**Chapter 6: Quality Improvement and Control Tools**

**Test Bank**

**Multiple Choice**

1. With regard to the terms *quality control* and *quality assurance*, \_\_\_\_\_\_.

a. there is no difference between the two terms

b. quality assurance is the term we use today for what was formerly known as quality control

c. quality control is concerned with the quality of a product or service after it is produced or delivered

d. quality control is concerned with the application of government regulations governing quality

Ans: C

Cognitive Domain: Knowledge (Remember)

Learning Objective: 6-1. Explain the difference between quality control and quality assurance.

Answer Location: Quality Control Versus Quality Assurance

Difficulty Level: Easy

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution

2. With regard to the terms *quality control* and *quality assurance*, \_\_\_\_\_\_.

a. quality control is concerned with the quality of a product or service after it is produced or delivered

b. quality assurance aims to improve a product or service’s quality after it is produced or delivered

c. quality control is concerned with the quality of a product or service before it is produced or delivered

d. quality control is concerned with the application of government regulations governing quality

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Quality Control Versus Quality Assurance

Difficulty Level: Easy

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution

3. Quality improvement tools and techniques that managers use to manage quality include \_\_\_\_\_\_.

a. scatter diagrams

b. scrap and rework processes

c. complete inspection

d. employee termination on defect detection

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Quality Control Versus Quality Assurance

Difficulty Level: Easy

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution

4. Which of the following is NOT one of the quality appraisal tools that managers and employees use?

a. check sheets

b. Pareto charts

c. histograms

d. quick rework

Ans: D

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Quality Appraisal Tools

Difficulty Level: Easy

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution

5. Which of the following statements is NOT true with regard to check sheets?

a. These are used for repeated processes and operations.

b. These are forms used to collect and record quality-related data.

c. These sheets are difficult to design.

d. These sheets are easy to understand.

Ans: C

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Check Sheets

Difficulty Level: Easy

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution

6. A histogram \_\_\_\_\_\_.

a. is similar to a scatter diagram

b. shows the frequency of occurrences of values

c. is also referred to as a heat map

d. has been replaced by pie charts

Ans: B

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Histograms

Difficulty Level: Medium

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution

7. In a histogram, meaningful information is provided by \_\_\_\_\_\_.

a. the size of the pie chart

b. the color of the pie chart

c. the colors used in the heat map

d. the shape and size of the bars

Ans: D

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Histograms

Difficulty Level: Easy

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution

8. A Pareto chart \_\_\_\_\_\_.

a. is a vertical bar chart

b. shows bars arranged in increasing height from left to right

c. shows the values in different colors

d. is similar to a pie chart

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Pareto Charts

Difficulty Level: Easy

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution

9. In a Pareto chart, \_\_\_\_\_\_.

a. the height of an individual bar represents how often a particular problem has occurred

b. the taller the bar the less significant the problem

c. the color of an individual bar represents how often a particular problem has occurred

d. it is easy to spot the correlation between two variables

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Pareto Charts

Difficulty Level: Easy

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution

10. The Pareto chart \_\_\_\_\_\_.

a. is based on the Alfredo principle

b. states that 20% of quality problems stem from 80% of causes

c. shows bars arranged in decreasing height from left to right

d. shows bars in different colors based on the value they represent

Ans: C

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Pareto Charts

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

11. The Pareto chart is a good tool to use \_\_\_\_\_\_.

a. when the data from a manufacturing or a service process can be broken down into categories and the frequency of occurrences in each category can be counted

b. when we are considering only services

c. when we want to show the correlation between two variables

d. when we want show changes over a period of time

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Pareto Charts

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

12. A scatter diagram is a tool that can be used to \_\_\_\_\_\_.

a. visually determine if two variables are related or correlated

b. show the different causes that contribute to an effect

c. determine if a process is in control

d. show the contribution of different products to total revenue

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Scatter Diagrams

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

13. Which of the following terms is correctly paired with its description?

a. An independent variable is a variable whose value changes for one reason or another.

b. A dependent variable is a variable directly affected as a result of a change in an another dependent variable.

c. A correlation coefficient shows the frequency of occurrence of a dependent variable.

d. A correlation coefficient shows the frequency of occurrence of an independent. variable

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Scatter Diagrams

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

14. If two variables are negatively correlated, an increase in one variable \_\_\_\_\_\_.

a. has a proportional increase in the other variable

b. is associated with a decrease in the other variable

c. is associated with an increase in the other variable

d. has no effect on the other variable

Ans: B

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Scatter Diagrams

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

15. The cause-and-effect diagram \_\_\_\_\_\_.

a. is also known as a fishbone diagram because of the way it looks

b. graphically displays the frequency of occurrence of a quality problem

c. was developed by W. Edwards Deming

d. shows the relationship between two variables

Ans: A

Cognitive Domain: Knowledge (Remember)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Scatter Diagrams

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

16. Which of the following is NOT one of the categories in a fishbone diagram?

a. machines (e.g., equipment used in manufacturing)

b. methods (e.g., processes)

c. materials (e.g., materials and semifinished goods)

d. middle-men (e.g., wholesalers)

Ans: D

Cognitive Domain: Knowledge (Remember)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Cause-and-Effect Diagrams (Fishbone Diagrams)

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

17. Which of the following is NOT true regarding a process flow chart?

a. It graphically displays the dollar cost of a step in a process.

b. It helps a firm’s quality improvement team understand how the process currently works and identify quality-related issues and redundant steps.

c. It shows how much value is added by each step in a process.

d. It displays compliance with government regulations.

Ans: B

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Process Flowcharts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

18. Which of the following is NOT one of the tools used to prevent defects?

a. statistical process control (SPC)

b. process capability analysis

c. Taguchi methods

d. scrap and rework

Ans: D

Cognitive Domain: Knowledge (Remember)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Quality Defect Prevention Tools

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

19. Which of the following is true of SPC?

a. It resembles a fishbone and is hence also known as a fishbone diagram.

b. It is applicable only in manufacturing.

c. It tells us whether a process is stable and conforms to specifications.

d. It tells us whether a process is capable of meeting customer expectations.

Ans: C

Cognitive Domain: Knowledge (Remember)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Statistical Process Control (SPC)

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

20. A quality characteristic \_\_\_\_\_\_.

a. can be a variable or an attribute

b. is always an independent variable

c. is usually an ordinal value

d. is not easily measured

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Measures of Quality

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

21. Attributes are characteristics that \_\_\_\_\_\_.

a. are counted using whole numbers

b. are presented with decimal values

c. are always ratio type of data

d. are usually independent variables

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Measures of Quality

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

22. Variables are quality characteristics that are \_\_\_\_\_\_.

a. measured on a continuous scale

b. are counted using whole numbers

c. are always nominal type of data

d. are usually independent variables

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Variations in a Process

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

23. Common cause variations are \_\_\_\_\_\_.

a. the consequence of government regulations

b. the consequence of ISO requirements

c. the result of poor raw materials

d. not avoidable

Ans: D

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Variations in a Process

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

24. Common cause variations \_\_\_\_\_\_.

a. are the result of random natural differences

b. are so called because they occur frequently

c. occur only occasionally under special circumstances

d. are the result of government interference in business

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Variations in a Process

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

25. Examples of assignable causes include \_\_\_\_\_\_.

a. defective raw materials and components

b. defects caused by government regulation

c. defects caused by ISO requirements

d. defects caused in the natural course of manufacturing

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Variations in a Process

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

26. A control chart \_\_\_\_\_\_.

a. shows the correlation between two variables

b. monitors the consistency of a process

c. shows the causes of a particular defect

d. displays whether a process meets with customer specifications

Ans: B

Cognitive Domain: Application (Apply)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Control Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

27. Which of the following is a feature of a control chart?

a. a center line

b. an upper specification limit

c. a lower specification limit

d. the modal value of a process defect

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Control Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

28. Generally speaking, a process is presumed to be stable and in control when \_\_\_\_\_\_.

a. the values on the control chart are randomly distributed around the center line

b. the values on the control chart fall outside the upper control limit

c. the values on the control chart fall outside the lower control limit

d. the values on the control chart can be traced to a special cause

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Control Charts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

29. If the values in a control chart follow a pattern (instead of being random), then \_\_\_\_\_\_.

a. we can say that a special cause is present

b. the process is within control

c. the operator is out of control

d. there is excessive common cause variation

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Control Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

30. A control chart shows \_\_\_\_\_\_.

a. the reason a process is out of control

b. the time period when the process became out of control

c. the costs that result when a process is out of control

d. the costs that result when a process does not meet customer specifications

Ans: B

Cognitive Domain: Application (Apply)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Control Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

31. A control chart \_\_\_\_\_\_.

a. should be used frequently as it can catch defective processes early

b. should be used only when a process is known to be defective

c. should be used only at critical stages in a process

d. should never be used as it is expensive

Ans: B

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: When and Where to Use Control Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

32. Which of the following is an appropriate point for the use of a control chart?

a. after a product has been manufactured but prior to delivery to customer

b. before costly or irreversible operations are performed

c. once customer complaints exceed a predetermined threshold level

d. when liability costs from products exceed a certain level

Ans: B

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: When and Where to Use Control Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

33. Which of the following is associated with a control chart?

a. center line

b. upper specification limit

c. lower specification limit

d. cumulative defect line

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Types of Control Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

34. Samples are used because measuring every product or service produced is \_\_\_\_\_\_.

a. time consuming

b. easy to do

c. inexpensive

d. not required by government regulations

Ans: A

Cognitive Domain: Knowledge (Remember)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Designing Control Charts

Difficulty Level: Easy

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

35. In taking a sample, the quality control manager needs to ensure \_\_\_\_\_\_.

a. that the sample is representative of the population

b. that each observation in the sample is collected from a different process

c. that the population is representative of the sample

d. that government regulations governing sampling are followed

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Designing Control Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

36. A sampling distribution \_\_\_\_\_\_.

a. describes the randomness of the variation in a sample’s values

b. shows how much of the entire population varies from the sample

c. is similar to a histogram

d. shows from which parts of the population a sample is chosen

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Designing Control Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

37. The central limit theorem states that \_\_\_\_\_\_.

a. as the size of a sample gets larger and larger, its distribution approaches the normal distribution only if the underlying population from which the samples were collected is normally distributed

b. as the size of a sample gets smaller and smaller, its distribution approaches the normal distribution, if the underlying population from which the samples were collected is not normally distributed

c. as the size of a sample gets larger and larger, its distribution approaches the normal distribution, even if the underlying population from which the samples were collected is not normally distributed

d. as the size of a population gets larger and larger, its distribution approaches the normal distribution, even if the population is not normally distributed to begin with

Ans: C

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-2. Apply the various tools for appraising the quality of products and processes.

Answer Location: Designing Control Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

38. Which of the following statements is true with regard to the proportion of normally distributed data and number of standard deviations from the mean?

a. The percentage of data from the mean to one standard deviation to the left of the mean is 42%.

b. The percentage of data from the mean to two standard deviations to the right of the mean is 68%.

c. The percentage of data within three standard deviations (plus/minus) from the mean is about 99%.

d. The percentage of data within one standard deviations (plus/minus) from the mean is about 95%.

Ans: C

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Designing Control Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

39. In designing control charts, companies usually use \_\_\_\_\_\_.

a. two standard deviations because narrower control limits may a lead a manager to erroneously conclude that the process is out of control when in fact the variation that led to the points falling out of the control limits was purely random

b. two standard deviations because broader control limits may a lead a manager to erroneously conclude that the process is out of control when in fact the variation that led to the points falling out of the control limits was purely random

c. three standard deviations because narrower control limits may a lead a manager to erroneously conclude that the process is out of control when in fact the variation that led to the points falling out of the control limits was purely random

d. three standard deviations because broader control limits may a lead a manager to erroneously conclude that the process is out of control when in fact the variation that led to the points falling out of the control limits was purely random

Ans: C

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Designing Control Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

40. The most frequently used control charts for monitoring the variable quality characteristics are \_\_\_\_\_\_.

a. mean charts and range charts

b. mean charts and median charts

c. mean charts and mode charts

d. median charts and variance charts

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

41. Which of the following statements is correct?

a. A mean chart monitors the variation between samples.

b. A range chart monitors the variability due to special causes.

c. A range chart monitors the variability due to common causes.

d. A range chart monitors the standard deviation resulting from common causes.

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

42. The two most common types of attribute control charts are \_\_\_\_\_\_.

a. c-charts and range-charts

b. c-charts and p-charts

c. mean-charts and range-charts

d. p-charts and range-charts

Ans: B

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Control Charts for Attributes: C-Charts and P-Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

43. Which of the following types of charts are correctly paired with its description?

a. C-charts are used to monitor countable occurrences, such as the number of nonconformities or defects per unit.

b. P-charts are used to monitor the timing of defects or errors in a product or service.

c. C-charts are used to monitor the timing of defects or errors in a product or service.

d. P-charts are used to monitor the defects per million opportunities in a product or service.

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Control Charts for Attributes: C-Charts and P-Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

44. C-charts are used to monitor \_\_\_\_\_\_.

a. counts of defects per unit

b. proportion of defects per unit

c. timing of defects per unit

d. costs of defects per unit

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Control Charts for Attributes: C-Charts and P-Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

45. In general, control charts for attributes require \_\_\_\_\_\_.

a. larger sample sizes to develop meaningful quality measures

b. smaller sample sizes to develop meaningful quality measures

c. the population size to be larger to develop meaningful quality measures

d. the population size to be smaller to develop meaningful quality measures

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Control Charts for Attributes: C-Charts and P-Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

46. Which of the following types of charts can only classify an item as defective or nondefective?

a. p-charts

b. c-charts

c. mean-charts

d. range charts

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Control Charts for Attributes: C-Charts and P-Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

47. The theoretical basis for constructing a c-chart is \_\_\_\_\_\_.

a. the normal distribution

b. the Poisson distribution

c. the beta distribution

d. the exponential distribution

Ans: B

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Constructing a C-Chart

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

48. Which of the following is true about the assumptions underlying the Poisson distribution?

a. The probability of occurrence of an event (defect) over a narrow interval of time, area, or space is small and directly proportional to the size of that interval.

b. The probability of two such events (defects) occurring in that same narrow interval is so large that it is highly likely.

c. The probability of two such events (defects) occurring as a result of the same cause is so large that it is highly likely.

d. The probability of two such events (defects) having identical liability costs is so small that it is highly likely.

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Constructing a C-Chart

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

49. Process capability analysis is a technique used to determine whether \_\_\_\_\_\_.

a. a process is able to meet a set of design specification limits

b. a process falls within a set of control limits

c. a process is compliant with government regulations

d. a process is compliant with ISO requirements

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Process Capability Analysis

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

50. Design specification limits are also known as \_\_\_\_\_\_.

a. tolerances

b. CTQs

c. VOC

d. defects

Ans: A

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Process Capability Analysis

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

51. The upper and lower control limits of a control chart \_\_\_\_\_\_.

a. are similar to design specification limits

b. represent the voice of the customer

c. represent the voice of the process

d. represent the voice of the management

Ans: C

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Process Capability Analysis

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

52. Two commonly used measures to calculate the capability of a process are \_\_\_\_\_\_.

a. the process capability index and process centering capability index

b. the process centering capability index and the control index

c. the control index and the range specification

d. the range specification and the process capability index

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Measures of Process Capability

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

53. The process capability index \_\_\_\_\_\_.

a. is a measure of how well a process meets its control limits

b. is the ratio of the range of design tolerances to the range of the variability of the process

c. is the product of the range of design tolerances to the range of the variability of the process

d. is the reciprocal of the range of design tolerances to the range of the variability of the process

Ans: B

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Measures of Process Capability

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

54. Which of the following is true with regard to the process capability index?

a. It is represented by Cp.

b. The actual capability of the process is inversely related to the process capability index.

c. It is represented by Pc.

d. The actual capability of the process is inversely related to customer expectations.

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Measures of Process Capability

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

55. If Cp is less than 1, then \_\_\_\_\_\_.

a. the specification width is less than the range of the process

b. the process is capable of consistently meeting its design specifications

c. the process is incapable of being compliant with government regulations

d. the process is incapable of being compliant with ISO requirements

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Measures of Process Capability

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

56. If Cp is greater than 1, then \_\_\_\_\_\_.

a. the specification width is greater than the range of the process

b. the process is incapable of consistently meeting its design specifications

c. the specification width is less than the range of the process

d. the process is incapable of meeting government requirements

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Measures of Process Capability

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

57. It is common for companies to aim for \_\_\_\_\_\_.

a. a process capability index value of 1.33 or greater

b. a process capability index value of 1.32 or lower

c. a control chart index of 1.33 or greater

d. a control chart index of 1.32 or lower

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Measures of Process Capability

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

58. The process capability index (Cp) \_\_\_\_\_\_.

a. is the primary measure used to track process capability

b. shows how well a process is centered between specification limits

c. shows the cost of noncompliance with government regulations

d. shows the cost of noncompliance with ISO requirements

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Measures of Process Capability

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

59. The process capability index \_\_\_\_\_\_.

a. shows whether a process is capable or not

b. may need to be supplemented by the Pareto chart

c. is similar to the cause-and-effect diagram

d. shows the costs of noncompliance with government regulations

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: The Process Centering Capability Index (Cpk)

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

60. As a rule of thumb, to do a process capability analysis \_\_\_\_\_\_.

a. we should collect a minimum of 20 samples

b. each sample in our data collection should have at least 500 items

c. we should collect a maximum of 20 samples

d. each sample in our data collection should be from a different population

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: The Process Centering Capability Index (Cpk)

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

61. When we need to be particularly sure about the quality of a product, we should \_\_\_\_\_\_.

a. do a process capability analysis at the start of the production run to ensure the process is working well and repeat the process capability analysis frequently

b. do a Pareto analysis frequently to ensure that the mean is not shifting

c. do a physical inspect of each unit produced to ensure compliance with customer requirements

d. do a specification conformance test

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: The Process Centering Capability Index (Cpk)

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

62. Which of the following is true with regard to sigma levels for the health care industry?

a. Operating at the 4σ quality level can be too demanding.

b. Operating at lower sigma levels given the inherent variation from one patient to another.

c. Operating at the 3σ quality level can be too risky.

d. Operating at the 3σ quality level can be too expensive.

Ans: C

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Revisiting Six Sigma: Calculating Six Sigma Quality of a Process

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

63. The goal of a Six Sigma effort is \_\_\_\_\_\_.

a. to produce 3.4 defects in a million opportunities

b. to produce no fewer than 3.4 defects in a million opportunities

c. to produce at very high levels of quality

d. to produce no more than 3.4 defects in a million opportunities

Ans: D

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Revisiting Six Sigma: Calculating Six Sigma Quality of a Process

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

64. In a Six Sigma process, a defect is \_\_\_\_\_\_.

a. anything that falls outside of customer specifications limits (USL and LSL)

b. something that occurs less than 99.9997% of the time

c. anything that does not meet government regulations

d. anything that does not meet ISO requirements

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-3. Apply the various tools for preventing defects in products and processes, including control charts, a process capability analysis, and how to calculate Six Sigma levels of quality.

Answer Location: Revisiting Six Sigma: Calculating Six Sigma Quality of a Process

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

65. Which of the following is NOT related to quality improvement?

a. quality control charts

b. statistical process control

c. Six Sigma

d. termination of employees who produce a single defect

Ans: D

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Quality Design Tools

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

66. The greatest impact on a product’s quality comes from \_\_\_\_\_\_.

a. the design of the product

b. the company’s ability to rework defective products

c. the quality inspection process

d. firing workers for producing poor quality products

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Quality Design Tools

Difficulty Level: Medium

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

67. Which of the following is NOT an important tool for robust product design?

a. the Taguchi-loss function

b. the parameter design process

c. a design of experiments (DOE)

d. a Pareto analysis

Ans: D

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: The Taguchi Method (Robust Design)

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

68. Which of the following is NOT a goal of robust design?

a. designing products that are insensitive to changes in different environmental conditions

b. designing products that are not easily affected by machine wear and tear

c. designing products that can handle minor differences in raw materials

d. designing products that can handle variations in the price of raw materials

Ans: D

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: The Taguchi Method (Robust Design)

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

69. According to Taguchi, any deviation from the product’s quality target results in \_\_\_\_\_\_.

a. a loss to society

b. a loss to the employee

c. a failure to be compliant with government regulations

d. increased customer dissatisfaction

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: The Taguchi Method (Robust Design)

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

70. The Taguchi-loss function is known as \_\_\_\_\_\_.

a. the quadratic function

b. material-loss function

c. compliance failure

d. loss of process capability

Ans: C

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: The Taguchi Method (Robust Design)

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

71. Parameter design focuses on \_\_\_\_\_\_.

a. determining the optimal design of a product and the processes used to produce it so as to minimize variations

b. ensuring that the process capability index is greater than 1.33

c. ensuring that the process capability index is less than 1.33

d. minimizing variations in raw materials

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Parameter Design

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

72. Which of the following, according to Taguchi, represents the two categories that affect the design of any product or system?

a. control factors and noise factor

b. special causes and assignable causes

c. variations due to supplier and variations due to manufacturer

d. variations due to manufacturer and variations due to consumer

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Parameter Design

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

73. Signal factors in a process are \_\_\_\_\_\_.

a. controlled by the designer or operator of the product

b. outside the control of the designer or operator of the product

c. factors that occur randomly

d. also known as noise factors

Ans: A

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Parameter Design

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

74. Factors that a designer can control include \_\_\_\_\_\_.

a. random factors

b. signal factors

c. noise factors

d. ISO factors

Ans: B

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Parameter Design

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

75. Which of the following is NOT one of the factors in parameter design?

a. control factors

b. signal factors

c. noise factors

d. input factors

Ans: D

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Parameter Design

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

76. Which of the following is a factor that is difficult for a designer to control?

a. control factors

b. signal factors

c. noise factors

d. input factors

Ans: C

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Parameter Design

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

77. Which pair of terms fill in the blanks in the statement: The design of experiments help determine which \_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ impact product/process or system performance.

a. Controllable factors, noise factors

b. Special factors, assignable factors

c. Noise factors, assignable factors

d. Controllable factors, signal factors

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Design of Experiments (DOE)

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

78. Which of the following statements is true with regard to categories of control charts?

a. P-Charts are used for monitoring services; c-charts are for monitoring manufacturing processes.

b. There are three categories of control charts: one for monitoring signals, one for monitoring control attributes, and the third for monitoring noise factors.

c. There are two categories of control charts: one for use in manufacturing and the other for use in services.

d. There are two categories of control charts: one for monitoring attributes and the other for monitoring variables.

Ans: D

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Types of Control Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

79. To check if a process is in control, we need \_\_\_\_\_\_.

a. both a mean chart and a range chart

b. only a mean chart

c. only a range chart

d. only a process capacity index

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: When Is a Process Out of Control?

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

80. If the standard deviation of the population is not known, \_\_\_\_\_\_ as a measure of dispersion.

a. we can take an educated guess

b. we can use the range value (the difference between the maximum and minimum values)

c. we can use the variance

d. we can use the mean plus or minus three standard deviations

Ans: B

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

81. If the standard deviation in a sample is 1 and the sample size is 25, then the standard error of the mean is \_\_\_\_\_\_.

a. 0.20

b. 2.00

c. 1.44

d. 2.63

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

82. If the standard deviation in a sample is 4 and the sample size is 49, then the standard error of the mean is \_\_\_\_\_\_.

a. about 0.29

b. about 0.08

c. about 12.25

d. about 0.92

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

83. To construct a mean chart when we do not know the mean of the population, we \_\_\_\_\_\_.

a. can take the average of all sample mean

b. can make an educated guess

c. can take a larger sample

d. cannot construct the mean chart

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

84. If the mean of the population is not known, we can take the average of all sample means. This average \_\_\_\_\_\_.

a. is known as the grand mean

b. represents the mean of the specification limits

c. displays process capability

d. is equal to the mode

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

85. The range of a sample \_\_\_\_\_\_.

a. is the difference between the maximum and minimum values in the sample

b. is the same as the mean of the sample

c. can be represented by the reciprocal of the standard deviation

d. can be represented by the reciprocal of the variance

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

86. In constructing variable control charts,\_\_\_\_\_\_.

a. the population standard deviation is typically unknown

b. the sample standard deviation is typically unknown

c. we can use the population mean instead of the population standard deviation

d. we can use the population mode instead of the population range

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Easy

AACSB: Analytical thinking (able to analyze and frame problems)

87. In constructing variable control charts, when the population standard deviation is not known we typically use \_\_\_\_\_\_.

a. the variance as a measure of dispersion

b. the range as a measure of dispersion

c. the mean as a measure of dispersion

d. the mode as a measure of dispersion

Ans: B

Cognitive Domain: Application (Apply)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Easy

AACSB: Analytical thinking (able to analyze and frame problems)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Data Table A | | | | | |
| *Sample Number* | *Item 1* | *Item 2* | *Item 3* | *Item 4* |
| 1 | 13.10 | 13.90 | 12.80 | 13.20 |
| 2 | 13.80 | 13.00 | 12.50 | 12.70 |
| 3 | 14.00 | 12.90 | 13.10 | 13.50 |
| 4 | 12.30 | 13.30 | 12.80 | 13.60 |
| 5 | 13.10 | 12.60 | 13.30 | 12.90 |
| 6 | 12.50 | 13.40 | 12.80 | 13.30 |
| 7 | 13.60 | 12.70 | 13.30 | 13.80 |
| 8 | 12.50 | 13.50 | 13.10 | 12.90 |
| 9 | 13.00 | 13.60 | 12.70 | 13.20 |
| 10 | 12.80 | 12.90 | 12.70 | 13.30 |

88. Refer to Data Table A. The value 13.10 is \_\_\_\_\_\_.

a. the grand mean

b. the average of values for Item 1

c. the average of values for Item 2

d. the average of values for Item 3

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

89. Refer to Data Table A. The mean of the ranges is \_\_\_\_\_\_.

a. 1.00

b. 0.7

c. 1.7

d. 0.27

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Easy

AACSB: Analytical thinking (able to analyze and frame problems)

90. Refer to Data Table A. The value for A2 is \_\_\_\_\_\_.

a. 2.059

b. 0

c. 0.729

d. 0.308

Ans: D

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Easy

AACSB: Analytical thinking (able to analyze and frame problems)

91. Refer to Data Table A. The upper control limit for the mean chart is \_\_\_\_\_\_\_.

a. 12.8

b. 0

c. 15.4

d. 13.4

Ans: D

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Designing Control Charts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

92. Refer to Data Table A. The value for D3 is \_\_\_\_\_\_.

a. 0

b. 0.223

c. 2.059

d. 2.282

Ans: B

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Designing Control Charts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

93. Refer to Data Table A. The lower control limit for the range chart is \_\_\_\_\_\_.

a. 1.777

b. 0.223

c. 0

d. 2.282

Ans: B

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Designing Control Charts

Difficulty Level: Medium

AACSB: Analytical thinking (able to analyze and frame problems)

94. For a control chart to monitor variable quality characteristics, if we are interested in the variation between samples we would need to use \_\_\_\_\_\_.

a. a range chart

b. a mean chart

c. a p-chart

d. a c-chart

Ans: B

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Hard

AACSB: Application of knowledge (able to translate knowledge of business and management into practice)

95. For a control chart to monitor variable quality characteristics, if we are interested in the variation within samples we would need to use \_\_\_\_\_\_.

a. a range chart

b. a mean chart

c. a p-chart

d. a c-chart

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

96. When we monitor variable a quality characteristic, we are referring to quality characteristics that can be measured on \_\_\_\_\_\_.

a. a continuous scale

b. a discrete scale

c. a binary scale

d. an integer scale

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Variables: Mean Charts and Range Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

97. The control chart used to monitor countable occurrences uses \_\_\_\_\_\_.

a. a continuous scale

b. a discrete scale

c. a binary scale

d. a random scale

Ans: B

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Attributes: C-Charts and P-Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

98. In general, which of the following is NOT a condition that needs to be met in order to use a c-chart?

a. when the product can be easily classified as *defective* or *nondefective*

b. when there is a need to monitor the number of defects or nonconformities in each unit or sample

c. when the samples examined for occurrences of defects are drawn from a very large population

d. when the potential errors or nonconformities that could occur are known prior to data collection

Ans: A

Cognitive Domain: Analysis (Analyze)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Control Charts for Attributes: C-Charts and P-Charts

Difficulty Level: Hard

AACSB: Analytical thinking (able to analyze and frame problems)

99. The Six Sigma quality program was introduced by \_\_\_\_\_\_.

a. Toyota

b. General Electric

c. Motorola

d. Allied Signal

Ans: C

Cognitive Domain: Knowledge (Remember)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Revisiting Six Sigma: Calculating Six Sigma Quality of a Process

Difficulty Level: Easy

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution

100. The average delivery time for a pizza delivery service is 27 minutes with a standard deviation of 3 minutes. If a customer were to receive the delivery within one standard deviation from the mean, he would get this pizza \_\_\_\_\_\_.

a. between 0 and 24 minutes

b. between 24 and 30 minutes

c. between 27 and 33 minutes

d. between 27 and 39 minutes

Ans: B

Cognitive Domain: Comprehension (Understand)

Learning Objective: 6-4. Use quality design tools to improve product or process design.

Answer Location: Revisiting Six Sigma: Calculating Six Sigma Quality of a Process

Difficulty Level: Easy

AACSB: Systems and processes in organizations, including planning and design, production/operations, supply chains, marketing, and distribution