

QUESTION 1

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

QUESTION 2

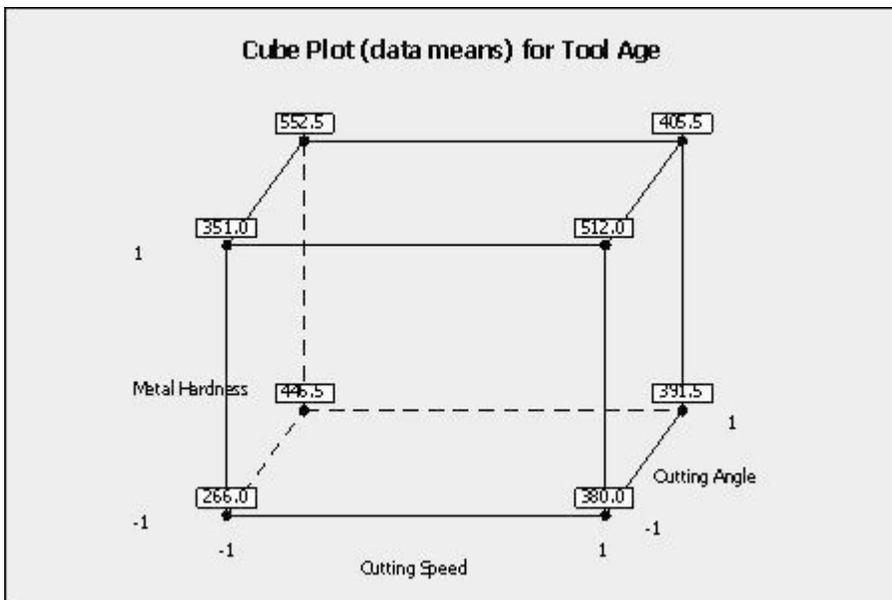
What conclusion is most correct about the Experimental Design shown here with the response in the far right column?

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

QUESTION 3

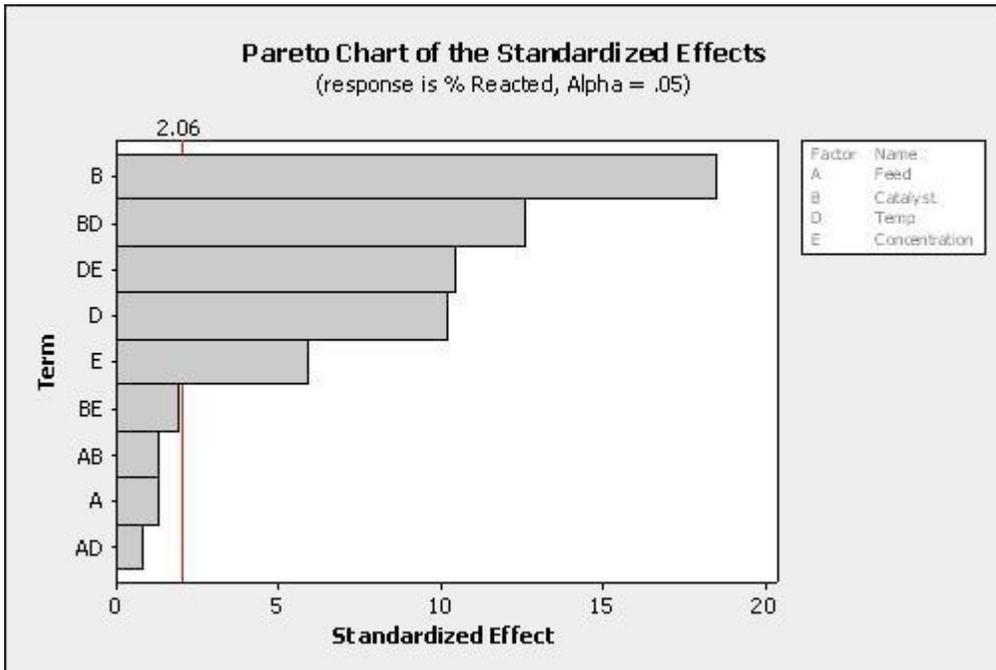
Which statement(s) are correct about the Factorial Plot shown here? (Note: There are 3 correct answers).



- 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

QUESTION 4

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

QUESTION 5

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

- A. True
- B. False

QUESTION 6

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

- A. True
- B. False

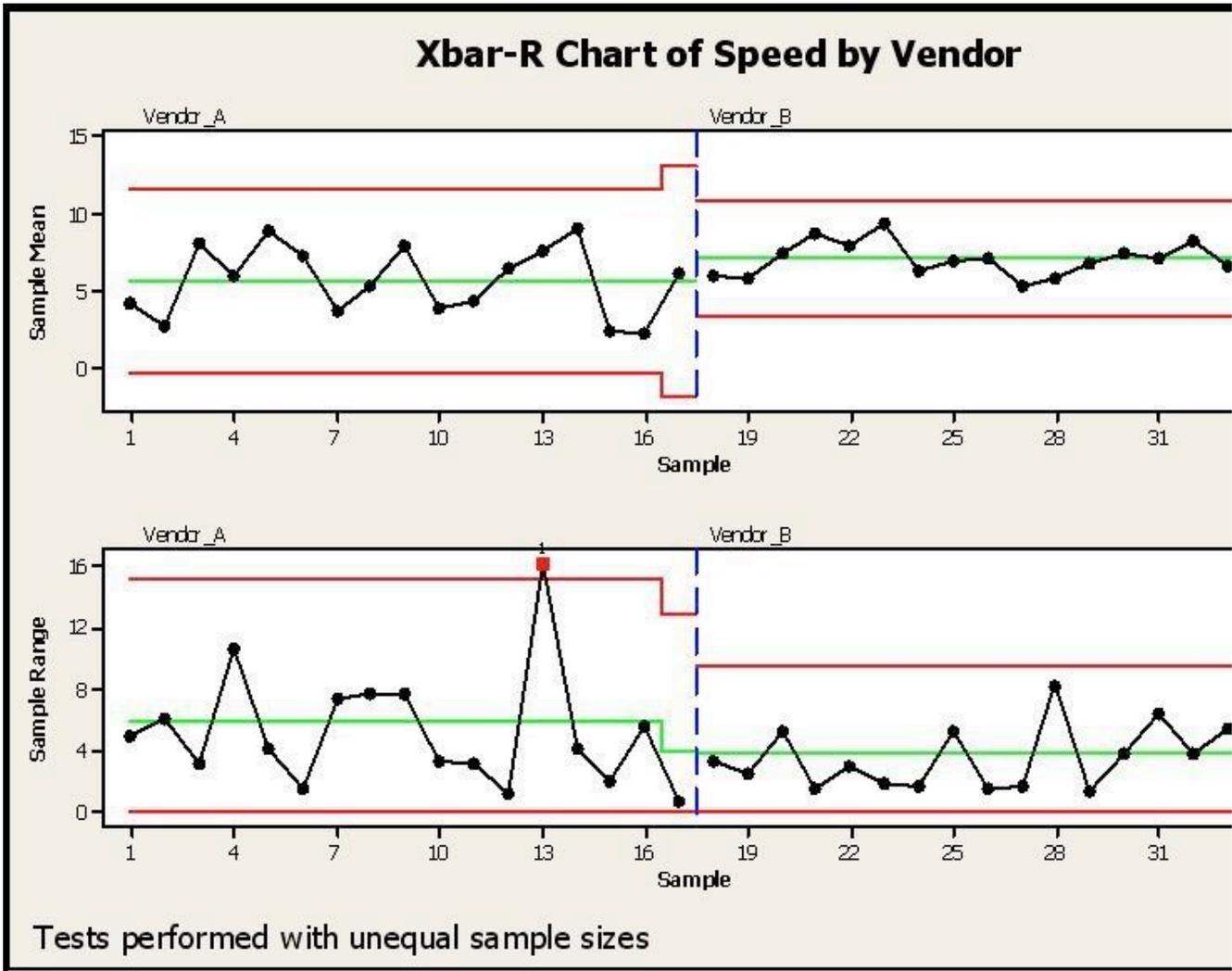
QUESTION 7

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

- A. True
- B. False

QUESTION 8

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 as Vendor A shows a situation out of control as shown in red
- D. Vendor B as the Control Limits are much narrower than Vendor A
- E. Vendor B with higher lead time, but a process with much narrower Control Limits

QUESTION 9

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

QUESTION 10

A Factorial Experiment based on a Level 2 Design with 6 factors would require 16 runs to fully assess the interactions.

- A. True
- B. False

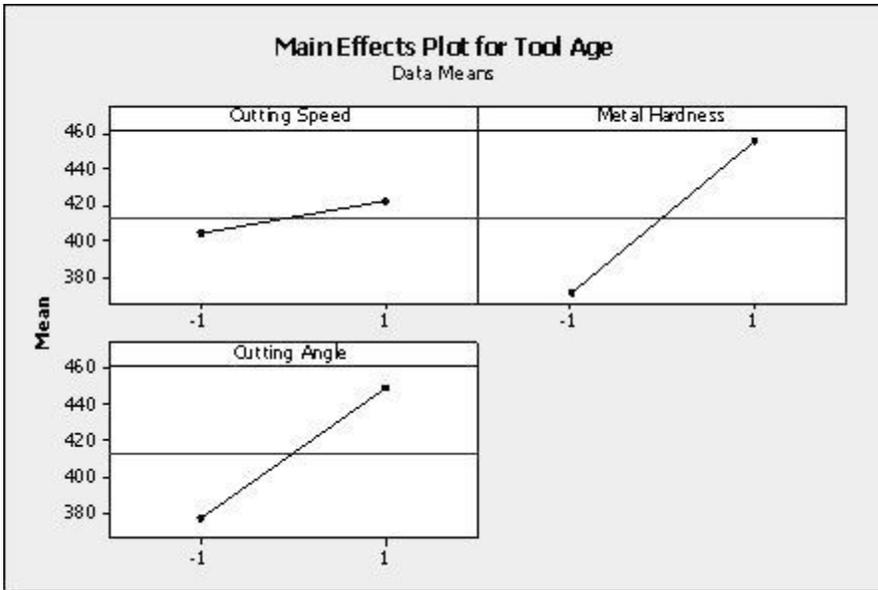
QUESTION 11

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

- A. True
- B. False

QUESTION 12

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

QUESTION 13

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

- 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

QUESTION 14

Which statement(s) are 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

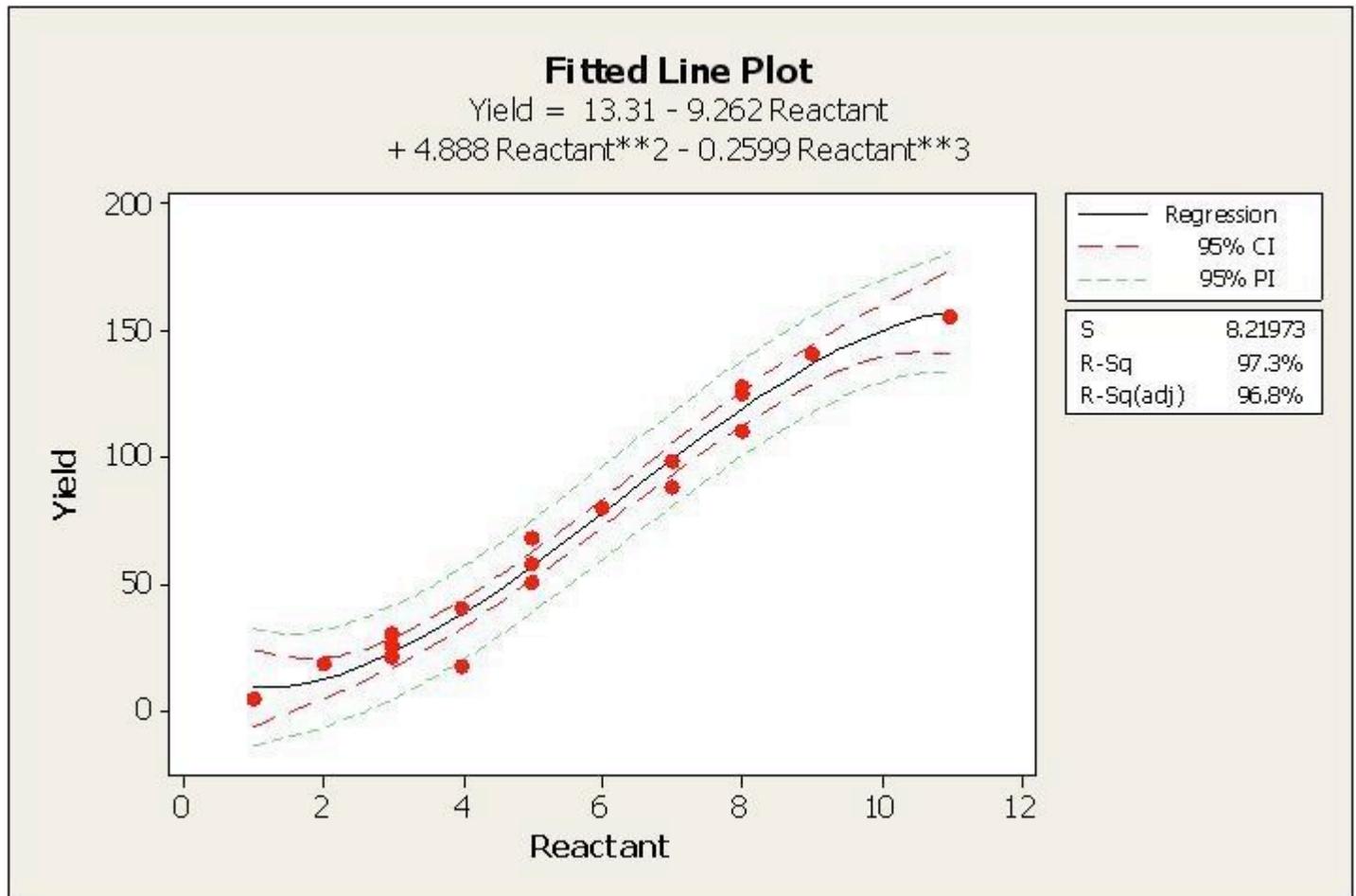
QUESTION 15

A valid mathematical Regression represents all of the characteristics shown except

- A. The residuals when plotted follow a Normal Distribution
- B. The sum of the residuals is zero
- C. All of the standardized residuals will be within ± 3 Standard Deviations
- D. Most standardized residuals are within ± 2 Standard Deviations

QUESTION 16

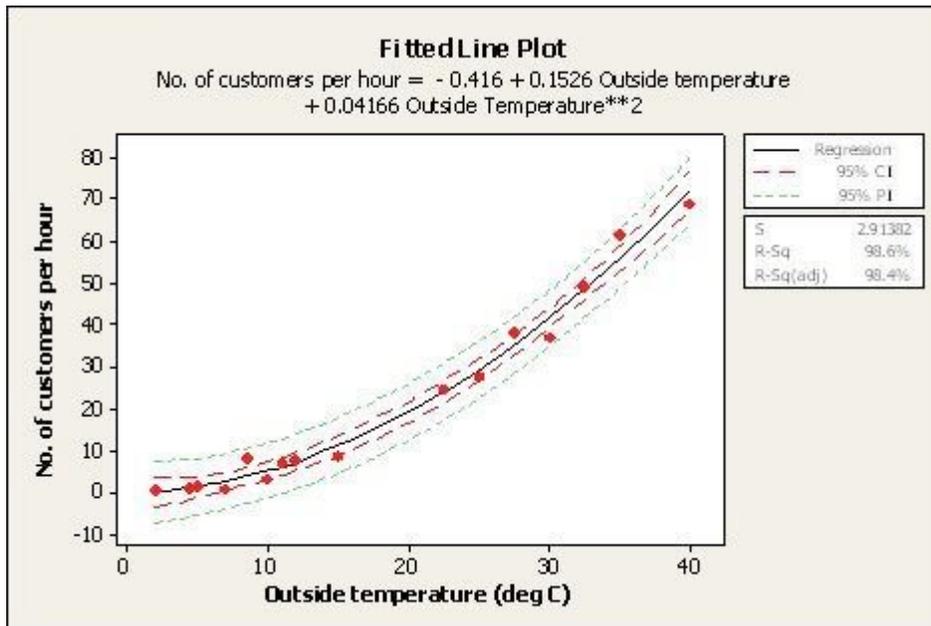
Which statement is NOT correct about the Fitted Line Plot shown here?



- 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

QUESTION 17

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

QUESTION 18

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.

QUESTION 19

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

- A. True
- B. False

QUESTION 20

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

QUESTION 21

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

- A. True
- B. False

QUESTION 22

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.

QUESTION 23

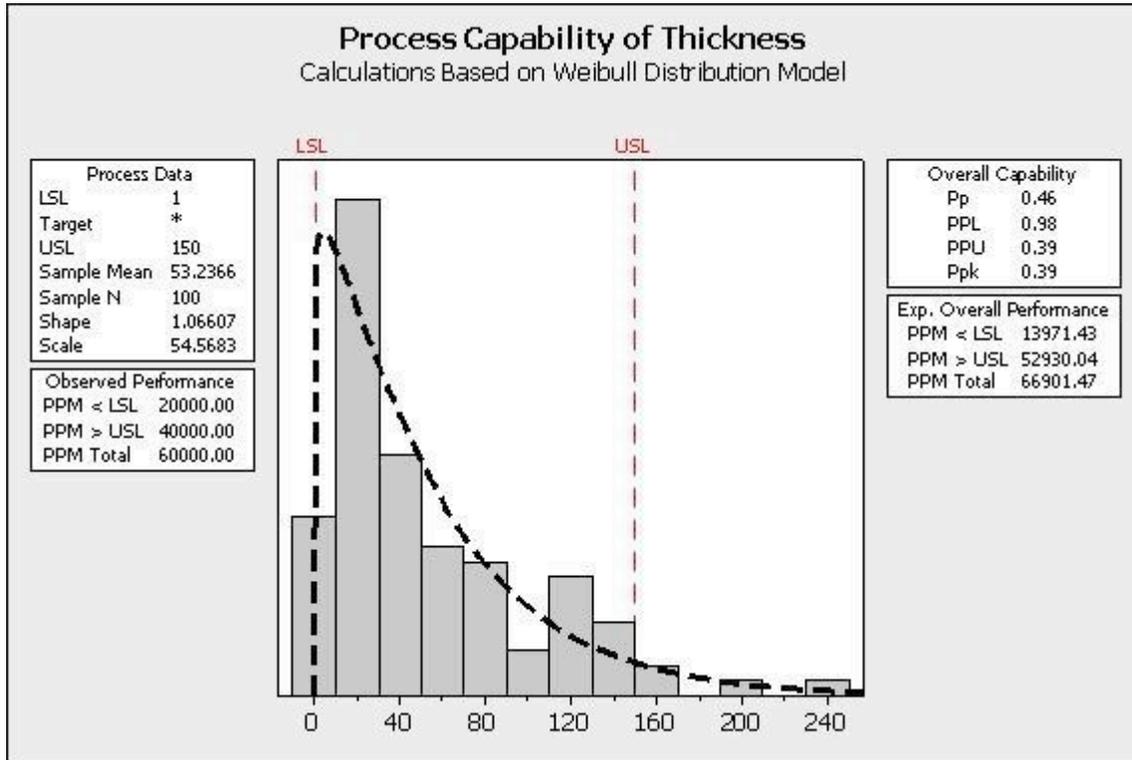
For the data set shown here which of these statements is/are true?

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

QUESTION 24

Review the analysis shown here.

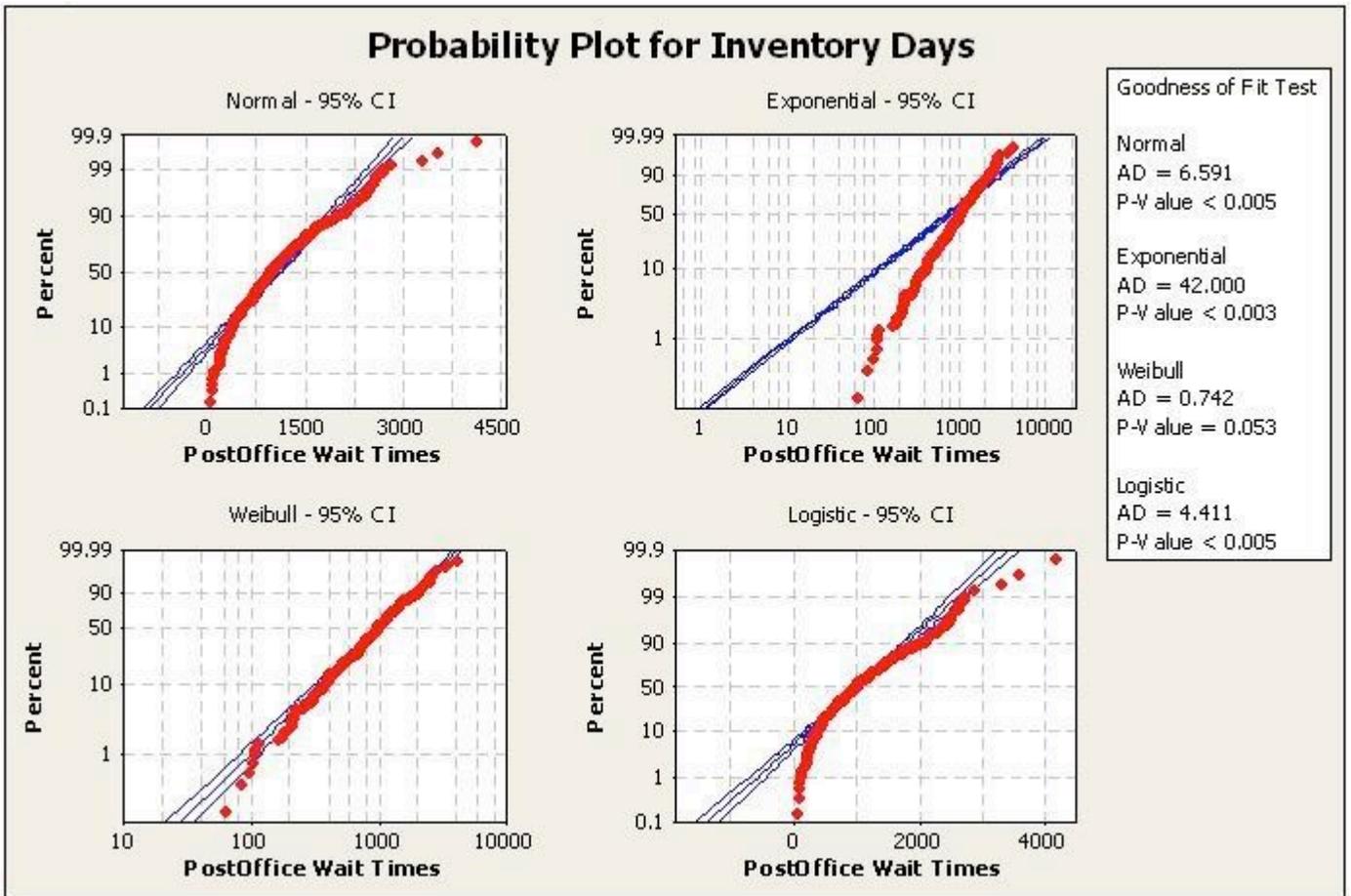


Which statements are true about the process? (Note: There are 3 correct answers).

- 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.

QUESTION 25

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

QUESTION 26

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

QUESTION 27

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

QUESTION 28

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

QUESTION 29

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

QUESTION 30

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

QUESTION 31

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

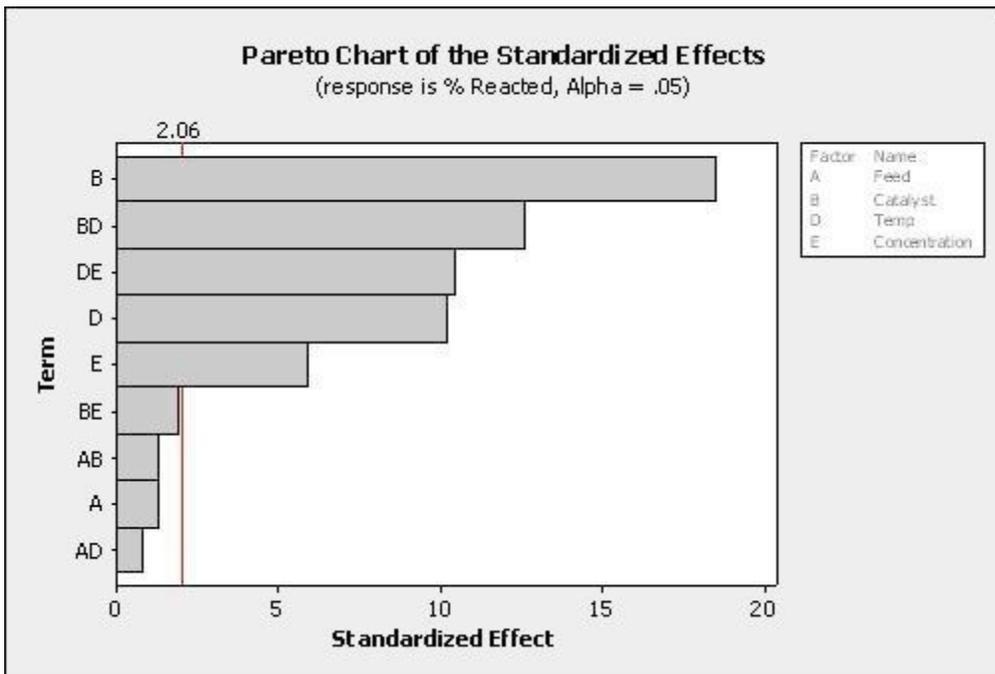
QUESTION 32

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

QUESTION 33

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

QUESTION 34

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

- A. True
- B. False

QUESTION 35

Appropriate measures means that measurements are _____.

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

QUESTION 36

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

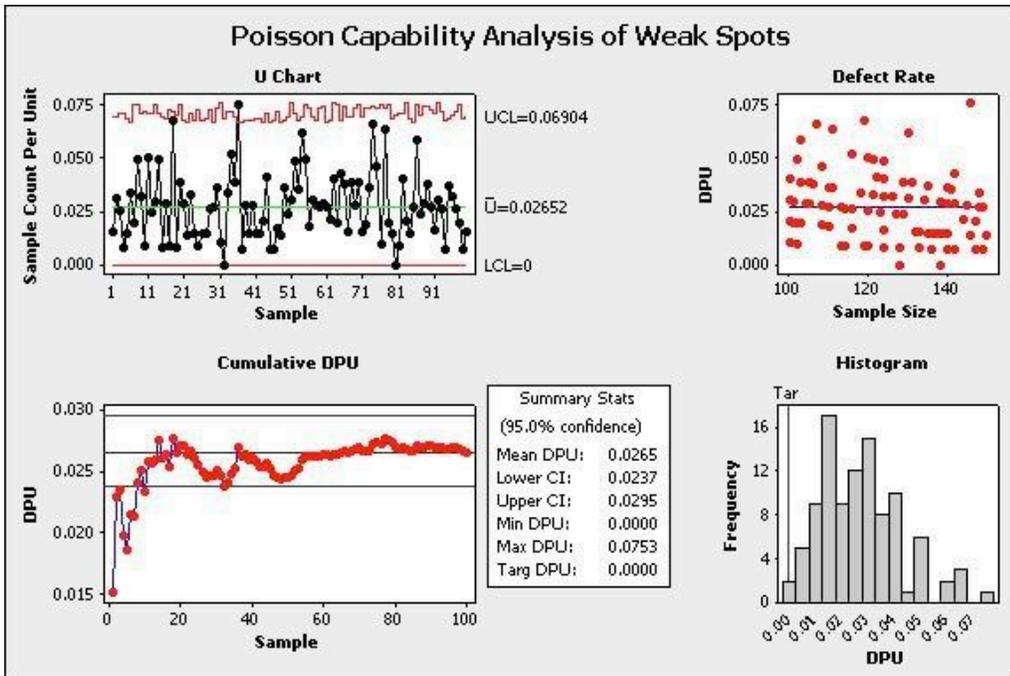
QUESTION 37

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

- A. True
- B. False

QUESTION 38

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.

QUESTION 39

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

- A. True
- B. False

QUESTION 40

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

- A. True
- B. False

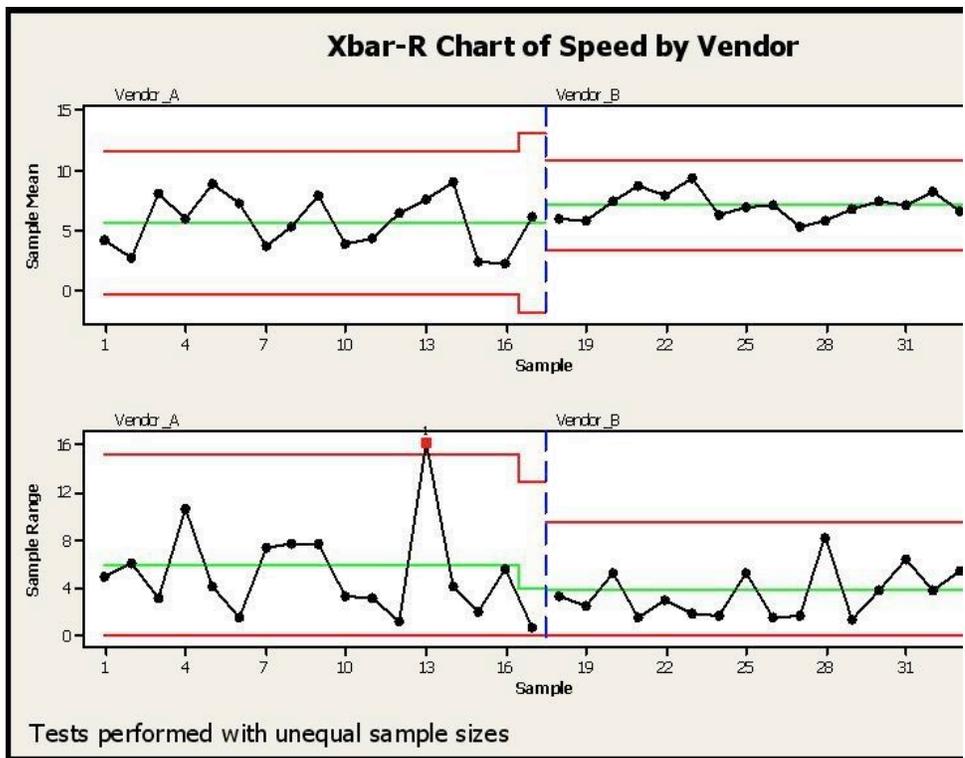
QUESTION 41

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

- A. True
- B. False

QUESTION 42

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
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- 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

QUESTION 43

If you can Poka-Yoke a defect out of the process entirely then you do not need use SPC on the characteristic of interest in the defect.

- A. True
- B. False

QUESTION 44

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

QUESTION 45

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

- A. Cycle Time
- B. Defects
- C. No. of Units Reworked
- D. Labor Hours
- E. All of these answers are correct

QUESTION 46

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

QUESTION 47

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

QUESTION 48

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

QUESTION 49

The two types of data that are to be used in Statistical Analysis are Attribute and Variance.

- A. True
- B. False

QUESTION 50

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

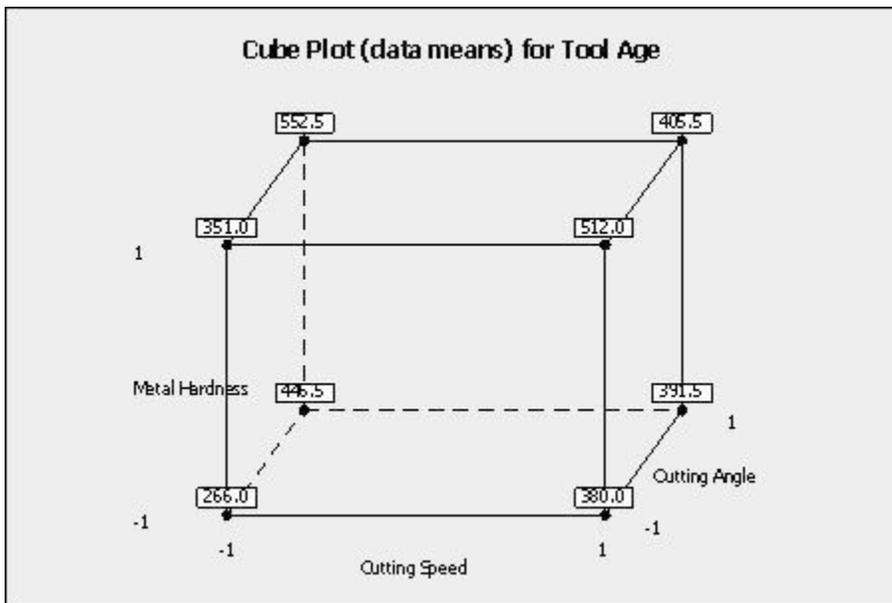
QUESTION 51

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

- A. True
- B. False

QUESTION 52

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
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- E. These plots are an example of interaction plots

QUESTION 53

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
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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
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% methane	1	7.062
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- A. The air-fuel ratio explains most of the TurbineOutput variation
- B. The Regression explains over 98% of the process variation
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- D. If the air-fuel ratio increases by 1, the TurbineOutput more than triples
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QUESTION 54

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
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QUESTION 55

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

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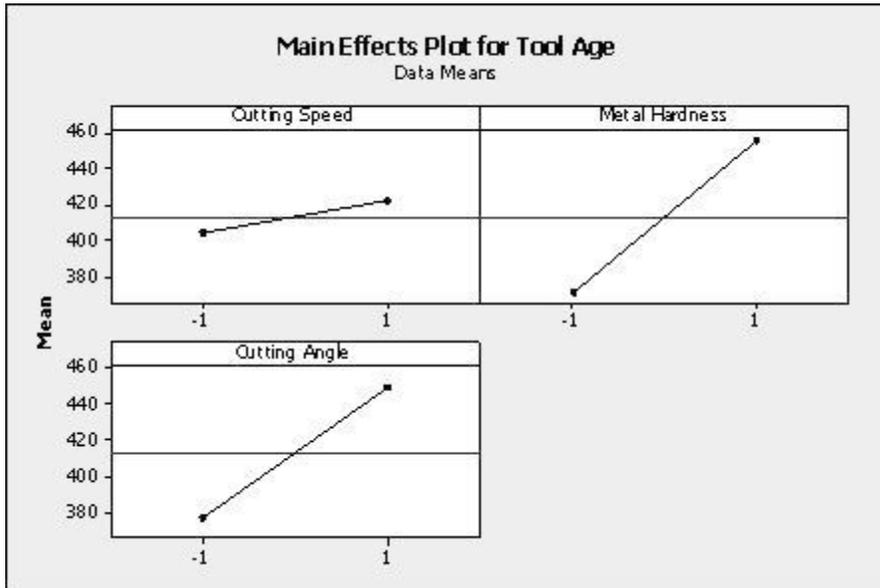
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Screening experiments are the proper choice when a Belt is faced with the situation of highly Fractional Factorial Designs.

- A. True
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QUESTION 57

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

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- C. This Simple Linear Regression explains 98+% of the process variation
- D. This Multiple Linear Regression has four statistically significant independent variables

QUESTION 59

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

QUESTION 60

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

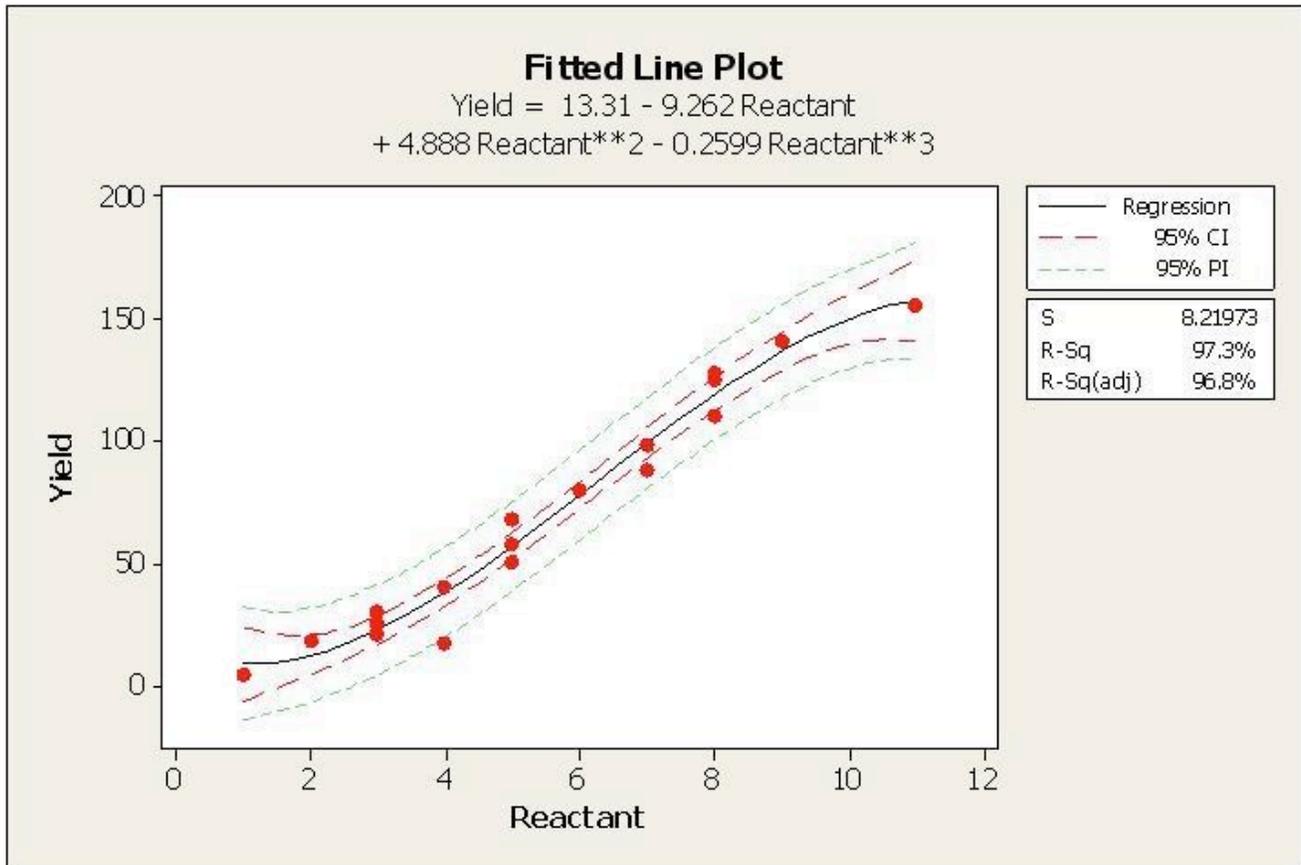
QUESTION 61

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

QUESTION 62

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

QUESTION 63

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

- A. True
- B. False

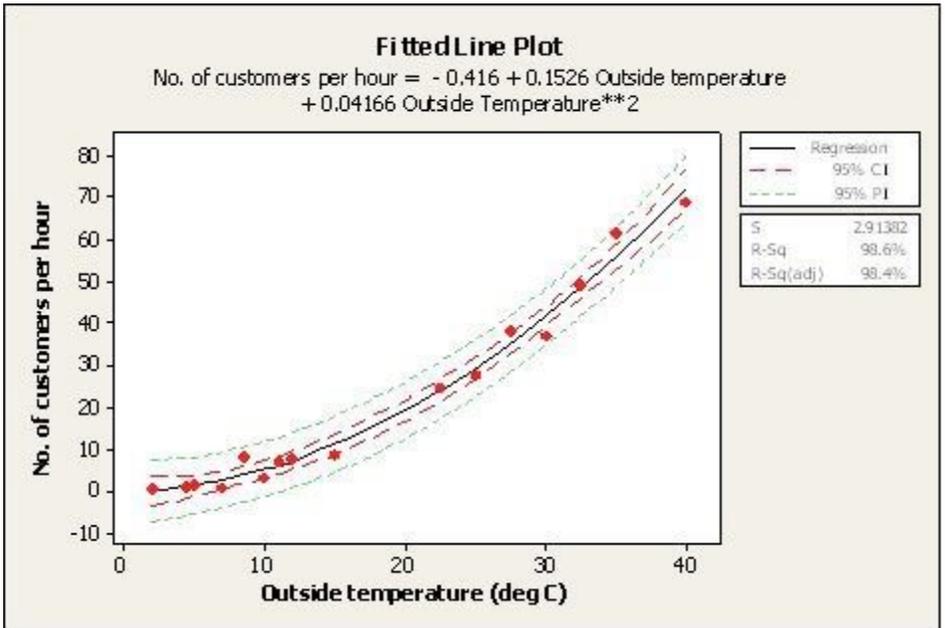
QUESTION 64

A valid mathematical Regression represents all of the characteristics shown except _____.

- A. All of the standardized residuals will be within ± 3 Standard Deviations
- B. The sum of the residuals is zero
- C. The residuals when plotted follow a Normal Distribution
- D. Most standardized residuals are within ± 2 Standard Deviations
- E. The Residual is equal to the difference between the observed and predicted values

QUESTION 65

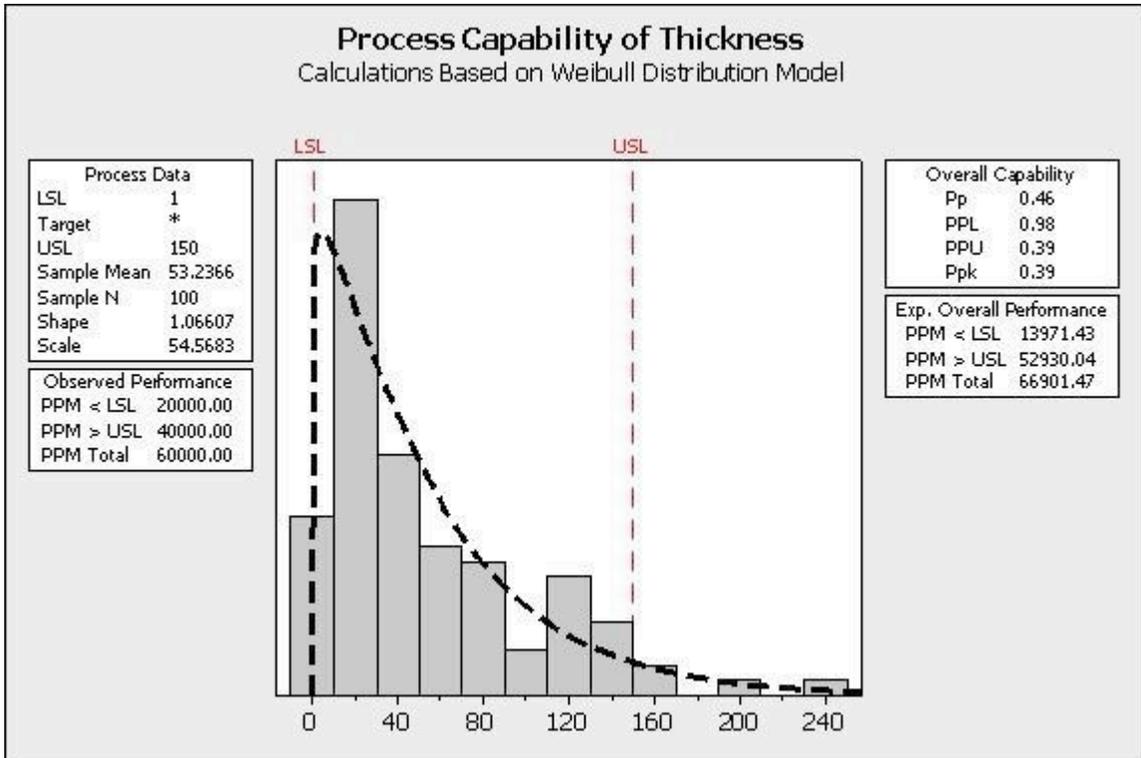
Which statement(s) are correct about the Regression shown here? (Note: There are 2 correct answers).



- 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

QUESTION 66

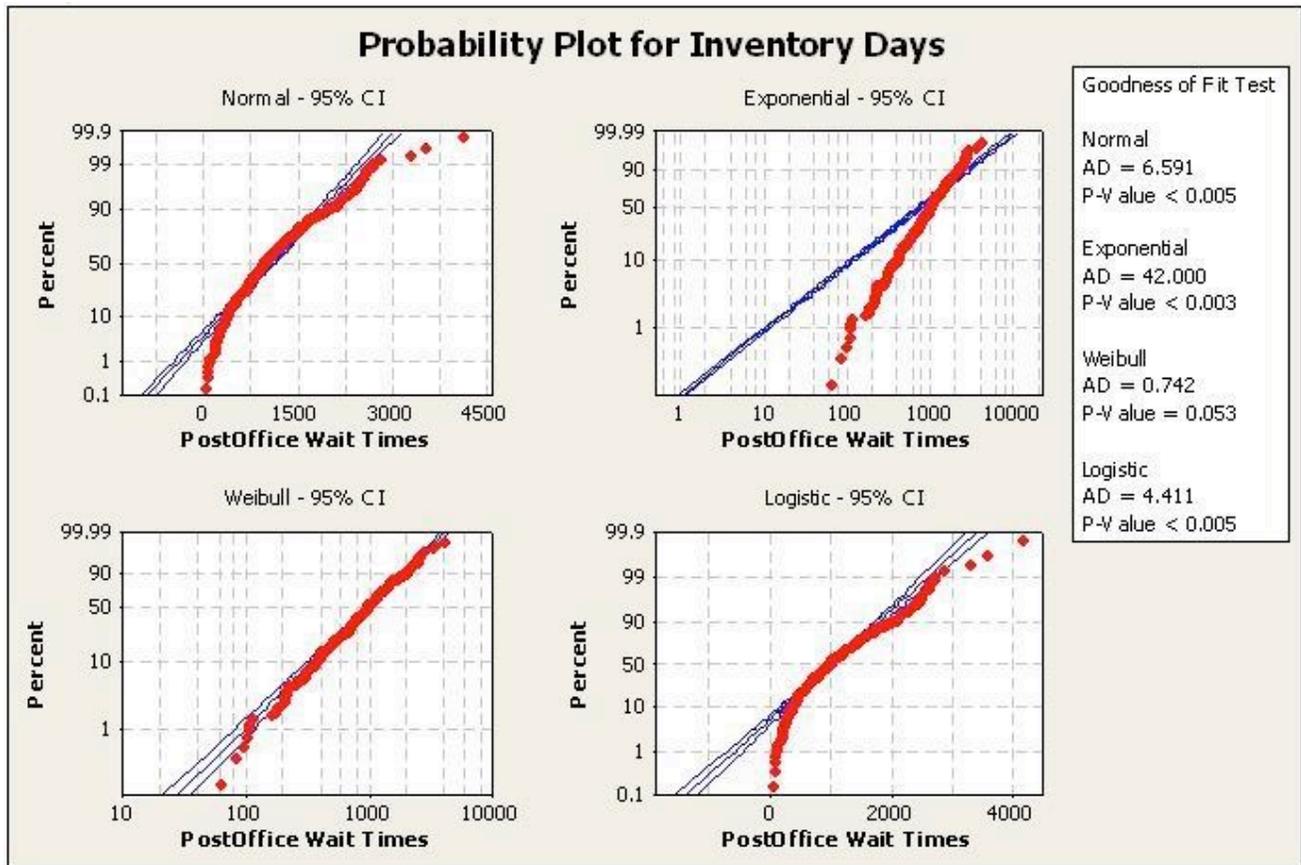
Review the analysis shown here. Which statements are true about the process? (Note: There are 3 correct answers).



- 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

QUESTION 67

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

QUESTION 68

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

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

QUESTION 69

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

QUESTION 70

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

- A. True
- B. False

QUESTION 71

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

QUESTION 72

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

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		

QUESTION 73

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

- 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
- E. If we wanted to compare the Central Tendencies of all three samples we could use the Mann-Whitney test

QUESTION 74

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

QUESTION 75

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

QUESTION 76

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

QUESTION 77

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

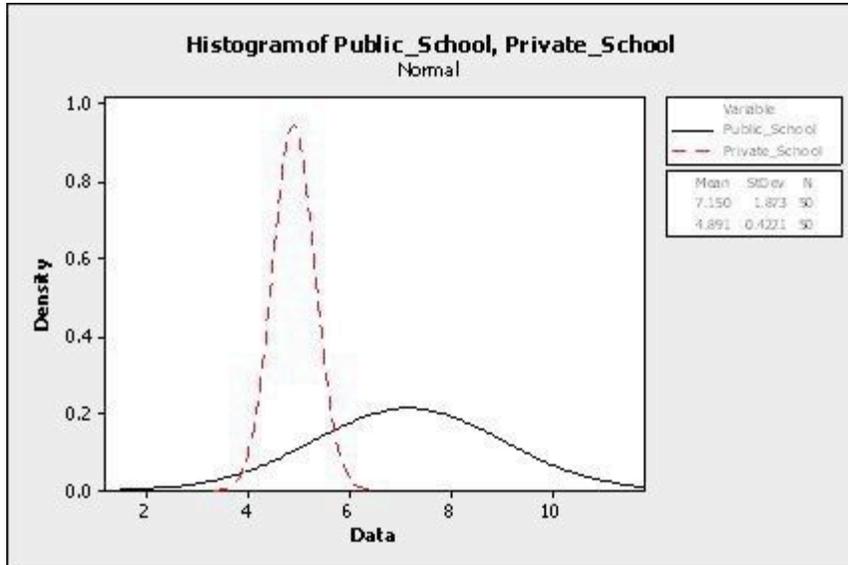
QUESTION 78

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

QUESTION 79

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

QUESTION 80

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

- A. True
- B. False

QUESTION 81

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

QUESTION 82

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.g. Normal Distribution)
- B. Process Technology
- C. Process Standard Deviation
- D. Presence of Special Causes or solely Common Causes
- E. Seasonal variation in process

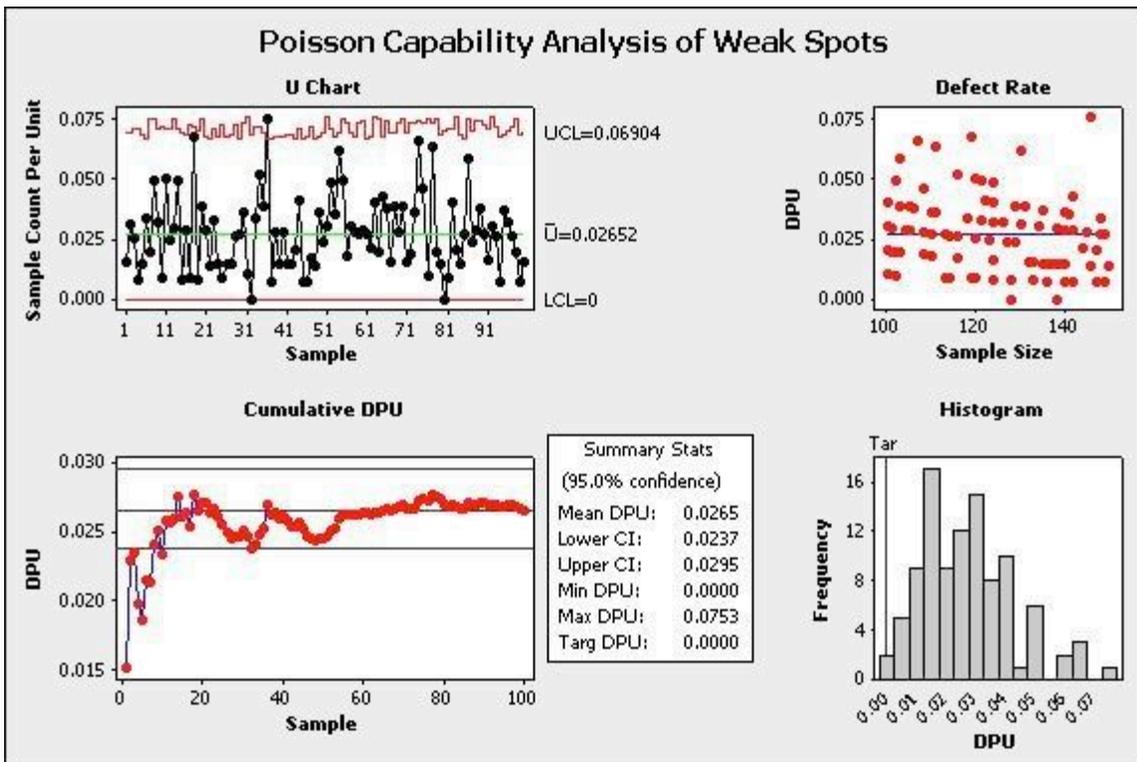
QUESTION 83

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

- A. True
- B. False

QUESTION 84

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

QUESTION 85

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

QUESTION 86

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

- A. True
- B. False

QUESTION 87

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

QUESTION 88

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

- A. True
- B. False

QUESTION 89

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

QUESTION 90

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

- A. True
- B. False

QUESTION 91

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

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

QUESTION 92

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"

QUESTION 93

Special Cause Variation falls into which two categories? (Note: There are 2 correct answers).

- A. Natural
- B. Short term
- C. Assignable
- D. Pattern

QUESTION 94

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

QUESTION 95

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

QUESTION 96

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

QUESTION 97

There are 14 different defects that can occur on a completed time card. The payroll department collects 328 cards and finds a total of 87 defects. DPMO =:

- A. $87 \div 328$
- B. $87 \div (328 \times 14)$
- C. $14 \div 87$
- D. $87 \div 14 \times 1,000,000$
- E. $328 \div 87$
- F. $87 \times 1,000,000 \div (14 \times 328)$

QUESTION 98

A management team lists nine goals across the top of a rectangle and 15 activity initiatives along the left hand side of the rectangle. If one of the activities strongly supports one of the goals a circle is placed in the box where that activity's row intersects the goal's column. If the activity's support is very strong a "bulls eye" is placed in the box and if the support is weak a triangle is used. This best describes which problem solving tool?



- A. Affinity diagram
- B. Inter-relationship digraph
- C. Tree diagram
- D. Process decision program chart
- E. Matrix diagram

- F. Prioritization matrix
- G. Activity network diagram

QUESTION 99

The management team in the above problem assigns each goal a numerical value designating its importance. The "bulls eyes," circles and triangles are replaced by the values 3, 2 and 1 respectively. Entries are made in each box by multiplying the 3, 2 or 1 by the goal value. The importance of each activity is calculated by adding the entries in its row.

	#1 (5)	#2 (8)	#3 (2)	Total
Activity #1	3 (15)			45
Activity #1		1 (8)	2 (4)	12
Activity #1	2 (10)	3 (24)		34
etc.				

- A. Affinity diagram
- B. Inter-relationship digraph
- C. Tree diagram
- D. Process decision program chart
- E. Matrix diagram
- F. Prioritization matrix

QUESTION 100.

This table displays the inventory of fasteners in a storage cabinet. An item is selected at random from the fastener cabinet. Find the approximate probability it is a bolt.

		size			
		.500	.625	.750	.875
Nut		146	300	74	41
Washer		280	276	29	32
Bolt		160	214	85	55

- A. 160
- B. .160
- C. .09
- D. .30
- E. none of the above