

SECTION III

PROCESS MANAGEMENT - SAMPLE QUESTIONS

3.14. The term "metrics" most frequently refers to:

- a. A unit of measurement
- b. The metric system
- c. Net present value
- d. An evaluation method

Solution: This is a definition question. Answers **a** and **b** refer to a traditional form of measurement such as the metric system and are incorrect. Answer **c** is a project financial consideration. The modern definition of "metrics" implies a form of measurement or evaluation (answer **d**).

Answer d is correct.

Reference: *CSSBB Primer*, Section III - 16/18.

3.15. The best reason for instituting a quality cost system is:

- a. To satisfy ISO 9001 requirements
- b. To achieve a proper balance of prevention, appraisal, and failure costs
- c. To identify opportunities for improvement
- d. To benchmark major competitors

Solution: Although elements of answers **a**, **b**, and **d** may be true, the best reason for a quality cost system (of those choices presented) is to help identify potential improvement areas.

Answer c is correct.

Reference: *CSSBB Primer*, Section III - 32.

3.16. Business process management is most concerned with:

- a. Allocating resources between functional departments
- b. Controlling and improving processes to create shareholder value
- c. Understanding and following the SIPOC diagram
- d. Developing closed loop relationships with customers and suppliers

Solution: BPM focuses on understanding, controlling, and improving business processes. Answers **c** and **d** relate to the SIPOC technique for six sigma management and improvement. Answer **a** is a distracter choice.

Answer b is correct.

Reference: *CSSBB Primer*, Section III - 2/5.

SECTION IV

TEAM MANAGEMENT - SAMPLE QUESTIONS

- 4.29. It is noted that the involvement and participation of which of the following team roles expands and increases over time?
- a. Team members
 - b. Facilitator
 - c. Sponsor
 - d. Leader

Solution: The involvement and participation of team members increases over time. The opposite is true for facilitators and leaders (where they both exist). Sponsors maintain a steady or decreasing involvement.

Answer a is correct.

Reference: *CSSBB Primer*, Section IV - 30.

- 4.30. Quality Council of Indiana offers a question CD, which students can use to measure their knowledge in various CSSBB BOK areas. From QCI's perspective this tool would be considered:
- a. A classical training tool with low development costs
 - b. A technical training tool with low user costs
 - c. A classical training tool with high user costs
 - d. A technical training tool with low development costs

Solution: The question describes a technical training tool. Only answers **b** and **d** are options. QCI must sell about 500 of these units to defray the development costs. So from the standpoint of the producer, the user costs would be considered low. When compared to current and past competitor prices, the user should consider the user price to be relatively low as well.

Answer b is correct.

Reference: *CSSBB Primer*, Section IV - 69.

- 4.31. What is the major advantage of the A3 report?
- a. It is more thorough than other problem solving tools
 - b. It is a concise problem presentation format
 - c. It requires less preparation time than other reports
 - d. It minimizes the need for a follow-up plan

Solution: The A3 report can be used to make proposals, display status, present information, and function as a problem solving format.

In all cases, it is concisely displayed on a single 11" x 17" sheet of paper.

Answer b is correct.

Reference: *CSSBB Primer*, Section IV - 33/35.

SECTION IV

TEAM MANAGEMENT - SAMPLE QUESTIONS

- 4.32. The situational leadership model which exhibits both low supportive and low directive behavior is called?
- a. Directing
 - b. Coaching
 - c. Supporting
 - d. Delegating

Solution: The delegating leadership style has both low directive and low supportive behaviors.

Answer d is correct.

Reference: *CSSBB Primer*, Section IV - 38.

- 4.33. Material rewards to team members should always:
- a. Be the same for all members of the team
 - b. Be individualized for each team member within an established value range
 - c. Be something with the company's logo on it
 - d. Clearly distinguish those who made significant contributions

Solution: Each member of a team is responsible for the success or failure of the team. Therefore, material rewards should always be the same for each individual on the team.

Answer a is correct.

Reference: *CSSBB Primer*, Section IV - 50/51.

- 4.34. Training methods using lectures, books, and homework:
- a. Are seldom used for high tech products
 - b. Will be obsolete within 20 years
 - c. Allows for instructor adjustment to meet class specific needs
 - d. Requires a relatively high cost for preparation of course materials

Solution: The question concerns classical training tools. Classical training methods may be used for high tech products. Although more technological methods may be used in the future, there is no indication that they will be obsolete in twenty years. These two statements indicate that answers **a** and **b** are false. Answer **c** is true and is a major advantage of classical training. Answer **d** is false. Although the cost per student is relatively high for classical training, the cost for course material preparation is relatively low.

Answer c is correct.

Reference: *CSSBB Primer*, Section IV - 68.

SECTION IX

IMPROVE - SAMPLE QUESTIONS

9.34. The iterative approach to DOE refers to:

- a. The use of sequential experimentation
- b. Ensuring the stability of the process during experimentation
- c. Ensuring the capability of the measurement system
- d. Appropriate estimates of experimental error

Solution: The iterative approach to DOE is the recognition that sequential experimentation will often yield more satisfactory results than "one big experiment." Answers **b**, **c**, and **d** refer to traditional experimental assumptions that must not be taken for granted (they should be checked).

Answer a is correct.

Reference: *CSSBB Primer*, Section IX - 14.

9.35. What is required for SMED?

- a. All internal and external setup steps must be reviewed in detail
- b. Outside specialists with knowledge on dies must be consulted
- c. Outstanding communications between operators and setup personnel
- d. Process mapping of improvement steps

Solution: Reviewing internal and external setup tasks are more critical than the other answer choices.

Answer a is correct.

Reference: *CSSBB Primer*, Section IX - 58/61.

9.36. The term level in experimental design refers to:

- a. The complexity of the design
- b. The specific settings of input factors
- c. The number of output responses
- d. The number of independent trials or tests

Solution: The term level most often refers to the different settings of an input factor. The other answer choices are meant to be distracters.

Answer b is correct.

Reference: *CSSBB Primer*, Section IX - 7.

SECTION IX

IMPROVE - SAMPLE QUESTIONS

- 9.37. A prime reason to consider the use of evolutionary operations (EVOP) in industrial facilities would be:
- When a bold strategy for improvement is considered
 - When existing industrial processes are not running at their highest efficiencies
 - To test large samples in a conservative manner
 - Because calculations for EVOP are simplified and will lead to better results

Solution: Answer **a** is incorrect; other test methods are bolder than EVOP. Large test samples are carried out in a conservative nature, but that is why EVOP is performed. The calculations in EVOP are simplified, but may not lead to better results. Box (1978) states that answer **b** is the best reason for EVOP.

Answer b is correct.

References: *CSSBB Primer*, Section IX - 31. Box, G., Hunter, W., & Hunter, J. (1978). *Statistics for Experimenters*. New York: John Wiley & Sons.

- 9.38. To achieve rapid improvement, which of the following concepts is appropriate?
- Standard work
 - Poka-yoke
 - Kaizen blitz
 - 5S activities

Solution: A kaizen blitz can generate dramatic improvements. The effects of 5S, standard work, and poka-yoke are more gradual.

Answer c is correct.

Reference: *CSSBB Primer*, Section IX - 38/47 and 64.

- 9.39. A designed experiment of three factors (A, B, & C) at two levels was conducted. The eight runs were analyzed, suggesting that one level of factor A showed significant improvement. The plant manager stated that no additional runs are needed. The experimenter's response should be:
- The experiment did its job and should be closed
 - The results of the test should be implemented immediately
 - Additional replications are needed to verify the experiment
 - An EVOP should be conducted to improve the process further

Solution: Running an EVOP is not appropriate at this time. The process may not be stable yet. The experiment itself may require additional replications to verify the results. Experimental budgets should be sufficient to allow for additional runs.

Answer c is correct.

References: *CSSBB Primer*, Section IX - 13/14. Gunter, B. (June, 1996). "Fundamental Issues in Experimental Design." Quality Progress.

SECTION IX

IMPROVE - SAMPLE QUESTIONS

9.40. Identify the best way to error proof activities?

- a. By corrective actions
- b. By preventive actions
- c. By containment actions
- d. By temporary actions

Solution: Preventive action prevents errors from occurring. Corrective, temporary, and containment actions correct errors after they occur.

Answer b is correct.

Reference: *CSSBB Primer*, Sections VIII - 131 and IX - 41/43.

9.41. The repeated trials in a designed experiment allow for:

- a. First order modeling
- b. Determination of experimental error
- c. Nested experimentation
- d. The resolution of main effects

Solution: Repeated trials allow for the determination of experimental error.

Answer b is correct.

Reference: *CSSBB Primer*, Section IX - 9.

9.42. How does poka-yoke respond to human error?

- a. By eliminating human error
- b. By punishing human error
- c. By rewarding defect detection due to human error
- d. By catching human error before it becomes a defect

Solution: Human error is a natural condition. Dr. Shigeo Shingo created the brilliant concept of creating devices or procedures to catch human errors before nonconforming products are produced.

Answer d is correct.

Reference: *CSSBB Primer*, Section IX - 41/43.

SECTION XI

DESIGN FOR SIX SIGMA - SAMPLE QUESTIONS

11.13. The stage gate process is used by many companies to screen and pass projects. Many companies may fail to use the process properly. A common problem in the stage gate process that could negate its benefits would be:

- a. Failure to kill a project
- b. Too many kills in the system
- c. Teams are overloaded with projects
- d. Requirements are not established

Solution: Generally, it is not a problem with too many “kills” in the stage gate process. Not enough kills will overload teams with too many projects. It is the failure to kill projects that is the main problem.

Answer a is correct.

Reference: *CSSBB Primer*, Section XI - 5.

11.14. DFX has many internal and external customer-based objectives. Which of the following would be considered an external target?

- a. Design for assembly
- b. Design for features
- c. Design for testability
- d. Design for manufacture

Solution: The best external, customer-based answer choice is design for features. Assembly, testability, and manufacture are internal customer benefits.

Answer b is correct.

Reference: *CSSBB Primer*, Section XI - 12/14.

11.15. At what robust design stage would the use of more expensive components or processes be considered?

- a. Control
- b. Tolerance
- c. Parametric
- d. Concept

Solution: The three key principles of robust design are: concept, parameter, and tolerance. In the concept step, lowest cost components and manufacturing techniques are used. If the design doesn't meet requirements then more expensive components or processes are considered in the tolerance design phase.

Answer b is correct.

References: *CSSBB Primer*, Section XI - 16/19.

SECTION XI

DESIGN FOR SIX SIGMA - SAMPLE QUESTIONS

11.16. A corporation makes a product which is a blend of three ingredients (A, B, and C). If the individual tolerances for the weights of the three ingredients are as shown below, what would be the tolerance for the blended product?

Ingredient A: 66 ± 3.0 grams
Ingredient B: 20 ± 2.0 grams
Ingredient C: 14 ± 1.73 grams

- a. 100 ± 6.73 grams
- b. 100 ± 4.46 grams
- c. 100 ± 4.00 grams
- d. 100 ± 2.59 grams

Solution: This question requires the use of the additive law of variances. The \pm tolerance may be treated as $\pm 3S$.

$$\begin{aligned}S_{\text{Total}}^2 &= S_A^2 + S_B^2 + S_C^2 \\S_{\text{Total}}^2 &= 3.0^2 + 2.0^2 + 1.73^2 \\S_{\text{Total}} &= \sqrt{9 + 4 + 3} = 4.0 \text{ grams}\end{aligned}$$

The mean for the blend is 100 and the tolerance is ± 4.0 grams. Therefore, the blend will be 100 ± 4.0 grams.

Answer c is correct.

Reference: *CSSBB Primer*, Section XI - 29.

11.17. What signal to noise (s/n) ratio would be used to calculate system performance for items such as shrinkage, wear, deterioration rate?

- a. Nominal is best
- b. Robust is best
- c. Smaller is better
- d. Larger is better

Solution: The question content includes items in which smaller is better are desirable outcomes.

Answer c is correct.

References: *CSSBB Primer*, Section XI - 20/21.

SECTION XI

DESIGN FOR SIX SIGMA - SAMPLE QUESTIONS

- 11.18. The most significant difference between the six step DMADOV design process and the four step IDOV design process is:
- The two additional design steps in the DMADOV process
 - IDOV uses validate and DMADOV uses verify
 - The IDOV process is quicker
 - IDOV includes measure and analyze in the design step

Solution: Answers **a** and **b** are factually true, but not significant. Answer **c** is false. Having two fewer letters in the IDOV acronym does not make it quicker. IDOV combines the measure step into the identify and design step. IDOV also includes the analyze step with the design step.

Answer d is correct.

Reference: *CSSBB Primer*, Section XI - 7/8.

- 11.19. An example of design for test is:
- 100% testing of units during manufacture
 - BIST (built-in self test)
 - PRU (parallel redundant units)
 - AFR (automated fault reporting)

Solution: BIST (built-in self test) incorporates the design for test into the product. The advantage of this method is that all units can quickly be tested. The disadvantage of this method is determining a valid test sequence and the additional cost of incorporating the BIST. Answers **c** PRU and **d** AFR are fictitious acronyms.

Answer b is correct.

Reference: *CSSBB Primer*, Section XI - 12 (and logic).