
**THE
SIX SIGMA BLACK BELT
SOLUTION TEXT**

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SECTION II

ENTERPRISE-WIDE DEPLOYMENT - SAMPLE QUESTIONS

- 2.1 Lean and six sigma share in common all of the following issues, EXCEPT:
- They both focus on continuous improvement
 - They both require top management commitment
 - They both focus on customer satisfaction
 - They both require long learning curves

Solution: Note that a negative response is requested. Lean and six sigma are not opposite or mutually exclusive. Answers **a** and **c** are reasons why lean and six sigma so naturally became a powerful hybrid approach for continuous improvement. Both approaches, separately or combined, require management commitment. Many of the lean tools have short learning curves.

Answer d is the correct, incorrect, choice.

Reference: *CSSBB Primer*, Section II - 34/38 (and logic).

- 2.2. Reluctance of a line manager to release manpower or resources to a project manager is one type of:
- Matrix management
 - Objective prioritization
 - Organizational roadblock
 - Harmonization of responsibility and authority

Solution: Organizational roadblocks to a project include those due to 1) top management, 2) change of objectives, 3) lack of allocated resources, 4) conflicts in project priority, and so on.

Answer c is correct.

Reference: *CSSBB Primer*, Section II - 47/49 (and logic).

- 2.3. Which of the following concepts is mostly associated with Taiichi Ohno?
- SPC
 - TOC
 - CTQ
 - TPS

Solution: Taiichi Ohno is the main contributor to the Toyota Production System (TPS).

Answer d is correct.

Reference: *CSSBB Primer*, Section II - 24 and 29/30.

SECTION II

ENTERPRISE-WIDE DEPLOYMENT - SAMPLE QUESTIONS

- 2.4. Increasing performance in a lean six sigma corporation from 3 sigma to 4 sigma would reduce defects per million by a factor of:
- 2
 - 8
 - 10
 - 16

Solution: Since six sigma is referenced in the question, the assumption is that a ± 1.5 sigma must be included. Using the shift, the 4 sigma defect rate is 6,210 ppm and the 3 sigma defect rate is 66,810 ppm or a ratio of 1:10.76.

Answer c is correct.

Reference: *CSSBB Primer*, Section II - 3.

- 2.5. Relative to the duties and responsibilities of departments within a six sigma company, the most critical requirement calls for:
- Task forces and teams
 - The establishment of liaison roles
 - A matrix organizational structure
 - Cross functional collaboration

Solution: The most necessary requirement is cross functional collaboration. Under this umbrella, task forces and liaison roles can be created. A matrix organizational structure may or may not make sense, but certainly a matrix structure for specific projects is often necessary.

Answer d is correct.

Reference: *CSSBB Primer*, Section II - 49.

- 2.6. The extension from lean production to lean office is possible because:
- The office produces a variety of services
 - The concept of waste applies to every business environment
 - Offices are more data driven than manufacturing
 - There is little difference between production and office environments

Solution: Answers **a** and **c** are filler choices. Answer **d** is a distant second choice. Many production and office environments may be viewed as very different. Both environments may need very different approaches for lean implementation. The single concept that allows the extension of lean production to lean office is that every system contains waste.

Answer b is correct.

Reference: *CSSBB Primer*, Section II - 23 (and logic).

SECTION II

ENTERPRISE-WIDE DEPLOYMENT - SAMPLE QUESTIONS

2.7. Which American figure is seen as the earliest advocate of waste reduction?

- a. Henry Ford
- b. Frederick W. Taylor
- c. W. Edwards Deming
- d. James Womack

Solution: Henry Ford's dramatic gains at his Highland Park and River Rouge plants could be seen as the earliest examples of waste reduction.

Answer a is correct.

Reference: *CSSBB Primer*, Section II - 24/27.

2.8. As a rule, which of the following statements can be made regarding organizations that are tall and narrow?

- a. They are less bureaucratic than many other structures
- b. Communication channels allow for the rapid dissemination of information
- c. They are typical for many large organizations
- d. They handle decision-making rapidly

Solution: Many companies today are using restructuring of their organization as a way to reduce costs and to become more competitive. Tall and narrow organizations may be more, not less, bureaucratic. Communication channels in tall and narrow organizations are more subject to filtering; thus, slowing down information. This also slows down decision-making. Larger organizations tend to be more tall and narrow.

Answer c is correct.

Reference: *CSSBB Primer*, Section II - 47.

2.9. What guru is MOST widely associated with DOE?

- a. Shingo
- b. Juran
- c. Ishikawa
- d. Taguchi

Solution: Certainly design of experiments is (was) not outside of the grasp of any of the four listed luminaries. However, Taguchi presented a cookbook approach for Japanese (and later American) engineers to use in the application of DOE.

Answer d is correct.

Reference: *CSSBB Primer*, Section II - 6 and 19/20.

SECTION II

ENTERPRISE-WIDE DEPLOYMENT - SAMPLE QUESTIONS

- 2.10. What is the best upper management reason for not providing black belt assistance to an improvement team?
- Black belt resources may be tight
 - It forces the team to develop their own skills
 - It may not be required
 - It requires the team to ask for help

Solution: Several of the answer choices may be applicable, but the best one, according to Pande, is answer **c**. Management may choose to apply black belt resources in a targeted approach.

Answer c is correct.

References: *CSSBB Primer*, Section II - 44/45 and 53. Pande, P.S., Newman, P.R., & Cavanaugh, R.R. (2000). *The Six Sigma Way*. New York: McGraw-Hill.

- 2.11. In highly effective six sigma companies, most employees receive some training. What group is most likely to receive sponsorship training?
- Senior management
 - Master black belt candidates
 - Black belt candidates
 - Green belt candidates

Solution: Sponsorship training is normally given to upper management. Master black belt, black belt, and green belt candidates receive more extensive technical instruction.

Answer a is correct.

Reference: *CSSBB Primer*, Section II - 45.

- 2.12. From an upper management perspective, what has been the principal motivating factor in embracing lean six sigma?
- Bottom line results
 - Market share growth
 - Defect reductions
 - Customer focus

Solution: Philip Crosby once stated that upper management is interested in money, making money, and not losing money. He said there must be something else, but he never got that far in conversations with them. Answers **b**, **c**, and **d** could be considered subsets of answer **a**.

Answer a is correct.

Reference: *CSSBB Primer*, Section II - 5 (and logic).

SECTION II

ENTERPRISE-WIDE DEPLOYMENT - SAMPLE QUESTIONS

2.13. The concept most closely associated with lean production is:

- a. Better quality
- b. Faster production
- c. Flexible production
- d. Elimination of waste

Solution: All answer choices have merit. A good lean implementation will result in better quality, and faster and more flexible production. However, the central concept in lean production is the elimination of waste.

Answer d is correct.

Reference: *CSSBB Primer*, Section II - 23 and 34.

2.14. The most UNLIKELY approach to overcome employee resistance to change is:

- a. Mandating the change
- b. Negotiating the conditions of the change
- c. Providing training on the change
- d. Involvement with the change project

Solution: Note that a negative response is requested. Mandating the change is one way to implement a change, but this action does not overcome resistance to the change. The reason for the change should be explained to employees, and the employees should be involved with the change to achieve "buy-in".

Answer a is the correct, incorrect, choice.

Reference: *CSSBB Primer*, Section II - 52 (and logic).

2.15. In almost any type of process flow diagram, the element that indicates a need for correction and adjustment is called:

- a. SIPOC
- b. Inputs
- c. Feedback
- d. Outputs

Solution: SIPOC is an acronym for a high level process map. This choice is too broad for this question. Process and systems diagrams usually have inputs and outputs but corrections and adjustments are made based on feedback.

Answer c is correct.

Reference: *CSSBB Primer*, Section II - 40.

SECTION II

ENTERPRISE-WIDE DEPLOYMENT - SAMPLE QUESTIONS

2.16. Which luminary is generally recognized as being the creator of the control chart?

- a. Deming
- b. Shewhart
- c. Harry
- d. Ishikawa

Solution: The honor belongs to Dr. Walter Shewhart. In fact, some quality professionals still refer to them as Shewhart control charts.

Answer b is correct

Reference: *CSSBB Primer*, Section II - 6 and 18/19.

2.17. The dissemination of knowledge within a modern organization is normally coordinated by:

- a. IT or MIS department
- b. Quality department
- c. Engineering department
- d. Technology department

Solution: This question presents some tough choices. All of the departments can be involved. Because of the words "dissemination" and "coordinated" in a computer driven, internet and intranet age, then the IT or MIS department is the most logical choice.

Answer a is correct.

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

2.18. Which of the following quality luminaries would be most clearly identified as a proponent of improvement and breakthrough projects?

- a. Ishikawa
- b. Deming
- c. Juran
- d. Crosby

Solution: Juran's Trilogy consists of three processes: quality planning, quality control, and quality improvement. The quality improvement phase would certainly be considered a project approach to improvement.

Answer c is correct.

Reference: *CSSBB Primer*, Section II - 6 and 17 (and logic).
