

IASSC

Exam Questions ICBB

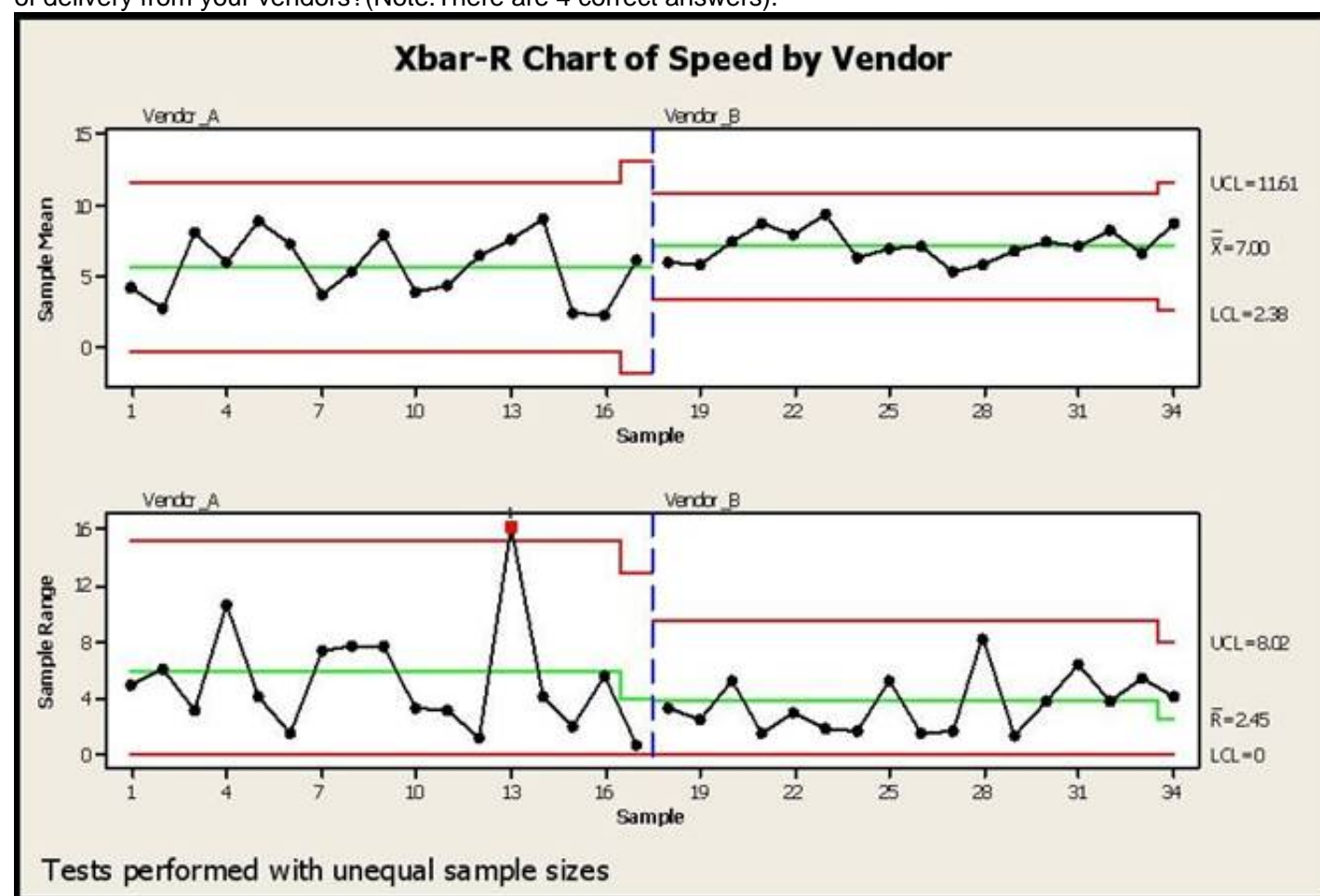
IASSC Certified Lean Six Sigma Black Belt



NEW QUESTION 1

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).

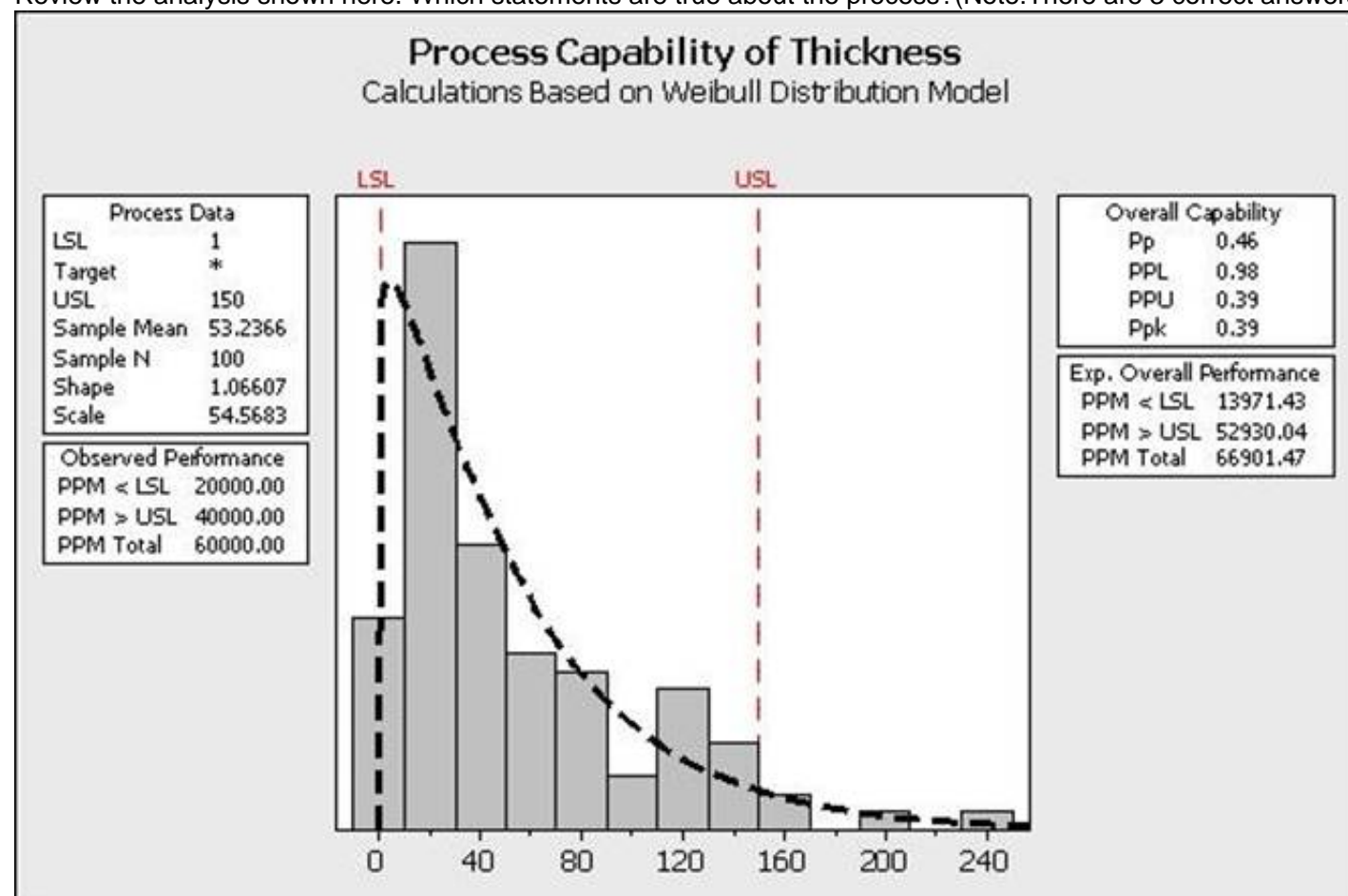


- A. Vendor A with a much shorter lead time in delivery
- B. Vendor B as it has a better consistency (lower variance) on lead time
- C. Vendor B since Vendor A shows a situation out of control as shown in red
- D. Vendor B since the Control Limits are much narrower than Vendor A
- E. Vendor B has higher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

Answer: BCDE

NEW QUESTION 2

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 3

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 4

For the data shown here which statement(s) are true?(Note:There are 2 correct answers).

Grade A	Grade B	Grade C
0.917	1.1	0.63
0.68	0.173	4.17
1.74	0.24	0.6
0.3	0.67	0.84
0.33	6.94	0.22
4.13		

- A. With 95% confidence, we cannot conclude if the samples are from three Normal Distributions.
- B. With greater than 95% confidence, we conclude the samples are from Non-normal Distributions.
- C. If we wanted to compare the Central Tendencies of these three samples we would use the one way ANOVA test.
- D. If we wanted to compare the Central Tendencies of these three samples we could use Mood's Median test.

Answer: BD

NEW QUESTION 5

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 6

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 7

Customers make their decisions based on Features, Integrity (of the seller) Delivery and_____ ?

- A. Color
- B. Expense
- C. Season
- D. None

Answer: B

NEW QUESTION 8

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 9

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 10

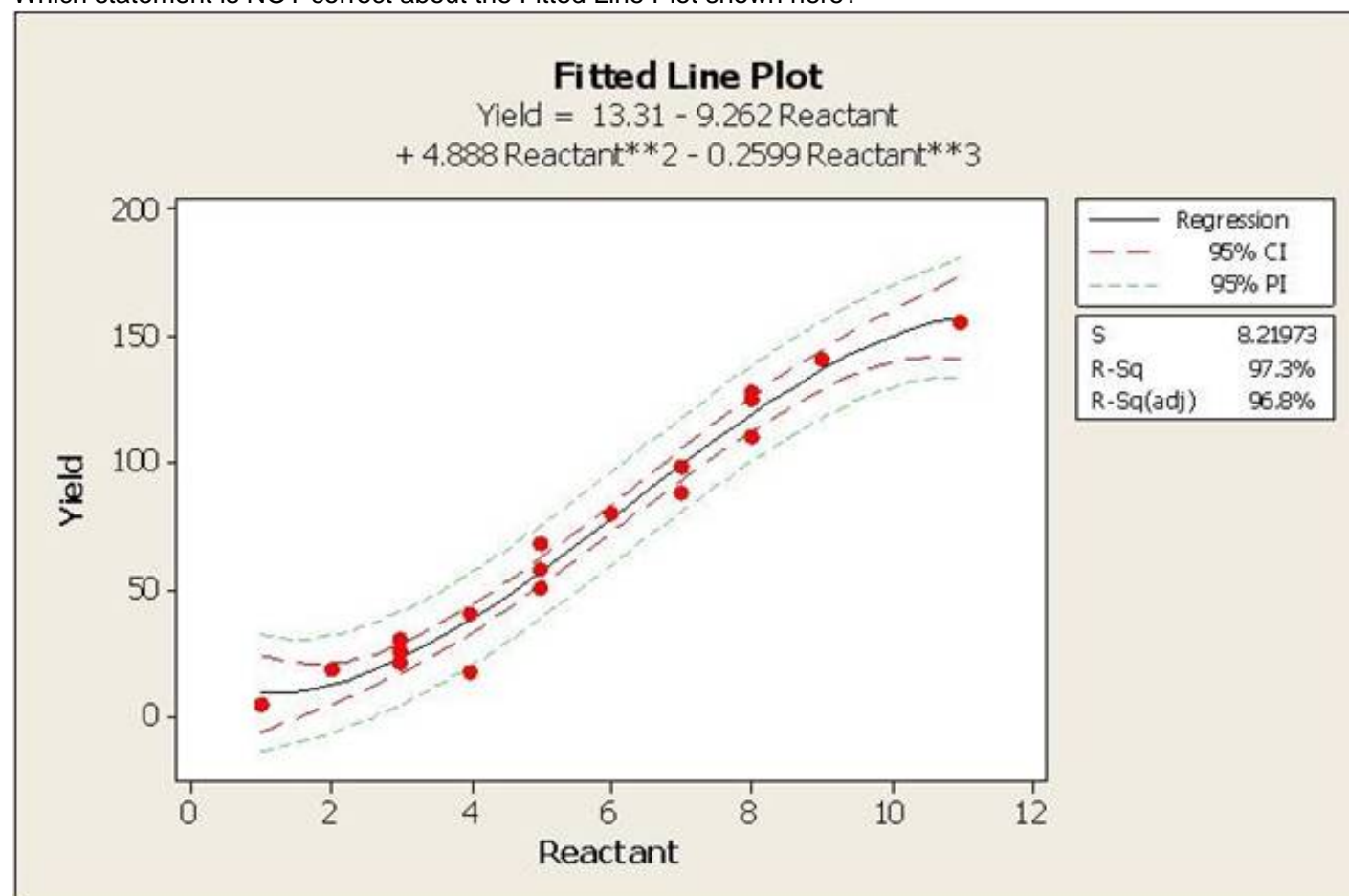
Data that can be measured on a continuum and has meaningful decimal subdivisions are _____ data.

- A. Continuous
- B. Surplus
- C. Discrete
- D. Variable

Answer: A

NEW QUESTION 10

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 14

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

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

Answer: C

NEW QUESTION 16

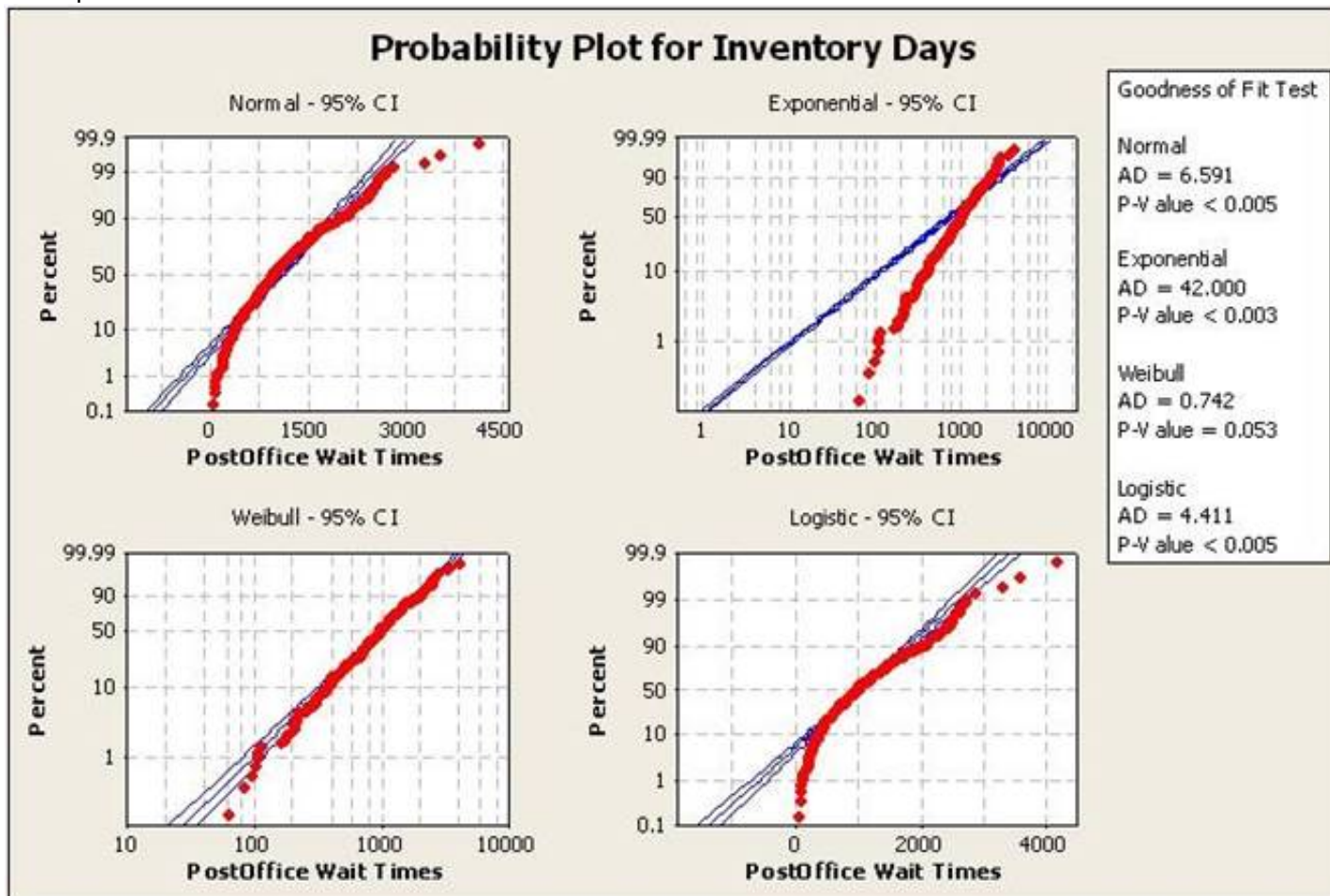
A valuable tool to use during the Measure Phase to show material and information flow throughout an entire process is the _____ .

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

Answer: A

NEW QUESTION 18

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 23

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 26

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 27

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 29

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 30

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 33

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

- A. True
- B. False

Answer: B

NEW QUESTION 37

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 41

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 46

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 51

Using this data calculate the percentage of DPU.

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

Answer: B

NEW QUESTION 53

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 55

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 59

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 60

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 61

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 66

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 68

Calculate the Rolled Throughput Yield of this process using this data. Data: unit input: 1450, unit output: 1390, defects repaired: 320, scrap: 60

- A. 71.33%
- B. 72.66%
- C. 73.79%
- D. 77.93%

Answer: B

NEW QUESTION 72

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 73

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 76

The English words used for the 5S's are _____, _____, Shining, Standardizing and Sustaining. (Note: There are 2 correct answers).

- A. Shaping
- B. Sorting
- C. Shifting
- D. Straightening

Answer: BD

NEW QUESTION 79

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 81

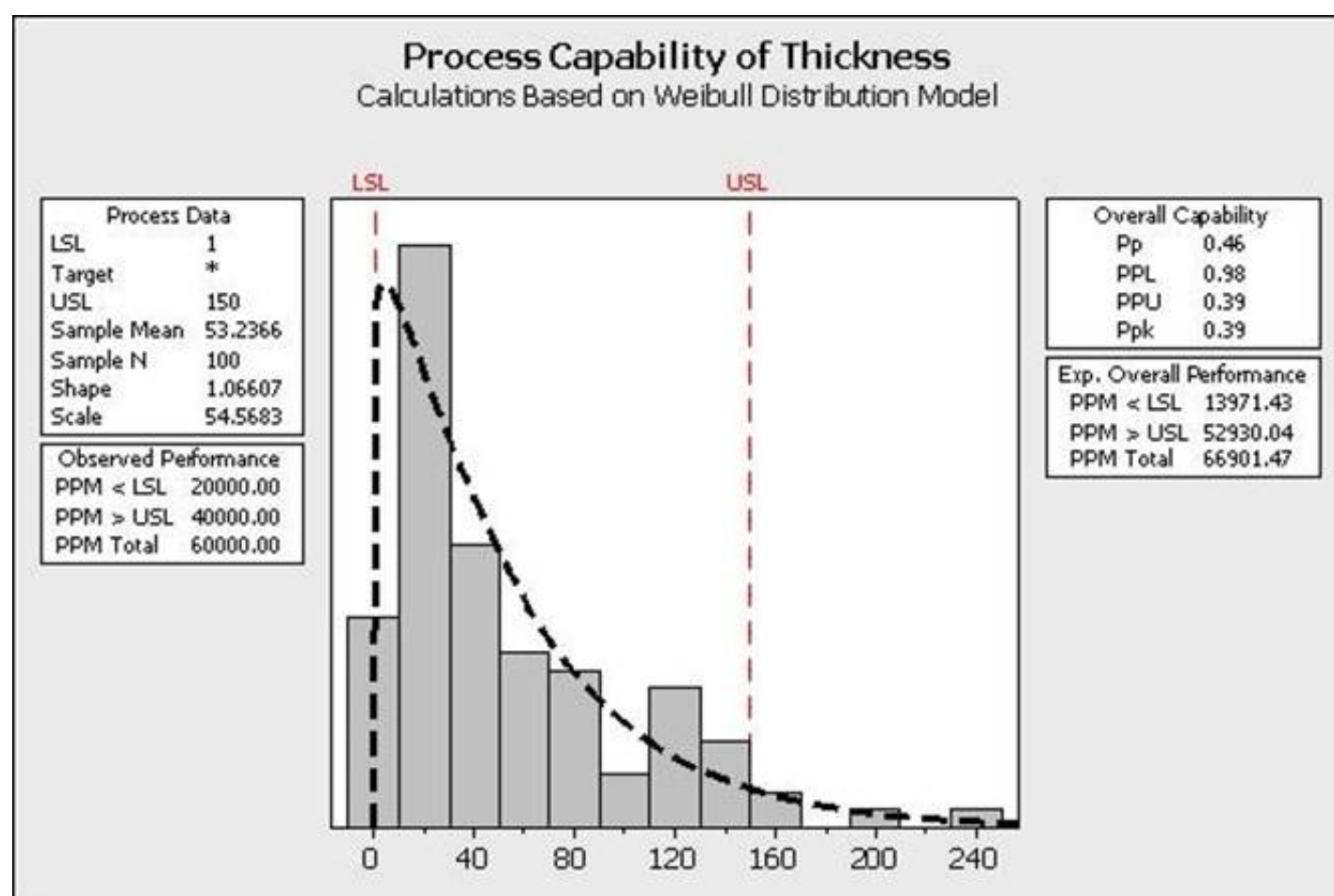
Time is always the metric on the horizontal scale of a(n) _____ Chart.

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

Answer: C

NEW QUESTION 82

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 83

The relationship between a response variable and one or more independent variables is investigated and modeled by use of which of these?

- A. X-Y Matrix
- B. Baldrige Assessment
- C. Critical X's Definition
- D. Analysis of Variance (ANOVA)

Answer: D

NEW QUESTION 87

Which statement is most correct for the Regression Analysis shown here?

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 Regression explains 50.8% of the process variation
- B. The air-fuel ratio explains most of the TurbineOutput variation
- C. This Simple Linear Regression explains 98+% of the process variation
- D. This Multiple Linear Regression has four statistically significant independent variables

Answer: B

NEW QUESTION 90

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

- A. True
- B. False

Answer: A

NEW QUESTION 93

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 97

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 101

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 106

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 109

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 110

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 113

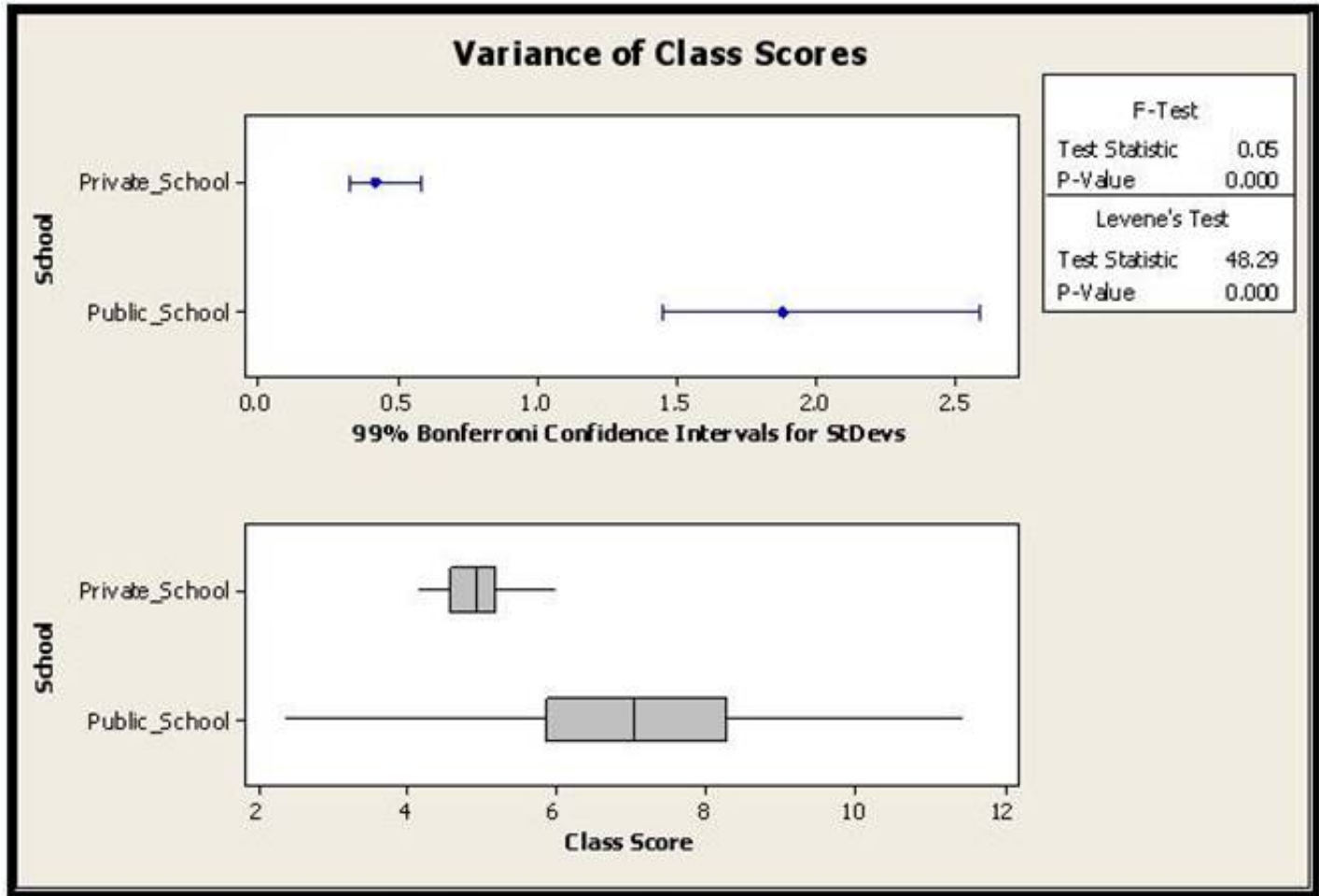
Situations where standardized work needs to be incorporated include all of these except _____.

- 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 115

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 119

When a Belt properly analyzes the results of an experiment he must examine the Residuals in expectation of finding all of the following except _____.

- A. Some Residuals higher than others
- B. Residuals will represent a Linear Regression
- C. All Residuals within 2 Standard Deviations of the Mean
- D. Some Residuals lower than others

Answer: B

NEW QUESTION 122

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

- A. r2 value is smaller than the absolute value of r
- B. Correlation Coefficient equals r2
- C. Coefficient of Determination is less than r2
- D. Correlation Coefficient equals r divided by 2

Answer: A

NEW QUESTION 123

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 126

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 129

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 130

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 132

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 134

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 139

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 140

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

Answer: A

NEW QUESTION 142

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 147

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 150

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 154

Sally and Sara sell flower pots at their garage sale. Sally motivates Sara mentioning that they will sell a minimum of 22 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 18.2 pots per day were sold with a Standard Deviation of 0.9 pots. What is the Z value for this sales process?

- A. 1.23
- B. 1.62
- C. 2.11
- D. 4.22

Answer: D

NEW QUESTION 157

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. SIPOC
- B. FMEA
- C. Business Case
- D. Team charter

Answer: B

NEW QUESTION 161

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 163

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 164

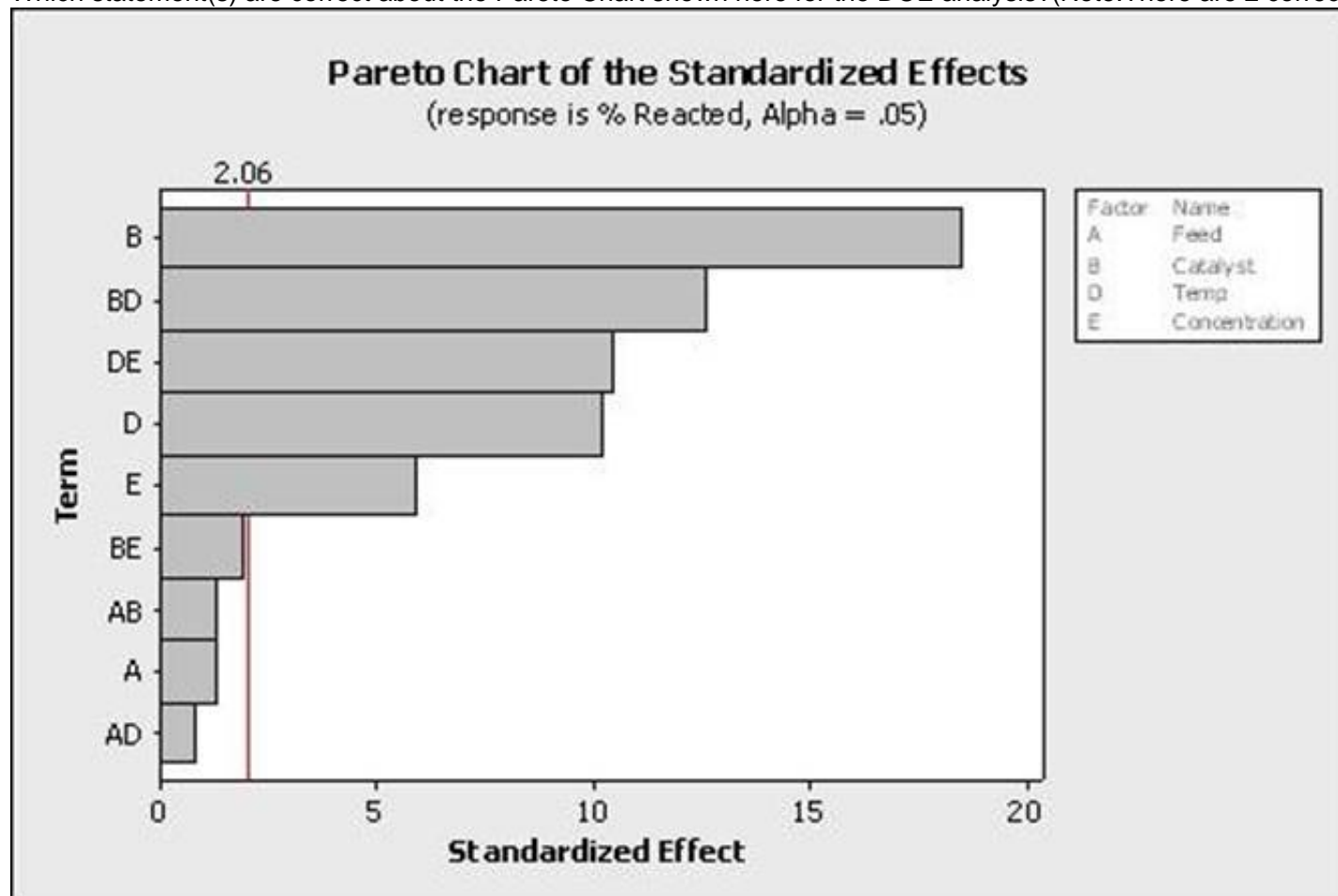
Using this partial Z Table, how many units from a month's production run are expected to not satisfy customer requirements for the following process?
 Upper specification limit: 8.4 Lower specification limit: 4.7 Mean of the process: 6.2 Standard Deviation: 2.2 Monthly production: 360 units

- A. 8
- B. 13
- C. 28
- D. 57

Answer: D

NEW QUESTION 169

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 170

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 175

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

- A. Uncommon
- B. Ordinary
- C. Special
- D. Selective

Answer: C

NEW QUESTION 178

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 183

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 188

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 190

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

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

Answer: D

NEW QUESTION 191

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 194

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 197

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 200

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 203

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

- A. True
- B. False

Answer: B

NEW QUESTION 208

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 210

Following process modifications, the Null Hypothesis states that no improvement to the process has occurred. If we discover the Null Hypothesis Test was rejected when it was false that would be a(n) _____.

- A. Type I Error
- B. Type II Error
- C. Type III Error
- D. Alpha Error

Answer: B

NEW QUESTION 215

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 217

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 222

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 227

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 231

The English words used for the 5S's are Sorting, Straightening, _____, _____ and Sustaining. (Note:There are 2 correct answers).

- A. Shaping
- B. Shining
- C. Standardizing
- D. Signing

Answer: BC

NEW QUESTION 233

As a means of measuring the effects on other areas of a process as a result of changes in the primary metric we also define and track _____.

- A. Parallel process metrics
- B. Secondary metrics
- C. Tertiary metrics
- D. Industry standards

Answer: B

NEW QUESTION 235

The Waste of Overproduction is defined as _____.

- A. The unnecessary movement of people and equipment
- B. The liability of materials that are bought, invested in and not immediately sold or used
- C. Producing more than the next step needs or more than the customer buys
- D. The extra movement of material

Answer: C

NEW QUESTION 240

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

TurbineOutput = 16.5 + 3.21 Air-Fuel Ratio + 0.386 % methane
+ 0.0166 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			

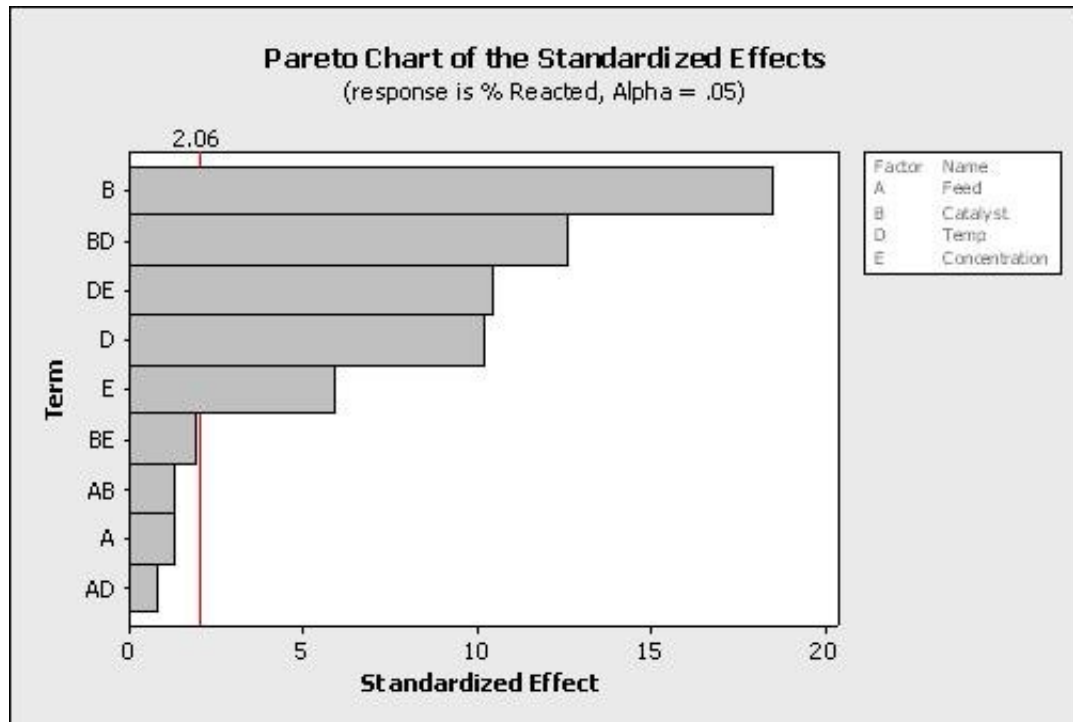
Source	DF	Seq SS
Air-Fuel Ratio	1	159.048
% methane	1	7.062
SteamExitTemp	1	3.892

- 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 243

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 247

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 252

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 257

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 261

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 265

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 266

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 267

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

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

Answer: A

NEW QUESTION 270

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 273

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 274

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 275

A fundamental rule is that both Standard Deviation and Variance can be added.

- A. True
- B. False

Answer: B

NEW QUESTION 279

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 280

Use this data to calculate the Z score. Average oF.65, Standard Deviation: 3, Upper Spec Limit: 72

- A. 0.27
- B. 1.5
- C. 2.33
- D. 4.12

Answer: C

NEW QUESTION 285

A dock worker for a feed supplier was tasked with assuring the proper weight in the feed bags as they left the dock. One of the columns listed the range of weight of the bags included in the studies. This required plotting a Histogram of the weight of the bags. 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. Interval Scale Data
- C. Nominal Scale Data
- D. Ration Scale Data

Answer: B

NEW QUESTION 286

Since Normality is required if we intend to use the data collected as a predictive tool. To test for Normality of data we must determine if the P-value is _____.

- A. Equal to 0.05
- B. Less than 0.05
- C. Greater than 0.05
- D. Greater than 0.5

Answer: C

NEW QUESTION 287

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 291

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 292

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 297

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 298

The distance between the Mean of a data set and the Point of Inflection on a Normal curve is called the _____.

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

Answer: B

NEW QUESTION 299

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 303

For the data set shown here which of these statements is/are true?

Grade A	Grade B	Grade C
0.917	1.1	0.63
0.68	0.173	4.17
1.74	0.24	0.6
0.3	0.67	0.84
0.33	6.94	0.22
4.13		

- A. Hypothesis Testing of Means or Medians cannot be done since there are an unequal number of observations for the 3 samples
- B. A Paired T-test would be applicable for comparing Grade B and Grade A since they follow each other in the data set
- C. Grade A has the lowest sample Mean of the 3 samples
- D. Grade A has a higher sample Mean than Grade B

Answer: C

NEW QUESTION 304

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

- A. True
- B. False

Answer: A

NEW QUESTION 308

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 311

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 316

The relationship between a response variable and one or more independent variables is investigated and modeled by use of _____.

- A. X-Y Matrix
- B. Baldrige Assessment
- C. Analysis of Variance (ANOVA)
- D. Critical X's Definition

Answer: C

NEW QUESTION 318

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

- A. True
- B. False

Answer: A

NEW QUESTION 320

Use this data to calculate the Z Score. Average of:92, Standard Deviation: 2, Upper Spec Limit: 101

- A. 0.75
- B. 1.5
- C. 2.25
- D. 4.50

Answer: D

NEW QUESTION 323

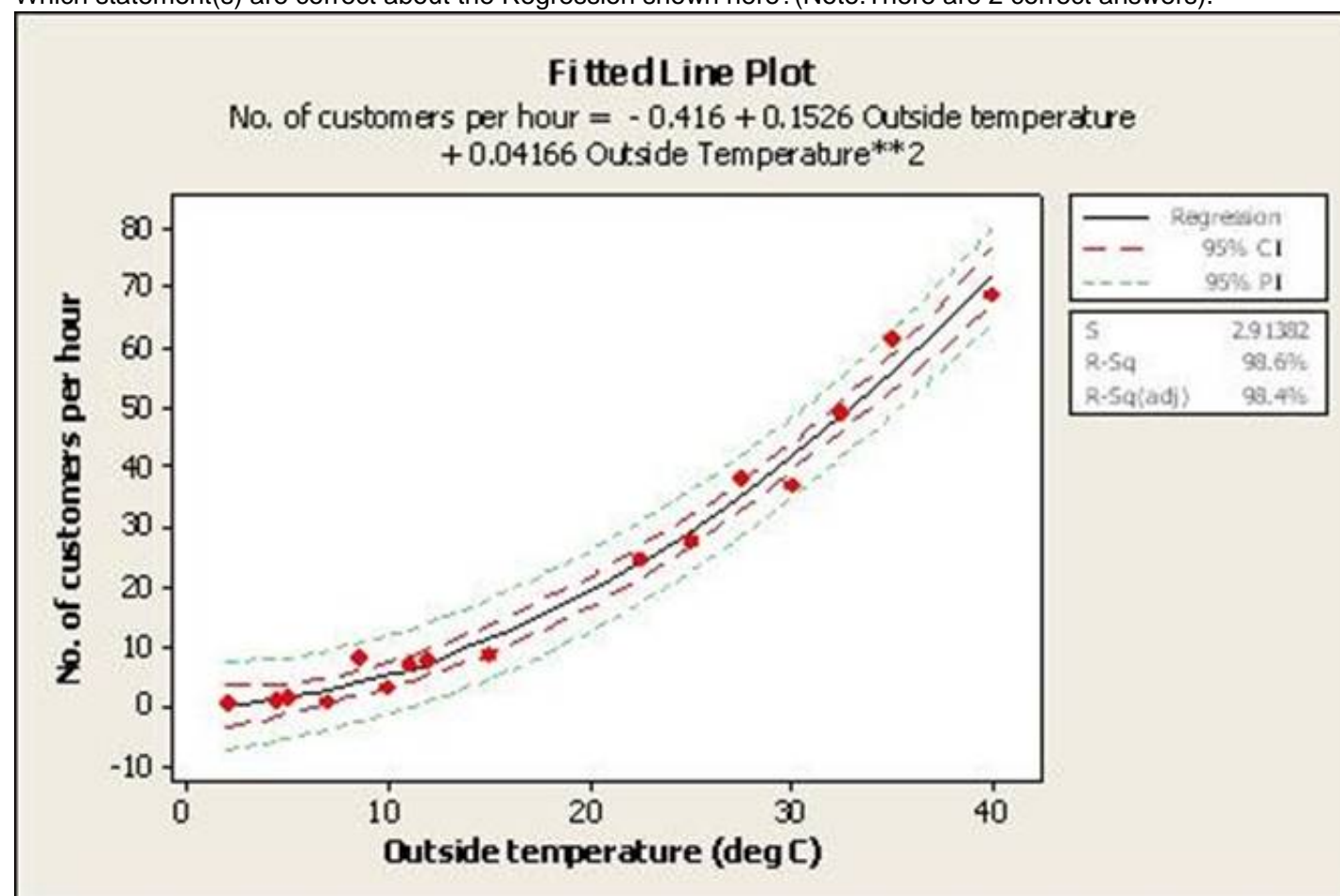
Which of these graphs demonstrates conditions which would be sufficient to enable OCAP for the process?

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

Answer: A

NEW QUESTION 326

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 330

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

- A. True
- B. False

Answer: A

NEW QUESTION 335

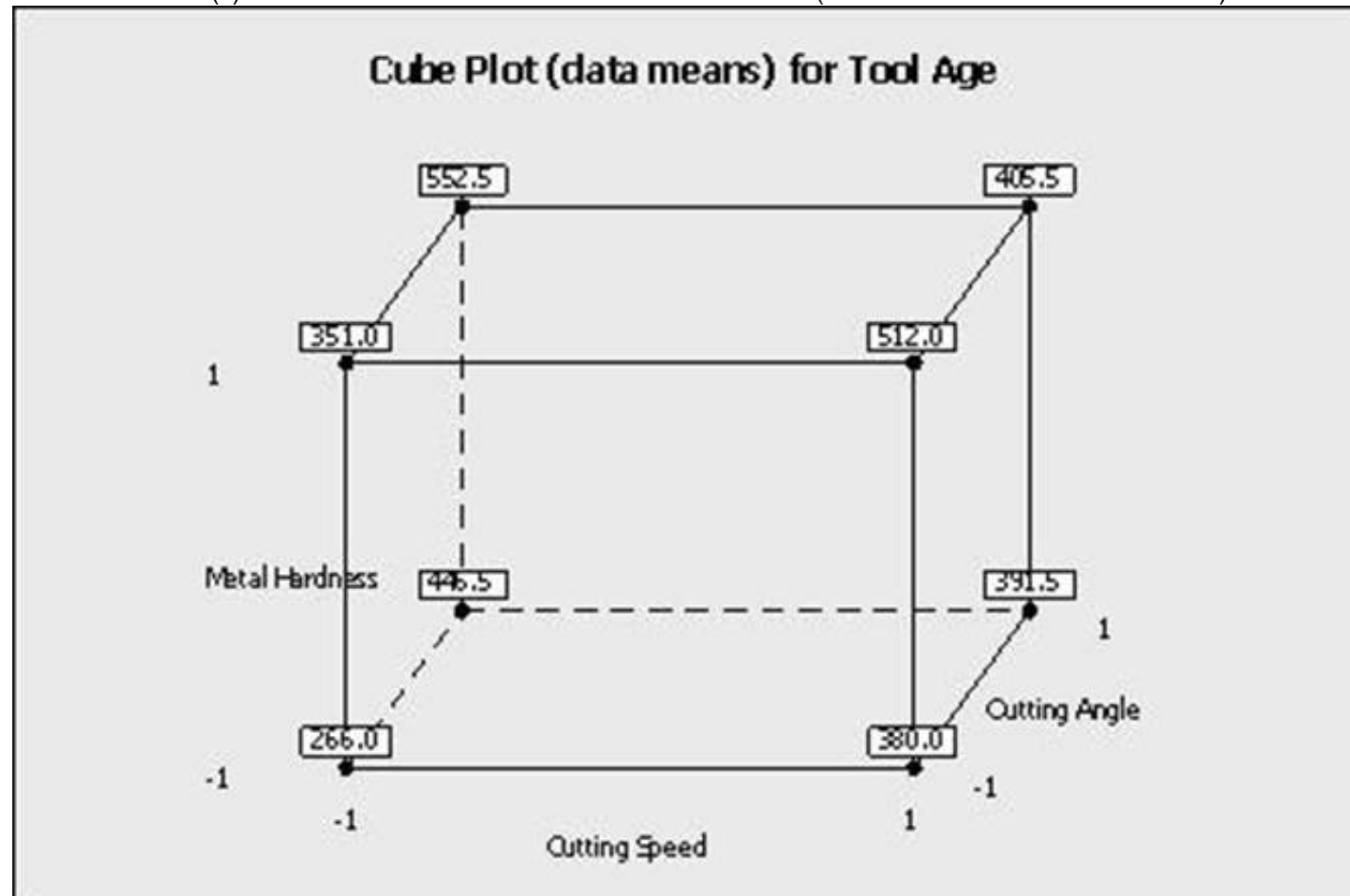
Two of the key deliverables for the Measure Phase are a robust description of the process and its flow and an assessment of the Measurement System.

- A. True
- B. False

Answer: A

NEW QUESTION 339

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 340

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 341

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 342

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 343

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 346

A fundamental rule is that both Standard Deviation and Variance can be added.

- A. True
- B. False

Answer: B

NEW QUESTION 351

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 355

Customers make their decisions based on Features, Integrity (of the seller) Delivery and _____?

- A. Color
- B. Expense
- C. Season
- D. None

Answer: B

NEW QUESTION 358

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 360

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 363

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 365

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 368

A Full Factorial experiment using a 2 level 4 factor approach has been proposed to test the viability of an extrusion machine experiment. How many treatment combinations will this approach involve?

- A. 8
- B. 16
- C. 32
- D. 64

Answer: B

NEW QUESTION 370

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 375

The primary objective in removal of waste is to improve the Order Production Cycle where the time from _____ to the time of receipt of payment is compressed.

- A. Shift start
- B. Product development
- C. Receipt of an order
- D. New fiscal year

Answer: C

NEW QUESTION 380

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 385

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

- A. True
- B. False

Answer: A

NEW QUESTION 388

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 389

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