IASSC Lean Six Sigma Black Belt Certification

Sample Paper

PEOPLECERT

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IASSC SIX SIGMA CERTIFICATION EXAM

SAMPLE PAPER – BLACK BELT

Sample Test Questions *(Select all applicable answers)*

Phase 1 - Define Phase

1. A Belt is attempting to improve the soldering on a micro-processor used for a new hand-held device. As a result he should build a list of Critical to Quality Characteristics based on _____.

   a. Service benefits

   b. Product features

   c. Price

   d. Size of unit

2. A dairy learned through a Lean Six Sigma project their ice cream products could be stored at a temperature 2 degrees higher than they had historically used. Since their energy costs for ice cream storage cost $6,000 per month per degree of temperature, what was reported as the savings from this LSS project?

   a. $72,000

   b. $144,000

   c. $432,000

   d. $720,000

3. Producing more than is needed by the next step in the process or more than the customer needs is an example of which of the Seven Elements of Waste?

   a. Overproduction

   b. Correction (defects)

   c. Inventory

   d. Motion

Phase 2 - Measure Phase

1. An FMEA is an important tool for a Black Belt. From the list below select the **three** items that best describe the benefits obtained from constructing a FMEA.

   a. Predict where/when/how failures may occur

   b. Estimate the severity, occurrence and detection of defects

   c. Helps display the procedural order of a process

   d. Identify ways in which a process can fail to meet customer requirements

2. The shape of a Normal Distribution is impacted **primarily** by:

   a. Sample Error

   b. Mean

   c. Data Type

   d. Variance

3. The graphic below depicts a situation where the measurements are:

   a. Accurate

   b. Precise

   c. Accurate and Precise

   d. Neither Accurate or Precise

Phase 3 - Analyze Phase

1. Since 95% of Normally Distributed data is within +/- 2 Standard Deviations of the Mean, then the probability is _____% that a sample Mean is within +/- 2 Standard Deviations of the population Mean.

   a. 30

   b. 47.5

   c. 75

   d. 95

2. After running some statistical tests, a Belt found that the P-value was greater then 0.05 which indicated:

   a. There is a difference or relationship with at least 95% confidence

   b. There is no difference or relationship with at least 95% confidence

   c. To reject the Null Hypothesis with a least 95% confidence

   d. To run five more tests to get 95% confidence

   e. To change the Null Hypothesis

3. A wine distributor hypothesizes that sales average $12,000 per month. A sample report of 10 months with a Mean of $11,277 was selected. The Standard Deviation is $3,772. Using an alpha of 5 percent, is the distributor statistically confident? What are the correct Degrees of Freedom if doing the t-test?

   a. 1

   b. 9

   c. 10

   d. 11

Phase 4 - Improve Phase

Regression Analysis: Tons mined versus Personnel hours

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The Regression Equation is Tons mined = 4.359 + 0.000310 Personnel hours

S = 0.0559431   R-Sq = 39.2%   R-Sq(adj) = 33.1%

Analysis of Variance

Source       DF         SS         MS     F      P
Regression    1  0.0201823  0.0201823  6.45  0.029
Error        10  0.0312964  0.0031296
Total        11  0.0514787
```

1. Which **two** statements are correct for the Regression Analysis displayed above?

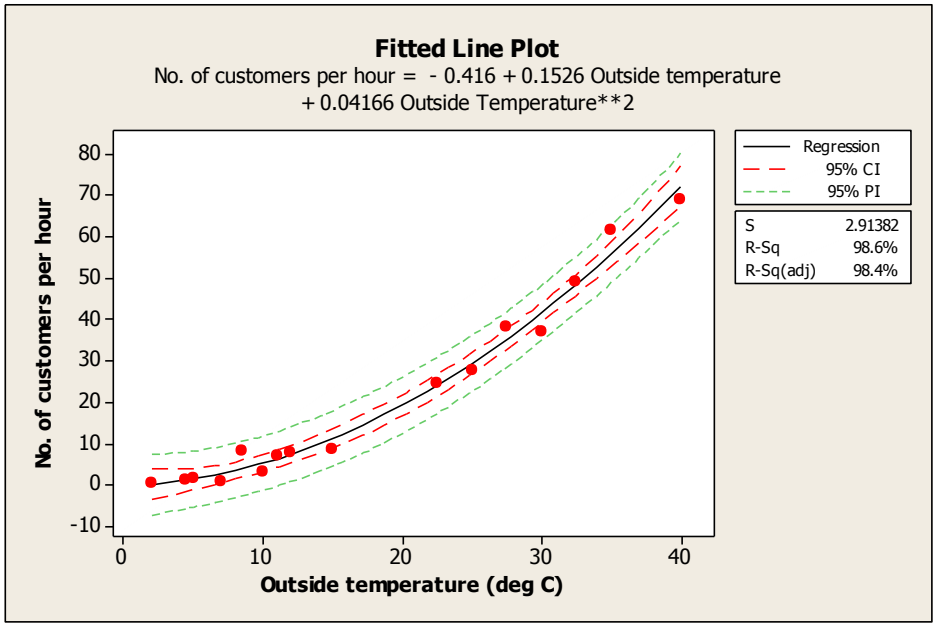
   a. The regression analysis based on the "p-value" is statistically significant at 95 % confidence

   b. The independent variable is "Tons mined."

   c. The regression is statistically insignificant as the R^2 value is < 80 %.

   d. The dependent variable is "Tons mined."

   e. The input "Personnel hours" has a significant impact on "Tons mined."



2. Which statement is **incorrect** about the above Regression?

a. The dependent variable is the outside temperature.

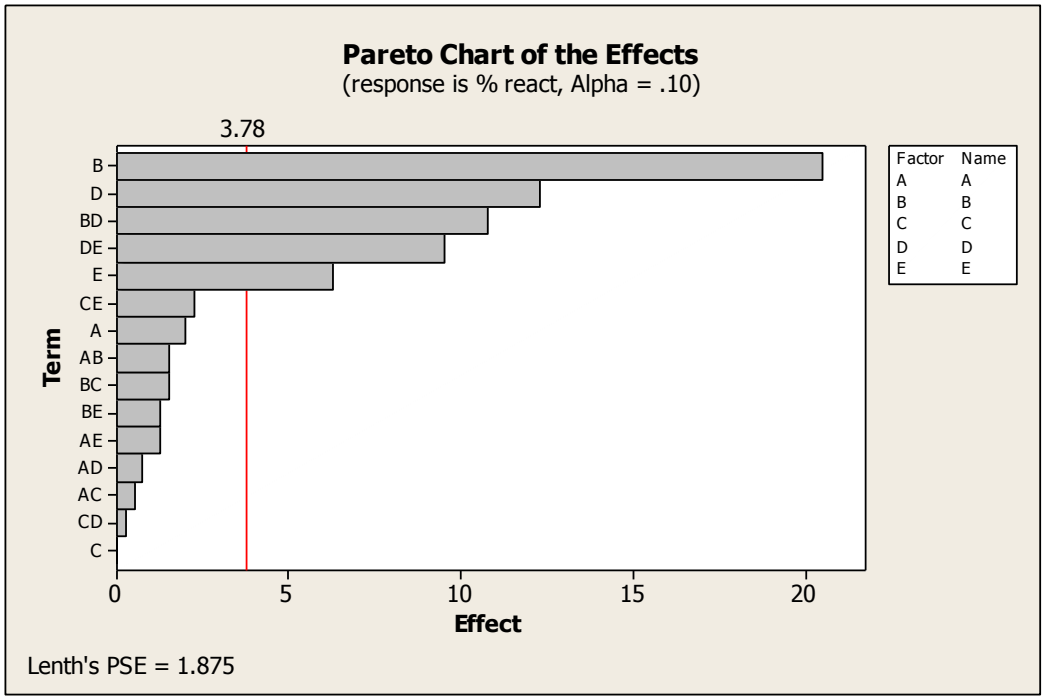
b. The Regression is an example of a quadratic equation.

c. With at least 95% confidence, we can expect less than 30 customers per hour when the outside temperature is 21 deg C.

d. If the outside temperature was to increase from 20 to 30 deg C, the number of customers per hour should increase by nearly 20.

e. With at least 95% confidence, the retailer would expect less than 10 customers per hour if the temperature outside is less than 5 deg C.

f. If the outside temperature was 30 deg C, with at least 95% confidence we would expect less than 50 customers per hour.



3. Which of the following statements is **false** of the Pareto Chart Effects diagram output shown by Minitab™ above?

   a. There are 5 factors varied in this experimental effort.

   b. Factor "B" has the highest effect on the output measured in this experiment.

   c. Three-Way interaction effects have a significant effect on the output.

   d. Factor "C" has the lowest effect on the output measured in this experiment.

   e. Two-Way interactions and Main effects are to be pursued in further trials.

Phase 5 - Control Phase

1. Which item is the least descriptive of a properly designed control system using the Lean toolbox?

   a. Balanced and consistent work flow across a process

   b. Zero inventory of Work In Process (WIP)

   c. Tidy, organized and maintained office equipment or machinery

   d. Labeled inventory areas which control the production of material or services

2. A characteristic of properly executed SPC includes which of the following (Select **two** answers):

   a. Immediate response to an out of control indication

   b. After a action to an out of control indication of violating the 3 sigma limits, the next data point is just within the 3 sigma limits so another action was taken to further reduce the response

   c. Plotting the response from the process at the end of the day and then analyzing for out of control conditions and taking actions if still out of control

   d. Creation of Out of Control Action Plans before using an SPC Chart in the process

3. If unsustained results are the case after project closure, what actions should be taken to recapture the benefits of the Six Sigma project?

   a. Contact the Belt no matter where he/she is

   b. Contact the Belt if still in the same process area

   c. Reference the Control Plans and key finding in the final report

   d. Check to see if the SPC Charts are up to date

SAMPLE TEST QUESTIONS ANSWER KEY

Phase 1 - Define Phase

1.	B	Product features
2.	B	$144,000
3.	A	Overproduction

Phase 2 - Measure Phase

1.	A	Predict where/when/how failures may occur
	B	Estimate the severity, occurrence and detection of defects
	D	Identify ways in which a process can fail to meet customer requirements
2.	D	Variance
3.	B	Precise

Phase 3 - Analyze Phase

1.	D	95
2.	B	There is no difference or relationship with at least 95% confidence
3.	B	9

Phase 4 - Improve Phase

1.	D	The dependent variable is “Tons mined.”
	E	The input “Personnel hours” has a significant impact on “Tons mined.”
2.	A	The dependent variable is the outside temperature.
3.	C	Three-Way interaction effects have a significant effect on the output.

Phase 5 - Control Phase

1. B Zero inventory of Work In Process (WIP)

2. A Immediate response to an out of control indication

   D Creation of Out of Control Action Plans before using an SPC Chart in the process

3. C Reference the Control Plans and key finding in the final report

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