

# Construction and Industry

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## Question: 1

Which key performance indicator is calculated by subtracting current costs from ideal costs?

- A. Cost of poor quality
- B. Revenue growth
- C. Competitive quality
- D. Performance on quality improvement

**Answer: A**

Explanation:

The cost of poor quality is calculated by subtracting current costs from ideal costs. This is just a rough estimate as the exact value of the cost of poor quality is unknowable. The point of estimating the cost of poor quality is to get a general idea of what savings could be made available through remediation and improvement efforts. Revenue growth is calculated by determining the net increase in sales figures over a particular interval. Competitive quality is an umbrella term for a set of metrics related to the parts of performance that have the most influence on sales. Some competitive quality measures depend on obtaining information from customers. Performance on quality improvement, finally, is a subjective metric that includes the number of completed and active projects, the financial results of these projects, and the number of employees and hours required for the project.

## Question: 2

Which type of chart is appropriate when sample size is variable and each sample may contain more than one instance of the targeted condition?

- A. P chart
- B. Autocorrelation chart
- C. U chart
- D. X-bar chart

**Answer: C**

Explanation:

U chart is appropriate when sample size is variable and each sample may contain more than one instance of the targeted condition. These are control charts most appropriate for handling attributes data. A P chart, on the other hand, is better for measuring the percentage of samples with a particular characteristic when sample size is variable and the characteristic will either be present or absent. An autocorrelation chart indicates the relationships between various factors in the

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process. An  $\bar{X}$  chart, finally, is a control chart for variables data, in which the subgroup averages are assessed to determine the process location variation over time.

### Question: 3

What is the purpose of PERT analysis during the analyze phase of DMAIC?

- A.To identify the most influential steps in a process
- B.To monitor improvements in cycle time
- C.To identify the critical path of a process
- D.To reduce cycle time

**Answer: C**

Explanation:

The purpose Of program evaluation and review techniques (PERT) analysis during the analyze phase Of DMAIC is to identify the critical path Of a process. PERT analysis uses activity network diagrams and other charts to isolate the tasks on the critical path. Note that the critical path is the sequence of necessarily consecutive steps in a task such that the sum of the durations required for each step on the critical path will be the minimum amount of time required for the total process. PERT analysis may also be used to identify the most influential steps in a process. though this takes place during the define stage of DMAIC: Likewise. PERT analysis may be used during the improve stage to monitor adjustments to cycle urne. The overarching goal of PERT analysis is to reduce cycle time. but this answer choice is too general to be correct.

### Question: 4

Which of the following is a disadvantage of using engineering process control devices to prevent deviation?

- A.The devices must be monitored by human operators.
- B.The use Of these devices precludes the use Of statistical process controls.
- C.These devices require constant maintenance.
- D.These devices cannot handle multiple inputs.

**Answer: B**

Explanation:

One disadvantage of using engineering process controls to prevent deviation is that the use of these devices precludes the use of statistical process controls. An engineering process control is a mechanism that automatically adjusts inputs when it detects variations in the process. A thermostat is a basic example of an engineering process control. It is not necessary for these devices to be monitored by human operators, and in most cases. engineering process controls do not require constant maintenance. The constant adjustments made by these devices, however. mean that any data related to their activities is not independent and. therefore, cannot be analyzed with statistical process control charts. However, the engineering process controls used by heavy industry are

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capable of handling a number of different inputs and outputs simultaneously.

### Question: 5

Which form of leveling typically includes the use Of heijunka boxes?

- A.Leveling by volume
- B.Leveling by product
- C.Demand leveling
- D.Customer leveling

**Answer: B**

Explanation:

Leveling by product typically includes the use of heijunka boxes. A heijunka box is a tool for scheduling in which the tasks to be completed and the estimated times for initiation and completion are listed. The point of leveling by product is to reduce inefficiency by adjusting the mix of products or the order in which they are produced. Leveling by volume, by contrast, is an approach to reducing inefficiency in which production is aligned with average demand. Demand leveling is a series of strategies that attempt to make customer demand more uniform and predictable. There is no such thing as customer leveling.

### Question: 6

Which parameter of a statistical distribution relates to the sharpness of its peak?

- A.Central tendency
- B.Kurtosis
- C.Skewness
- D.Standard deviation

**Answer: B**

Explanation:

Kurtosis is the parameter of a statistical distribution related to the sharpness of the peak In a normal distribution, where the points resemble the standard bell curve, the kurtosis value is one. If the peak is sharper, the kurtosis value will be higher than one; if the peak is less severe, the kurtosis value vwill be less than one. Central tendency is the general trend of the data: In an asymmetrical distribution, the median is roughly equivalent to the central tendency, while in an asymmetrical distribution, the mean is a better marker. Skewness is basically the difference between the mean and the mode of a data set. The mode ofthe data set is the value that appears most often. Finally, the standard deviation of the data set is the average amount of variation from the mean.

### Question: 7

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If a mixed-level experimental design has four factors with three levels and two factors with three levels, how many total runs are required for the experiment?

- A.24
- B.64
- C.72
- D.90

**Answer: D**

Explanation:

If a mixed-level experimental design has four factors with three levels and two factors with three levels, 90 total runs will be required. The formula for calculating the number of required runs for a mixed-level experimental design is similar to that used on a complete factorial design. The number of factors must be raised to the power equal to the number of levels for that factor. So, for this problem, the total number of runs is calculated as  $3^4 + 3^2 = 81 + 9 = 90$ .

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