ICBB

QUESTION 1
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

QUESTION 2
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

QUESTION 3
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

QUESTION 4
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

QUESTION 5

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

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

QUESTION 6

Special Cause Variation falls into which two categories?

A. Natural & Unnatural
B. Short Term & Long Term
C. Assignable & Pattern
D. Attribute & Discreet

QUESTION 7

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

QUESTION 8

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

QUESTION 9
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 10
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

QUESTION 11
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

QUESTION 12
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

QUESTION 13
Upon completion and validation of an improvement to a process a Belt and the Project Team create a Control Plan that contains which of these?

A. Standard operating work description of the process change
B. Description of the monitoring system in place to assure continued compliance
C. Summary of the targeted critical metrics for process performance measurement
D. All of the above

QUESTION 14
What conclusion is most correct about the Experimental Design shown here with the response in the far right column?
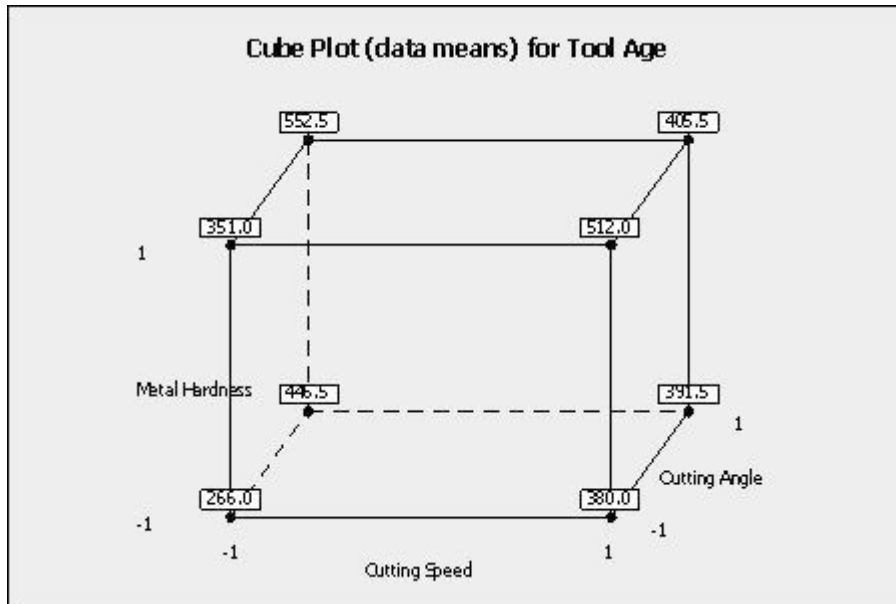
Adv	Bev	Des	Crux	Response
-1	-1	-1	-1	20
1	-1	-1	1	14
-1	1	-1	1	17
1	1	-1	-1	10
-1	-1	1	1	19
1	-1	1	-1	13
-1	1	1	-1	14
1	1	1	1	10

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 15

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

Cube Plot (data means) for Tool Age

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 16

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

QUESTION 17
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

QUESTION 18
Which statement(s) are correct about the Pareto Chart shown here for the DOE analysis? (Note: There are 2 correct answers).

Pareto Chart of the Standardized Effects
(response is % Reacted, Alpha = .05)
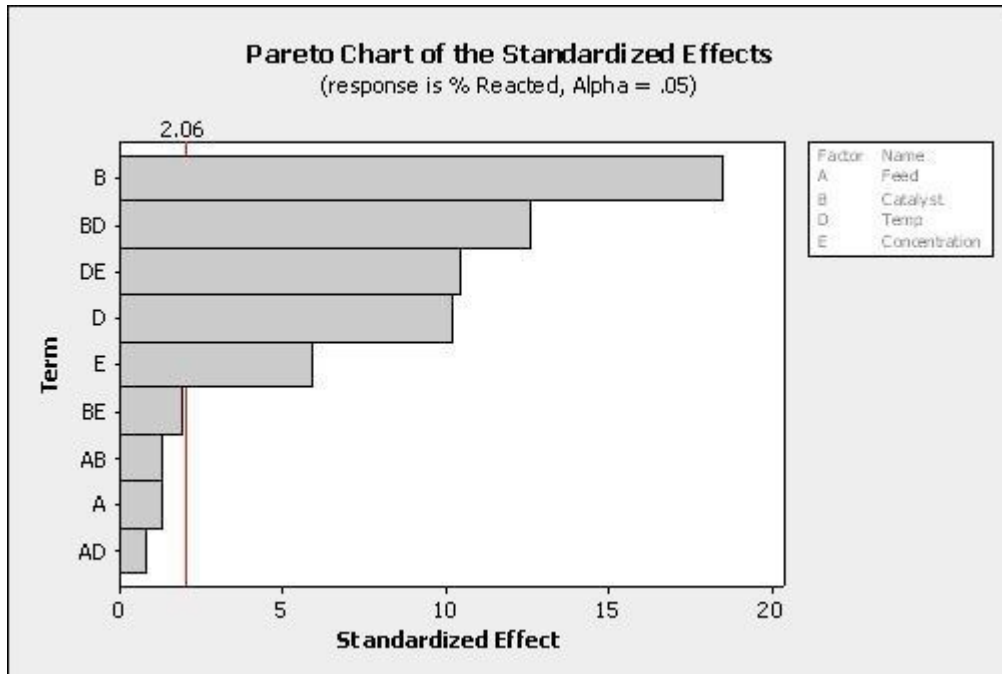
A. It is unknown from this graph how many factors were in the Experimental Design
B. The factors to keep in the mathematical model are E, D, DE, BD and B with an alpha risk equal to 2.06
C. The effects to keep in the mathematical model are E, D, DE, BD and B with an alpha risk equal to 0.05

D. The factors to keep in the mathematical model with a 5% alpha risk are BE, AB, A and AD

QUESTION 19
Fractional Factorial, _____and Response Surface Method are types of planned experiments.

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

QUESTION 20
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

QUESTION 21
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

QUESTION 22
If in an experiment all possible variable pairs sum to zero the design is Orthogonal.

A. True
B. False

QUESTION 23
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

QUESTION 24
The method of Steepest Ascent guides you toward a target inside the original inference space.

A. True
B. False

Explanation/Reference:
Explanation:

QUESTION 25

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

QUESTION 26
The Lean toolbox includes all of these items except _____.

A. Mistake Proofing
B. Visual Factory
C. Design of Experiments
D. Inventory Management

QUESTION 27
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?

QUESTION 28
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

QUESTION 29
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

QUESTION 30

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

A. True

B. False

QUESTION 31

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

QUESTION 32

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

A. Sign-off

B. Signal

C. Bell to ring

D. Work order

QUESTION 33

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

QUESTION 34
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).

Xbar-R Chart of Speed by Vendor

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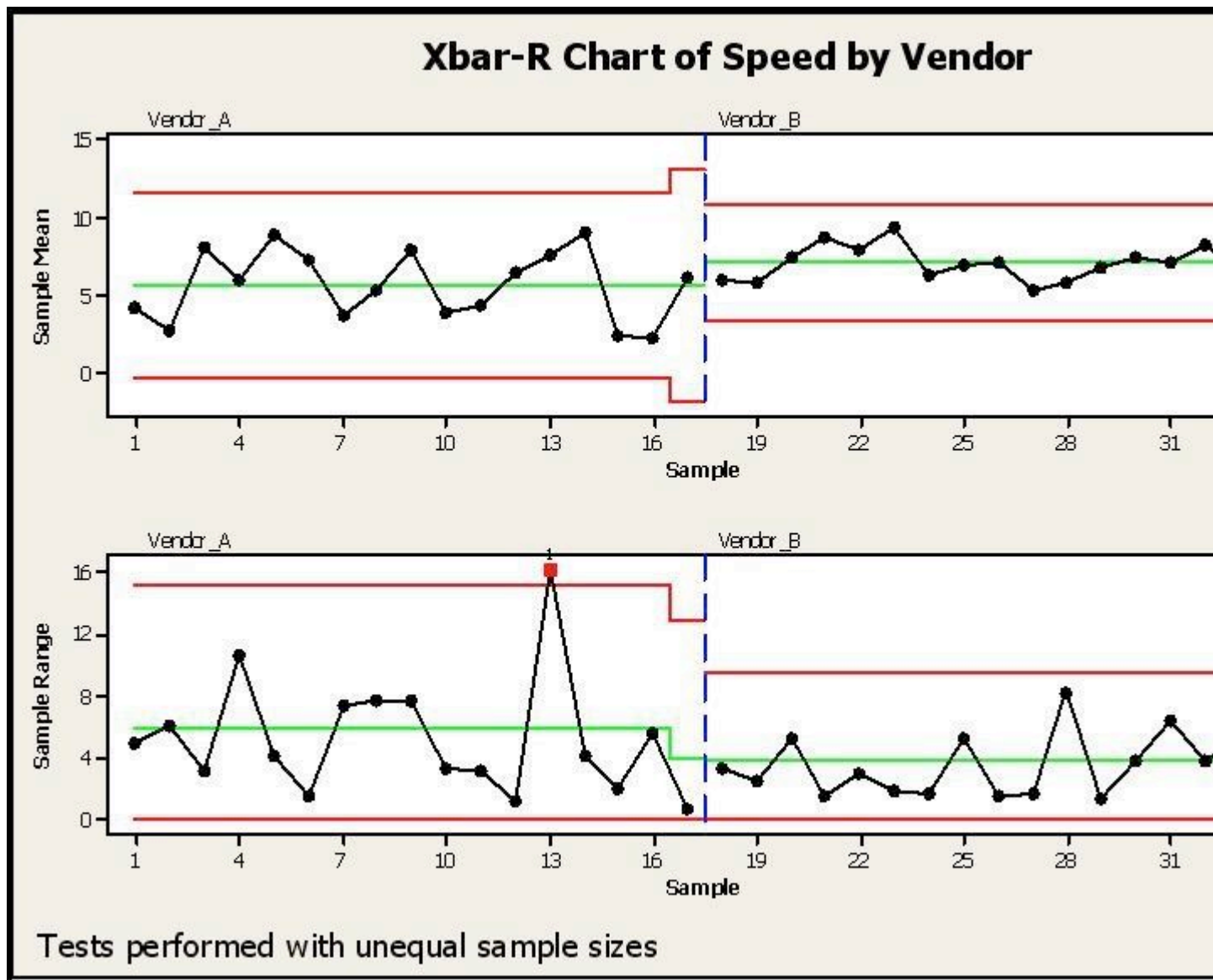
A. Vendor A with a much shorter lead time in delivery
B. Vendor B as it has a better consistency (lower variance) on lead time
C. Vendor B as Vendor A shows a situation out of control as shown in red
D. Vendor B as the Control Limits are much narrower than Vendor A
E. Vendor B with higher lead time,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

QUESTION 35

Fractional Factorial designs are used to reduce the _____ because the number of runs has been lowered.

A. Time and cost of experiments

B. Number of people involved

C. Number of data measurement points

D. Output summary

QUESTION 36

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 37

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 38

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?
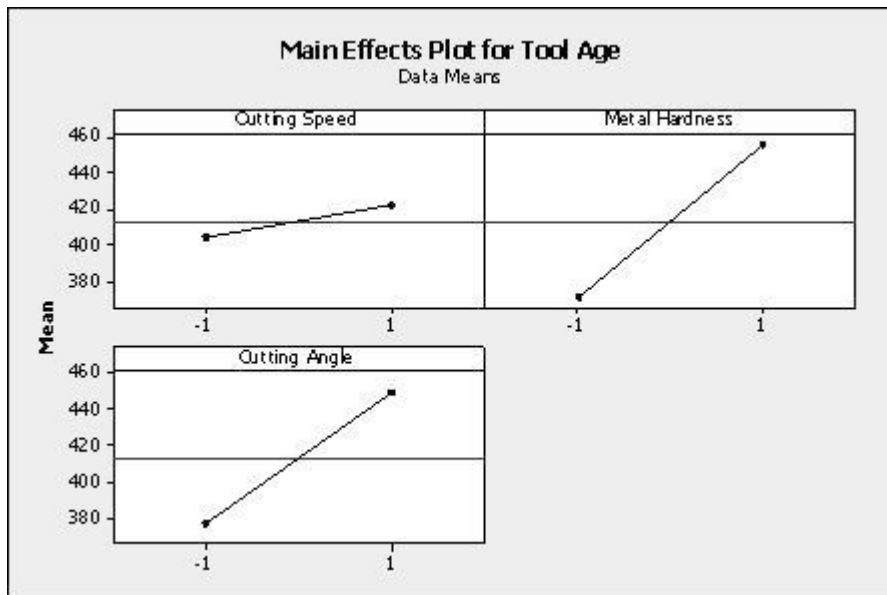
A. 6

B. 9

C. 27

D. 54

QUESTION 39

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

A. True

B. False

QUESTION 40

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

Main Effects Plot for Tool Age
Data Means

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 41
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

QUESTION 42
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
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 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 43

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 44

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

A. Negative
B. Positive
C. Monomial
D. Single alignment

QUESTION 45

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

QUESTION 46

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

Fitted Line Plot
Yield = 13.31 - 9.262 Reactant
+ 4.888 Reactant**2 - 0.2599 Reactant**3
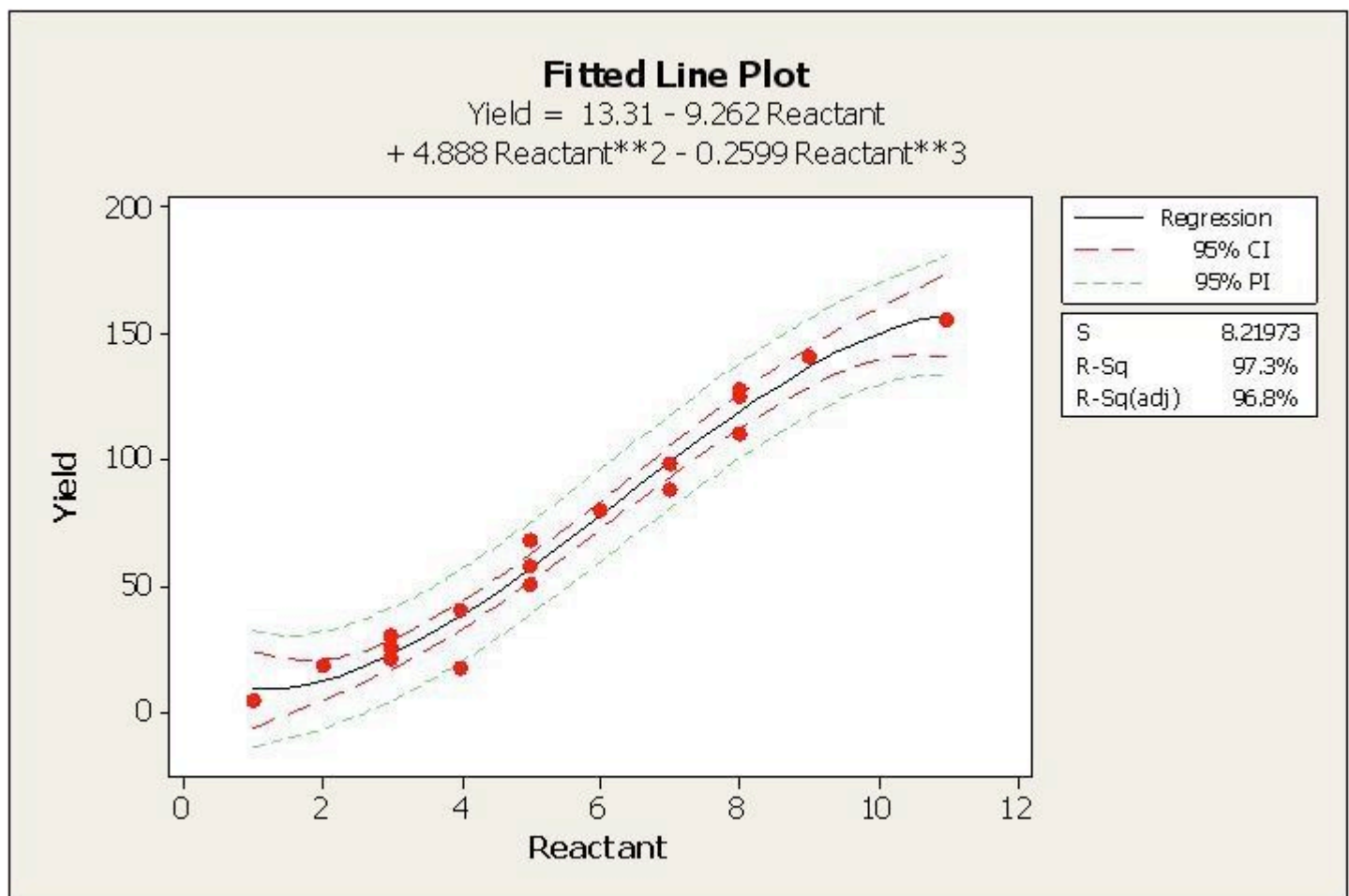
A. The independent variable is the reactant
B. If the reactant was 6 units, with 95 % confidence we would expect a minimum yield of 100 units
C. With at least 95% confidence, we can expect less than 10 units of Yield when the reactant is at a value of 1
D. A reactant value between 2 and 4 units yields around 20 to 40
E. When the reactant increases, the expected yield would increase

QUESTION 47
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

QUESTION 48

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
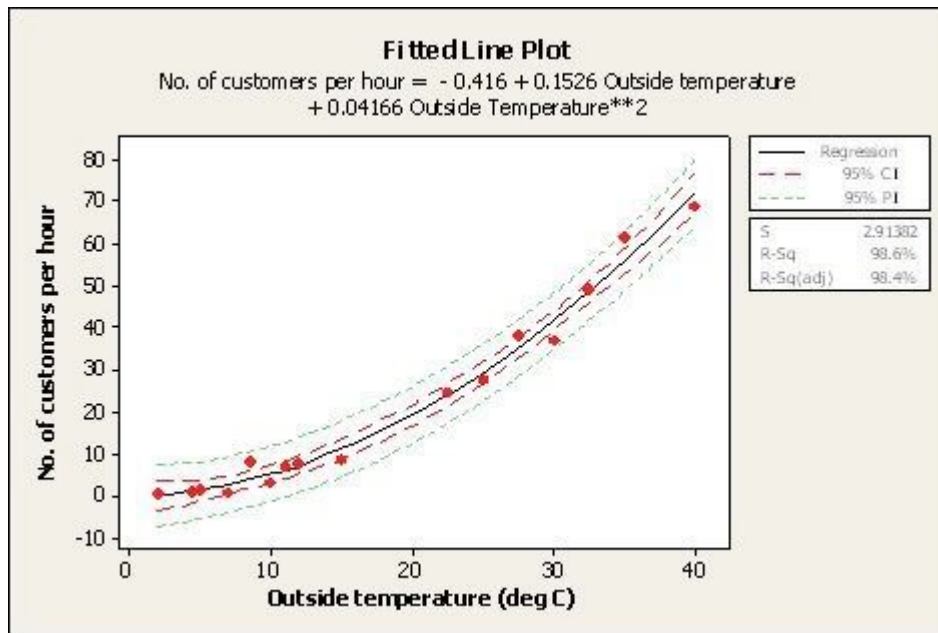

QUESTION 49

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. Some Residuals lower than others

C. All Residuals within 2 Standard Deviations of the Mean

D. Residuals will represent a Linear Regression

QUESTION 50

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

Fitted Line Plot
No. of customers per hour = - 0.416 + 0.1526 Outside temperature
+ 0.04166 Outside Temperature**2

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 51
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 52
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.

QUESTION 53

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 54

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

QUESTION 55

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

QUESTION 56

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

QUESTION 57
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

QUESTION 58
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

QUESTION 59
The relationship between a response variable and one or more independent variables is investigated and modeled by use of _____.

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

QUESTION 60
An ANOVA used across many dependent variables could increase the Beta risk.

A. True
B. False

QUESTION 61
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 62
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

QUESTION 63
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 64
Contingency Tables are used to test for association, or dependency, between two or more classifications.

A. True
B. False

QUESTION 65
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 66
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

QUESTION 67
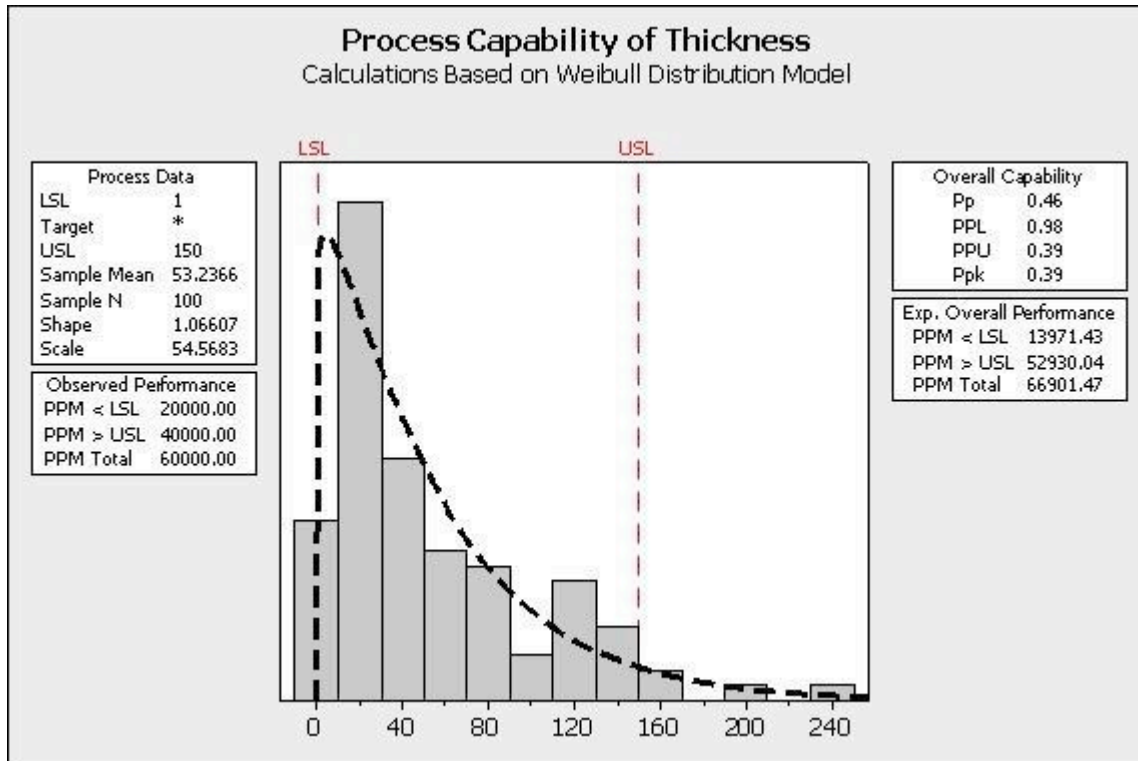For the data set shown here which of these statements is/are true?

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 68
Review the analysis shown here.

Process Capability of Thickness
Calculations Based on Weibull Distribution Model

Process Data
LSL	1
Target	*
USL	150
Sample Mean	53.2366
Sample N	100
Shape	1.06607
Scale	54.5683

Observed Performance
PPM < LSL	20000.00
PPM > USL	40000.00
PPM Total	60000.00

Overall Capability
Pp	0.46
PPL	0.98
PPU	0.39
Ppk	0.39

Exp. Overall Performance
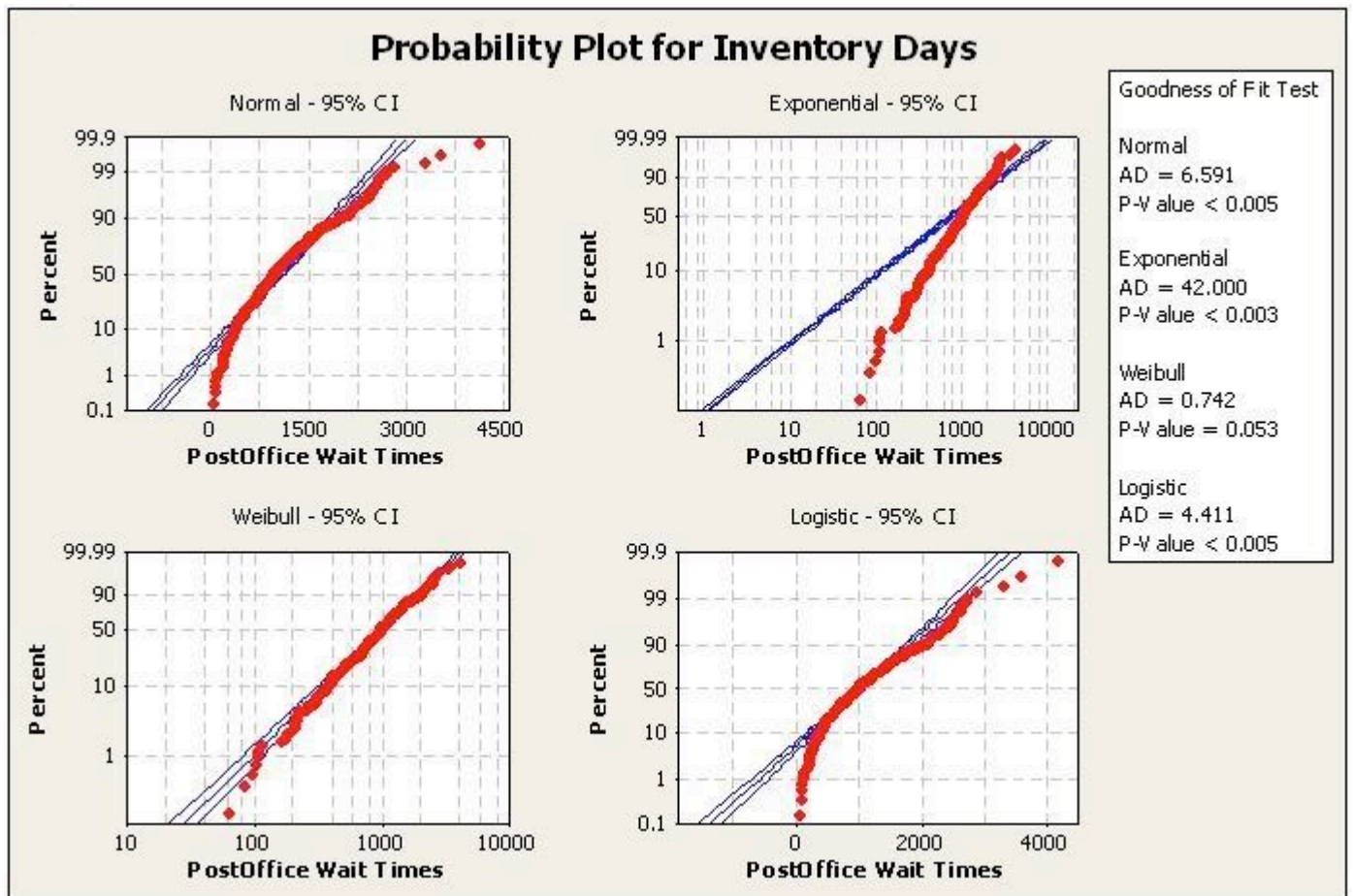|	
PPM < LSL	13971.43
PPM > USL	52930.04
PPM Total	66901.47

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 69

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.

Probability Plot for Inventory Days

Goodness of Fit Test

Normal
AD = 6.591
P-Value < 0.005

Exponential
AD = 42.000
P-Value < 0.003

Weibull
AD = 0.742
P-Value = 0.053

Logistic
AD = 4.411
P-Value < 0.005

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 70
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 71

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

QUESTION 72

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 73

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

QUESTION 74

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 75

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. F-test and test of variances of 2 samples
D. Practical and Statistical significance

QUESTION 76
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

QUESTION 77
From the variance F-test shown above, which of these conclusions is/are valid?

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

QUESTION 78
Time is always the metric on the horizontal scale of a(n) _____ Chart.

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

QUESTION 79
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

QUESTION 80
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 81
On a _____ a Belt screens variables, or various inputs, to analyze their relative impact on the output of concern.

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

QUESTION 82
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 83

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

QUESTION 84
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

QUESTION 85
The Normal Distribution is considered to be the most important distribution in statistics and, among other things is defined as having a total area under the curve of 1, is mounded and symmetrical and the Mean, Median and Mode are _____.

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

QUESTION 86
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.   Alpha Error
B.   Type I Error
C.   Type II Error
D. Type III Error

QUESTION 87
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 88
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.

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

QUESTION 89
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

QUESTION 90
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

QUESTION 91
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

QUESTION 92
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.
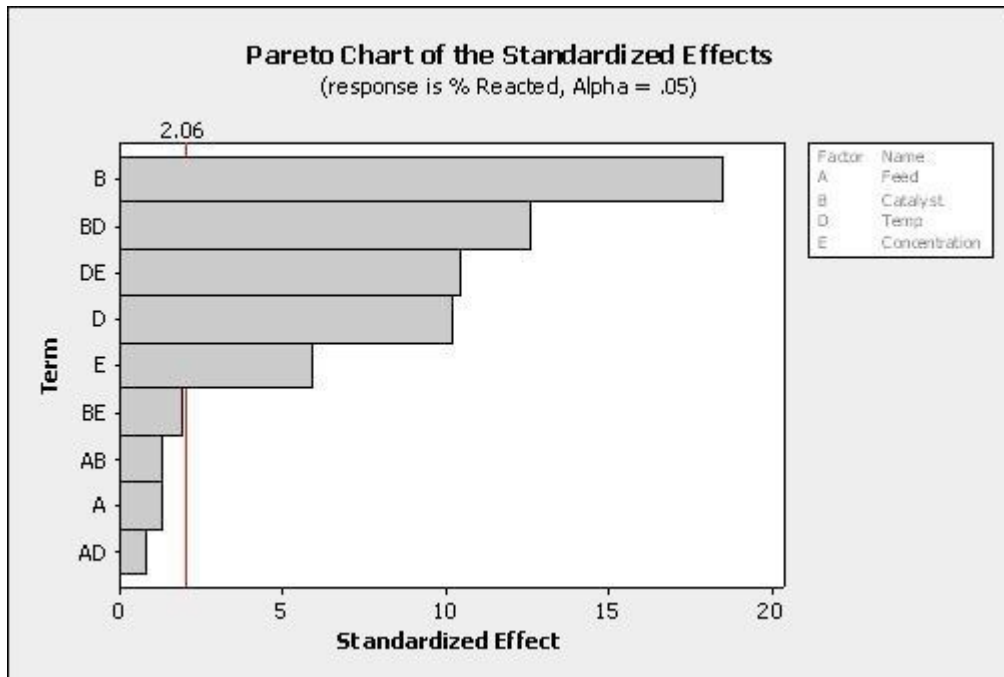
A. 10
B. 128
C. 256
D. 64

QUESTION 93
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 94

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

Pareto Chart of the Standardized Effects
(response is % Reacted, Alpha = .05)

Factor	Name
A	Feed
B	Catalyst
D	Temp
E	Concentration

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 95
With Measurement System Analysis we are concerned with two issues that impact the potential variability of the data. They are _____ and Accuracy.

A. Spread
B. Reliability
C. Precision
D. Deflection

QUESTION 96
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

QUESTION 97
Accuracy can be assessed in several ways and a fairly accurate means of measurement is visual comparison.

A. True
B. False

QUESTION 98
Measurement _____ is defined as the difference between the observed and the expected values for a given set of data.

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

QUESTION 99
Appropriate measures means that measurements are _____.

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

QUESTION 100
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

QUESTION 101
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 102
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

QUESTION 103
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

QUESTION 104

Each of the items listed would impact the Process Capability for a process with a continuous output except
_____.

A. Shape of process data distribution (e.g. Normal Distribution) B.
Process Technology
C. Process Standard Deviation
D. Seasonal variation in process

QUESTION 105

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

A. True
B. False

QUESTION 106

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

QUESTION 107

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

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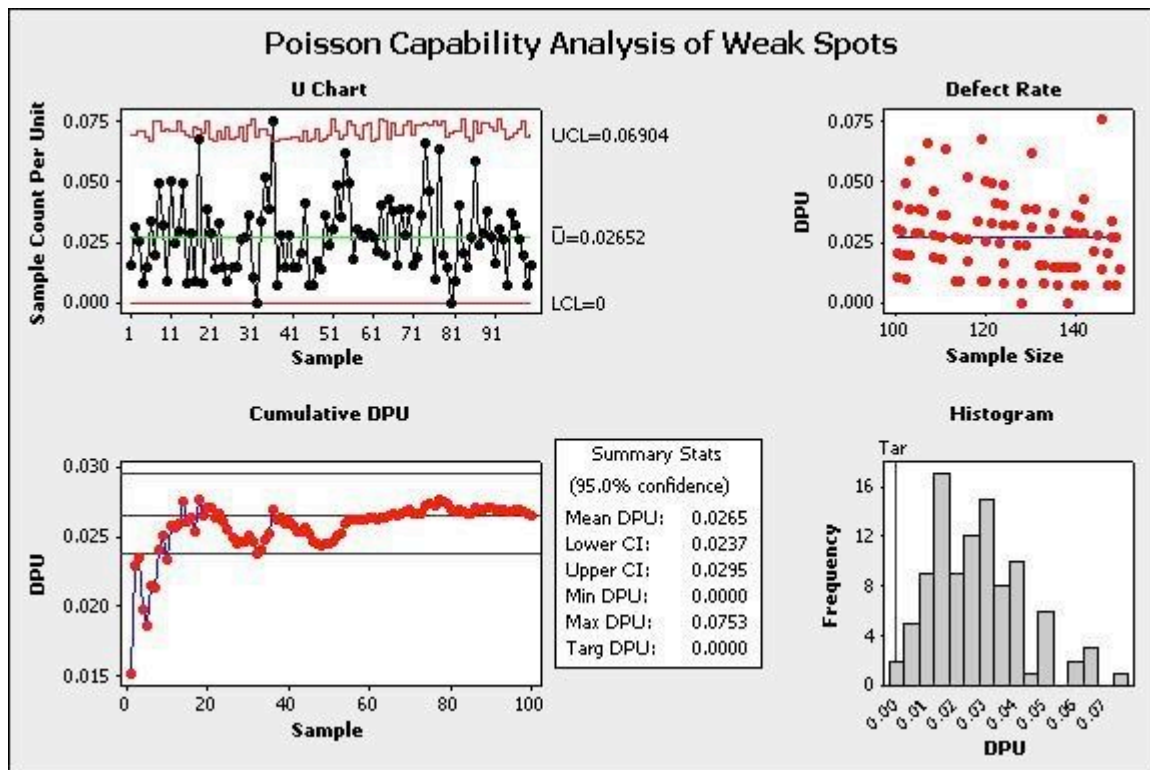C. Performance tends to improve over time
D. Cp is better for the long-term

QUESTION 108

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

QUESTION 109

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

Poisson Capability Analysis of Weak Spots

(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 110
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

QUESTION 111
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

QUESTION 112
Fractional Factorial, _____ and Response Surface Method are types of planned experiments.

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

QUESTION 113
If in an experiment all possible variable pairs sum to zero the design is Orthogonal.

A. True
B. False

QUESTION 114
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

QUESTION 115
The method of Steepest Ascent guides you toward a target inside the original inference space.

A. True
B. False

QUESTION 116
The Lean toolbox includes all of the following items except _____.

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

QUESTION 117
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?

QUESTION 118
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

QUESTION 119
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

QUESTION 120
Kaizens or Kaikakus and Six Sigma projects are intended to create breakthrough, significant process improvement versus minor, incremental improvements.

A. True

B. False

QUESTION 121
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

QUESTION 122
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

QUESTION 123
When a Belt implements an improvement that is automated thus requiring no particular understanding for use he has applied which Lean tool?

A. Mistake Proofing

B. Kaizen Event

C. 5S

D. None of the above

QUESTION 124
Kanban establishes a means of monitoring production, conveyance and delivery information such that efficient flow is established. The method used by Kanban is to require a _____ before anything moves.

A. Sign-off

B. Signal

C. Bell to ring

D. Work order

QUESTION 125

For a Kanban to be successful which of these must occur?

A. Consistent cycle times

B. Fairly stable process demand of product or service

C. Low defect rate of incoming product or service

D. All of the above

QUESTION 126

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).

Xbar-R Chart of Speed by Vendor
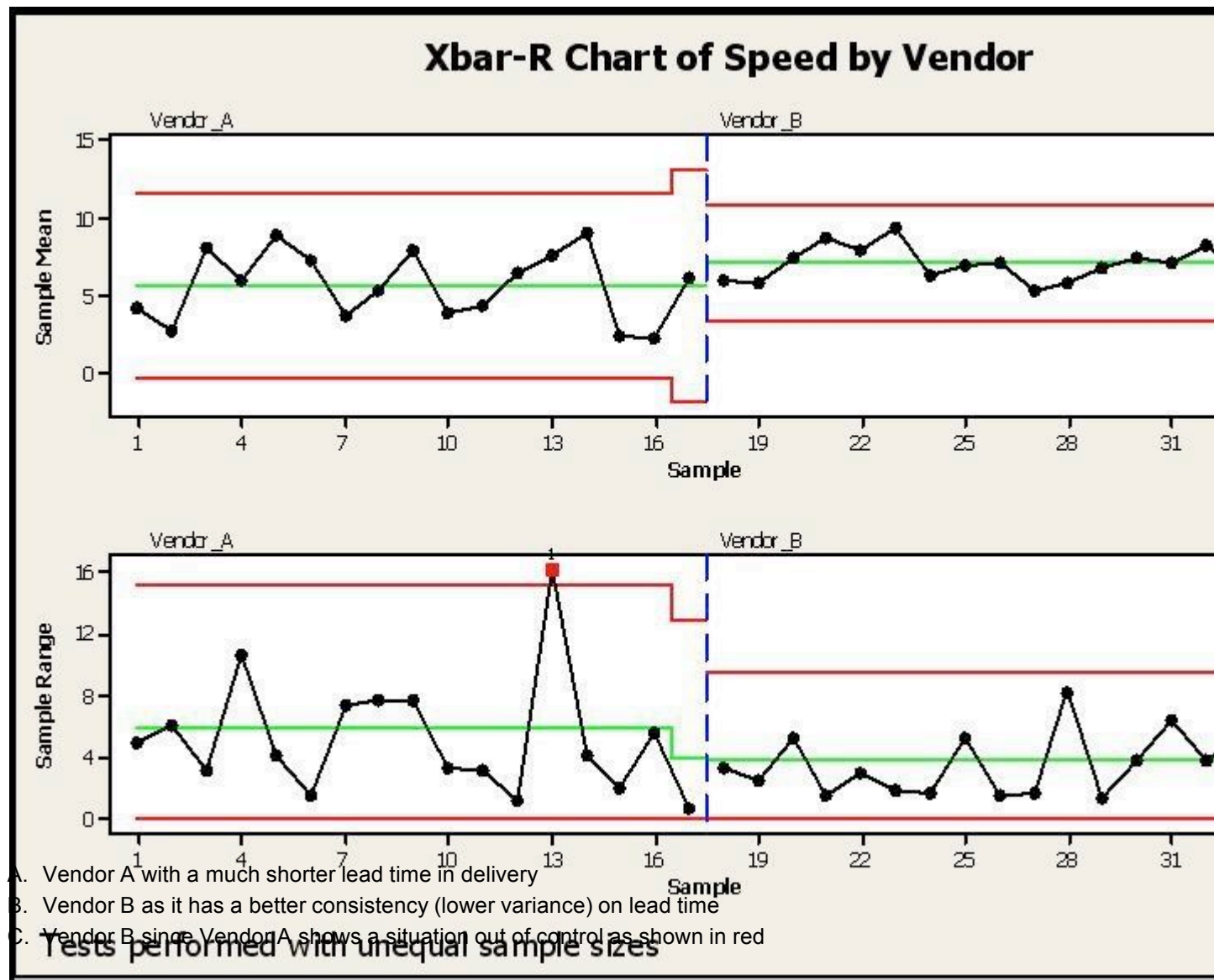
A. Vendor A with a much shorter lead time in delivery

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

Tests performed with unequal sample sizes

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 127
Common and Special Cause _____ are the focus of Statistical Process Control.

A. Prediction

B. Ideation

C. Capability

D. Variation

QUESTION 128
Special Cause Variation falls into which two categories? (Note: There are 2 correct answers).

A. Natural

B. Short term

C. Assignable

D. Pattern

QUESTION 129
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

QUESTION 130
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

QUESTION 131
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 132
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

QUESTION 133
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

QUESTION 134

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

QUESTION 135

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

QUESTION 136

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

QUESTION 137

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

QUESTION 138
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

QUESTION 139
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 140
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

QUESTION 141
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. $Y = Z(X2)$
B. $Y = f(X3)$
C. $Y = f(Xn)$
D. $Y = g(X+ 1.5)$

QUESTION 142
When we gather information for the Voice of the Business we are primarily interested in information concerning the _____ of the business.

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

QUESTION 143
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

QUESTION 144
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

QUESTION 145
Customers make their decisions based on Features, Integrity (of the seller) Delivery and _____?

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

QUESTION 146
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

QUESTION 147
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

Correct Answer: B
Section: (none)

Explanation

Explanation/Reference:
Explanation:

QUESTION 148
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 149
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. Pareto Principle
C. Balance Equation
D. Connection Principle

QUESTION 150
Using this data calculate the percentage of DPU.

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

QUESTION 151
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

QUESTION 152
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%

QUESTION 153
"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

QUESTION 154
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

Correct Answer: B
Section: (none)

Explanation

Explanation/Reference:
Explanation:

QUESTION 155
Which Element of Waste best describes "the unnecessary movement of materials and goods"?

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

QUESTION 156
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

QUESTION 157
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 158
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

QUESTION 159
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

QUESTION 160
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

QUESTION 161
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 162
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

QUESTION 163
In a Fishbone Diagram the 6M's stand for Methods, _____, Machine, Man, Mother Nature and Materials.

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

QUESTION 164
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

QUESTION 165
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

QUESTION 166
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

QUESTION 167
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 168
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

QUESTION 169
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 170
The two types of data that are to be used in Statistical Analysis are Attribute and Variance.

A. True

B. False

QUESTION 171
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

QUESTION 172

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

A. Continuous

B. Surplus

C.
Discrete

D.
Variable

QUESTION 173

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 174

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

A. Population

B. Sample

C. Frame

D. Spread

QUESTION 175

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

A. True

B. False

QUESTION 176

One of the methods of testing a Measurement System is to have at least two people take multiple readings from the same instrument and of the same sample set to judge the Repeatability and Reproducibly. This approach is called a _____ study.

A. Correlation Analysis

B. Gage R & R

C. Bimodal

D. Dual Attribute

QUESTION 177

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

A. Weibull

B.

Binomial C.

Poisson D.

Normal

QUESTION 178

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

QUESTION 179

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

QUESTION 180

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

A. Median

B. Mean

C. Center Point

D. Mode

QUESTION 181

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

QUESTION 182

If a Belt needed to model the data for the number of weaves in section of carpet fabric she would use the

_____ Distribution approach.

A. Poisson
B. Extended
C. Exponential
D. Weibull

QUESTION 183
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

QUESTION 184
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
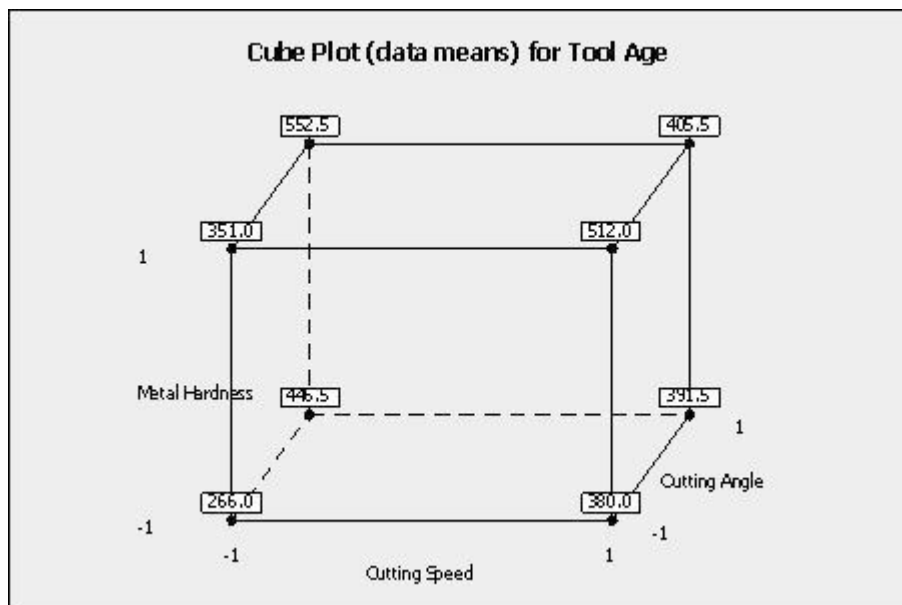
A. 8
B. 13
C. 28
D. 57

QUESTION 185
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

QUESTION 186
Which statement(s) are correct about the Factorial Plot shown here? (Note: There are 3 correct answers).

Cube Plot (data means) for Tool Age

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 187
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

QUESTION 188
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 189
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

QUESTION 190
A Factorial Experiment based on a Level 2 Design with 4 factors would require 16 runs to fully assess the interactions.
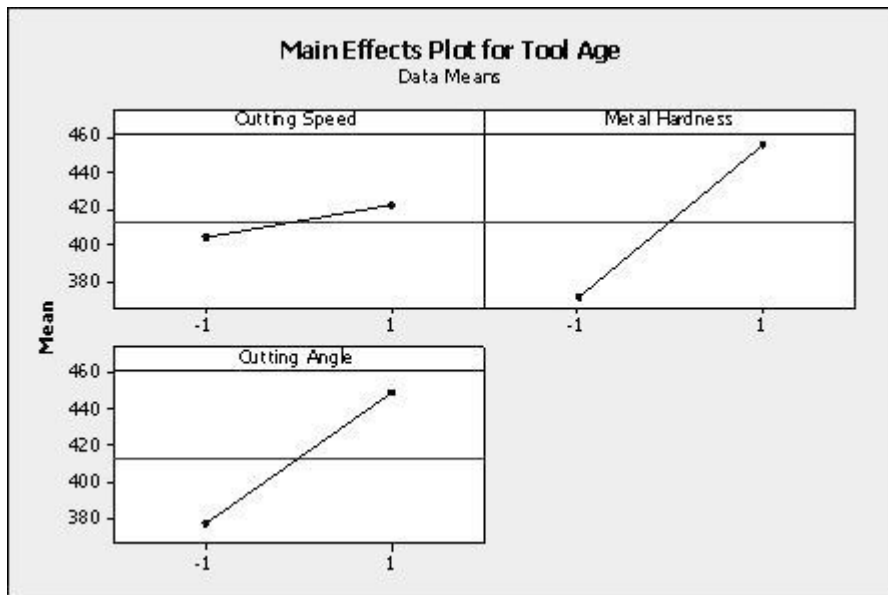
A. True
B. False

QUESTION 191
Screening experiments are the proper choice when a Belt is faced with the situation of highly Fractional Factorial Designs.

A. True
B. False

QUESTION 192
Which statement(s) are correct about the DOE Factorial plot output here? (Note: There are 3 correct answers).

Main Effects Plot for Tool Age
Data Means

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 193
Which statement is most correct for the Regression Analysis shown here?

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 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 194

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

QUESTION 195

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 196
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

QUESTION 197
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 198
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 199
Which statement is NOT correct about the Fitted Line Plot shown here?

Fitted Line Plot
Yield = 13.31 - 9.262 Reactant
+ 4.888 Reactant**2 - 0.2599 Reactant**3
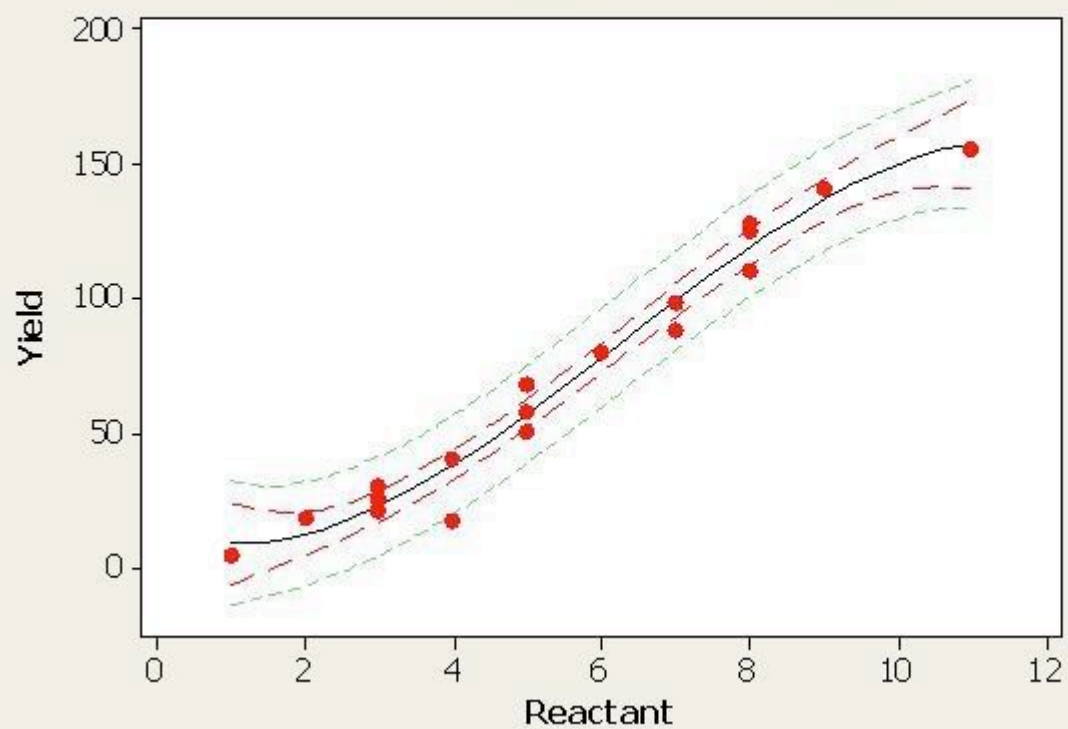
Regression	
95% CI	
95% PI	

S	8.21973
R-Sq	97.3%
R-Sq(adj)	96.8%

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 200
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

QUESTION 201
Contingency Tables are used to test for association, or dependency, between two or more classifications.

A. True
B. False

QUESTION 202
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
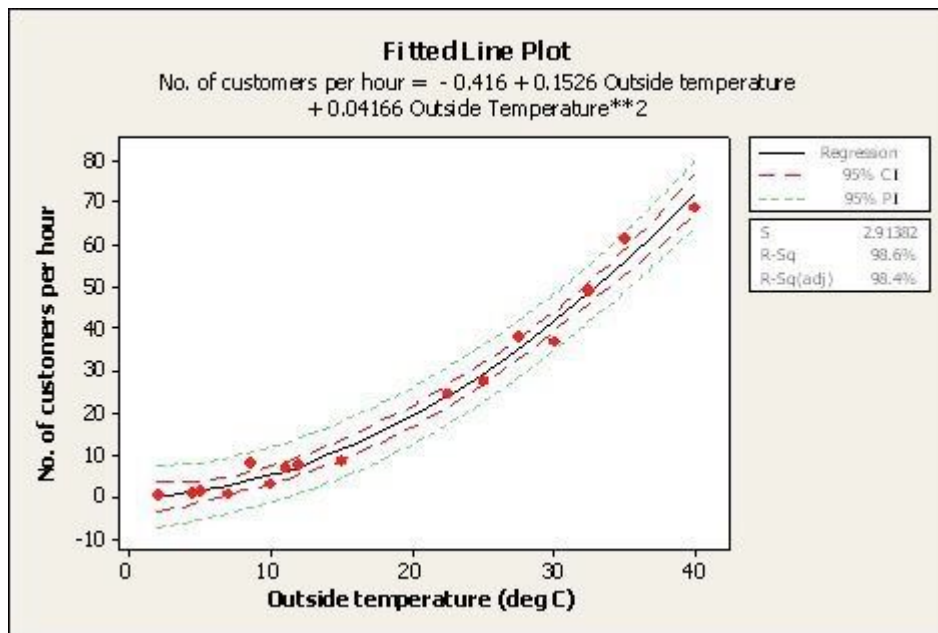D. Correlation Coefficient equals r divided by 2

QUESTION 203
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 204
Which statement(s) are correct about the Regression shown here? (Note: There are 2 correct answers).

Fitted Line Plot
No. of customers per hour = - 0.416 + 0.1526 Outside temperature
+ 0.04166 Outside Temperature**2

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 205
Review the analysis shown here. Which statements are true about the process? (Note: There are 3 correct answers).
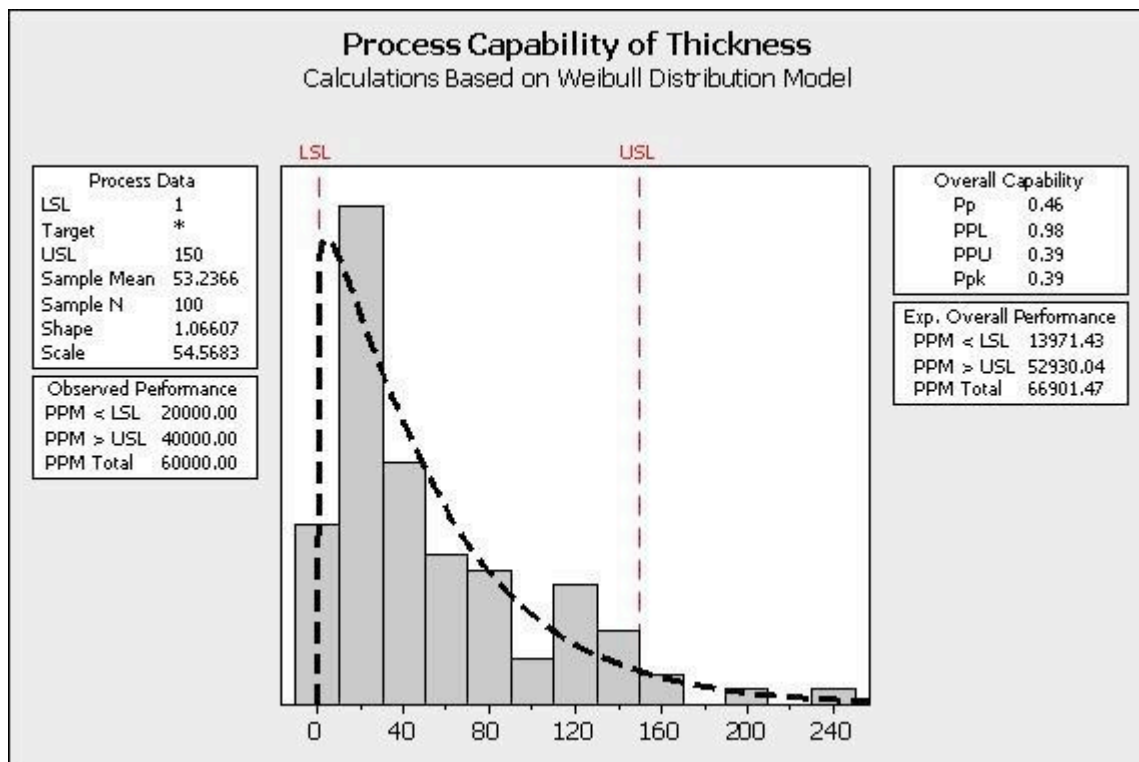
Process Capability of Thickness
Calculations Based on Weibull Distribution Model

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 206
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.

Probability Plot for Inventory Days
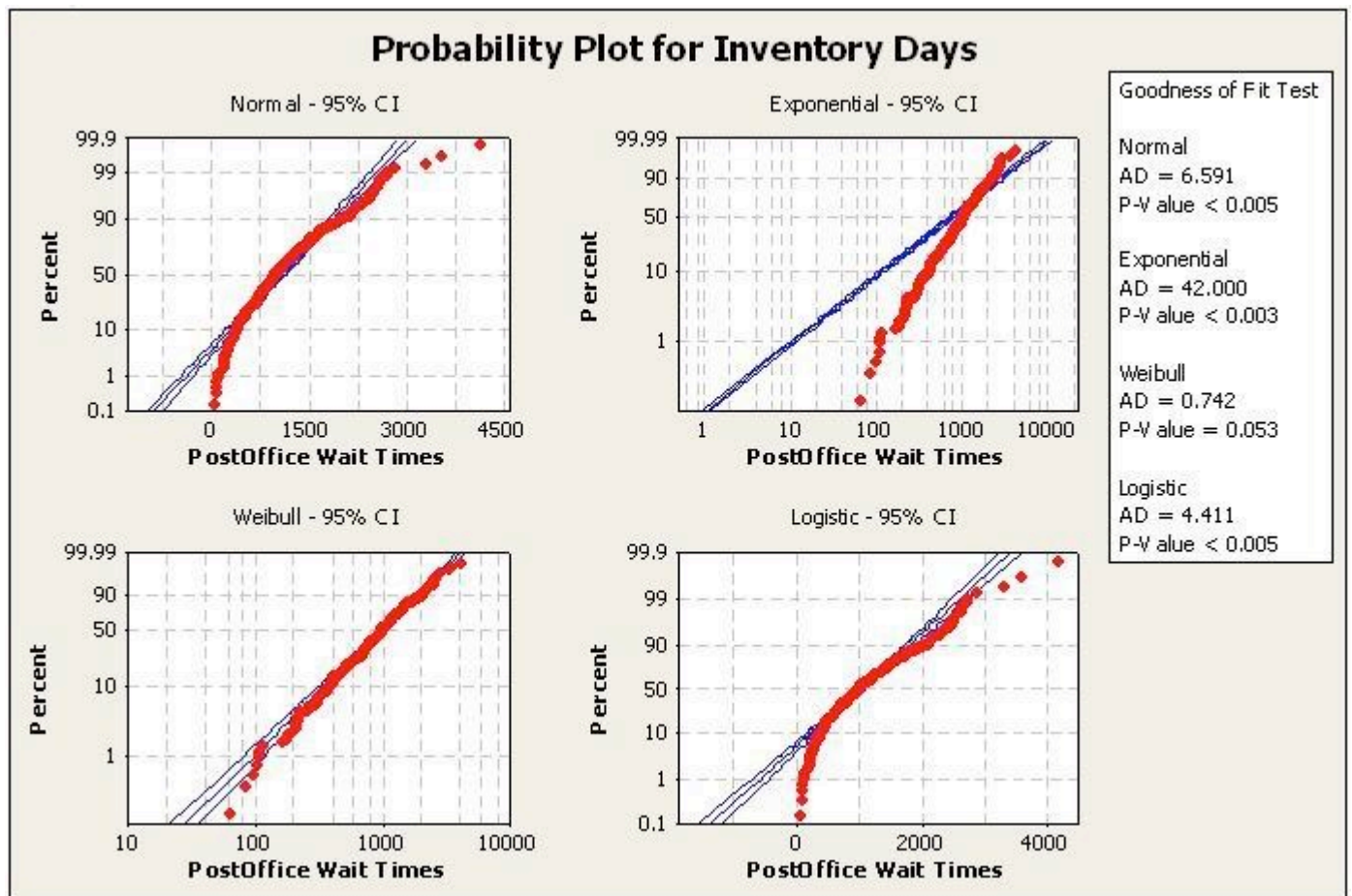
Which distribution type is best used for performing the Capability Analysis?

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

QUESTION 207
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 208
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

QUESTION 209

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 210

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 $2,800 in order to stay within budget. Using a sample of 55 first article components, a Mean of the new product upgrade price of $2,240 and a Standard Deviation of $120 was estimated. Based on the data provided, the Z value for the data assuming a Normal Distribution is?

A. 2.33
B. 4.67
C. 6.48
D. 8.28

QUESTION 211
A Belt working in a supply chain environment has to make a decision to change suppliers of critical raw materials for a new product upgrade. The purchasing manager is depending on the Belt's effort requiring that the average cost of an internal critical raw material component be less than or equal to $4,200 in order to stay within budget. Using a sample of 35 first article components, a Mean of the new product upgrade price of $4,060, and a Standard Deviation of $98 was estimated. In order to increase the Long Term Z value to 4, what is the maximum long term variation in pricing the Belt can accept for his upgraded critical raw material component?

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

QUESTION 212
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

QUESTION 213
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

QUESTION 214

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

QUESTION 215

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. Baldridge Assessment
C. Critical X's Definition
D. Analysis of Variance (ANOVA)

QUESTION 216

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

A. True
B. False

QUESTION 217
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 218
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 219
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

QUESTION 220
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
E. If we wanted to compare the Central Tendencies of all three samples we could use the Mann- Whitney test

QUESTION 221
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

QUESTION 222
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

QUESTION 223
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 224
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 225
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

QUESTION 226

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

A. Beta risk

B. Range of data

C. Alpha risk

D. Sample size

QUESTION 227
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

QUESTION 228
From the variance F-test shown above, which of these conclusions is/are valid?

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

QUESTION 229
Time is always the metric on the horizontal scale of a(n) _____ Chart.

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

QUESTION 230
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

QUESTION 231
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 232
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 233
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

QUESTION 234
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 235
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

QUESTION 236
The Central Limit Theorem says that as the sample size becomes large the sample Mean distribution will form a Normal Distribution, _____.

A. If the Measurement System is properly calibrated

B. When the data is collected accurately

C. If the shape is evenly spread

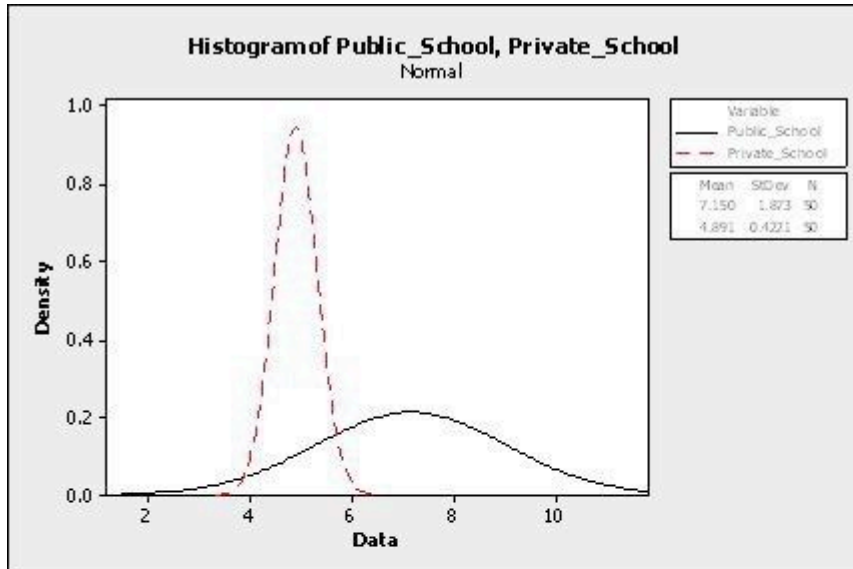D. No matter what the shape of the population distribution of individuals

QUESTION 237

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 238

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.

Histogram of Public_School, Private_School
Normal

	Variable			
	Public_School			
	Private_School			
	Mean	StDev	N	
	7.150	1.873	50	
	4.891	0.4221	50	

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 239

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

QUESTION 240

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

A. True
B. False

QUESTION 241
With Measurement System Analysis we are concerned with two issues that impact the potential variability of the data. They are _____.

A. Precision and Accuracy
B. Reliability and Repeatability
C. Error and Spread
D. Sensitivity and Deflection

QUESTION 242
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

QUESTION 243
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

QUESTION 244
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

QUESTION 245
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 246
Appropriate measures means that measurements are _____.

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

QUESTION 247
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

QUESTION 248
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 249
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

QUESTION 250
For Attribute Data, Process Capability is defined as the average proportion of nonconforming products.

A. True
B. False

QUESTION 251
When we compare short-term and long-term Capability which of these is true?

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

QUESTION 252
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

QUESTION 253
Which statements are correct about the advanced Capability Analysis shown here? (Note: There are 3 correct answers).

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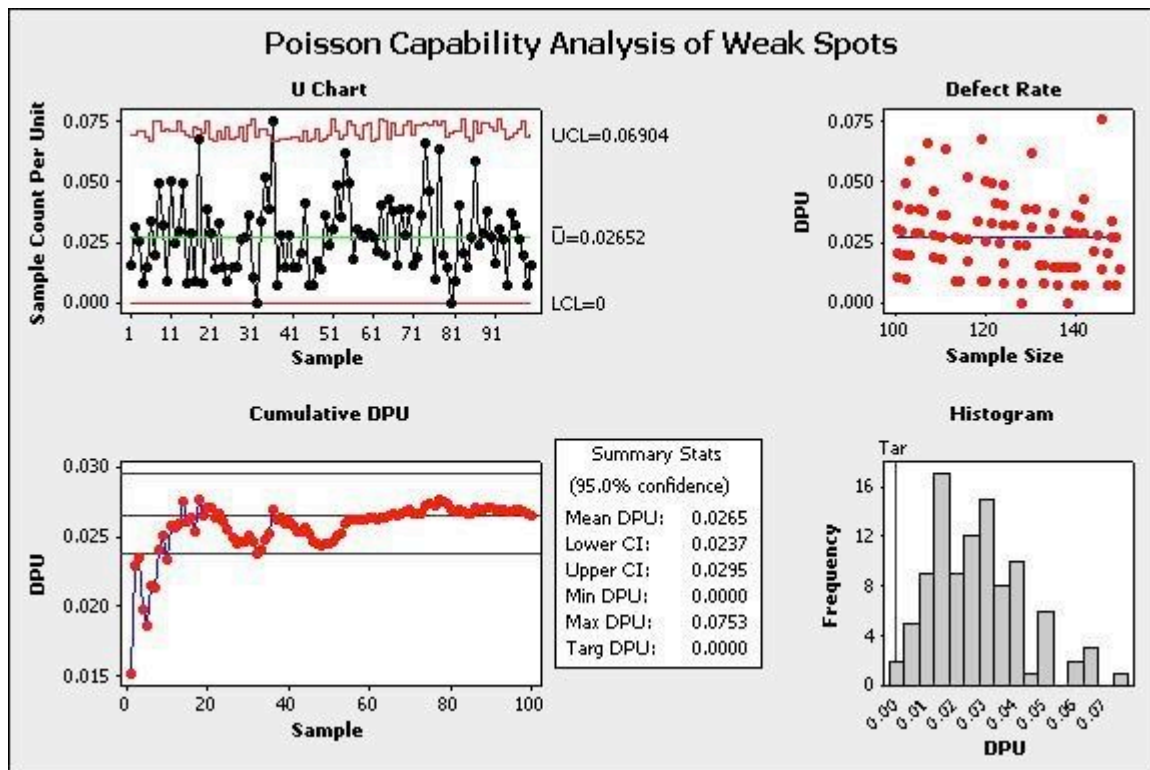
A. This is a Poisson Capability Analysis
B. The average DPU with 95% confidence is between 0.024 and 0.0295
C. The DPU does not seem to vary depending on sample size
D. The process shows only one instance of being out of control statistically so we have confidence in the estimated DPU of this process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

QUESTION 254
The Greek letter "sigma" is used by mathematicians to signify _____.

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

QUESTION 255

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

QUESTION 256
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 257
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

QUESTION 258
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(X2)
B. Y =
f(X3) C.
Y =
f(Xn)
D. Y = g(X+ 1.5)

QUESTION 259
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

QUESTION 260
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

QUESTION 261
Customers make their decisions based on Features, Integrity (of the seller) Delivery and _____?

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

QUESTION 262
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

QUESTION 263
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

QUESTION 264
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

QUESTION 265
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

QUESTION 266
Using this data calculate the percentage of DPU.
Data: 763 defects, 18,000 units.

A. 2.12

B. 3.42

C. 4.24

D. 5.72

QUESTION 267
Calculate the Rolled Throughput Yield of this process using this data. Data: unit input: 1215, unit output: 1180, defects repaired: 184, scrap: 42

A. 80.85%

B. 81.40%

C. 82.23%

D. 84.96%

QUESTION 268

"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

QUESTION 269
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 270
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

QUESTION 271
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

QUESTION 272
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

QUESTION 273
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 274
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

QUESTION 275
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

QUESTION 276
Which Element of Waste best describes "the unnecessary movement of materials and goods"?

A. Overprocessing

B. Inventory
C. Motion
D. Conveyance

QUESTION 277
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

QUESTION 278
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 279
During the _____ phase of 5S is when we might implement a Red Tag program.

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

Explanation:

QUESTION 280
In a Fishbone Diagram the 6M's stand for Methods, Measurements, Machine, Man, Mother Nature and
_____ .

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

QUESTION 281
Which one of these tools is frequently used to help drill down to possible causes once a Fishbone Diagram is constructed?

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

QUESTION 282
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 283
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

QUESTION 284
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 285
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 286
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

QUESTION 287
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

QUESTION 288
Of the various types of data shown below which is NOT representative of Variable Data.

A. Length of a table
B. Liters of solution added to a formula
C. Number of employees wearing a uniform
D. Miles per hour of a vehicle

QUESTION 289
The two types of data that can be used in Statistical Analysis are Attribute and Variable.

A. True
B. False

QUESTION 290
All the data points that represent the total set of information of interest is called the _____ .

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

QUESTION 291
Data that can be measured on a continuum and has meaningful decimal subdivisions are _____ data.

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

QUESTION 292
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

QUESTION 293
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

QUESTION 294

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

A. True

B. False

QUESTION 295

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

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

QUESTION 296

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

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

QUESTION 297

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

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

QUESTION 298

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

QUESTION 299
The _____ Distribution would be the most desirable for modeling the number of stitch defects in a portion of fabric.

A. Exponential
B. Extended
C. Poisson
D. Weibull

QUESTION 300
Which of these graphical presentations displays the values of each individual reading?

A. Histogram
B. Box Plot
C. Stem and Leaf Plot
D. X-Y Diagram