's, will be Normally Distributed.

- A. True
- B. False

Answer: B

NEW QUESTION 13

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 18

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 20

A Belt rearranged the location of the parts inventory for a rework station locating the most often used parts to be within hand reach of the repair person. This rearrangement resulted in quicker repair times by eliminating one of seven major elements of waste which is the Waste of _____ .

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

Answer: A

NEW QUESTION 23

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 24

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

- A. True
- B. False

Answer: B

NEW QUESTION 26

Cost of Poor Quality (COPQ) can be classified as Visible Costs and Hidden Costs. Which of these items is a Visible Cost?

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

Answer: C

NEW QUESTION 28

Using this data calculate the percentage of DPU.

- A. 2.74
- B. 3.23
- C. 4.56
- D. 5.93

Answer: B

NEW QUESTION 30

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 35

Fractional Factorial designs are used to reduce the time and cost of experiments because the _____ has been lowered.

- A. Number of data measurement points
- B. Number of runs
- C. People involved
- D. Output summary

Answer: B

NEW QUESTION 37

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 39

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 41

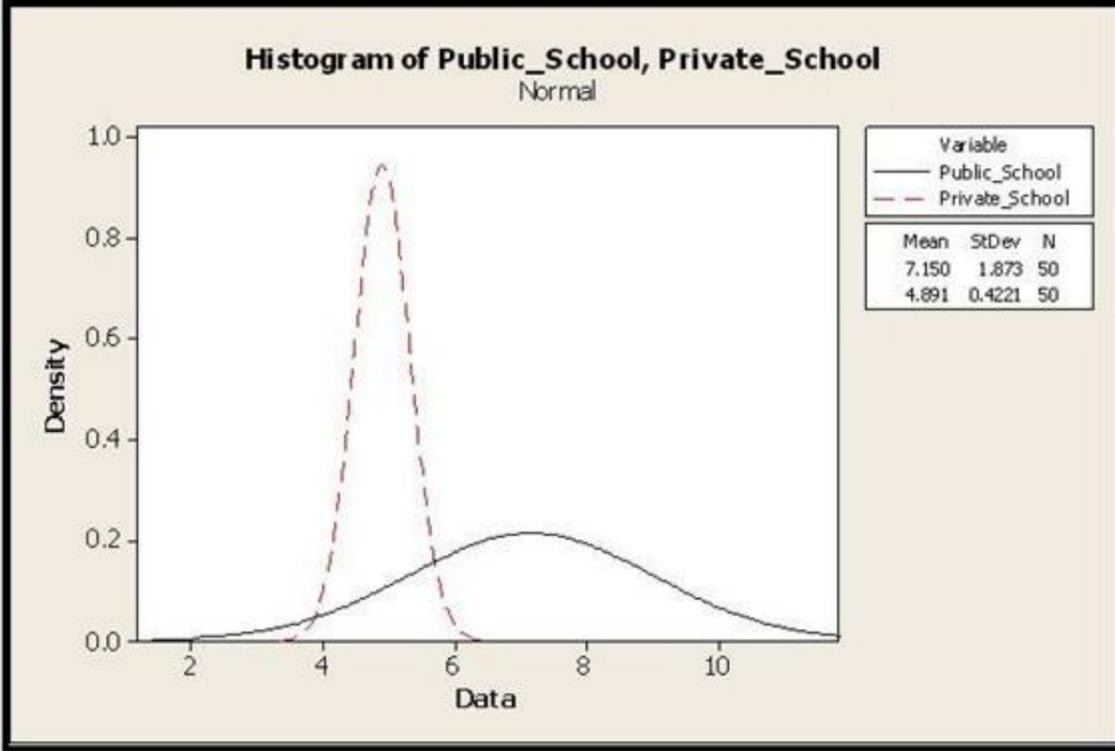
The calculation of Column Total times Row Total divided by Grand Total yields expected values from what type of chart?

- A. Pareto Chart
- B. Sakami Table
- C. Contingency Table
- D. None

Answer: C

NEW QUESTION 46

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 = mu (Private_School) - mu (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 48

Calculate the Rolled Throughput Yield of this process using this data. Data:unit input: 1215, unit output: 1180, defectsrepaired:184, scrap: 42

- A. 80.85%
- B. 81.40%
- C. 82.23%
- D. 84.96%

Answer: B

NEW QUESTION 49

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 51

Using this partial Z Table, how many units from a month's production run are expected to not satisfy customer requirements for the following process?
Upper specification limit: 7.2 Lower specification limit: 4.3 Mean of the process: 5.9 Standard Deviation: 0.65 Monthly production: 450 units

- A. 3
- B. 7
- C. 10
- D. 12

Answer: C

NEW QUESTION 52

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 55

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 56

What dollar amount of savings would a project show if it reduced your outstanding Accounts Receivable by \$1.4 million dollars to \$5.3 million total and your organization's marginal cost of capital was 6.2%?

- A. \$43,400
- B. \$86,800
- C. \$117,500
- D. \$328,600

Answer: B

NEW QUESTION 61

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 66

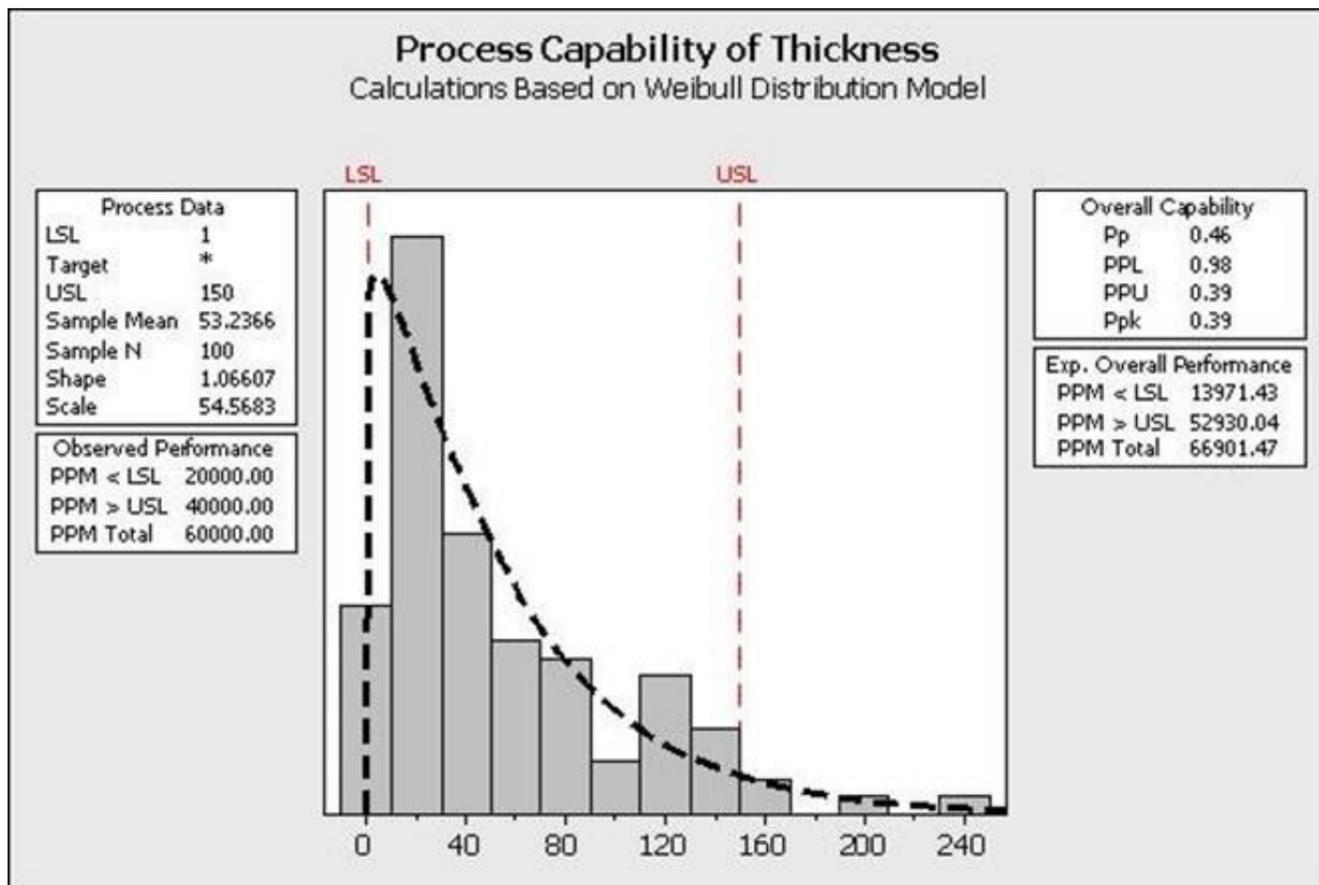
Which statement(s) are incorrect about Fractional Factorial Designs?

- A. A Half Fractional Design for 5 factors has the same number of experimental runs as a Full Factorial Design for 4 factors assuming no repeats or replicates or Center Points
- B. Quarter Fractional experiments can exist for those with 4 factors
- C. Resolution V design is desired while controlling costs of experimentation
- D. Half Fractional experiments do not exist for those designs with only 2 factors

Answer: C

NEW QUESTION 67

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 69

The Lean toolbox includes all of the following items except _____.

- A. Poke-Yoke
- B. Standard Operating Procedures
- C. Kaizen
- D. 5S the work area

Answer: B

NEW QUESTION 70

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

- A. True
- B. False

Answer: A

NEW QUESTION 74

An example of the waste of mismanaged Inventory is _____.

- A. Capital costs of money
- B. Value decrease from aged inventory
- C. Cost of storage space
- D. All of these answers are correct

Answer: D

NEW QUESTION 76

A _____ is used primarily to track the stability of the average value of a metric of interest.

- A. NP Chart
- B. Xbar-R Chart
- C. I-MR Chart
- D. C Chart

Answer: B

NEW QUESTION 81

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

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

Answer: C

NEW QUESTION 86

Assessing process proportion as opposed to evaluating a process with respect to a set target can be done using one or more of these.(Note:There are 2 correct answers).

- A. Process proportion equals some desired value
- B. Process proportion equals some value range
- C. Target is current
- D. When we deal with Attribute type data
- E. Proportion of the tail is equal

Answer: AD

NEW QUESTION 87

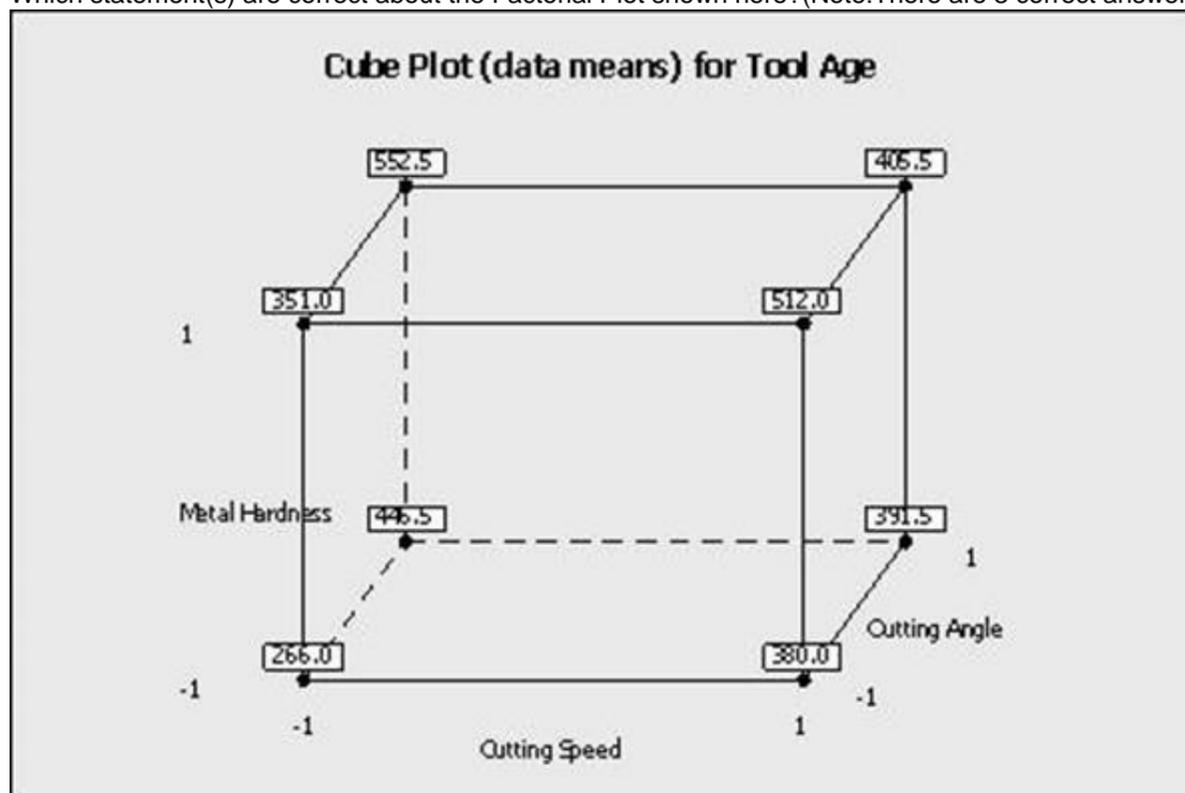
All the data points that represent the total set of information of interest is called the _____.

- A. Population
- B. Sample
- C. Frame
- D. Spread

Answer: A

NEW QUESTION 90

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 93

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 95

Of the various types of data shown which is NOT representative of Variable Data.

- A. Child's height is 4 foot 3 inches
- B. Three employees wore hard hats
- C. Car burned 2.7 gallons of gasoline
- D. Train was going 140 kilometers per hour

Answer: B

NEW QUESTION 97

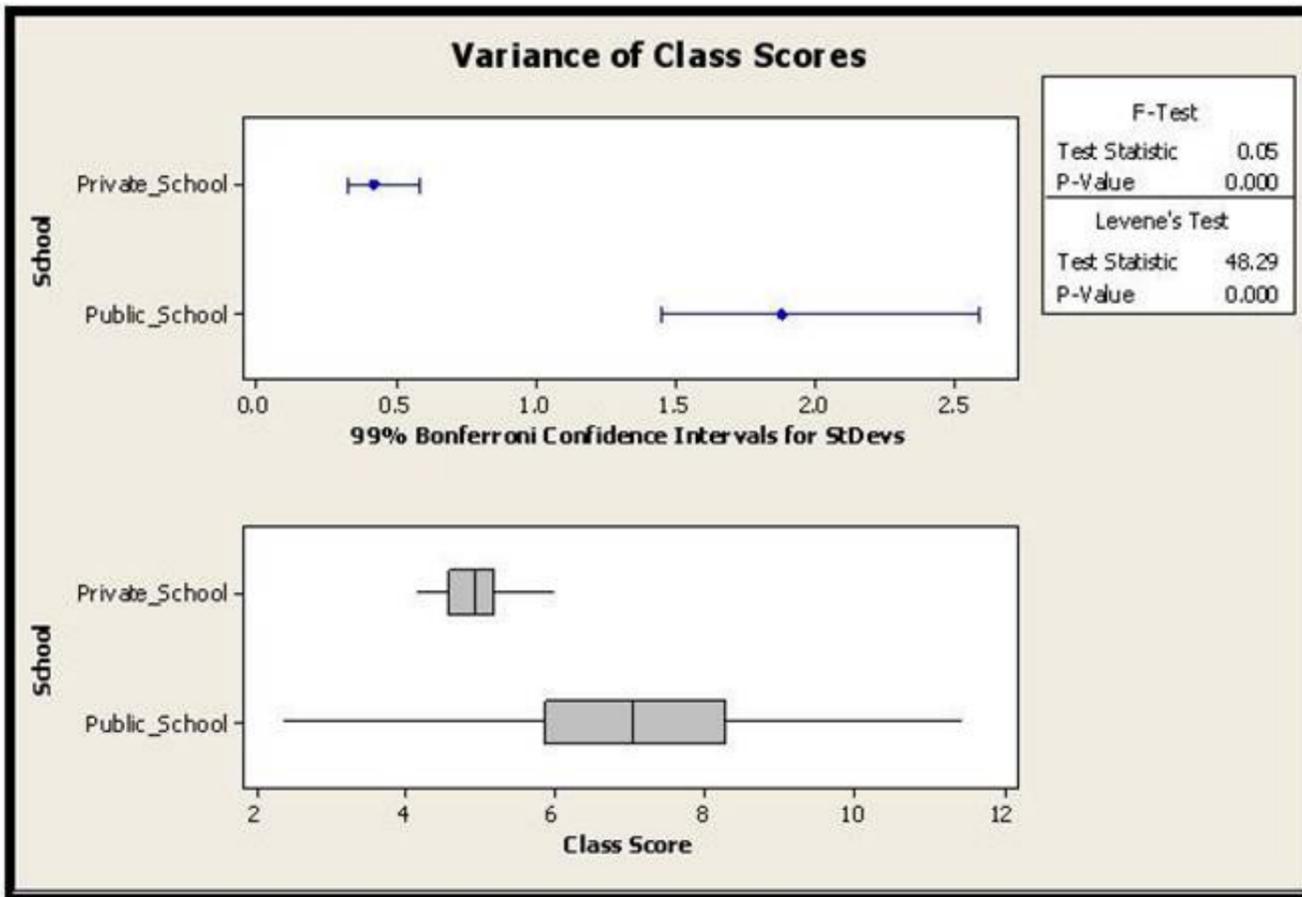
If a Six Sigma project was to reduce repair station inventory and the team found the inventory was creeping up over time which Lean tools should be considered in the Control Phase to reestablish and sustain the project success?

- 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 101

From the variance F-test shown above, which of these conclusions is/are valid?



Test for Equal Variances: Class Score versus School

99% Bonferroni confidence intervals for standard deviations

School	N	Lower	StDev	Upper
Private_School	50	0.32753	0.42210	0.58233
Public_School	50	1.45338	1.87303	2.58404

F-Test (Normal Distribution)
 Test statistic = 0.05, p-value = 0.000

- A. The variance between the class score distribution is significantly different
- B. The variance between the class score distribution is not significantly different
- C. This test applies only to Normal Distributed data at 99 % confidence
- D. This test applies only to Non-normal Data at 99 % confidence
- E. There are not enough data points to make any statistical conclusions

Answer: A

NEW QUESTION 105

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 110

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 113

Sally bought a blender from her local appliance store. When she changed blades the blender would not function. 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: B

NEW QUESTION 114

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 117

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 121

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 124

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 129

Questions that can be best answered by a Visual Factory include all of these except _____.

- A. Are downtime issues easily noted?
- B. Can extra inventory be seen easily?
- C. Are unneeded tools or supplies easily noted?
- D. Are setups optimized for lower scrap levels?

Answer: D

NEW QUESTION 131

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 134

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

- A. True
- B. False

Answer: B

NEW QUESTION 139

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 142

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 147

Following the completion of a LSS project the Belt not only creates a Control Plan he also develops a _____ so those involved in the process know what to do when the critical metrics move out of spec.

- A. Response Plan
- B. Call List
- C. Chain-of-Command
- D. Defect Analysis Plan

Answer: A

NEW QUESTION 151

Statistical Difference is the magnitude of difference or change required to distinguish between a true difference, brought about by change or improvement, and one that could have occurred by chance.

- A. True
- B. False

Answer: A

NEW QUESTION 152

For her injection molding project a _____ Belt needed to track the percentage of defectives of a particular sample set so she used a to display the data?

- A. Individual Chart
- B. C Chart
- C. Xbar Chart
- D. P Chart

Answer: D

NEW QUESTION 155

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 160

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

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

Answer: D

NEW QUESTION 161

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 164

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 167

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 170

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 172

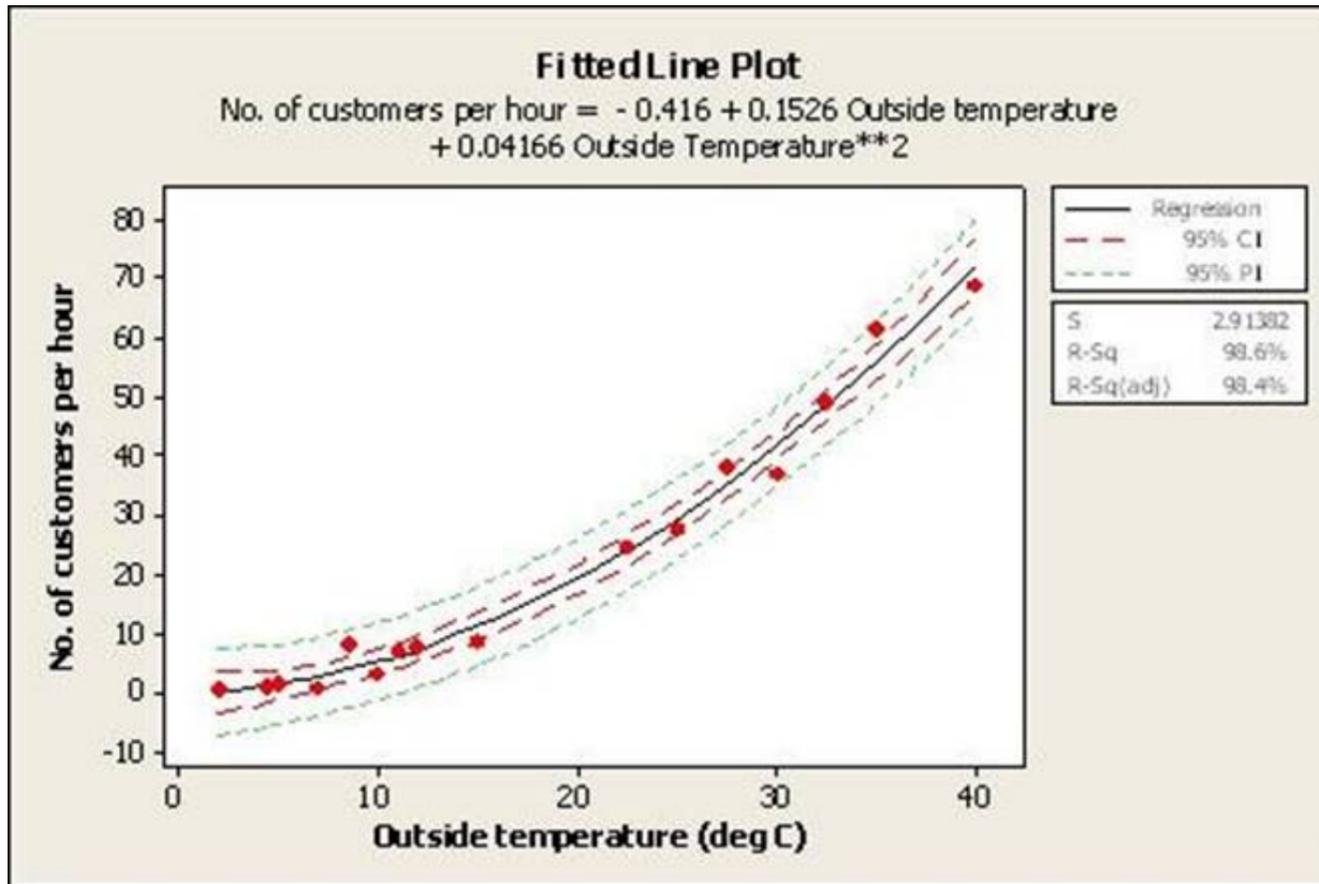
What is the Ppk of a process with a spread of 24 units, an average of 68, an upper limit of 82 and a lower limit of 54?

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

Answer: C

NEW QUESTION 175

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 180

How many experimental runs exist in a Full Factorial and fully randomized design for 4 factors with 2 replicates for the Corner Points and no Center Points? The factors in the experiment are only at 2-levels.

- A. 10
- B. 32
- C. 256
- D. 64

Answer: B

NEW QUESTION 181

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 184

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 188

When analyzing the behavior of our process to assess customer satisfaction we are concerned about both the variation such that it stays within the spec limits and how well the Mean is _____ the process requirements.

- A. Balanced against
- B. Over and above
- C. Twice as great as
- D. Centered relative to

Answer: D

NEW QUESTION 189

How many experimental runs exist in a Full Factorial and fully randomized design for 5 factors with 2 replicates for the Corner Points and no Center Points? The

factors in the experiment are only at 2-levels.

- A. 10
- B. 128
- C. 256
- D. 64

Answer: D

NEW QUESTION 192

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 196

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 200

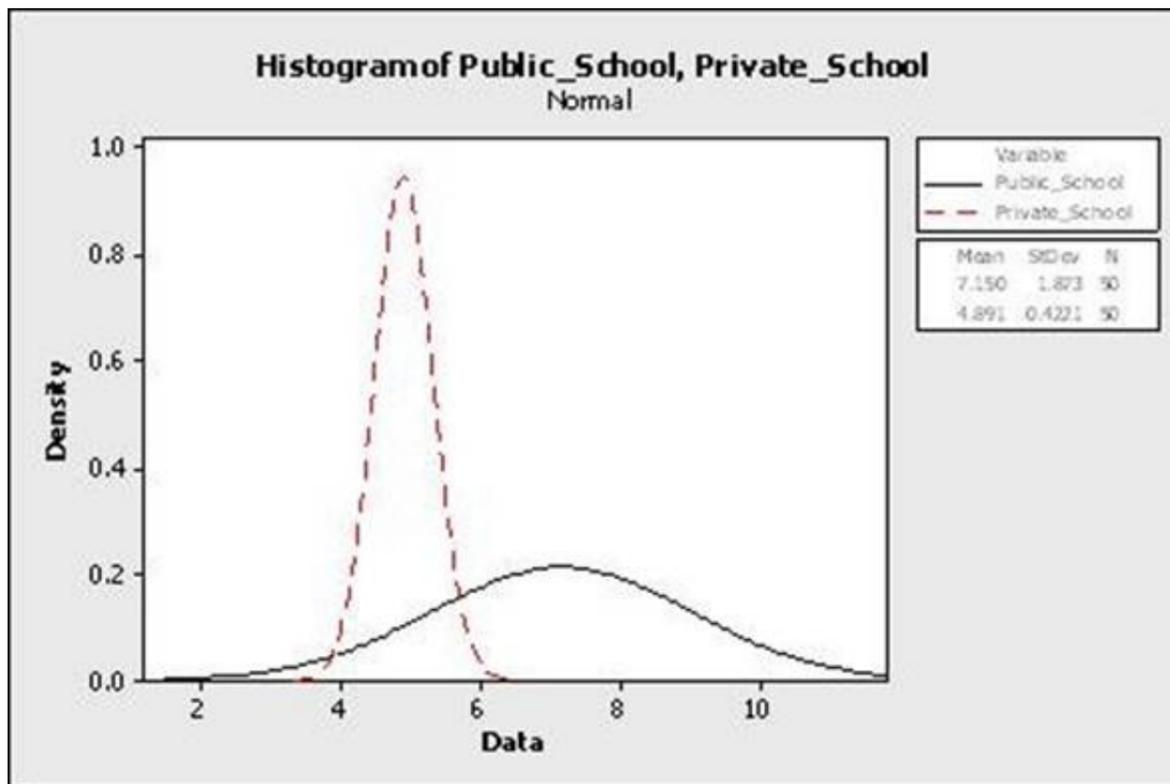
If an experiment has 5 factors and no replicates for a 2-level Experimental Design with 16 experimental runs which statement is incorrect?

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

Answer: C

NEW QUESTION 203

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

Answer: A

NEW QUESTION 207

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. Ration Scale Data
- C. Nominal Scale Data
- D. Interval Scale Data

Answer: D

NEW QUESTION 211

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 215

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 216

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. 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 217

Which statement(s) are incorrect about Fractional Factorial Designs?

- A. A Half Fractional Design for 5 factors has the same number of experimental runs as a Full Factorial Design for 4 factors assuming no repeats or replicates or Center Points
- B. Quarter Fractional experiments can exist for those with 4 factors
- C. Resolution V design is desired while controlling costs of experimentation
- D. Half Fractional experiments do not exist for those designs with only 2 factors

Answer: C

NEW QUESTION 218

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 222

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 225

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

- A. Histograms
- B. SPC Charts
- C. NP Charts
- D. Pareto Charts

Answer: B

NEW QUESTION 228

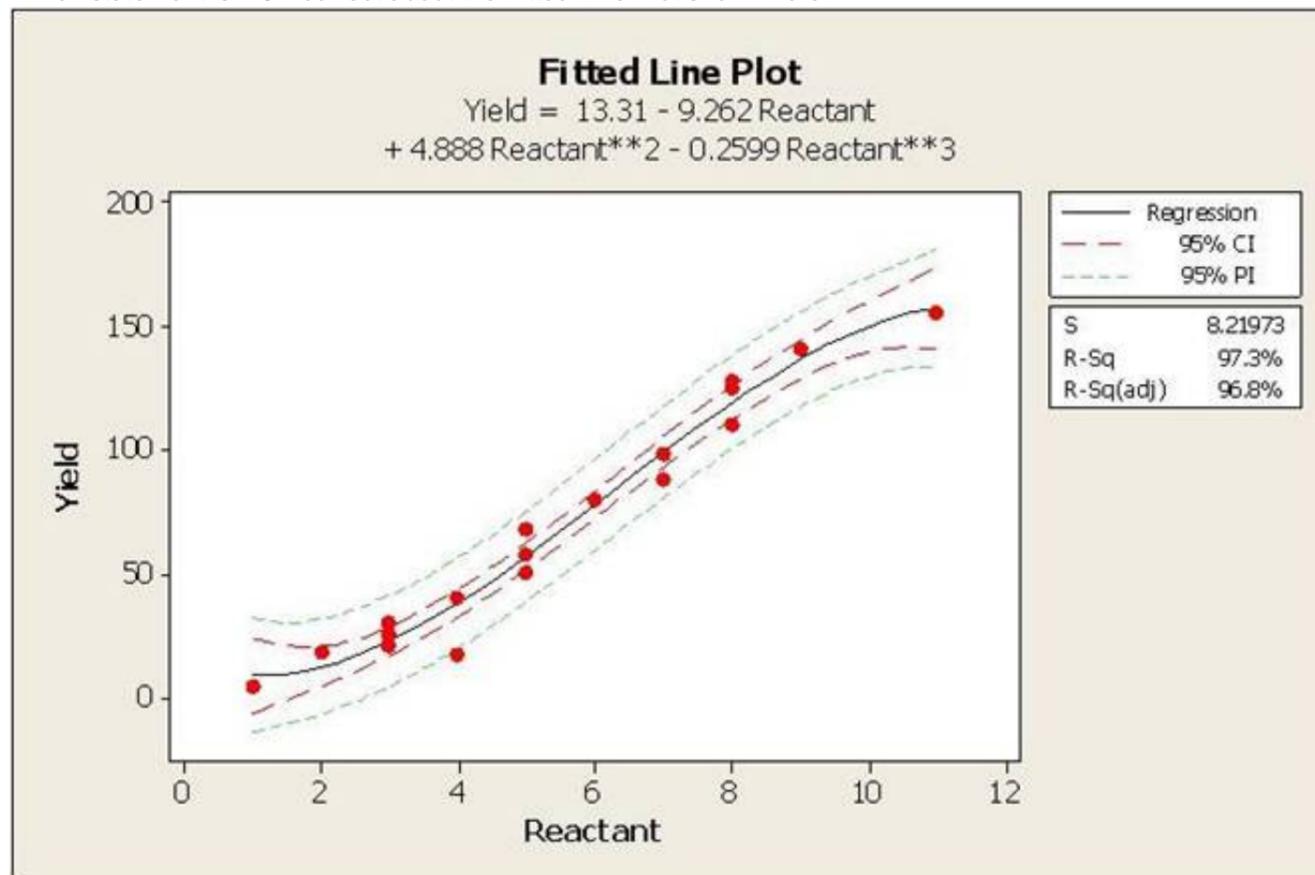
Relative to a Design of Experiments the term _____ refers to variables being a linear combination of each other.

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

Answer: C

NEW QUESTION 231

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



- A. The independent variable is the reactant
- B. If the reactant was 10 units, with 95% confidence we would expect a minimum yield of 148 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 6 and 8 units yields around 40 to 60
- E. When the reactant increases, the expected yield would increase

Answer: D

NEW QUESTION 233

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 238

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 242

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 246

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 249

Sally and Sara sell flower pots at their garage sale. Martha motivates Rose mentioning that they will sell a minimum of 16 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 15.2 pots per day were sold with a Standard Deviation of 0.6 pots. What is the Z value for this sales process?

- A. 0.67
- B. 1.13
- C. 1.33
- D. 2.66

Answer: C

NEW QUESTION 251

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 254

A natural logarithmic base is not required for which of these distributions for probability calculations?

- A. Weibull
- B. Normal
- C. Poisson
- D. Binomial

Answer: D

NEW QUESTION 258

For Attribute Data, Process Capability is defined as the average proportion of nonconforming products.

- A. True
- B. False

Answer: A

NEW QUESTION 263

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

- A. True
- B. False

Answer: A

NEW QUESTION 264

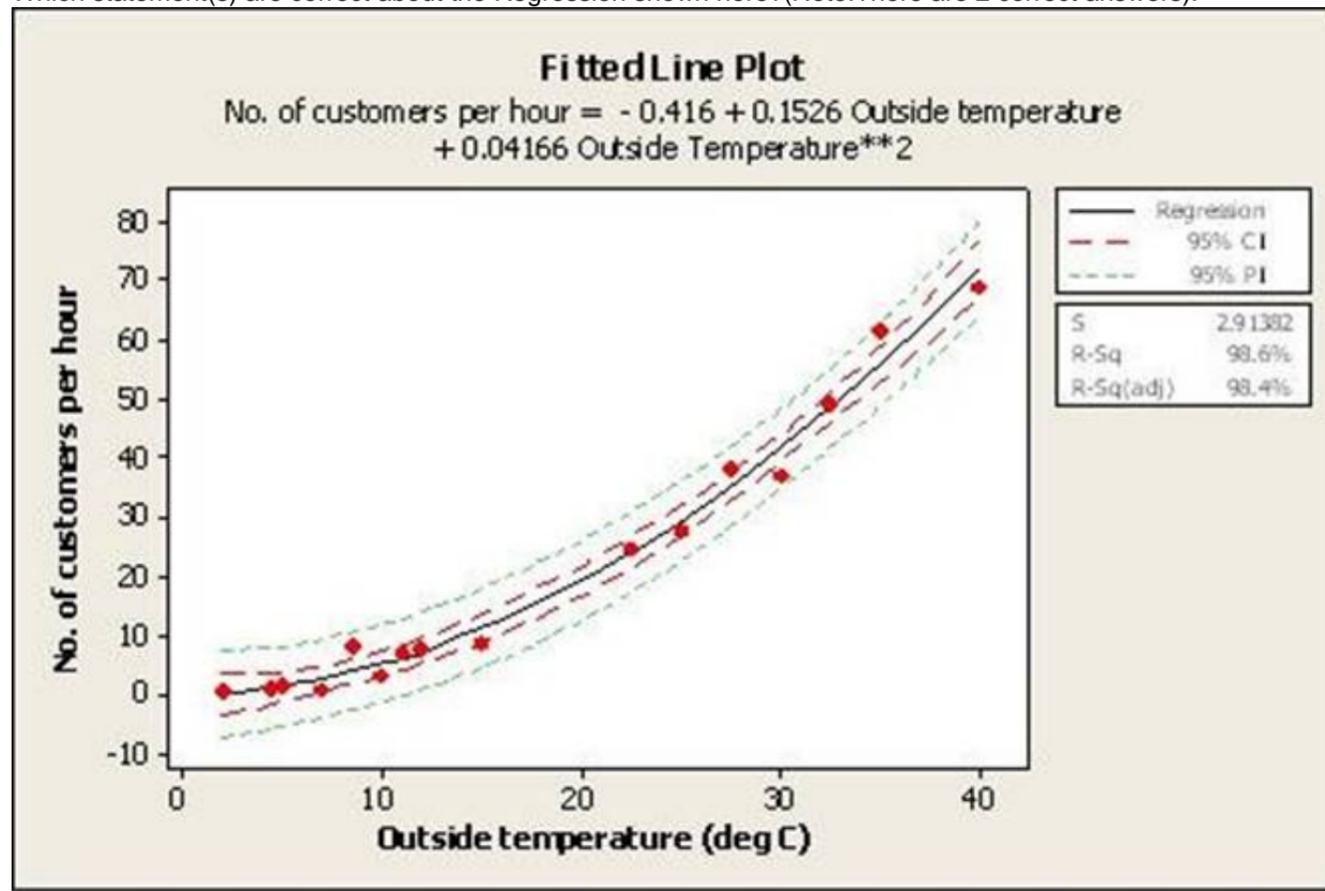
To properly analyze the variables impacting the output of a process we need to collect data that represents at least 80% of the variation in the process and assure ourselves we are collecting data from all three types of variation which are _____.

- A. Within, Between and Temporal
- B. Within, Between and Temporary
- C. Without, Above and Below
- D. Induced, Natural and Unavoidable

Answer: A

NEW QUESTION 269

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 274

“A calculated time frame that matches customer demand” is a definition of what Lean Principles term?

- A. Value Stream
- B. Kaizen event
- C. Takt time
- D. Kanban

Answer: C

NEW QUESTION 276

Contingency Tables are used to test for association, or dependency, between two or more classifications.

- A. True
- B. False

Answer: A

NEW QUESTION 279

When conducting a Hypothesis Test using Continuous Data the proper sample size is influenced by the extent to which we need to assess a Difference to be detected and the inherent variation in the process.

- A. True
- B. False

Answer: A

NEW QUESTION 282

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 285

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 289

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 290

To establish a sample size that will allow the proper overlap of distributions we do which of these?

- A. Multiply Alpha by 1.75
- B. Calculate one minus Beta
- C. Calculate Beta plus 2
- D. Multiply Beta by 3

Answer: B

NEW QUESTION 295

Production Line 1 is able to complete 500 units per shift. Production Line 2 is able to finish 1,500 units per shift. Production Line 2 is 3 times faster than Production Line 1. This analysis is an example of _____ Scale Data.

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

Answer: B

NEW QUESTION 300

When one speaks of 20% of something contributing 80% of the affect they are referring to what is known as the _____ .

- A. Shewhart Example
- B. Connection Principle
- C. Balance Equation
- D. Pareto Principle

Answer: D

NEW QUESTION 305

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 308

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 311

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 314

To be an effective Lean Six Sigma practitioner one must understand the difference between _____.

- A. ANOVA and the Analysis of Variance
- B. Nonparametric tests and tests of Non-normal Data
- C. Practical and Statistical significance
- D. F-test and test of variances of 2 samples

Answer: C

NEW QUESTION 318

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 323

A _____ is used primarily to track the stability of the average value of a metric of interest.

- A. NP Chart
- B. Xbar-R Chart
- C. I-MR Chart
- D. C Chart

Answer: B

NEW QUESTION 324

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 325

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 330

A valid Multiple Linear Regression (MLR) is characterized by all of these except _____.

- A. It is an assumption that the X's (inputs) are not correlated to each other
- B. The X's (inputs) are assumed to be independent of each other

- C. MLR is conducted based on a deliberate form of experimentation
- D. The Residuals from MLR analysis have to be Normally Distributed

Answer: C

NEW QUESTION 334

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 335

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 339

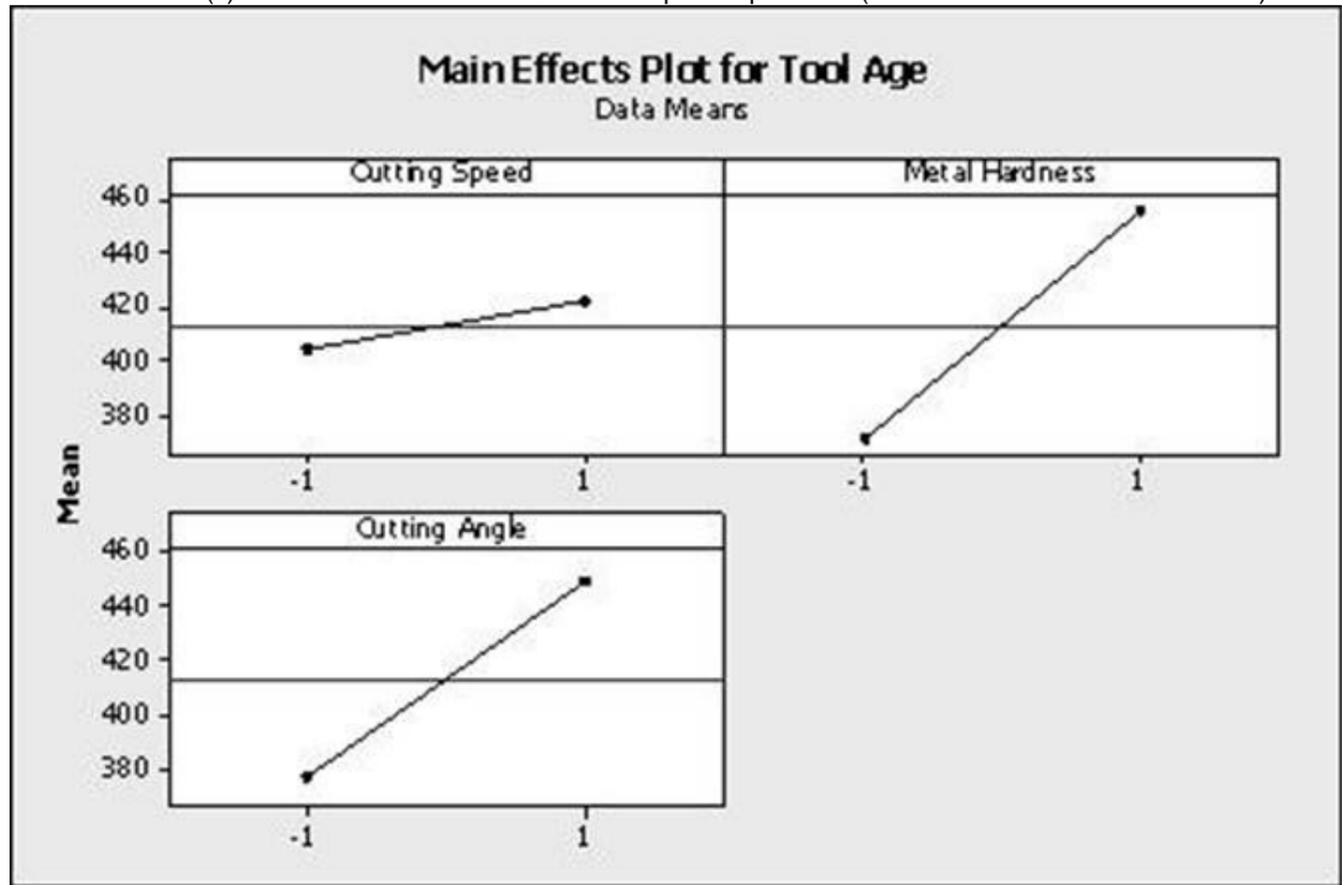
Appropriate measures means that measurements are .

- A. Representative
- B. Sufficient
- C. Contextual
- D. Relevant
- E. All of these answers are correct

Answer: E

NEW QUESTION 344

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 348

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