

## Chapter 11—Production and Operations Management

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### MATCHING

*Complete the following using the terms listed.*

- a. process layout
  - b. analytic production system
  - c. Gantt chart
  - d. PERT chart
  - e. production and operations management
  - f. flexible manufacturing system
  - g. critical path
  - h. computer-integrated manufacturing
  - i. Utility
  - j. perpetual inventory
  - k. materials requirement planning
  - l. Standardization
  - m. Routing
  - n. assembly line
  - o. Robot
  - p. just-in-time
  - q. Benchmarking
  - r. synthetic production system
  - s. make, buy, or lease decision
- 
1. Managing people and machinery in converting materials and resources into finished goods and services is called \_\_\_\_\_.
  2. The third component of mass production, \_\_\_\_\_, involves producing uniform, interchangeable goods and parts.
  3. A(n) \_\_\_\_\_ groups machinery and equipment according to their functions.
  4. Many firms maintain \_\_\_\_\_ systems to continually monitor the amounts and locations of their merchandise.
  5. A(n) \_\_\_\_\_, one of the oldest analytical methods for help with scheduling, tracks projected and actual work progress over time.
  6. The sequence of operations that require the longest time for completion is known as the \_\_\_\_\_.
  7. Firms create \_\_\_\_\_, or want-satisfying power, by converting raw materials and other inputs into finished goods and services.
  8. \_\_\_\_\_ is a production system in which computers help workers design products, control machines, and handle materials.
  9. A(n) \_\_\_\_\_ reduces a raw material to its component parts in order to extract one or more marketable products.
  10. \_\_\_\_\_ is a computer-based production planning system that ensures a firm has all the parts and materials it needs to produce its output at the right time and place, and in the right amounts.
  11. A complex project might require a(n) \_\_\_\_\_, which seeks to minimize delays by coordinating all aspects of the production process.
  12. A(n) \_\_\_\_\_ is a production facility that workers can quickly modify to manufacture different products.
  13. A(n) \_\_\_\_\_ is a programmable machine capable of performing a variety of jobs that require manipulation of materials and tools.
  14. The logical extension of specialization, mechanization, and standardization led to the development of the \_\_\_\_\_.
  15. A(n) \_\_\_\_\_ transforms raw materials into finished products.

16. An inventory system that tries to keep inventory on hand to a minimum, and seeks to eliminate all sources of waste, is called a(n) \_\_\_\_\_ system.
17. \_\_\_\_\_ determines the sequence of work throughout the facility and specifies who will perform each aspect of work at what location.
18. The process of determining how well other companies perform business functions or tasks is called \_\_\_\_\_.
19. The \_\_\_\_\_ is the first step in a company's production plan.

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|-----------------------|--------|--|
| 1. ANS: E             | DIF: 2 | REF: Strategic Importance of the Production Function |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 2. ANS: L             | DIF: 2 | REF: Strategic Importance of the Production Function |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 3. ANS: A             | DIF: 2 | REF: The Job of Production Managers                  |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 4. ANS: J             | DIF: 2 | REF: The Job of Production Managers                  |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 5. ANS: C             | DIF: 2 | REF: The Job of Production Managers                  |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 6. ANS: G             | DIF: 2 | REF: The Job of Production Managers                  |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 7. ANS: I             | DIF: 2 | REF: Chapter Opener                                  |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 8. ANS: H             | DIF: 2 | REF: Technology and the Production Process           |
| NAT: AACSB Technology |        | MSC: KN  |
| 9. ANS: B             | DIF: 2 | REF: Production Processes                            |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 10. ANS: K            | DIF: 2 | REF: The Job of Production Managers                  |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 11. ANS: D            | DIF: 2 | REF: The Job of Production Managers                  |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 12. ANS: F            | DIF: 2 | REF: Technology and the Production Process           |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 13. ANS: O            | DIF: 2 | REF: Technology and the Production Process           |
| NAT: AACSB Technology |        | MSC: KN  |
| 14. ANS: N            | DIF: 2 | REF: Strategic Importance of the Production Function |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 15. ANS: R            | DIF: 2 | REF: Chapter Opener                                  |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 16. ANS: P            | DIF: 2 | REF: The Job of Production Managers                  |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 17. ANS: M            | DIF: 2 | REF: The Job of Production Managers                  |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 18. ANS: Q            | DIF: 2 | REF: Importance of Quality                           |
| NAT: AACSB Analytic   |        | MSC: KN  |
| 19. ANS: S            | DIF: 2 | REF: The Job of Production Managers                  |
| NAT: AACSB Analytic   |        | MSC: KN  |

## ESSAY

1. How can effective production and operations management benefit a firm?

ANS:

The production process is vital to the success of a firm. Production and operations managers coordinate the creation of goods and services that generate profits for the firm. Efficient management of the production process can lower costs of production, improve product quality, help the firm respond dependably to the demands of customers, and increase its ability to respond to changing demands or competitive conditions.

DIF: 3 REF: Strategic Importance of the Production Function

NAT: AACSB Reflective Thinking MSC: AP

2. Describe the differences between mass production, flexible production, and customer-driven production.

ANS:

Mass production is a system for manufacturing products in large amounts through effective combinations of employees with specialized skills, mechanization, and standardization. Mass production makes outputs available in large quantities at lower prices than individually crafted items would cost. While mass production efficiently creates large batches of similar items, flexible production can cost-effectively produce smaller batches. Flexible production generally involves using information technology to share the details of customer orders, programmable equipment to fulfill the orders, as well as skilled people to carry out whatever tasks are needed. Customer-driven production systems evaluate customer demands in order to link what a manufacturer makes with what customers want to buy. One method is to establish computer links between factories and retailers' systems, using data about sales as the basis for creating short-term forecasts and designing production schedules to meet those forecasts. Another is to make products specifically to order.

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NAT: AACSB Reflective Thinking MSC: AP

3. How are production processes classified? Give an example of each.

ANS:

The means of operating may involve either an analytic system or a synthetic system. An analytic system reduces a raw material into its component parts in order to extract one or more products. An example would be petroleum refining. A synthetic system combines a number of raw materials, or parts, or transforms raw materials to produce finished products. The manufacturing of a commercial aircraft is an example of a synthetic system. A continuous production process generates finished products over a period of time in long production runs, such as automobile assembly. An intermittent production process generates products in short production runs. Most services are the result of intermittent production processes.

DIF: 3 REF: Production Processes

NAT: AACSB Reflective Thinking MSC: AP

4. Discuss computer-aided design and computer-aided manufacturing.

ANS:

Computer-aided design (CAD) allows engineers to design products on computer screens faster and with fewer mistakes than they could achieve working with traditional drafting systems. Using an electronic pen, an engineer can sketch 3-D designs on an electronic drafting board or directly on the screen. The computer also provides tools to make design changes and to analyze the design for certain characteristics and problems. Computer-aided manufacturing (CAM) picks up where CAD leaves off. Computer tools enable a manufacturer to analyze the steps that a machine must take to produce a needed product or part. Electronic signals transmitted to processing equipment provide instructions for performing the appropriate production steps in the correct order.

DIF: 3                      REF: Technology and the Production Process  
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5. Describe a flexible manufacturing system.

ANS:

A flexible manufacturing system is a facility that can be changed quickly to manufacture different products. Computers are used to control machinery, while robots are used to produce and transport parts and materials. Robots can even be programmed to replace drills, blades, and other parts of machines without using humans to perform these functions. Flexible manufacturing systems have been enhanced by powerful new software that allows machine tools to be reprogrammed while they are running.

DIF: 3                      REF: Technology and the Production Process                      NAT: AACSB Technology  
MSC: KN

6. What are the three factors in the facility location decision? Give examples of businesses most affected by each individual factor.

ANS:

The three factors are transportation (including proximity to markets, proximity to raw materials, and the availability of transportation alternatives), human factors (the labor supply, local regulations, and community living conditions), and physical factors (water supply, energy, and hazardous waste and other environmental issues). Businesses affected by transportation factors include hotels (proximity to markets) and mining companies (proximity to raw materials). Businesses affected by human factors include software manufacturers (labor supply). Businesses affected by physical factors include paper mills (water supply) and chemical manufacturers (energy).

DIF: 3                      REF: The Location Decision  
NAT: AACSB Reflective Thinking                      MSC: AP

7. What is the purpose of an environmental impact study, and how does it influence a plant's location decision?

ANS:

The purpose of an environmental impact study is to analyze how a proposed plant would affect the quality of life in the surrounding area. Possible effects include transportation facilities, energy requirements, water and sewage treatment needs, natural plant life and wildlife. Water, air, and noise pollution are also studied.

DIF: 2                      REF: The Location Decision                      NAT: AACSB Reflective Thinking  
MSC: AP

8. Describe the major tasks of production and operations managers.

ANS:

Production and operations managers oversee the work of people and machinery to convert inputs -- raw materials and other resources -- into finished goods and services. They perform four major tasks. First, they plan the overall production process. Next, they determine the best layout for the firm's production facilities and implement the production plan. Finally, they control the production process to maintain the highest possible quality. Part of the control process involves continuous evaluation of results. If problems occur, managers return to the first step and adjust the process.

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NAT: AACSB Analytic                      MSC: KN

9. Discuss the basic types of layouts for manufacturing facilities.

ANS:

The basic types of layouts for manufacturing facilities are process layouts, product layouts, and fixed-position layouts. The process layout accommodates a variety of nonstandard products in relatively small batches. A product layout design accommodates a few products in relatively large quantities. A fixed-position layout locates the product in a fixed position. Workers, materials, and machines are transported to and from it.

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10. Discuss the factors a firm should consider when deciding whether to make, buy, or lease components.

ANS:

One of the fundamental issues facing every producer is the make, buy, or lease decision -- choosing whether to manufacture a needed product or component in-house, purchase it from an outside supplier, or lease it. Some of the factors to consider include the costs of leasing or purchasing parts from outside suppliers compared with the costs of producing them in-house. The decision sometimes hinges on the availability of outside suppliers that can dependably meet standards for quality and quantity. The need for confidentiality sometimes affects the decision, as does the short- or long-term duration of the firm's needs for supplies.

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11. Once a company decides what raw materials and component parts to purchase, what factors do production managers use for comparison in choosing the best supplier?

ANS:

Production managers compare the quality, prices, availability, and services offered by competing suppliers. Different vendors may offer virtually identical quality levels and prices, so choices often depend on factors such as the firm's previous experience with each supplier, speed of delivery, warranties on purchases, and other services. Long-term contracts may also be a factor.

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MSC: KN

12. Explain why it's essential for managers to seek a balance when controlling inventory.

ANS:

The task of inventory control is to balance the need to maintain adequate supplies against the need to minimize funds invested in inventory. Excessive inventory results in unnecessary expenditures for warehousing, taxes, insurance, and maintenance. Conversely, inadequate inventory may mean production delays, lost sales, and inefficient operations. Managers must balance the need to keep merchandise on hand to meet demand against the costs of carrying inventory.

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NAT: AACSB Reflective Thinking MSC: AP

13. Describe just-in-time (JIT) inventory systems.

ANS:

Just-in-time (JIT) inventory systems seek to eliminate all sources of waste (anything that does not add value) in operations activities by providing the right part at the right place and at the right time. Compared with traditional production, this program reduces inventory and costs as it improves the quality of goods and services. Not only do JIT systems lower factory inventory levels and inventory carrying costs, JIT systems also enable firms to respond quickly to changes in the market.

DIF: 2 REF: The Job of Production Managers NAT: AACSB Analytic  
MSC: KN

14. Discuss the five steps in production control.

ANS:

The five steps in production control are planning, routing, scheduling, dispatching, and follow-up. Production planning determines the amount of resources that are needed to produce a certain amount of goods and services. Routing specifies where and by whom each aspect of production will be performed. Scheduling involves developing timetables that specify how long it will take to perform each operation and when it will be performed. Dispatching instructs each department on what to do and the time allowed for its completion. The follow-up phase spots problems in the production process and informs management of needed adjustments.

DIF: 3 REF: The Job of Production Managers  
NAT: AACSB Analytic MSC: KN

15. Explain the concept of benchmarking.

ANS:

Benchmarking is an important part of a quality control program. Benchmarking determines how well other companies (not just competitors) perform business functions or tasks. It's the process of establishing other companies' standards and best practices.

DIF: 2 REF: Importance of Quality NAT: AACSB Analytic  
MSC: KN

16. What is ISO certification? What are the advantages of a product having ISO 9000 certification?

ANS:

ISO certification signifies that a product has met a set of requirements for quality processes. These standards define how a company should ensure that its products meet customer requirements. Studies show that customers prefer to buy from companies that are specifically ISO 9000 certified (where companies must undergo an on-site audit). Companies, in turn, believe that being ISO 9000 certified helps them retain customers who might otherwise leave to work with an ISO 9000-certified corporation.

DIF: 2                      REF: Importance of Quality  
NAT: AACSB Analytic                      MSC: KN

### **MULTIPLE CHOICE**

1. The want-satisfying power of a good or service is called \_\_\_\_\_.  
a. Quality  
b. Ownership  
c. Worth  
d. Utility

ANS: D                      DIF: 2                      REF: Chapter Opener  
NAT: AACSB Analytic                      MSC: KN

2. Guardian uses raw materials and other inputs to make glass. Through the production process, Guardian is creating \_\_\_\_\_ utility.  
a. Time  
b. Production  
c. Form  
d. Ownership

ANS: C                      DIF: 2                      REF: Chapter Opener  
NAT: AACSB Reflective Thinking                      MSC: AP

3. \_\_\_\_\_ is the use of people and machinery to convert materials into finished goods or services.  
a. Manufacturing  
b. Production  
c. Distribution  
d. Marketing

ANS: B                      DIF: 2                      REF: Chapter Opener  
NAT: AACSB Analytic                      MSC: KN

4. When a food manufacturer uses people and machinery to convert dough and cheese into frozen pizza, the manufacturer is practicing \_\_\_\_\_.  
a. time utility  
b. Distribution  
c. Production  
d. process utility

ANS: C                      DIF: 2                      REF: Chapter Opener  
NAT: AACSB Reflective Thinking                      MSC: AP

5. What is the task of production and operations management?  
a. To determine the most economical routes for transporting the firms' products  
b. To manage the use of people and machinery in converting materials and resources into finished goods and services  
c. To manage the use of people and other resources in the development of distribution channels and promotional strategies  
d. To design systems that will provide managers with information useful for decision making

ANS: B                      DIF: 3                      REF: Chapter Opener  
NAT: AACSB Analytic                      MSC: KN

6. When the editors of *Contemporary Business* use computers, paper, and human effort to create the new edition of a text, they are engaged in \_\_\_\_\_.
- Production
  - Marketing
  - creating time utility
  - creating possession utility

ANS: A                      DIF: 2                      REF: Chapter Opener  
NAT: AACSB Reflective Thinking                      MSC: AP

7. Which of the following are combined to result in mass production?
- Mechanization, specialized labor, and robots
  - Standardization, job-order production, and specialized labor
  - Analytic systems, synthetic systems, and continuous processes
  - Mechanization, specialized labor, and standardization

ANS: D                      DIF: 2                      REF: Strategic Importance of the Production Function  
NAT: AACSB Analytic                      MSC: KN

8. The production manager in a manufacturing company divides employee work into small segments made up of repetitious tasks. The manager is involved in \_\_\_\_\_.
- Specialization
  - Standardization
  - Mechanization
  - quality management

ANS: A                      DIF: 2                      REF: Strategic Importance of the Production Function  
NAT: AACSB Reflective Thinking                      MSC: AP

9. Which of the following statements about standardization is NOT correct?
- Standardization is used as the basis for custom-made machinery.
  - The availability of standardized parts makes possible the replacement of defective and worn-out components.
  - Standardized parts can reduce the cost of repairs.
  - Standardized parts can be produced in quantity and assembled later.

ANS: A                      DIF: 2                      REF: Strategic Importance of the Production Function  
NAT: AACSB Analytic                      MSC: KN

10. \_\_\_\_\_ revolutionized the factory by introducing the moving assembly line.
- Frederick Taylor
  - Alfred Sloan
  - Henry Ford
  - Henry Gantt

ANS: C                      DIF: 2                      REF: Strategic Importance of the Production Function  
NAT: AACSB Analytic                      MSC: KN

11. Grocery stores use scanners not only for faster check-out times, but as a tool to obtain merchandise sales data and create short-term forecasts. This system is known as \_\_\_\_\_ production.
- product-focused
  - quality control
  - data marketing
  - customer-driven

ANS: D                      DIF: 2                      REF: Strategic Importance of the Production Function

12. A production system that reduces a raw material to its component parts in order to extract one or more marketable products is a(n) \_\_\_\_\_ production system.
- Synthetic
  - Intermittent
  - Analytic
  - Flexible

ANS: C

DIF: 2

REF: Production Processes

NAT: AACSB Analytic

MSC: KN

13. Which production system combines a number of raw materials or parts into a finished product, or changes raw materials into completely different finished products?
- Extractive
  - Intermittent
  - Unified
  - Synthetic

ANS: D

DIF: 2

REF: Production Processes

NAT: AACSB Analytic

MSC: KN

14. Which production system is Smith-Kline Beecham using when it combines calcium carbonate, simethicone, corn syrup, and other ingredients to make Tums Plus?
- Service
  - Analytic
  - Synthetic
  - Extractive

ANS: C

DIF: 2

REF: Production Processes

NAT: AACSB Reflective Thinking

MSC: AP

15. Which production process describes a manufacturing operation in which long production runs generate finished products over a period of time?
- Continuous
  - Intermittent
  - Customized
  - Periodic

ANS: A

DIF: 2

REF: Production Processes

NAT: AACSB Analytic

MSC: KN

16. An oil refinery is an example of a(n) \_\_\_\_\_ production system.
- Analytic
  - Intermittent
  - Continuous
  - Synthetic

ANS: C

DIF: 2

REF: Production Processes

NAT: AACSB Reflective Thinking

MSC: AP

17. Publishers always keep a certain number of books in inventory to fill orders. Therefore, publishers are involved in \_\_\_\_\_ production.
- Intermittent
  - Continuous

- c. Custom
- d. job-order

ANS: A                      DIF: 2                      REF: Production Processes  
NAT: AACSB Reflective Thinking                      MSC: AP

18. A(n) \_\_\_\_\_ is a re-programmable machine that is capable of performing a variety of tasks requiring programmed manipulation of materials and tools.
- a. personal computer
  - b. hand tool
  - c. assembly line
  - d. Robot

ANS: D                      DIF: 2                      REF: Technology and the Production Process  
NAT: AACSB Technology                      MSC: KN

19. All of the following statements concerning robots are correct EXCEPT:
- a. The cost of robots has risen sharply in recent years as they have become more sophisticated.
  - b. A variety of industries are now using robot technology.
  - c. Robots have freed people from boring, dangerous assignments.
  - d. Robots assist humans in non-manufacturing tasks.

ANS: A                      DIF: 2                      REF: Technology and the Production Process  
NAT: AACSB Technology                      MSC: KN

20. Engineers at DaimlerChrysler use computers to build new car models in the virtual world before they are ever built in automobile plants. These engineers are using \_\_\_\_\_.
- a. computer-aided manufacturing
  - b. flexible manufacturing systems
  - c. computer-aided design
  - d. computer-integrated manufacturing

ANS: C                      DIF: 3                      REF: Technology and the Production Process  
NAT: AACSB Reflective Thinking | AACSB Technology                      MSC: AP

21. The process that enables manufacturers to use computers to analyze the steps a machine must take to produce a product or part is \_\_\_\_\_.
- a. computer-aided manufacturing
  - b. Program Evaluation and Review Technique
  - c. computer-aided design
  - d. computer-integrated manufacturing

ANS: A                      DIF: 3                      REF: Technology and the Production Process  
NAT: AACSB Technology                      MSC: KN

22. Composite Technology uses a computer to control its production process. The computer transmits signals to machines for performing the appropriate steps in the correct order. What system is Composite Technology using?
- a. Computer-aided design
  - b. Computer-aided manufacturing
  - c. Flexible manufacturing
  - d. Computer-integrated manufacturing

ANS: B                      DIF: 3                      REF: Technology and the Production Process  
NAT: AACSB Reflective Thinking | AACSB Technology                      MSC: AP

23. Model Ball Bearing Company produces 30 basic types of ball bearings. Its manufacturing system uses computer-controlled machining centers, robots, and remote-controlled carts to deliver materials. In addition, the system can be modified quickly to produce the different ball bearings. The manufacturing system that is described is a \_\_\_\_\_ system.
- a. computer-aided design
  - b. static manufacturing
  - c. synthetic manufacturing
  - d. flexible manufacturing

ANS: D                      DIF: 3                      REF: Technology and the Production Process  
NAT: AACSB Reflective Thinking | AACSB Technology                      MSC: AP

24. Florida Fixtures uses a computer system that controls the entire production function from designing products to ordering raw materials. What kind of production system is Florida Fixtures using?
- a. Flexible manufacturing system
  - b. Computer-aided design
  - c. Computer-integrated manufacturing
  - d. Computer-aided manufacturing

ANS: C                      DIF: 3                      REF: Technology and the Production Process  
NAT: AACSB Reflective Thinking | AACSB Technology                      MSC: AP

25. Which of the following would probably be the most important consideration in determining where to locate a petroleum refinery?
- a. Physical characteristics
  - b. Proximity to raw materials
  - c. Labor supply
  - d. Location of customers

ANS: B                      DIF: 2                      REF: The Location Decision  
NAT: AACSB Reflective Thinking                      MSC: AP

26. In selecting a production facility location, proximity to raw materials would be most important to which of the following?
- a. Steel manufacturer
  - b. Jewelry manufacturer
  - c. Electronics company
  - d. Automobile parts manufacturer

ANS: A                      DIF: 2                      REF: The Location Decision  
NAT: AACSB Reflective Thinking                      MSC: AP

27. Which company would be most interested in locating in an area close to their market?
- a. Sheet rock manufacturer
  - b. Shipbuilding company
  - c. Dry cleaner
  - d. Pharmaceutical company

ANS: C                      DIF: 2                      REF: The Location Decision  
NAT: AACSB Reflective Thinking                      MSC: AP

28. Tamara is the owner of a bakery with all perishable products. What will be her primary consideration in regard to location?
- a. Proximity to raw materials

- b. Proximity to her market
- c. Availability of transportation alternatives
- d. Proximity to labor supply

ANS: B                      DIF: 2                      REF: The Location Decision  
 NAT: AACSB Reflective Thinking                      MSC: AP

29. Computer chip manufacturers, such as Intel, must be primarily concerned with \_\_\_\_\_.
- a. Availability water supply
  - b. Labor supply
  - c. Proximity to markets
  - d. Availability to energy

ANS: A                      DIF: 2                      REF: The Location Decision  
 NAT: AACSB Reflective Thinking                      MSC: AP

30. Many electronics firms are located in California's Silicon Valley because of the \_\_\_\_\_.
- a. climate and moderate humidity, which is necessary for production
  - b. level of skilled personnel
  - c. proximity to raw materials
  - d. inexpensive transportation

ANS: B                      DIF: 2                      REF: The Location Decision  
 NAT: AACSB Analytic                      MSC: KN

31. Why have some companies set up assembly plants outside of the United States?
- a. Nearness to raw materials
  - b. Available marketing opportunities
  - c. Inexpensive energy
  - d. Low labor costs

ANS: D                      DIF: 2                      REF: The Location Decision  
 NAT: AACSB Analytic                      MSC: KN

32. Waste Disposal wants to build a landfill in northern Oakland County. The company must conduct a(n) \_\_\_\_\_ study, which includes analyzing the effect the landfill might have on the water supply, air conditions, and wildlife.
- a. market impact
  - b. consumer behavior
  - c. location feasibility
  - d. environmental impact

ANS: D                      DIF: 2                      REF: The Location Decision  
 NAT: AACSB Reflective Thinking                      MSC: AP

33. All of the following are primary tasks of production managers EXCEPT \_\_\_\_\_.
- a. planning the production process
  - b. selecting the most appropriate layout
  - c. controlling the production process
  - d. determining what products to produce

ANS: D                      DIF: 1                      REF: The Job of Production Managers  
 NAT: AACSB Analytic                      MSC: KN

34. Which of the following production manager tasks is completed first?
- a. Selecting the appropriate layout

- b. Determining what products to produce
- c. Planning the production process
- d. Implementing the production process

ANS: C                      DIF: 1                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

35. What is the first step to planning a production process?
- a. Choosing what goods or services to offer customers
  - b. Selecting the right supplier
  - c. Determining the appropriate level of inventory
  - d. Hiring employees

ANS: A                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

36. Traditionally, automobile assembly plants were set up with a \_\_\_\_\_ layout.
- a. Product
  - b. Process
  - c. fixed-position
  - d. customer-oriented

ANS: A                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

37. The production facility for a space shuttle would probably be organized according to a \_\_\_\_\_ layout.
- a. customer-oriented
  - b. Process
  - c. fixed-position
  - d. Product

ANS: C                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

38. A firm that produces a variety of nonstandard products in relatively small quantities would probably use a \_\_\_\_\_ layout.
- a. customer-oriented
  - b. Process
  - c. Product
  - d. fixed-position

ANS: B                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

39. Which of the following layouts would be appropriate for manufacturers of bulky, heavy, or fragile products?
- a. Process layout
  - b. Fixed-position layout
  - c. Customer-oriented layout
  - d. Product layout

ANS: B                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

40. Which of the following layouts would be appropriate for a manufacturer who needs to produce large numbers of a single product?
- a. Product layout
  - b. Process layout
  - c. Fixed-position layout
  - d. Customer-oriented layout

ANS: A                      DIF: 2  
NAT: AACSB Analytic

REF: The Job of Production Managers  
MSC: KN

41. A plant where plastic 2-liter bottles are manufactured probably uses a \_\_\_\_\_ layout.
- a. customer-oriented
  - b. Product
  - c. Process
  - d. fixed-position

ANS: B                      DIF: 2  
NAT: AACSB Reflective Thinking

REF: The Job of Production Managers  
MSC: AP

42. A law firm most likely utilizes a \_\_\_\_\_ layout.
- a. customer-oriented
  - b. Product
  - c. Process
  - d. fixed-position

ANS: A                      DIF: 2  
NAT: AACSB Reflective Thinking

REF: The Job of Production Managers  
MSC: AP

43. Implementing a production plan involves all of the following steps EXCEPT \_\_\_\_\_.
- a. creating a feasible budget
  - b. controlling inventory
  - c. selecting the best suppliers for materials
  - d. deciding whether to make, buy or lease components

ANS: A                      DIF: 2  
NAT: AACSB Analytic

REF: The Job of Production Managers  
MSC: KN

44. How can a firm best protect themselves against an interruption in the supply of parts?
- a. Transport the parts in its own transportation vehicles.
  - b. Maintain more than one supply source.
  - c. Use suppliers from the city where the firm is located.
  - d. Select suppliers through a competitive bidding process.

ANS: B                      DIF: 2  
NAT: AACSB Reflective Thinking

REF: The Job of Production Managers  
MSC: AP

45. Which of the following would most likely be purchased on a long-term contractual basis?
- a. High-fashion clothing
  - b. Office supplies purchased in small amounts
  - c. A custom-made machine
  - d. Raw materials

ANS: D                      DIF: 2  
NAT: AACSB Analytic

REF: The Job of Production Managers  
MSC: KN

46. The Omega Corporation's supplier has offered the company a 5 percent discount if it will order more units less frequently. If Omega accepts the supplier's offer, the cost of carrying inventory will \_\_\_\_\_ and the cost of stockouts (running out of inventory) will \_\_\_\_\_.
- a. rise; decrease
  - b. rise; stay the same
  - c. fall; decrease
  - d. fall; stay the same

ANS: A                      DIF: 3                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

47. All of the following expenses are involved in storing inventory EXCEPT \_\_\_\_\_.
- a. Maintenance
  - b. Acquisition
  - c. Insurance
  - d. warehouse rent

ANS: B                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

48. Snyder Industries uses 100,000 widgets each year. If Snyder decides to place more orders each year, ordering fewer widgets each time, Snyder will be carrying \_\_\_\_\_ inventory on average and the risk of stockouts (running out of inventory) will \_\_\_\_\_.
- a. more; fall
  - b. more; rise
  - c. less; fall
  - d. less; rise

ANS: D                      DIF: 3                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

49. Tidewater Company uses 100,000 pounds of fresh flowers each year. Because of rising energy costs, it has become more expensive for Tidewater to store flowers. All other factors being equal, Tidewater should \_\_\_\_\_ its inventory of fresh flowers, which would \_\_\_\_\_ the risk of stockouts (running out of inventory).
- a. reduce; have no effect on
  - b. increase; have no effect on
  - c. reduce; increase
  - d. increase; increase

ANS: C                      DIF: 3                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

50. Which of the following would present a challenge for a just-in-time (JIT) investment system?
- a. Vendor managed inventory
  - b. Sudden increase in demand
  - c. Increase in the number of suppliers
  - d. Long-term relationships with suppliers

ANS: B                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

51. \_\_\_\_\_ is a computer-based production planning system by which a firm can ensure that it has needed parts and materials available at the right time and place and in the correct amounts.
- a. Materials requirement planning

- b. Just-in-time inventory system
- c. Computer-aided manufacturing
- d. Vendor-managed inventory

ANS: A                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

52. When Best Buy vendors ship merchandise directly to stores instead of distribution centers, the company is utilizing \_\_\_\_\_.
- a. inventory control
  - b. perpetual inventory
  - c. vendor-managed inventory
  - d. production control

ANS: C                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

53. Isaac's job involves setting up well-designed procedures for coordinating people, materials, and machinery for the production of mesh filters. Isaac is involved in \_\_\_\_\_.
- a. inventory control
  - b. facility design
  - c. production control
  - d. manufacturing resource planning (MRP II)

ANS: C                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

54. Which phase of production control determines the amount of all resources needed to produce a certain amount of goods and services?
- a. Scheduling
  - b. Dispatching
  - c. Production planning
  - d. Routing

ANS: C                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

55. \_\_\_\_\_ is the phase of production control that determines the sequence of work and specifies where and by whom each aspect of production will be performed.
- a. Follow-up
  - b. Routing
  - c. Scheduling
  - d. Dispatching

ANS: B                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

56. A Gantt chart is associated with which step in production control?
- a. Routing
  - b. Scheduling
  - c. Dispatching
  - d. Follow-up

ANS: B                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

57. Elijah is a warehouse production manager and has been assigned a complex project that might result in lengthy delays. In order to coordinate all aspects of the production process, Elijah has created a(n) \_\_\_\_\_ chart.
- a. Gantt
  - b. ISO
  - c. PERT
  - d. FMS

ANS: C                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

58. The critical path in a PERT chart represents the \_\_\_\_\_.
- a. areas of operations that require the least amount of technical support
  - b. areas of operations that have abundant and extra time
  - c. sequence of operations that involves outside suppliers
  - d. sequence of operations that requires the longest time for completion

ANS: D                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

59. Part of Vicky's job as a production supervisor is to instruct each department on what work to do and the time in which they have to complete their work assignments. This part of her job is known as \_\_\_\_\_.
- a. Routing
  - b. Dispatching
  - c. Scheduling
  - d. Planning

ANS: B                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

60. The last step in production control is to spot problems in the production process and inform management of needed adjustments. This phase is called \_\_\_\_\_.
- a. follow-up
  - b. Evaluation
  - c. process control
  - d. Dispatching

ANS: A                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

61. When choosing an appropriate vendor, production managers consider all of the following EXCEPT \_\_\_\_\_.
- a. Dispatching
  - b. warranties on purchases
  - c. delivery dependability
  - d. services from competing companies

ANS: A                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

62. A firm can monitor quality level output in all of the following ways EXCEPT \_\_\_\_\_.
- a. customer surveys
  - b. electronic sensors
  - c. visual inspections

d. share of marketplace

ANS: D DIF: 2

REF: Importance of Quality

NAT: AACSB Analytic

MSC: KN

63. Companies that use the Six Sigma concept are trying to reduce defects to \_\_\_\_\_ percent of total production.
- five-sixths of one
  - Three
  - One
  - less than one tenth of one

ANS: D DIF: 2

REF: Importance of Quality

NAT: AACSB Analytic

MSC: KN

64. When a company looks to an established, superlative product as a guide for their new product, they are \_\_\_\_\_.
- implementing quality control
  - Forecasting
  - implementing quality standards
  - Benchmarking

ANS: D DIF: 2

REF: Importance of Quality

NAT: AACSB Reflective Thinking

MSC: AP

65. The \_\_\_\_\_ was established to promote the development of standardized products to facilitate trade and cooperation across national borders. These standards have now become a widely recognized quality model throughout the world.
- European Economic Community
  - International Organization for Standardization
  - WTO
  - NATO Business Alliance

ANS: B DIF: 2

REF: Importance of Quality

NAT: AACSB Analytic

MSC: KN

66. Owen is a factory manager for Gateway Computers and is conducting a visual inspection of component hardware and comparing against established quality standards. Owen is measuring \_\_\_\_\_.
- benchmarking
  - production planning
  - critical path
  - quality control

ANS: D DIF: 2

REF: Importance of Quality

NAT: AACSB Reflective Thinking

MSC: AP

## TRUE/FALSE

1. All outputs of the production process are tangible goods and services.

ANS: F DIF: 1

REF: Chapter Opener

NAT: AACSB Analytic

MSC: KN

2. A company uses raw materials to produce a product. The company is creating production utility.

ANS: F                      DIF: 2                      REF: Chapter Opener  
NAT: AACSB Reflective Thinking                      MSC: AP

3. The production process converts inputs into outputs.

ANS: T                      DIF: 2                      REF: Chapter Opener  
NAT: AACSB Analytic                      MSC: KN

4. The production process is irrelevant to not-for-profit organizations.

ANS: F                      DIF: 1                      REF: Strategic Importance of the Production Function  
NAT: AACSB Analytic                      MSC: KN

5. A car battery is an example of a standardized part, which simplifies the replacement process.

ANS: T                      DIF: 1                      REF: Strategic Importance of the Production Function  
NAT: AACSB Reflective Thinking                      MSC: AP

6. The assembly line is a logical extension of specialization and standardization.

ANS: T                      DIF: 2                      REF: Strategic Importance of the Production Function  
NAT: AACSB Analytic                      MSC: KN

7. Flexible production systems are less complicated and require less cooperation than do mass production systems.

ANS: F                      DIF: 2                      REF: Strategic Importance of the Production Function  
NAT: AACSB Analytic                      MSC: KN

8. Mass production makes outputs available in larger quantities, but higher costs, than individually crafted items would cost.

ANS: F                      DIF: 2                      REF: Strategic Importance of the Production Function  
NAT: AACSB Analytic                      MSC: KN

9. Trisha owns a line of hand-made jewelry. She is paid in advance and creates items that are custom made according to her clients' specifications. Trisha uses a system of customer-driven production.

ANS: T                      DIF: 2                      REF: Strategic Importance of the Production Function  
NAT: AACSB Reflective Thinking                      MSC: AP

10. An analytic production system reduces a raw material to its component parts in order to extract a marketable product or products.

ANS: T                      DIF: 1                      REF: Production Processes  
NAT: AACSB Analytic                      MSC: KN

11. An auto assembly plant is an example of analytic production.

ANS: F                      DIF: 2                      REF: Production Processes  
NAT: AACSB Reflective Thinking                      MSC: AP

12. Most services, such as accountants and plumbers, result from intermittent production systems.

ANS: T                      DIF: 2                      REF: Production Processes  
NAT: AACSB Reflective Thinking                      MSC: AP

13. A “lights out” factory is completely automated to the extent where no workers are needed to make what the factory produces.

ANS: T                      DIF: 2                      REF: Technology and the Production Process  
NAT: AACSB Technology                      MSC: KN

14. An important use of robots is to free humans from potentially dangerous assignments such as handling hazardous materials.

ANS: T                      DIF: 1                      REF: Technology and the Production Process  
NAT: AACSB Technology                      MSC: KN

15. Computer-aided design systems pick up where computer-aided manufacturing systems leave off.

ANS: F                      DIF: 2                      REF: Technology and the Production Process  
NAT: AACSB Technology                      MSC: KN

16. Boeing engineers use computers to build new commercial jet models in the virtual world before they are actually built in production. Boeing is using a computer-aided manufacturing system.

ANS: F                      DIF: 3                      REF: Technology and the Production Process  
NAT: AACSB Reflective Thinking | AACSB Technology                      MSC: AP

17. Computer-integrated manufacturing combines the use of robots, CAD/CAM, and flexible manufacturing systems.

ANS: T                      DIF: 2                      REF: Technology and the Production Process  
NAT: AACSB Technology                      MSC: KN

18. When choosing the location of a plant, transportation access is the only consideration.

ANS: F                      DIF: 2                      REF: The Location Decision  
NAT: AACSB Analytic                      MSC: KN

19. For software manufacturers, human factors are more important than transportation factors.

ANS: T                      DIF: 2                      REF: The Location Decision  
NAT: AACSB Analytic                      MSC: KN

20. Plant location decisions become more limited when skilled technicians are required.

ANS: T                      DIF: 2                      REF: The Location Decision  
NAT: AACSB Reflective Thinking                      MSC: AP

21. Availability of adequate labor is a more important location decision for hotels and other service businesses than proximity to markets.

ANS: F                      DIF: 2                      REF: The Location Decision  
NAT: AACSB Reflective Thinking                      MSC: AP

22. Production managers must continually evaluate results of the production process and make adjustments along the way.

ANS: T                      DIF: 1                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

23. The production planning process begins with the choice of goods and services to offer customers.

ANS: T                      DIF: 1                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

24. A product layout is one in which the product remains in a fixed position and workers, materials, and machines are transported to and from it.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

25. A process layout groups machinery and other equipment according to their functions.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

26. Automobile assembly lines have been traditionally based on process layouts.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

27. A product layout can efficiently produce a large number of similar products but is relatively inflexible.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

28. Custom machine shops are typically organized in a product layout.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

29. Airplane manufacturers have traditionally used a fixed-position layout.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

30. A customer-oriented layout is common in service facilities.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

31. The decision to make, buy, or lease sometimes hinges on the availability of outside suppliers that can dependably meet a firm's standards for quality and quantity.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

32. Managers should maintain access to multiple supply sources.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

33. Raw materials are often purchased on a long-term contractual basis.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

34. The need for confidentiality sometimes affects the decision to purchase or lease.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

35. Fundamentally, price is the only consideration when selecting a supplier.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

36. Even with a major purchase, negotiations between a purchaser and potential vendors are done as quickly as possible in order to begin the manufacturing process.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

37. Many firms insist on long-term contracts with suppliers to ensure the availability of materials.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

38. It is always less costly to have inventory shortages than to have excess inventory.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

39. Perpetual inventory systems typically use computers to continuously monitor the amounts and locations of their stocks.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Technology                      MSC: KN

40. Just-in-time inventory systems increase production flexibility and allow for continuous production.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

41. Just-in-time inventory systems seek to eliminate all sources of waste in operations activities.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

42. One potential problem with just-in-time systems is the added risk of running out of inventory if demand unexpectedly surges.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

43. Megan's company builds custom guitars based on client specifications. Her company would best utilize a just-in-time system.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

44. MRP is a management philosophy aimed at improving profits by involving workers in the operations process and eliminating waste through cost reductions, inventory reductions, and quality improvements.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

45. Robert owns a small art gallery with only a few components. His company does not necessarily need an inventory system based on materials requirement planning.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

46. Production control creates procedures for coordinating people, materials, and machinery efficiently.

ANS: T                      DIF: 1                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

47. The first step in production control is production scheduling.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

48. Eva is determining the sequence of work throughout a manufacturing facility and who will perform which task at which location. Eva is engaged in the production control step known as scheduling.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Reflective Thinking                      MSC: AP

49. Routing choices depend on the nature of the good or service and the facility layout.

ANS: T                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

50. Gantt charts are most effective for scheduling complex projects with several variables.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

51. PERT is a scheduling technique designed to minimize production delays.

ANS: T                      DIF: 1                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

52. The critical path in a PERT diagram illustrates the most expensive operations that need to be done.

ANS: F                      DIF: 2                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

53. The phase of production control in which the manager instructs each department on the work to be done and the time allowed for its completion is called dispatching.

ANS: T                      DIF: 1                      REF: The Job of Production Managers  
NAT: AACSB Analytic                      MSC: KN

54. Identifying how leaders in certain fields perform and continually comparing and measuring performance against these outstanding performers is called benchmarking.

ANS: T                      DIF: 2                      REF: Importance of Quality  
NAT: AACSB Analytic                      MSC: KN

55. Companies may use many different benchmarks, depending on their objectives.

ANS: T                      DIF: 1                      REF: Importance of Quality  
NAT: AACSB Reflective Thinking                      MSC: AP

56. Quality control involves measuring products and services against established quality standards.

ANS: T                      DIF: 1                      REF: Importance of Quality  
NAT: AACSB Analytic                      MSC: KN

57. A typical American factory spends up to half its operating budget identifying and fixing mistakes.

ANS: T                      DIF: 2                      REF: Importance of Quality  
NAT: AACSB Analytic                      MSC: KN

58. To receive an ISO family certification, a company must undergo an on-site audit.

ANS: T                      DIF: 2                      REF: Importance of Quality  
NAT: AACSB Analytic                      MSC: KN