

Operations Management, 11e (Krajewski et al.)
Chapter 1: Using Operations to Create Value

1.1 Role of Operations in an Organization

1) Operations management refers to the direction and control of inputs that transform processes into products and services.

Answer: TRUE

Reference: Role of Operations in an Organization

Difficulty: Easy

Keywords: operations management, inputs, process, transformation

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

2) As a functional area of a business, Operations translates materials and services into outputs.

Answer: TRUE

Reference: Role of Operations in an Organization

Difficulty: Easy

Keywords: operations management, inputs, process, transformation

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

3) The three main line functions of any business include Operations, Finance and Marketing.

Answer: TRUE

Reference: Role of Operations in an Organization

Difficulty: Easy

Keywords: operations, finance, marketing

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

4) Support functions in an organization include Accounting, Human Resources and Engineering.

Answer: TRUE

Reference: Role of Operations in an Organization

Difficulty: Easy

Keywords: accounting, human resources, engineering

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

5) Regardless of how departments like Accounting, Engineering, Finance, and Marketing function in an organization, they are all linked together through:

- A) management.
- B) processes.
- C) customers.
- D) stakeholders.

Answer: B

Reference: Role of Operations in an Organization

Difficulty: Moderate

Keywords: departments, functions, processes

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

6) The foundations of modern manufacturing and technological breakthroughs were inspired by the creation of the mechanical computer by:

- A) Charles Babbage.
- B) James Watt.
- C) Eli Whitney.
- D) Frederick Taylor.

Answer: A

Reference: Role of Operations in an Organization

Difficulty: Moderate

Keywords: Charles Babbage

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

7) Which of these Great Moments in Operations and Supply Chain Management did not occur in the 20th century?

- A) invention of the assembly line
- B) publication of the Toyota Production Systems book
- C) establishment of railroads
- D) strategic planning for achieving product variety

Answer: C

Reference: Role of Operations in an Organization

Difficulty: Moderate

Keywords: history, railroad

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

8) Operations management refers to the systematic design, direction, and control of _____ that transform _____ into products and services.

Answer: processes, inputs

Reference: Role of Operations in an Organization

Difficulty: Moderate

Keywords: process, input, transform, product, service

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

9) The three mainline functions of any business are _____, _____, and _____.

Answer: operations, finance, marketing

Reference: Role of Operations in an Organization

Difficulty: Moderate

Keywords: operations, finance, marketing, functions of a firm

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

10) What are the three key functions of a firm and what is each responsible for?

Answer: The three main functions of a firm are operations, finance, and marketing. The operations function transforms material and service inputs into product and service outputs. The finance function generates resources, capital and funds from investors and sales of the firm's goods and services in the marketplace. The marketing function is responsible for producing sales revenue of the outputs.

Reference: Role of Operations in an Organization

Difficulty: Moderate

Keywords: manufacturing process, service process

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

1.2 A Process View

1) A process involves transforming inputs into outputs.

Answer: TRUE

Reference: A Process View

Difficulty: Easy

Keywords: process, inputs, outputs

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

2) Every process has a customer.

Answer: TRUE

Reference: A Process View

Difficulty: Easy

Keywords: process, customer relationship

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

3) A nested process refers to a process within a process.

Answer: TRUE

Reference: A Process View

Difficulty: Easy

Keywords: nested process

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

4) At the level of the firm, service providers offer just services and manufacturers offer just products.

Answer: FALSE

Reference: A Process View

Difficulty: Moderate

Keywords: manufacturing, service, similarity, goods, services

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

5) At the process level, it is much easier to distinguish whether the process is providing a service or manufacturing a product.

Answer: TRUE

Reference: A Process View

Difficulty: Moderate

Keywords: manufacturing process, service process, goods, services

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

6) Manufacturing processes tend to be capital intensive, while service processes tend to be more labor intensive.

Answer: TRUE

Reference: A Process View

Difficulty: Easy

Keywords: manufacturing process, service process, capital intensive, labor intensive

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

7) Quality is more easily measured in a service process than in a manufacturing process.

Answer: FALSE

Reference: A Process View

Difficulty: Moderate

Keywords: manufacturing process, service process, quality

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

8) Contact with the customer is usually higher in a manufacturing process than in a service process.

Answer: FALSE

Reference: A Process View

Difficulty: Easy

Keywords: manufacturing process, service process, customer contact

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

9) At the level of the firm, service providers do not just offer services and manufacturers do not just offer products.

Answer: TRUE

Reference: A Process View

Difficulty: Easy

Keywords: manufacturing process, service process

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

10) Which of these statements about processes is NOT true?

A) A process can have its own set of objectives.

B) A process can involve work flow that cuts across departmental boundaries.

C) A process can require resources from several departments.

D) A process can exist without customers.

Answer: D

Reference: A Process View

Difficulty: Moderate

Keywords: process, customer relationship

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

11) Operations management is part of a production system that can be described in the following manner:

Organization: inputs→processes→outputs.

Which one of the following correctly describes a production system?

- A) airline: pilots→planes→transportation
- B) bank: tellers→computer equipment→deposits
- C) furniture manufacturer: wood→sanding→chair
- D) telephone company: satellites→cables→communication

Answer: C

Reference: A Process View

Difficulty: Moderate

Keywords: production system, input, process, output

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

Table 1.1

You are the Production Manager for the toy manufacturing process at the ABC Company.



12) Use the information provided in Table 1.1. An example of an internal customer is:

- A) the lumber company.
- B) the Receiving Department at ABC.
- C) the Shipping Department at ABC.
- D) the toy store at the mall.

Answer: C

Reference: A Process View

Difficulty: Moderate

Keywords: internal customer

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

13) Use the information provided in Table 1.1. An example of an internal supplier is:

- A) the lumber company.
- B) the Receiving Department at ABC.
- C) the Shipping Department at ABC.
- D) the toy store at the mall.

Answer: B

Reference: A Process View

Difficulty: Moderate

Keywords: internal supplier

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

14) Use the information provided in Table 1.1. An example of an external customer is:

- A) the lumber company.
- B) the Receiving Department at ABC.
- C) the Shipping Department at ABC.
- D) the toy store at the mall.

Answer: D

Reference: A Process View

Difficulty: Moderate

Keywords: external customer

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

15) Use the information provided in Table 1.1. An example of an external supplier is:

- A) the lumber company.
- B) the Receiving Department at ABC.
- C) the Shipping Department at ABC.
- D) the toy store at the mall.

Answer: A

Reference: A Process View

Difficulty: Moderate

Keywords: external supplier

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

16) Which of the following is an example of a nested process?

- A) At the start of the new semester, a student first pays tuition and then goes to the bookstore.
- B) A customer service representative verifies a caller's account information.
- C) A candidate's intent to graduate is checked for financial holds by the Bursar and for degree requirements by Advising before the diploma mill prints their sheepskin.
- D) A stockbroker calls a client and advises her to sell silver short.

Answer: C

Reference: A Process View

Difficulty: Easy

Keywords: nested process

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

17) Which of the following statements is more of a general characteristic of a manufacturing organization, as compared to a service organization?

- A) Short-term demand tends to be highly variable.
- B) Operations are more capital intensive.
- C) Outputs are more intangible.
- D) Quality is more difficult to measure.

Answer: B

Reference: A Process View

Difficulty: Moderate

Keywords: manufacturing organization, service organization, capital intensity

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

18) Which one of the following statements is more of a general characteristic of a service organization, as compared to a manufacturing organization?

- A) Output can be inventoried.
- B) The response time is longer.
- C) There is less customer contact.
- D) The facilities tend to be smaller.

Answer: D

Reference: A Process View

Difficulty: Moderate

Keywords: manufacturing organization, service organization, facilities

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

19) Manufacturing processes usually have:

- A) physical, durable output.
- B) high levels of customer contact.
- C) output that cannot be inventoried.
- D) low levels of capital intensity.

Answer: A

Reference: A Process View

Difficulty: Moderate

Keywords: manufacturing organization, service organization, physical output

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

20) Service processes usually have:

- A) physical, durable output.
- B) low levels of customer contact.
- C) output that can be inventoried.
- D) low levels of capital intensity.

Answer: D

Reference: A Process View

Difficulty: Moderate

Keywords: manufacturing organization, service organization, capital intensity

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

21) A(n) _____ is any activity or group of activities that takes one or more inputs, transforms and adds value to them, and provides one or more outputs for its customers.

Answer: process

Reference: A Process View

Difficulty: Moderate

Keywords: process, activity, input, value

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

22) List and briefly describe five differences between services and manufacturing. Provide examples to illustrate your arguments.

Answer:

| Manufactured Goods | Services |
|---|--|
| Physical, durable products | Intangible, perishable products |
| Output can be produced, stored, and transported | Can't be produced and stored |
| Low customer contact | Customers can be part of the input and part of the process |
| Have days to deliver | Must be offered within minutes |
| Regional, national, or international markets | Local markets |
| Large facilities | Small facilities |
| Capital intensive | Labor intensive |
| Quality easily measured | Quality not easily measured |

Examples will vary.

Reference: A Process View

Difficulty: Moderate

Keywords: manufacturing process, service process

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

23) Identify a large employer in your hometown. Describe this organization's inputs, processes, and outputs.

Answer: Answers will vary based on the employer selected.

Reference: A Process View

Difficulty: Moderate

Keywords: input, process, output

Learning Outcome: Describe the main types of operations processes and layouts in manufacturing and in services.

AACSB: Application of Knowledge

1.3 A Supply Chain View

1) A core process is a set of activities that delivers value to external customers.

Answer: TRUE

Reference: A Supply Chain View

Difficulty: Moderate

Keywords: core process, supply chain

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

2) The supplier relationship process selects the suppliers of services, materials and information, while the order fulfillment process facilitates the timely and efficient flow of these items into the firm.

Answer: FALSE

Reference: A Supply Chain View

Difficulty: Moderate

Keywords: supplier relationship, process, order fulfillment process

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

3) One distinction between core processes and support processes is that core process can cut across the organization while support processes do not.

Answer: FALSE

Reference: A Supply Chain View

Difficulty: Easy

Keywords: core process, process analysis

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

4) A set of activities that delivers value to external customers is a:

A) supply chain.

B) core process.

C) support process.

D) system.

Answer: B

Reference: A Supply Chain View

Difficulty: Moderate

Keywords: activity, core process

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

5) Budgeting, recruiting, and scheduling are examples of a(n):

A) development.

B) core process.

C) support process.

D) system.

Answer: C

Reference: A Supply Chain View

Difficulty: Moderate

Keywords: activity, support process

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

6) The process that facilitates the placement of orders and identifies, attracts, and builds relationships with external customers is called the:

- A) customer relationship process.
- B) new service development process.
- C) order fulfillment process.
- D) supplier relationship process.

Answer: A

Reference: A Supply Chain View

Difficulty: Moderate

Keywords: process, customer relationship

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

7) The process that includes the activities required to produce and deliver the service or product to the external customer is called the:

- A) customer relationship process.
- B) new service development process.
- C) order fulfillment process.
- D) supplier relationship process.

Answer: C

Reference: A Supply Chain View

Difficulty: Moderate

Keywords: process, order fulfillment

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

8) Which of these business processes typically lies within the realm of operations?

- A) complaint handling
- B) customer relationship
- C) help desks
- D) waste management

Answer: B

Reference: A Supply Chain View

Difficulty: Moderate

Keywords: process, customer relationship

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

9) The cumulative work of the processes of a firm is a(n) _____.

Answer: supply chain

Reference: A Supply Chain View

Difficulty: Moderate

Keywords: processes, supply chain

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

10) _____ provide vital resources and inputs to core processes.

Answer: Support processes

Reference: A Supply Chain View

Difficulty: Moderate

Keywords: support process, core process

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

1.4 Operations Strategy

1) A firm's core competencies should determine its core processes.

Answer: TRUE

Reference: Operations Strategy

Difficulty: Easy

Keywords: core competency, core process

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

2) Firm A wants to enter a foreign market and has a skill that is difficult to duplicate. Firm B desires this skill, so Firm A works with Firm B in an arrangement known as a joint venture.

Answer: FALSE

Reference: Operations Strategy

Difficulty: Moderate

Keywords: strategic alliance

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

3) The framework for carrying out all of an organization's functions is:

A) the competitive priority.

B) the corporate strategy.

C) the market analysis.

D) the organizational design.

Answer: B

Reference: Operations Strategy

Difficulty: Moderate

Keywords: corporate strategy

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

4) In response to social and political moves to discourage cigarette smoking, major cigarette manufacturers have had to diversify into other products. Identifying the pressures against smoking is an example of:

- A) environmental scanning.
- B) market segmentation.
- C) flow strategy.
- D) mission statement development.

Answer: A

Reference: Operations Strategy

Difficulty: Moderate

Keywords: environmental scanning, strategy

Learning Outcome: Discuss the role of operations management in corporate social responsibility and sustainability

AACSB: Application of Knowledge

5) A company realizes that recent layoffs at its primary customers reflect potential falling demands for its customers' products, and hence for its own products. The company has engaged in:

- A) flow strategy.
- B) market segmentation.
- C) mission statement redefinition.
- D) environmental scanning.

Answer: D

Reference: Operations Strategy

Difficulty: Moderate

Keywords: environmental scanning

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

6) Core competencies are:

- A) product or service attributes that represent the needs of a particular market segment.
- B) another name for competitive priorities.
- C) various flow strategies.
- D) the unique resources and strengths that management considers when formulating strategy.

Answer: D

Reference: Operations Strategy

Difficulty: Moderate

Keywords: core competency, strategy

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

7) Which of the following is an example of a core competency?

- A) facilities
- B) top quality
- C) low-cost operations
- D) on-time delivery

Answer: A

Reference: Operations Strategy

Difficulty: Moderate

Keywords: core competency

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

8) Price, quality, and the degree of customization are all examples of:

- A) volume needs.
- B) other needs.
- C) product needs.
- D) delivery system needs.

Answer: C

Reference: Operations Strategy

Difficulty: Moderate

Keywords: needs assessment

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

9) The Gap, Inc. has targeted teenagers and young adults in need of casual clothes, and through its GapKids stores, the parents or guardians of infants through 12-year-olds. This is an example of:

- A) market segmentation.
- B) a collaborative effort between the company and its customers.
- C) a needs assessment.
- D) a mission statement.

Answer: A

Reference: Operations Strategy

Difficulty: Moderate

Keywords: market segmentation

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

10) One form of strategic alliance is the _____, in which two firms agree to cooperate to produce a product or service together.

Answer: joint alliance

Reference: A Supply Chain View

Difficulty: Moderate

Keywords: joint alliance

Learning Outcome: Compare common approaches to supply chain design.

AACSB: Application of Knowledge

11) What are four core processes in a firm and how are they related?

Answer: The customer relationship process identifies, attracts, and builds relationships with external customers and facilitates the placement of orders. The order fulfillment process includes activities required to produce and deliver the service or product to the external customer. The new service/product development process designs and develops new services or products, which may be to customer specifications. The supplier relationship process selects the suppliers of services, materials, and information and facilitates the flow of these items into the firm. All of these processes exist to provide a service or product to the customer.

Reference: Operations Strategy

Difficulty: Moderate

Keywords: core process, customer relationship, service/product development, order fulfillment, supplier relationship

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

1.5 Competitive Priorities and Capabilities

1) Competitive priorities are the means by which operations implements the firm's corporate strategies.

Answer: FALSE

Reference: Competitive Priorities and Capabilities

Difficulty: Moderate

Keywords: competitive priority, corporate strategy

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

2) Flexibility is a possible competitive priority.

Answer: TRUE

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: flexibility, competitive priority

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

3) A firm once made purchasing decisions based on which supplier had the lowest cost. But once cash flow was healthy, purchasing decisions were made based on the fastest delivery of goods and services by firms. In this case, delivery speed is clearly the order qualifier.

Answer: FALSE

Reference: Competitive Priorities and Capabilities

Difficulty: Moderate

Keywords: competitive priority, order qualifier

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

4) Admission to the prestigious school had become so competitive that a high GPA is no longer enough to separate one fresh-faced high school student from another. Today's outstanding candidate must also demonstrate their involvement in a myriad of extracurricular activities in order to be admitted. It seems that good grades are now:

A) a needs assessment.

B) order qualifiers.

C) order winners.

D) a mission statement.

Answer: B

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: order qualifier

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

5) The first three cars I bought all fell apart around 50,000 miles. It was called planned obsolescence and no one seemed to care until companies entered the market that promised 70,000, then 80,000, and finally 100,000 warranties. What sets a great car apart from a good one now is not the quality, which is assumed, but performance, safety and fuel economy. A car that can achieve all three is highly sought after. In the automotive market, performance, safety and fuel economy are sterling examples of:

A) order winners.

B) a needs assessment.

C) order qualifiers.

D) a mission statement.

Answer: A

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: order winner

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

6) You are interested in buying a laptop computer. Your list of considerations include the computer's speed in processing data, its weight, screen size, and price. You consider a number of different models, and narrow your list based on speed and monitor screen size, then finally select a model to buy based on its weight and price. In this decision, weight and price are examples of:

- A) order qualifiers.
- B) a needs assessment.
- C) order winners.
- D) a mission statement.

Answer: C

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: order winner

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

7) Competitive priorities:

- A) may change over time.
- B) are the cost, quality, time and flexibility dimensions that a process or supply chain actually possesses and is able to deliver.
- C) are used to distinguish between a service that is considered and one that is actually purchased.
- D) are developed by a review of internal operations capabilities.

Answer: A

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: competitive priorities

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

8) You are interested in buying a laptop computer. Your list of considerations include the computer's speed in processing data, its weight, screen size and price. You consider a number of different models, and narrow your list based on its speed and monitor screen size, then finally select a model to buy based on its weight and price. In this decision, speed and monitor screen size are examples of:

- A) order winners.
- B) a mission statement.
- C) a needs assessment.
- D) order qualifiers.

Answer: D

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: order qualifier

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

9) Using an airline example for competitive priorities, the process capability of handling service needs of all market segments and promotional programs would be best described by:

- A) top quality.
- B) variety.
- C) consistent quality.
- D) delivery speed.

Answer: B

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: variety, competitive priorities

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

10) A company's ability to quickly introduce a new service or product would be best described as:

- A) volume flexibility.
- B) variety.
- C) consistent quality.
- D) development speed.

Answer: D

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: development speed, competitive priorities

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

11) A business focusing on increasing the efficiency of its operations is more directly addressing:

- A) volume flexibility.
- B) variety.
- C) consistent quality.
- D) low-cost.

Answer: D

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: efficiency, low-cost, competitive priority

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

12) While other suppliers bidding for the contract brought bids with lower per unit costs, Orchard wanted to take delivery based on the fact that the components they were using were machined to their exacting specifications 99.99999% of the time. Orchard's competitive priority was:

- A) top quality.
- B) consistent quality.
- C) on-time delivery.
- D) delivery speed.

Answer: B

Reference: Competitive Priorities and Capabilities

Difficulty: Moderate

Keywords: competitive priorities

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

13) A popular haberdashery could take a customer's measurements in the afternoon and produce a dandy suit ready for customer pickup by next morning. Their competitive priority was:

- A) variety.
- B) top quality.
- C) delivery speed.
- D) on-time delivery.

Answer: C

Reference: Competitive Priorities and Capabilities

Difficulty: Moderate

Keywords: competitive priorities

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

14) For students not wanting a traditional major in marketing or accounting, for example, the college decided to create a general business major, which allowed any combination of the easiest business courses to comprise the program. The competitive priority achieved in this example is:

- A) customization.
- B) delivery speed.
- C) consistent quality.
- D) low-cost.

Answer: A

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: customization, competitive priority

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

15) A company's ability to support varying rates of production is BEST described as:

- A) volume flexibility.
- B) variety.
- C) consistent quality.
- D) development speed.

Answer: A

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: volume flexibility, competitive priorities

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

16) A firm gains competitive advantage by outperforming competitors in terms of competitive priorities, which fall into four major groups: _____, _____, _____, and _____.

Answer: cost, quality, time, flexibility

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: competitive priorities, cost, quality, time, flexibility

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

17) _____ is the elapsed time between receiving a customer's order and filling it.

Answer: Lead time

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: time, delivery speed

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

18) _____ measures the frequency with which delivery-time promises are met.

Answer: On-time delivery

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: on-time delivery

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

19) _____ is the ability to accelerate or decelerate the rate of production quickly to handle large fluctuations in demand.

Answer: Volume flexibility

Reference: Competitive Priorities and Capabilities

Difficulty: Easy

Keywords: volume flexibility, demand fluctuations

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

20) Every sub-contractor knew that their quality had to be excellent to be considered for the project; it was their ability to deliver on time that would secure the lucrative contract. Quality was recognized as being an _____, but on-time delivery was the _____.

Answer: order qualifier, order winner

Reference: Competitive Priorities and Capabilities

Difficulty: Moderate

Keywords: order qualifier, order winner

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

21) Explain what an operations strategy is and the importance of competitive priorities. Give an example from an organization (public or private, manufacturing or service).

Answer: An operations strategy is the means by which operations implements the firm's corporate strategy. Competitive priorities are the key capabilities that operations must develop to compete successfully in a market segment. Possible competitive priorities include low-cost operation, high-performance design, consistent quality, delivery speed, on-time delivery, development speed, customization, and volume flexibility. Examples will vary.

Reference: Competitive Priorities and Capabilities

Difficulty: Moderate

Keywords: operations strategy competitive priorities

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

22) Name the two competitive priorities for quality and give an example of each.

Answer: The two competitive priorities are top quality, which is the determination of the level of operations performance required in making a product or performing a service, and consistent quality, which measures the frequency with which the product or service meets design specifications. Examples will vary.

Reference: Competitive Priorities and Capabilities

Difficulty: Moderate

Keywords: competitive priorities, top quality, consistent quality

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

23) Name the three competitive priorities for time and give an example of each.

Answer: The three competitive priorities for time are delivery speed, on-time delivery, and development speed. Delivery speed refers to the elapsed time between receiving a customer's order and filling it. On-time delivery measures the frequency with which delivery-time promises are met. Development speed measures how quickly a new product or service is introduced.

Examples will vary.

Reference: Competitive Priorities and Capabilities

Difficulty: Moderate

Keywords: competitive priorities, delivery speed, on-time delivery, development speed

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

1.6 Addressing the Trends and Challenges in Operations Management

1) Strategic plans are developed farther into the future than tactical plans.

Answer: TRUE

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Easy

Keywords: strategic plans, tactical plans

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

2) Most products today are composites of global materials and services from throughout the world.

Answer: TRUE

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: globalization, products

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

3) The increased global presence of many firms has lessened the burden to behave ethically.

Answer: FALSE

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Easy

Keywords: ethics, global presence

Learning Outcome: Discuss the influences of the global competitive environment on operations management

AACSB: Application of Knowledge

4) Operations managers are involved at both the strategic and tactical levels of corporate strategy.

Answer: TRUE

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Easy

Keywords: strategic level, tactical level

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

5) In an assembly operation at a furniture factory, six employees assembled an average of 450 custom chairs per 5-day week. What is the labor productivity of this operation?

A) 90 chairs per worker per day

B) 20 chairs per worker per day

C) 15 chairs per worker per day

D) 75 chairs per worker per day

Answer: C

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: labor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Analytical Thinking

6) A manufacturing process requires 12 minutes of labor to make 10 units of product. Which of the following actions will increase productivity?

1. Increase labor per 10 units of production

2. Decrease labor per 10 units of production

3. Increase number of units per 10 minutes of labor

4. Decrease number of units per 12 minutes of labor

A) 1 and 3 only

B) 2 and 4 only

C) 1 and 4 only

D) 2 and 3 only

Answer: D

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Easy

Keywords: labor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Analytical Thinking

7) The details of weekly output and input for a fabrication process are as follows: output is 400 units, with a standard selling price of \$100 per unit. For the week, total labor costs are: 10 workers at 40 hours for the week, are paid \$15 per hour. Total material costs for the 400 units are \$5,000. Weekly overhead is charged at the rate of 1.5 times the labor costs. What is the multifactor productivity for the week?

- A) 0.02
- B) 0.75
- C) 1.50
- D) 2.00

Answer: D

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Easy

Keywords: multifactor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Analytical Thinking

Table 1.2

The Abco Company manufactures electrical assemblies. The current process uses 10 workers and produces 200 units per hour. You are considering changing the process with new assembly methods that increase output to 300 units per hour, but will require 14 workers. Particulars are as follows:

| | CURRENT PROCESS | NEW PROCESS |
|---------------------------------|----------------------------|--------------------|
| OUTPUT (UNITS / HOUR) | 200 | 300 |
| NUMBER OF WORKERS | 10 | 14 |
| MATERIAL COST / HOUR | \$120 | \$150 |

Workers are paid at a rate of \$10 per hour, and overhead is charged at 140% (or 1.4 times) labor costs. Finished switches sell for \$20 / unit.

8) Use the information provided in Table 1.2. What is the multifactor productivity of the current process?

- A) less than or equal to 8.0
- B) greater than 8.0 but less than or equal to 10.0
- C) greater than 10.0 but less than or equal to 12.0
- D) greater than 12.0

Answer: C

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: multifactor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Analytical Thinking

9) Use the information provided in Table 1.2. What is the multifactor productivity of the new process?

- A) less than or equal to 8.0
- B) greater than 8.0 but less than or equal to 10.0
- C) greater than 10.0 but less than or equal to 12.0
- D) greater than 12.0

Answer: D

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: multifactor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Analytical Thinking

10) Use the information provided in Table 1.2. Based on your productivity calculations, what decision should you make?

- A) implement the new process
- B) stay with the current process
- C) need more information to make a decision
- D) Either process is acceptable (since the multi-factor productivities are the same).

Answer: A

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: multifactor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Analytical Thinking

11) It takes the Blacksburg shipyard twenty six weeks with 500 workers to build a small tanker. Material costs are \$32 million and overhead costs are \$2 million. Workers cost \$40 per hour including benefits and work 40 hours per week. The ship sells for \$75 million. What is the multifactor productivity ratio?

- A) less than 1.0
- B) greater than 1.0 but less than or equal to 2.0
- C) greater than 2.0 but less than or equal to 3.0
- D) greater than 3.0

Answer: B

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: multifactor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Analytical Thinking

12) Which of the following would be considered an advantage of global competition?

- A) ability to safeguard proprietary technology in working with offshore suppliers
- B) a recent climate of low political risk and lessening nationalization
- C) high levels of worker skills in foreign countries mean less required training
- D) strong global competition and increased worldwide demand

Answer: D

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: global competition

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Diverse and Multicultural Work Environments

13) With regards to globalized operations and cost advantages, what China is to manufacturing, India is to:

- A) services.
- B) human resources.
- C) finance.
- D) supply chain.

Answer: A

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: global competition

Learning Outcome: Discuss the influences of the global competitive environment on operations management

AACSB: Application of Knowledge

14) Companies that do not have operations in China find it difficult to compete based on the basis of low prices with companies that do. Instead those companies tend to compete based on:

- A) quality and social responsibility.
- B) speed and small production runs.
- C) luxury.
- D) quality and small production runs.

Answer: B

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: global competition

Learning Outcome: Discuss the influences of the global competitive environment on operations management

AACSB: Application of Knowledge

15) Productivity is defined as _____ divided by _____.

Answer: output, input

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: output, input, productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

16) Half of the world's greenhouse gases are produced by only _____ nations.

Answer: seven

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: environment, greenhouse gas

Learning Outcome: Discuss the role of operations management in corporate social responsibility and sustainability

AACSB: Ethical Understanding and Reasoning

17) How has global competition affected productivity? Cite specific examples and reference the productivity equation to support your thesis.

Answer: Examples will vary; students should argue that the increase in global competition has increased productivity for those firms that have survived. Firms that fail (or have already failed) to effectively compete with new competition suffer from reduced sales, so the numerator in the productivity equation will be lower, perhaps without a commensurate decrease in the denominator, resulting in reduced productivity. Firms that are effectively competing against global competition probably have higher levels of productivity. Global operations might include cheaper or better raw materials and labor, resulting in a smaller denominator and higher productivity. Global competition might also inject new management techniques and leaner operations if some services are outsourced to specialist companies.

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: productivity, raw materials, labor

Learning Outcome: Discuss the influences of the global competitive environment on operations management

AACSB: Application of Knowledge

18) What are some disadvantages of globalization?

Answer: Operations in other countries can have disadvantages. A firm may have to relinquish proprietary technology if it turns over some of its component manufacturing to offshore suppliers or if suppliers need the firm's technology to achieve desired quality and cost goals. Political risks may also be involved. Each nation can exercise its sovereignty over the people and property within its borders. The extreme case is nationalization, in which a government may take over a firm's assets without paying compensation. Exxon and other large multinational oil firms are scaling back operations in Venezuela due to nationalization concerns. Further, a firm may actually alienate customers back home if jobs are lost to offshore operations. Employee skills may be lower in foreign countries, requiring additional training time. South Korean firms moved much of their sports shoe production to low-wage Indonesia and China, but they still manufacture hiking shoes and in-line roller skates in South Korea because of the greater skills required. In addition, when a firm's operations are scattered globally, customer response times can be longer. Coordinating components from a wide array of suppliers can be challenging.

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: globalization

Learning Outcome: Discuss the influences of the global competitive environment on operations management

AACSB: Application of Knowledge

19) What are some ethical issues that are prevalent in organizations that have a global operations presence?

Answer: Some countries are more sensitive than others about conflicts of interest, bribery, discrimination against minorities and women, minimum-wage levels, and unsafe workplaces. Managers must decide whether to design and operate processes that do more than just meet local standards. In addition, technological change brings debates about data protection and customer privacy. In an electronic world, businesses are geographically far from their customers, so a reputation of trust is paramount.

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: ethical issues, ethics, globalization

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

20) Barry's Tire Service completed 100 tire changes, six brake jobs, and 16 alignments in an eight-hour day with his standard crew of six mechanics. A brake specialist costs \$16 per hour, a tire changer costs \$8 per hour, and an alignment mechanic costs \$14 per hour. The materials cost for a day was \$2000, and overhead cost was \$500.

a. What is the shop's labor productivity if the retail price for each respective service is \$60, \$150, and \$40?

b. What is the multifactor productivity, if the crew consisted of two of each type mechanic?

Answer:

a.
$$\frac{(100 \times 60 + 6 \times 150 + 16 \times 40)}{6 \times 8} = \$157/\text{hr}$$

b.
$$\frac{\{(100 \times 60) + (6 \times 150) + (16 \times 40)\}}{\{(2 \times 8 \times 16) + (2 \times 8 \times 8) + (2 \times 8 \times 14) + 2000 + 500\}} = 2.43$$

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: labor productivity, multifactor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

21) Consider the information in Table 1.3.

Table 1.3

The Abco Company manufactures electrical assemblies. The current process uses 10 workers and produces 200 units per hour. You are considering changing the process with new assembly methods that increase output to 300 units per hour, but will require 14 workers. Particulars are as follows:

| | CURRENT PROCESS | NEW PROCESS |
|---------------------------------|----------------------------|--------------------|
| OUTPUT (UNITS / HOUR) | 200 | 300 |
| NUMBER OF WORKERS | 10 | 14 |
| MATERIAL COST / HOUR | \$120 | \$150 |

Workers are paid at a rate of \$10 per hour, and overhead is charged at 140% (or 1.4 times) labor costs. Finished switches sell for \$20/unit.

- Calculate the multifactor productivity for the current process.
- Calculate the multifactor productivity for the new process.
- Determine if the new process should be implemented.

Answer:

a.
$$\frac{(200)(\$20)}{(10)(\$10) + \$120 + (1.4)(10)(\$10)} = \frac{\$4,000}{\$360} = \underline{11.11}$$

b.
$$\frac{(300)(\$20)}{(14)(\$10) + \$150 + (1.4)(14)(\$10)} = \frac{\$6,000}{\$486} = \underline{12.35}$$

- The new process increases multifactor productivity and should be implemented.

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: labor productivity, multifactor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

22) The three person crew worked their way through the neighborhood, mowing lawns, edging, applying fertilizer and weed treatments where necessary and collecting all the clippings for use as mulch as part of their new green initiative. Their pricing scheme appears in Table A and the mix of orders and service costs appear in Table B:

- What is their multifactor productivity for these orders in the prestigious Edmond Oaks neighborhood?
- Which of the service combinations provided by them is the most productive service combination from a multifactor perspective?
- What is their labor productivity for the same mix of orders?

Table A: Price List

| SERVICE | PRICE | LABOR | MATERIAL |
|---------------------------|--|-------|----------|
| Mow lawn | \$75 | 1 hr | \$2 |
| Edge | \$20 | .25 | \$1 |
| Fertilizer treatment | \$120 | .25 | \$45 |
| Weed prevention treatment | \$80 | .25 | \$25 |
| Multiple services | 5% discount times the number of services | | |

Workers are paid at a rate of \$10 per hour, and overhead is charged at 120% (or 1.2 times) labor costs. For a customer that gets both mowing and edging, their \$95 bill would be discounted for two services times 5% for a total of 10% off the \$95 straight charge for a cost of \$85.50. A customer receiving three services would get a 15% discount off their service bill. Labor hours shown in Table A are total hours for the three-person crew.

Table B: Orders Processed

| SERVICE | # Customers |
|---|-------------|
| Mow lawn & edge | 6 |
| Mow lawn, edge, and fertilize | 3 |
| Mow lawn, edge, and weed prevention treatment | 2 |
| Mow lawn & fertilize | 2 |

Answer:

a. Multifactor Productivity Overall

$$\text{Total Revenue} = \$86 \times 6 + \$182.75 \times 3 + \$148.75 \times 2 + \$175.50 \times 2 = \$1709.75$$

$$\text{Labor Cost} = \$12.50 \times 6 + \$15 \times 3 + \$15 \times 2 + \$12.50 \times 2 = \$175$$

$$\text{Material Cost} = \$3 \times 6 + \$48 \times 3 + \$28 \times 2 + \$47 \times 2 = \$312$$

$$\text{Overhead Cost} = 1.2 \times (\$12.50 \times 6 + \$15 \times 3 + \$15 \times 2 + \$12.50 \times 2) = \$210$$

$$\text{Multifactor Productivity} = \frac{\$1709.75}{\$175 + \$312 + \$210}$$

$$\text{Multifactor Productivity} = 2.45$$

b. Multifactor Productivity by Service

$$\text{Mow \& Edge} = \frac{0.9 \times (\$75 + \$20)}{(1.25 \times \$10) + (\$2 + \$1) + 1.2 \times (1.25 \times \$10)} = 2.8$$

$$\text{Mow \& Edge \& Fertilize} = \frac{0.85 \times (\$75 + \$20 + \$120)}{(1.5 \times \$10) + (\$2 + \$1 + \$45) + 1.2 \times (1.5 \times \$10)} = 2.26$$

$$\text{Mow \& Edge \& Weed} = \frac{0.85 \times (\$75 + \$20 + \$80)}{(1.5 \times \$10) + (\$2 + \$1 + \$25) + 1.2 \times (1.5 \times \$10)} = 2.44$$

$$\text{Mow \& Fertilize} = \frac{0.9 \times (\$75 + \$120)}{(1.25 \times \$10) + (\$2 + \$45) + 1.2 \times (1.25 \times \$10)} = 2.36$$

The package with the highest multifactor productivity is the Mow & Edge

c. Overall Labor Productivity.

$$\text{Total Revenue} = \$85.59 \times 6 + \$182.75 \times 3 + \$148.75 \times 2 + \$175.50 \times 2 = \$1709.75$$

$$\text{Labor Cost} = \$12.50 \times 6 + \$15 \times 3 + \$15 \times 2 + \$12.50 \times 2 = \$175$$

$$\text{Labor Productivity} = \frac{\$1709.75}{\$175}$$

$$\text{Labor Productivity} = 9.77$$

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: labor productivity, multifactor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge

23) The three-person crew worked their way through the neighborhood, testing doorknobs and windows and slipping past security systems like a team of ninjas. Of course, they weren't ninjas, but a crew of brazen burglars, hoping to grab cash and other valuables to fence at the next level of their supply chain. Fortune smiles on them on this day in the prestigious Edmond Oaks neighborhood. A lawn maintenance crew is creating a tremendous racket mowing and edging lawns, which completely drowns out the sounds of breaking glass. Details of the day's haul appear in Table C.

- a. What is the multifactor productivity?
- b. What is the labor productivity?

Table C: The Haul

| ITEM | SALES PRICE | LABOR | MATERIAL |
|-----------------------|-------------|-------|----------|
| Krugerrand | \$1500 | 1 hr | \$2 |
| Flat screen TV | \$250 | .25 | \$1 |
| \$200 cash | \$200 | .05 | \$45 |
| Lava lamp | \$5 | .15 | \$25 |
| Rolex watch | \$180 | .10 | \$1 |

Workers are paid at a flat rate of 20% of the sales price of the merchandise. Materials cost represents the cost of gasoline and surgical gloves, and overhead is 20% of the sales price of the merchandise.

Answer:

- a. Multifactor Productivity

$$\text{Total Revenue} = \$1500 + \$250 + \$200 + \$5 + \$180 = \$2135$$

$$\text{Labor Cost} = 20\% \times (\$1500 + \$250 + \$200 + \$5 + \$180) = \$427$$

$$\text{Material Cost} = \$2 + \$1 + \$45 + \$25 + \$1 = \$74$$

$$\text{Overhead Cost} = 20\% \times (\$1500 + \$250 + \$200 + \$5 + \$180) = \$427$$

$$\text{Multifactor Productivity} = \frac{\$2135}{\$427 + \$74 + \$427}$$

$$\text{Multifactor Productivity} = 2.30$$

- b. Labor Productivity

$$\text{Total Revenue} = \$1500 + \$250 + \$200 + \$5 + \$180 = \$2135$$

$$\text{Labor Cost} = 20\% \times (\$1500 + \$250 + \$200 + \$5 + \$180) = \$427$$

$$\text{Labor Productivity} = \frac{\$2135}{\$427}$$

$$\text{Labor Productivity} = 5$$

Reference: Addressing the Trends and Challenges in Operations Management

Difficulty: Moderate

Keywords: labor productivity, multifactor productivity

Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization.

AACSB: Application of Knowledge