

IASSC Six Sigma Black Belt Certification



Sample Paper



PEOPLECERT - Personnel Certification Body

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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 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 two factors which are:
 - a. Sample Error
 - b. Mean
 - c. Type of Data
 - d. Standard Deviation
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 than 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

1. Regression Analysis: Tons mined versus Personnel hours

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

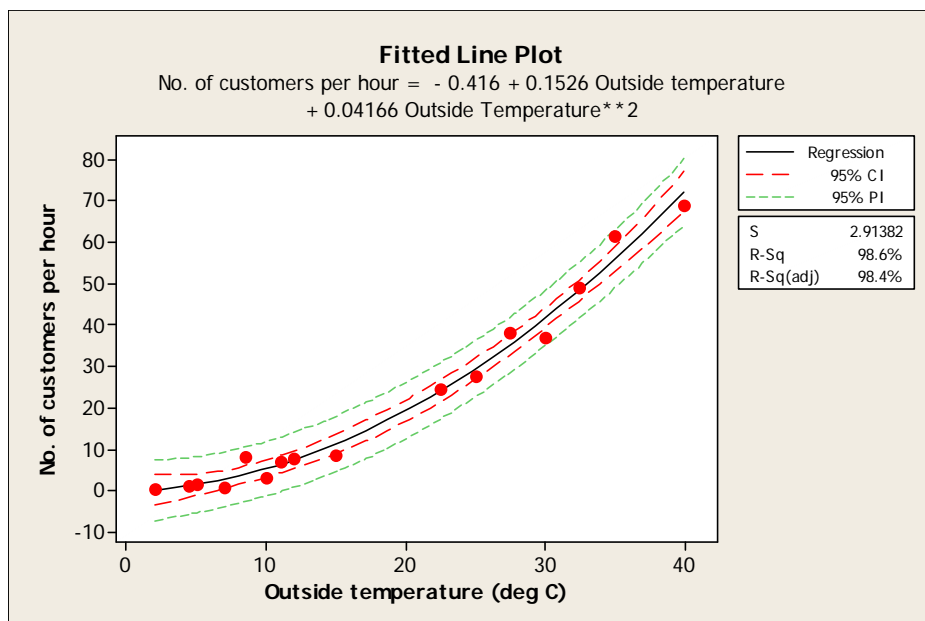
S = 0.0559431 R-Sq = 39.2% R-Sq(adj) = 33.1%

Analysis of Variance

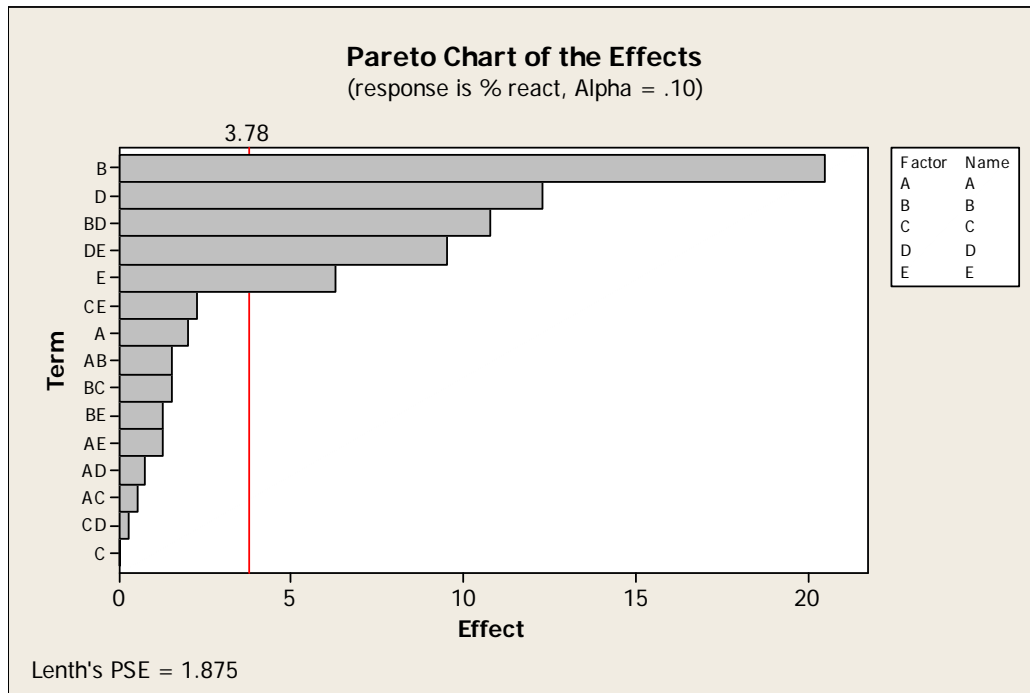
Source	DF	SS	MS	F	P
Regression	1	0.0201823	0.0201823	6.45	0.029
Error	10	0.0312964	0.0031296		
Total	11	0.0514787			

Which statements are correct for the above Regression Analysis?

- This Regression is an example of Simple Linear Regression.
- This Regression is statistically significant because the P-value is less than 0.05 and the Residuals are appropriate.
- This Regression is statistically insignificant because R-squared is much less than 80%.
- The independent variable is "tons mined".
- If each month was one observation value and 11 months of data was used to analyze for this Regression.



2. Which statement is incorrect about the above Regression?
- The dependent variable is the outside temperature.
 - The Regression is an example of a quadratic equation.
 - With at least 95% confidence, we can expect less than 30 customers per hour when the outside temperature is 21 deg C.
 - If the outside temperature was to increase from 20 to 30 deg C, the number of customers per hour should increase by nearly 20.
 - 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.
 - If the outside temperature was 30 deg C, with at least 95% confidence we would expect less than 50 customers per hour.



3. Which statements are correct about the Pareto Chart of effects from MINITAB™'s analysis of an Experimental Design.
- a. The number of experimental runs is 15 in this experiment.
 - b. Factor B has the largest effect on the output measured in the experiment.
 - c. Factor C has the smallest effect on the output measured in the experiment's results.
 - d. Main Effects B, D and E and 2-way interactions BD and DE should be retained in the mathematical model if the alpha is set to 10%
 - e. Main Effects B, D, and E and 2-way interactions BD and DE should be retained in the mathematical model if the alpha is set to 90%
 - f. Main Effects C and A and the 2-way interactions AB, BC, BE, AE, AD, AC and CD, and CD should be retained in the mathematical model if the alpha is set to 10%.



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:
 - 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. B Mean
D Standard Deviation
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. A This Regression is an example of Simple Linear Regression.
B This Regression is statistically significant because the P-value is less than 0.05 and the Residuals are appropriate.
2. A The dependent variable is the outside temperature.
3. B Factor B has the largest effect on the output measured in the experiment.
C Factor C has the smallest effect on the output measured in the experiment's results.
D Main Effects B, D and E and 2-way interactions BD and DE should be retained in the mathematical model if the alpha is set to 10%



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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