MULTIPLE CHOICE QUESTIONS

1. Deming’s philosophy called “A System of Profound Knowledge,” consists of four parts. Which of the following is not one of them?
   a. Appreciation for a system
   b. Understanding process variation
   c. Theory of knowledge
   d. Philanthropy

2. Deming emphasized that management’s job is to:
   a. optimize the system.
   b. maximize employment.
   c. achieve suboptimization.
   d. control the process indexes.

3. Factors that are present as a natural part of a process are called:
   a. primary variances.
   b. environmental causes of variation.
   c. common causes of variation.
   d. system variances.

4. Variations that result from special causes are often called:
   a. special variances.
   b. secondary causes of variation.
   c. random variances.
   d. assignable causes.

5. _____ arise from external sources that are not inherent in the process.
   a. Special causes
   b. Random variances
   c. Common causes
   d. Non-system variances

6. A system governed only by _____ is stable and its performance can be predicted.
   a. special causes
   b. common causes
   c. random variances
   d. assignable causes
7. While trying to improve the quality of the system, if managers try to “fix” a _____, they will actually increase the variation in the system.
   a. special cause
   b. secondary variance
   c. common cause
   d. random variance

8. In Deming’s view, _____ is/are the chief culprit of poor quality.
   a. common causes
   b. lack of monitoring
   c. assignable causes
   d. variation

9. SS-Melt Castings is a manufacturing unit supplying parts to engineering companies. Management is thinking about finding a solution for frequent quality issues related to product specifications. Having identified the issue to a common cause, which of the following is the best way to resolve the issue?
   a. Provide quality training to the production employees
   b. Change the technology of the process
   c. Revise product specifications
   d. Outsource specific operations to external vendors

10. Deming believed _____ should be the common language across the levels in an organization.
    a. costs
    b. efficiency
    c. management terms
    d. statistics

12. According to Juran, top management speaks in the language of _____, workers speak in the language of _____.
    a. costs; earnings
    b. dollars; things
    c. statistics; workhours
    d. power; loyalty

13. Which of the following are not one of the four categories of Juran’s definition of quality?
    a. Quality of design
    b. Quality of performance
    c. Availability
    d. Field service
14. Quality control involves all of the following except:
   a. identifying internal and external customers.
   b. establishing units of measurement.
   c. establishing standards of performance.
   d. interpreting the difference between actual performance and the standard.

15. Which of the following is not part of the Quality Trilogy of Juran’s philosophy?
   a. Quality planning
   b. Quality control
   c. Quality maintenance
   d. Quality improvement

16. Juran and Deming would argue that it is pointless to exhort a line worker to produce perfection, because:
   a. workers are not motivated to improve unless a financial incentive is offered.
   b. the overwhelming majority of imperfections are due to poorly designed manufacturing systems.
   c. it is the supervisor’s responsibility to ensure quality through effective quality control.
   d. management systems that are unsupportive of quality initiatives should be reengineered in advance.

17. Crosby’s Basic Elements of Improvement includes all of the following except:
   a. determination.
   b. education.
   c. implementation.
   d. inspection.

18. Which of the following is true of the Baldrige award?
   a. It purports to establish guidelines and criteria that can be used by business.
   b. The award exists simply to recognize product excellence.
   c. The award exists for the purpose of “winning.”
   d. Up to five companies can receive an award in each of the categories.

19. Which of the following is not part of the “leadership triad?”
   a. Leadership
   b. Strategic focus
   c. Process management
   d. Customer focus
20. _____ refers to an organization’s ability to address current business needs and to have the agility and strategic management to prepare successfully for the future, and to prepare for real-time or short-term emergencies.
   a. Sustainability
   b. Adaptability
   c. Proactiveness
   d. Strategic focus

21. As defined by the Union of Japanese Scientists and Engineers, _____ is a system of activities to assure that quality products and services required by customers are economically designed, produced, and supplied while respecting the principle of customer-orientation and the overall public well-being.
   a. Performance Excellence
   b. Companywide Quality Control
   c. Deming’s 14 Points
   d. Total Quality

22. Which of the following is not one of the recognition levels according to the European Foundation for Quality Management?
   a. EFQM Excellence Award
   b. Recognized for Excellence
   c. Committed to Excellence
   d. Innovated for Excellence

23. The most recent version of the written quality standards by the International Organization for Standardization is called the _____ family of standards.
   a. ISO 9000:10000
   b. ISO 10000:2005
   c. ISO 9000:2000
   d. ISO 2000:9000

24. The ISO 9000:2000 standards consist of three documents of which ISO 9001 pertains to:
   a. Fundamentals.
   b. Requirements.
   c. Vocabulary.
   d. Guidance for performance improvement.

25. Which of the following is true about ISO certification?
   a. The ISO 9000 standards originally were intended to be advisory in nature.
   b. The entire company and not individual sites must achieve recertification.
   c. Recertification is required every two years.
   d. Costs of recertification are borne by the company and the certifying firm.
26. The origin of the term six sigma came from a statistical measure that equates to _____ or fewer errors or defects per million opportunities.
   a. 2.6
   b. 3.4
   c. 4.3
   d. 4.5
   Answer: B

27. In both manufacturing and nonmanufacturing processes, places where the defective “product” is sent to be reworked or scrapped are referred to as:
   a. recycling units.
   b. outlier facilities.
   c. hidden factories.
   d. reengineering units.

28. In the DMAIC process, a source of customer dissatisfaction is referred to as a(n):
   a. critical to quality.
   b. outlier feature.
   c. dissatisfier.
   d. variance factor.

29. Which of the following is not true of the three main quality systems?
   a. Baldrige concentrates on fixing quality system problems and product and service nonconformities.
   b. ISO focuses on product and service conformity for guaranteeing equity in the marketplace.
   c. Six Sigma concentrates on measuring product quality and driving process improvement.
   d. ISO 9000 is an excellent starting point for companies with no formal quality assurance program.
   Answer: A

30. Six Sigma methodology is driven by a _____ methodology.
   a. fit-for-use
   b. conformance-to-specifications
   c. management-by-fact
   d. cost-driven
   Answer: C

CHAPTER 3
TOOLS AND TECHNIQUES FOR QUALITY DESIGN AND CONTROL
MULTIPLE CHOICE QUESTIONS

31. Design for Six Sigma consists of four principal activities. Which of the following is not one of them?
   a. Concept development
   b. Design development
   c. Design maximization
   d. Design verification
32. DFMEA stands for:
   a. design failure mode and effects analysis.
   b. design function mode and effects analysis.
   c. design failure mode and efficiency analysis.
   d. design feature methods and efficiency analysis.

33. The purpose of DFMEA is all of the following except:
   a. to recommend corrective design actions.
   b. to estimate the effect and seriousness of the failure.
   c. to identify all the ways in which a failure can occur.
   d. to act as the "voice of the customer" in product design.

34. Which of the following statements is true about various service components: degree of customer contact and interaction, the degree of labor intensity, and the degree of customization?
   a. A railroad is high in labor intensity but low on the other two dimensions.
   b. An interior design service would be low in all three dimensions.
   c. A hair-stylist would be high in all three dimensions.
   d. A fast-food restaurant would be high in customization and customer contact, but low in labor intensity.

35. The design of a process begins with the:
   a. operations manager.
   b. QFD department.
   c. customer.
   d. process owner.

36. ______ is a term that is commonly used to characterize flexibility and short cycle times.
   a. Customer-driven
   b. Proactiveness
   c. Agility
   d. Customer-readiness

37. ______ is an approach for mistake-proofing processes using automatic devices or methods to avoid simple human error.
   a. Poka-yoke
   b. QFD
   c. Quality circles
   d. Fail secure
38. _____ errors arise in the contact between the server and the customer.
   a. Treatment
   b. Contact
   c. Common
   d. System

39. _____ errors result from the task, treatment, or tangibles of the service.
   a. System
   b. Server
   c. Process
   d. Common

40. Doing work incorrectly, in the wrong order, or too slowly, as well as doing work not requested are examples of:
   a. treatment errors.
   b. task errors.
   c. tangible errors.
   d. preparation errors.

41. Which of the following is not an example of customer errors during an encounter?
   a. Inattention
   b. A memory lapse
   c. Learning from experience.
   d. Failure to remember steps

42. Customer errors at the resolution stage of a service encounter include all of the following except:
   a. failure to signal service inadequacies.
   b. follow instructions.
   c. learn from experience.
   d. execute appropriate postencounter actions.

43. _____ is the activity of ensuring conformance to the requirements and taking corrective action when necessary to correct problems and maintain stable performance.
   a. Quality engineering
   b. Compliance management
   c. QFD
   d. Control

44. Which of the following is not a component of a control system?
   a. A standard
   b. A flow of authority to enforce the standards
   c. A means of measuring accomplishment
   d. A comparison of actual results with the standard
45. The responsibility for control can be determined by checking the three components of control systems. If any of these criteria is not met, then the process is the responsibility of:
   a. management.
   b. quality control team.
   c. the process owner.
   d. the supervisor.

46. Which of the following is not one of the principles of statistical thinking?
   a. Processes have quantifiable and nonquantifiable variations.
   b. All work occurs in a system of interconnected processes.
   c. Variation exists in all processes.
   d. Understanding and reducing variation are keys to success.

47. The phenomenon that occurs when small changes in demand occur, the variation in production and inventory levels becomes increasingly amplified upstream at distribution centers, factories, and suppliers, that results in unnecessary costs and difficulties in managing material flow is known as:
   a. upstream variation.
   b. flagellation.
   c. bullwhip effect.
   d. quality dilemma.

48. Which of the following is not an operational problem created by excessive variation?
   a. Variation increases unpredictability.
   b. Variation increases capacity utilization.
   c. Variation makes it difficult to find root causes.
   d. Variation makes it difficult to detect potential problems early.

49. _____ is a methodology for monitoring a process to identify special causes of variation and signaling the need to take corrective action when it is appropriate.
   a. Quality function deployment
   b. Statistical process control
   c. Process management
   d. Variation mapping

50. If the variation in the process is due to _____ alone, the process is said to be in statistical control.
   a. random causes
   b. common causes
   c. special causes
   d. environmental causes
51. When _____ causes are present, the process is deemed to be out of control.
   a. common
   b. special
   c. random
   d. cumulative

52. In a control chart, the sample values will fall within upper control limit (UCL) and the lower control limit (LCL) if the process is affected only by _____ causes of variation.
   a. common
   b. random
   c. special
   d. cumulative

53. The Joint Commission Accreditation of Health Care Organizations (JCAHO) requires that health care providers should establish _____, which are levels at which special investigation of problems should occur.
   a. critical care levels
   b. healthcare indicators
   c. thresholds for evaluation
   d. upper limits for health indicators

54. Which of the following is not an example of a quality control parameter for the post office?
   a. Response time
   b. Sorting accuracy
   c. Time of delivery
   d. Percentage of express mail delivered on time

55. By viewing processes as interconnected components of a system, we avoid:
   a. root causes.
   b. capacity utilization.
   c. process variance.
   d. suboptimization.

CHAPTER 4
TOOLS AND TECHNIQUES FOR QUALITY IMPROVEMENT

MULTIPLE CHOICE QUESTIONS

56. A _____ is an intense and rapid improvement process in which a team or a department throws all its resources into an improvement project over a short time period.
   a. kaizen blitz
   b. quality blitzkrieg
   c. rapid deployment
   d. TQ impetus
57. Which of the following is not one of the fundamental questions to be asked in a Deming cycle methodology?
   a. What are we trying to accomplish?
   b. Who are the process owners of this quality initiative?
   c. What changes can we make that will result in improvement?
   d. How will we know that a change is an improvement?
   Answer: B

58. The DMAIC approach used in Six Sigma is expanded as:
   a. Define, Modify, Apply, Increment, and Close.
   b. Design, Measure, Analyze, Implement, and Cost.
   d. Define, Measure, Analyze, Improve, and Control.
   Answer: D

59. The process of drilling down to a more specific problem statement is called:
   a. root cause analysis.
   b. project scoping.
   c. problem mapping.
   d. variation analysis.
   Answer: B

60. The characteristics that have the most impact on product or service performance are called:
   a. critical to quality.
   b. critical variances.
   c. excellence features.
   d. essentials.
   Answer: A

61. The _____ phase of DMAIC focuses on why defects, errors, or excessive variation occur.
   a. Define
   b. Measure
   c. Analyze
   d. Control

62. In which phase of the DMAIC process does statistical thinking play a critical role?
   a. Define
   b. Measure
   c. Analyze
   d. Control
63. The statistically based tools are used extensively to gather and analyze data are referred to as _____ while the seven management and planning tools are been referred to as _____.
   a. measurement tools; analysis tools
   b. quantitative tools; qualitative tools
   c. traditional QC tools; hybrid tools
   d. seven QC tools; the new seven

64. _____ is a picture of a process that shows the sequence of steps performed.
   a. Cause-and-effect diagram
   b. Flowchart
   c. Pareto diagram
   d. Histogram

65. Flowcharts are also known as:
   a. step charts.
   b. Pareto diagrams.
   c. process maps.
   d. fishbone charts.

66. _____ are obtained by counting or from some type of visual inspection while _____ are collected by numerical measurement on a continuous scale.
   a. Attribute data; variable data
   b. Constant data; continuous data
   c. Specific data; variable data
   d. Universal data; control data

67. The number of invoices that contain errors is an example of _____ data.
   a. continuous
   b. variable
   c. attribute
   d. control

68. A histogram is a graphical representation of:
   a. the cause-and-effect relationship of data points.
   b. the variation in a set of data.
   c. historical trend of critical data over a period of time.
   d. critical to quality data.

69. _____ is a technique for prioritizing types or sources of problems.
   a. Cause-and-effect diagram
   b. Pareto analysis
   c. Scatter diagram
   d. A process map
70. Pareto analysis separates the _____ from the _____.  
   a. discrete; continuous  
   b. quantitative; qualitative  
   c. current data; historical data  
   d. vital few; trivial many

71. In a Pareto distribution, the characteristics are ordered:  
   a. according to the criticality.  
   b. from largest frequency to smallest.  
   c. historically, from the earliest to the latest.  
   d. in a sequential manner based on the work-flow.

72. _____ is also known as the Ishikawa diagram.  
   a. Pareto diagram  
   b. Cause-and-effect diagram  
   c. Histogram  
   d. Scatter diagrams

73. _____ illustrate relationships between hypothesized causes and effects.  
   a. Histograms  
   b. Pareto diagrams  
   c. Scatter diagrams  
   d. Cause-and-effects diagrams

74. _____, first proposed by Walter Shewhart in 1924, are the backbone of statistical process control.  
   a. Pareto charts  
   b. Histograms  
   c. Control charts  
   d. Scatter charts

75. Which of the following is not one of the key principles of lean thinking?  
   a. Reducing handoffs  
   b. Redesigning steps  
   c. Performing steps in parallel rather than in sequence  
   d. Involving key people early

76. _____ is designed to ensure that equipment is operational and available when needed.  
   a. Standardized work system  
   b. Source inspection  
   c. Pull production system  
   d. Total productive maintenance
In the _____ system, upstream suppliers do not produce until the downstream customer signals a need for parts.
   a. kaizen
   b. reduced handoff
   c. standardized work system
   d. pull production

_____ refers to rapid changeover of tooling and fixtures in machine shops so that multiple products in smaller batches can be run on the same equipment.
   a. Single minute exchange of dies
   b. Total productive maintenance
   c. Pull production
   d. Seiketsu

Breakthrough improvement refers to:
   a. continuous change.
   b. programmed innovation.
   c. discontinuous change.
   d. a lack of variation.

Breakthrough improvement is often motivated by:
   a. financial controls.
   b. stretch goals.
   c. Six Sigma objectives.
   d. benchmarking.

_____ is the search for best practices that will lead to superior performance.
   a. Benchmarking
   b. Flowcharting
   c. Alternatives analysis
   d. Anchoring

Two major types of benchmarking are _____ and _____.
   a. discrete; continuous
   b. historical; progressive
   c. quantifiable; nonquantifiable
   d. competitive; generic
84. The term _____ refers to approaches that produce exceptional results, are usually innovative in terms of the use of technology or human resources, and are recognized by customers or industry experts.
   a. best practices
   b. breakthrough practices
   c. innovation credits
   d. breakthrough standards

85. _____ is focused on breakthrough improvement to dramatically improve the quality and speed of work and to reduce its cost by fundamentally changing the processes by which work gets done.
   a. Benchmarking
   b. Reengineering
   c. Kanban
   d. Process mapping

86. A research study identified that the extent to which the process maps onto the dimensions of the business, from a single activity in one function to spanning the entire business unit is critical to the long-term success of reengineering initiatives. What is the reference to?
   a. Scope
   b. Depth
   c. Breadth
   d. Reach