1) Some of the operations-related activities of Hard Rock Café include designing meals and analyzing them for ingredient cost and labor requirements.
Answer: TRUE
Diff: 1
Topic: Global company profile
Objective: LO1-1

2) Because Hard Rock Cafes are themed restaurants, operations managers focus their layout design efforts on attractiveness while paying little attention to efficiency.
Answer: FALSE
Diff: 1
Topic: Global company profile
Objective: no LO

3) All organizations, including service firms such as banks and hospitals, have a production function.
Answer: TRUE
Diff: 2
Topic: What is operations management?
Objective: LO1-1

4) Operations management is the set of activities that creates value in the form of goods and services by transforming inputs into outputs.
Answer: TRUE
Diff: 1
Topic: What is operations management?
Objective: LO1-1

5) An example of a "hidden" production function is money transfers at banks.
Answer: TRUE
Diff: 2
Topic: What is operations management?
Objective: LO1-1

6) One reason to study operations management is to learn how people organize
themselves for productive enterprise.
Answer: TRUE
Diff: 1
Topic: Why study OM?
Objective: LO1-1
7) The operations manager performs the management activities of planning, organizing, staffing, leading, and controlling of the OM function.  
Answer: TRUE  
Diff: 1  
Topic: What operations managers do  
Objective: LO1-1

8) "How much inventory of this item should we have?" is within the critical decision area of managing quality.  
Answer: FALSE  
Diff: 1  
Topic: What operations managers do  
Objective: LO1-1

9) In order to have a career in operations management, one must have a degree in statistics or quantitative methods.  
Answer: FALSE  
Diff: 1  
Topic: What operations managers do  
Objective: LO1-1

10) Henry Ford is known as the Father of Scientific Management.  
Answer: FALSE  
Diff: 1  
Topic: The heritage of operations management  
Objective: LO1-1

11) Shewhart's contributions to operations management came during the Scientific Management Era.  
Answer: FALSE  
Diff: 1  
Topic: The heritage of operations management  
Objective: LO1-1

12) Customer interaction is often high for manufacturing processes, but low for services.  
Answer: FALSE  
Diff: 2  
Topic: Operations in the service sector  
Objective: LO1-2
13) Productivity is more difficult to improve in the service sector.
Answer: TRUE
Diff: 2
Topic: The productivity challenge
Objective: LO1-6
14) Manufacturing now constitutes the largest economic sector in postindustrial societies.
Answer: FALSE
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2

15) In the past half-century, while the number of people employed in manufacturing in the United States has decreased slightly, the output per worker has increased significantly.
Answer: TRUE
Diff: 1
Topic: Operations in the service sector
Objective: LO1-2

16) A knowledge society is one that has migrated from work based on knowledge to one based on manual work.
Answer: FALSE
Diff: 1
Topic: The productivity challenge
Objective: LO1-3

17) Productivity is the total value of all inputs to the transformation process divided by the total value of the outputs produced.
Answer: FALSE
Diff: 1
Topic: The productivity challenge
Objective: LO1-3

18) Measuring the impact of a capital acquisition on productivity is an example of multifactor productivity.
Answer: FALSE
Diff: 2
Topic: The productivity challenge
Objective: LO1-5

19) Ethical and social dilemmas arise because stakeholders of a business have conflicting perspectives.
Answer: TRUE
Diff: 1
Topic: Ethics and social responsibility
AACSB: Ethical Reasoning
Objective: no LO
Multiple Choice

1) Which of the following is not one of the Ten Critical Decisions of Operations Management?
A) location strategy
B) human resources and job design
C) managing quality
D) design of goods and services
E) determining the financial leverage position
Answer: E
Diff: 2
Topic: What operations managers do
Objective: no LO

2) An operations task performed at Hard Rock Café is
A) borrowing funds to build a new restaurant
B) advertising changes in the restaurant menu
C) calculating restaurant profit and loss
D) preparing employee schedules
E) all of the above
Answer: D
Diff: 2
Topic: Global company profile
Objective: LO1-1

3) Operations management is applicable
A) mostly to the service sector
B) to services exclusively
C) mostly to the manufacturing sector
D) to all firms, whether manufacturing or service
E) to the manufacturing sector exclusively
Answer: D
Diff: 2
Topic: What is operations management?
Objective: LO1-1

4) Which of the following are the primary functions of all organizations?
A) production/operations, marketing, and human resources
B) marketing, human resources, and finance/accounting
C) sales, quality control, and production/operations,
D) marketing, production/operations, and finance/accounting
E) research and development, finance/accounting, and purchasing
Answer: D
Diff: 2
Topic: Organizing to produce goods and services
Objective: LO1-1
5) Which of the following pioneers was not making a professional impact during the Scientific Management Era?
   A) Frank Gilbreth
   B) W. Edwards Deming
   C) Henry L. Gantt
   D) Lillian Gilbreth
   E) Frederick W. Taylor
   Answer: B
   Diff: 2
   Topic: The heritage of operations management
   Objective: no LO

6) Which of the following would not be an operations function in a commercial bank?
   A) auditing
   B) teller scheduling
   C) maintenance
   D) collection
   E) check clearing
   Answer: A
   Diff: 2
   Topic: Organizing to produce goods and services
   Objective: LO1-1

7) The marketing function's main concern is with
   A) producing goods or providing services
   B) procuring materials, supplies, and equipment
   C) building and maintaining a positive image
   D) generating the demand for the organization's products or services
   E) securing monetary resources
   Answer: D
   Diff: 2
   Topic: Organizing to produce goods and services
   Objective: LO1-1

8) Which of the following tasks within an Airline Company are related to Operations?
   A) Crew Scheduling
   B) International Monetary Exchange
   C) Sales
   D) Advertising
E) Accounts Payable
Answer: A
Diff: 2
Topic: Organizing to produce goods and services
Objective: LO1-1
9) Reasons to study Operations Management include
A) studying how people organize themselves for productive enterprise
B) knowing how goods and services are consumed
C) understanding what human resource managers do
D) learning about a costly part of the enterprise
E) A and D
Answer: E
Diff: 2
Topic: Why study OM?
Objective: LO1-1

10) Reasons to study Operations Management include learning about
A) how people organize themselves for productive enterprise
B) how goods and services are produced
C) what operations managers do
D) a costly part of the enterprise
E) all of the above
Answer: E
Diff: 1
Topic: Why study OM?
Objective: LO1-1

11) The five elements in the management process are
A) plan, direct, update, lead, and supervise
B) accounting, finance, marketing, operations, and management
C) organize, plan, control, staff, and manage
D) plan, organize, staff, lead, and control
E) plan, lead, organize, manage, and control
Answer: D
Diff: 1
Topic: What operations managers do
Objective: LO1-1

12) Illiteracy and poor diets have been known to cost countries up to what percent of their productivity?
A) 2%
B) 5%
C) 10%
D) 20%
E) 50%
Answer: D
Diff: 2
Topic: Productivity variables
AACSB: Multicultural and Diversity
Objective: LO1-6
13) Which of the following is not an element of the management process?
A) controlling
B) leading
C) planning
D) pricing
E) staffing
Answer: D
Diff: 1
Topic: What operations managers do
Objective: LO1-1

14) An operations manager is not likely to be involved in
A) the design of goods and services to satisfy customers' wants and needs
B) the quality of goods and services to satisfy customers' wants and needs
C) the identification of customers' wants and needs
D) work scheduling to meet the due dates promised to customers
E) maintenance schedules
Answer: C
Diff: 1
Topic: What operations managers do
Objective: LO1-1

15) All of the following decisions fall within the scope of operations management except for
A) creating the company income statement
B) design of goods and processes
C) location of facilities
D) managing quality
E) All of the above fall within the scope of operations management.
Answer: A
Diff: 1
Topic: What operations managers do
Objective: LO1-1

16) The Ten Critical Decisions of Operations Management include
A) layout strategy
B) maintenance
C) process and capacity design
D) managing quality
E) all of the above
Answer: E
Diff: 1
Topic: Why study OM?
Objective: LO1-1
17) Which of the following is **not** one of The Ten Critical Decisions of Operations Management?
A) layout strategy
B) maintenance
C) process and capacity design
D) mass customization
E) supply-chain management
Answer: D
Diff: 2
Topic: Why study OM?
Objective: LO1-1

18) The Ten Critical Decisions of Operations Management include
A) finance/accounting
B) advertising
C) process and capacity design
D) pricing
E) all of the above
Answer: C
Diff: 2
Topic: Why study OM?
Objective: LO1-1

19) Which of the following are part of the Ten Critical Decisions of Operations Management?
I. Design of goods and services
II. Managing Quality
III. Layout Strategy
IV. Marketing
V. Pricing of Goods and Services
A) I,II,V
B) I,II,IV
C) II,III,V
D) I,II,III
E) All of the above
Answer: D
Diff: 2
Topic: Why study OM?
Objective: LO1-1
20) ASQ, ISM, APICS, and PMI are important professional organizations to operations management because 
A) they provide certification for professionals 
B) they allow professionals to keep up with industry developments 
C) they facilitate professional networking 
D) none of the above 
E) all of the above 
Answer: E 
Diff: 2 
Topic: What operations managers do 
Objective: LO1-1 

21) Walter Shewhart is listed among the important people of operations management because of his contributions to 
A) assembly line production 
B) measuring the productivity in the service sector 
C) just-in-time inventory methods 
D) statistical quality control 
E) all of the above 
Answer: D 
Diff: 2 
Topic: The heritage of operations management 
Objective: LO1-1 

22) Walter Shewhart, in the __________, provided the foundations for __________ in operations management. 
A) 1920s; statistical sampling 
B) United Kingdom; mass production 
C) U.S. Army; logistics 
D) nineteenth century; interchangeable parts 
E) none of the above 
Answer: A 
Diff: 2 
Topic: The heritage of operations management 
Objective: LO1-1 

23) Eli Whitney, in the __________, provided the foundations for __________ in operations management. 
A) 1920s; statistical sampling 
B) United Kingdom; mass production
C) U.S. Army; logistics  
D) nineteenth century; interchangeable parts  
E) none of the above  
Answer: D  
Diff: 2  
Topic: The heritage of operations management  
Objective: LO1-1

24) The person most responsible for popularizing interchangeable parts in manufacturing was  
A) Frederick Winslow Taylor  
B) Henry Ford  
C) Eli Whitney  
D) Whitney Houston  
E) Lillian Gilbreth  
Answer: C  
Diff: 2  
Topic: The heritage of operations management  
Objective: LO1-1

25) The "Father of Scientific Management" is  
A) Henry Ford  
B) Frederick W. Taylor  
C) W. Edwards Deming  
D) Frank Gilbreth  
E) just a figure of speech, not a reference to a person  
Answer: B  
Diff: 1  
Topic: The heritage of operations management  
Objective: LO1-1

26) Henry Ford is noted for his contributions to  
A) material requirements planning  
B) statistical quality control  
C) assembly line operations  
D) scientific management  
E) time and motion studies  
Answer: C  
Diff: 1  
Topic: The heritage of operations management
27) Who among the following is associated with contributions to quality control in operations management?
A) Charles Babbage
B) Henry Ford
C) Frank Gilbreth
D) W. Edwards Deming
E) Henri Fayol
Answer: D
Diff: 2
Topic: The heritage of operations management
Objective: LO1-1
28) The field of operations management is shaped by advances in which of the following fields?
A) chemistry and physics
B) industrial engineering and management science
C) biology and anatomy
D) information technology
E) all of the above
Answer: E
Diff: 2
Topic: The heritage of operations management
Objective: LO1-1

29) Which of the following is the best example of a pure service?
A) counseling
B) oil change
C) heart transplant
D) electric Co-Op
E) all of the above
Answer: A
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2

30) Which of the following statements is true?
A) The person most responsible for initiating the use of interchangeable parts in manufacturing was Eli Whitney.
B) The origins of management by exception are generally credited to Frederick W. Taylor.
C) The person most responsible for initiating the use of interchangeable parts in manufacturing was Walter Shewhart.
D) The origins of the scientific management movement are generally credited to Henry Ford.
E) The person most responsible for initiating the use of interchangeable parts in manufacturing was Henry Ford.
Answer: A
Diff: 2
Topic: The heritage of operations management
Objective: LO1-1

31) The service sector makes up approximately what percentage of all jobs in the
United States?
A) 12%
B) 40%
C) 66%
D) 79%
E) 90%
Answer: D
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2
32) Which is **not** true regarding differences between goods and services?
A) Tangible goods are generally produced and consumed simultaneously; services are not.
B) Most goods are common to many customers; services are often unique to the final customer.
C) Services tend to have a more inconsistent product definition than goods.
D) Services tend to have higher customer interaction than goods.
E) All of the above are true.
Answer: A
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2

33) Which is **not** true regarding differences between goods and services?
A) Services are generally produced and consumed simultaneously; tangible goods are not.
B) Services tend to be more knowledge-based than goods.
C) Services tend to have a more inconsistent product definition than goods.
D) Goods tend to have higher customer interaction than services.
E) None of the above is true.
Answer: D
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2

34) Which of the following services is least **likely to be unique**, i.e., customized to a particular individual's needs?
A) dental care
B) hairdressing
C) legal services
D) elementary education
E) computer consulting
Answer: D
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2

35) Which of the following is **not** a typical service attribute?
A) intangible product
B) easy to store
C) customer interaction is high
D) simultaneous production and consumption
E) difficult to resell
Answer: B
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2
36) Which of the following statements is **true**?
A) Manufacturing now constitutes the largest economic sector in postindustrial societies
B) The number of people employed in manufacturing has increased since 1950
C) Each manufacturing employee now produces about 20 times more than in 1950
D) All of the above are true.
E) None of the above is true.
Answer: C
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2

37) Which of the following attributes is most typical of a service?
A) production and consumption occur simultaneously
B) tangible
C) mass production
D) consistency
E) easy to automate
Answer: A
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2

38) Which of the following is a similarity between goods and services?
A) mass production
B) consistency
C) automation
D) application of operations management
E) all of the above
Answer: D
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2

39) Current trends in operations management include all of the following **except**
A) just-in-time performance
B) rapid product development
C) mass customization
D) empowered employees
E) All of the above are current trends.
Answer: E
Diff: 2
Topic: Exciting new trends in operations management
Objective: LO1-1
40) Which of the following is **not** a current trend in operations management?
A) just-in-time performance
B) global focus
C) supply-chain partnering
D) mass customization
E) All of the above are current trends.
Answer: E
Diff: 2
Topic: Exciting new trends in operations management
Objective: LO1-1

41) New trends in operations management include
A) global focus
B) mass customization
C) empowered employees
D) rapid product development
E) All of the above are new trends in operations management.
Answer: E
Diff: 2
Topic: Exciting new trends in operations management
Objective: LO1-1

42) Which of the following statements about trends in operations management is false?
A) Job specialization is giving way to empowered employees.
B) Local or national focus is giving way to global focus.
C) Environmentally-sensitive production is giving way to low-cost focus.
D) Rapid product development is partly the result of shorter product cycles.
E) All of the above statements are false.
Answer: C
Diff: 2
Topic: Exciting new trends in operations management
Objective: LO1-1

43) A foundry produces circular utility access hatches (manhole covers). If 120 covers are produced in a 10-hour shift, the productivity of the line is
A) 1.2 covers/hr
B) 2 covers/hr
C) 12 covers/hr
D) 1200 covers/hr
E) none of the above
Answer: C
Diff: 1
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4
44) A foundry produces circular utility access hatches (manhole covers). Currently, 120 covers are produced in a 10-hour shift. If labor productivity can be increased by 20%, it would then be
A) 14.4 covers/hr
B) 24 covers/hr
C) 240 covers/hr
D) 1200 covers/hr
E) none of the above
Answer: A
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4

45) Gibson Valves produces cast bronze valves on an assembly line. If 1600 valves are produced in an 8-hour shift, the productivity of the line is
A) 2 valves/hr
B) 40 valves/hr
C) 80 valves/hr
D) 200 valves/hr
E) 1600 valves/hr
Answer: D
Diff: 1
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4

46) Gibson Valves produces cast bronze valves on an assembly line, currently producing 1600 valves each 8-hour shift. If the productivity is increased by 10%, it would then be
A) 180 valves/hr
B) 200 valves/hr
C) 220 valves/hr
D) 880 valves/hr
E) 1760 valves/hr
Answer: C
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4
47) Gibson Valves produces cast bronze valves on an assembly line, currently producing 1600 valves per shift. If the production is increased to 2000 valves per shift, labor productivity will increase by
A) 10%
B) 20%
C) 25%
D) 40%
E) 50%
Answer: C
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4

48) The Dulac Box plant produces 500 cypress packing boxes in two 10-hour shifts. What is the productivity of the plant?
A) 25 boxes/hr
B) 50 boxes/hr
C) 5000 boxes/hr
D) none of the above
E) not enough data to determine productivity
Answer: A
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4

49) The Dulac Box plant works two 8-hour shifts each day. In the past, 500 cypress packing boxes were produced by the end of each day. The use of new technology has enabled them to increase productivity by 30%. Productivity is now approximately
A) 32.5 boxes/hr
B) 40.6 boxes/hr
C) 62.5 boxes/hr
D) 81.25 boxes/hr
E) 300 boxes/hr
Answer: B
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4
50) The Dulac Box plant produces 500 cypress packing boxes in two 10-hour shifts. Due to higher demand, they have decided to operate three 8-hour shifts instead. They are now able to produce 600 boxes per day. What has happened to productivity?
A) It has not changed.
B) It has increased by 37.5 boxes/hr.
C) It has increased by 20%.
D) It has decreased by 8.3%.
E) It has decreased by 9.1%.
Answer: A
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4

51) Productivity measurement is complicated by
A) the competition's output
B) the fact that precise units of measure are often unavailable
C) stable quality
D) the workforce size
E) the type of equipment used
Answer: B
Diff: 2
Topic: The productivity challenge
Objective: LO1-3

52) The total of all outputs produced by the transformation process divided by the total of the inputs is
A) utilization
B) greater in manufacturing than in services
C) defined only for manufacturing firms
D) multifactor productivity
E) none of the above
Answer: D
Diff: 2
Topic: The productivity challenge
Objective: LO1-5

53) Which productivity variable has the greatest potential to increase productivity?
A) labor
B) globalization
C) management
D) capital
E) none of the above
Answer: C
Diff: 2
Topic: The productivity challenge
Objective: LO1-6

54) Which of the following nets the largest productivity improvement?
A) increase output 15%
B) decrease input 15%
C) increase both output and input by 5%
D) increase output 10%, decrease input 3%
E) decrease input 10%, increase output 3%
Answer: B
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-5

55) Productivity can be improved by
A) increasing inputs while holding outputs steady
B) decreasing outputs while holding inputs steady
C) increasing inputs and outputs in the same proportion
D) decreasing inputs while holding outputs steady
E) none of the above
Answer: D
Diff: 2
Topic: The productivity challenge
Objective: LO1-6

56) The largest contributor to productivity increases is __________, estimated to be responsible for __________ of the annual increase.
A) management; over one-half
B) Mr. Deming; one-half
C) labor; two-thirds
D) capital; 90%
E) technology; over one-half
Answer: A
57) The factor responsible for the largest portion of productivity increase in the U.S. is
A) labor
B) management
C) capital
D) All three combined; it is impossible to determine the contribution of individual factors.
E) None of these
Answer: B
58) Which of the following is not true when explaining why productivity tends to be lower in the service sector than in the manufacturing sector?
A) Services are typically labor-intensive.
B) Services are often difficult to evaluate for quality.
C) Services are often an intellectual task performed by professionals.
D) Services are difficult to automate.
E) Service operations are typically capital intensive.
Answer: E
Diff: 2
Topic: The productivity challenge
Objective: LO1-6

59) Three commonly used productivity variables are
A) quality, external elements, and precise units of measure
B) labor, capital, and management
C) technology, raw materials, and labor
D) education, diet, and social overhead
E) quality, efficiency, and low cost
Answer: B
Diff: 2
Topic: The productivity challenge
Objective: LO1-3

60) The service sector has lower productivity improvements than the manufacturing sector because
A) the service sector uses less skilled labor than manufacturing
B) the quality of output is lower in services than manufacturing
C) services usually are labor-intensive
D) service sector productivity is hard to measure
E) none of the above
Answer: C
Diff: 2
Topic: The productivity challenge
Objective: LO1-6

61) Productivity tends to be more difficult to improve in the service sector because the work is
A) often difficult to automate
B) typically labor-intensive
C) frequently processed individually
D) often an intellectual task performed by professionals
E) All of the above make service productivity more difficult.
Answer: E
Diff: 2
Topic: The productivity challenge
Objective: LO1-6
62) Firm A operates 10 hours each day, producing 100 parts/hour. If productivity were increased 20%, how many hours would the plant have to work to produce 1000 parts?
A) less than 2 hours
B) between 9 and 10 hours
C) between 2 and 6 hours
D) between 6 and 8 hours
E) between 8 and 9 hours
Answer: E
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4

63) A cleaning company uses 10 lbs each of chemicals A, B and C for each house it cleans. After some quality complaints, the company has decided to increase its use of chemical A by an additional 10 lbs for each house. By what % has productivity (houses per pound of chemical) fallen?
A) 0%
B) 10%
C) 15%
D) 25%
E) 33%
Answer: D
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4

64) A cleaning company uses $10 of chemicals, $40 of labor, and $5 of misc. expenses for each house it cleans. After some quality complaints, the company has decided to increase its use of chemicals by 50%. By what % has multifactor productivity fallen?
A) 0%
B) 8.3%
C) 25%
D) 50%
E) none of the above or unable to determine
Answer: B
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-5
65) Among the ethical and social challenges facing operations managers are
A) honoring stakeholder commitments
B) maintaining a sustainable environment
C) efficiently developing and producing safe, quality products
D) providing a safe workplace
E) all of the above
Answer: E
Diff: 1
Topic: Ethics and social responsibility
AACSB: Ethical Reasoning
Objective: no LO

66) Among the ethical and social challenges facing operations managers are
A) honoring financial commitments
B) maintaining a sustainable environment
C) developing low-cost products
D) providing an efficient workplace
E) all of the above
Answer: B
Diff: 2
Topic: Ethics and social responsibility
AACSB: Ethical Reasoning
Objective: no LO

67) Which of the following is not among the ethical and social challenges facing operations managers?
A) honoring stakeholder commitments
B) maintaining a sustainable environment
C) efficiently developing and producing safe, quality products
D) increasing executive pay
E) providing a safe workplace
Answer: D
Diff: 1
Topic: Ethics and social responsibility
AACSB: Ethical Reasoning
Objective: no LO
68) A business's stakeholders, whose conflicting perspectives cause ethical and social dilemmas, include
A) lenders
B) suppliers
C) owners
D) employees
E) all of the above
Answer: E
Diff: 1
Topic: Ethics and social responsibility
AACSB: Ethical Reasoning
Objective: no LO

Short Answer

1) Starbucks stopped requiring signatures on credit-card purchases under $25 in an attempt to reduce __________.
Answer: transaction time (or service time)
Diff: 1
Topic: The productivity challenge
Objective: LO1-6

2) __________ is the set of activities that transforms inputs into goods and services.
Answer: Operations management
Diff: 1
Topic: What is operations management?
Objective: LO1-1

3) Marketing, Production, and __________ are the three functions that all organizations must perform to create goods and services.
Answer: finance/accounting
Diff: 1
Topic: Organizing to produce goods and services
Objective: LO1-1

4) "Should we make or buy this component?" is an issue in the __________ critical decision area.
Answer: supply chain management
Diff: 1
Topic: What operations managers do
5) Henry Ford and __________ are credited with the development of the moving assembly line.
Answer: Charles Sorensen
Diff: 1
Topic: The heritage of operations management
Objective: LO1-1

6) When a tangible product is not included in a service, such as with counseling, it is called a __________.
Answer: pure service
Diff: 1
Topic: Operations in the service sector
Objective: LO1-2

7) __________ is the ability of the organization to be flexible enough to cater to the individual whims of consumers.
Answer: Mass customization
Diff: 2
Topic: Exciting new trends in operations management
Objective: LO1-1

8) __________ is the operations management trend that moves more decision making to the individual worker.
Answer: Empowered employees
Diff: 2
Topic: Exciting new trends in operations management
Objective: LO1-1

9) __________ is the total of all outputs produced by the transformation process divided by the total of the inputs.
Answer: Multifactor productivity
Diff: 1
Topic: The productivity challenge
Objective: LO1-5

10) Productivity is the ratio of __________ to __________. Using this relationship, productivity can be improved by __________ or __________.
Answer: outputs, inputs; reducing inputs while holding outputs constant; increasing
outputs while holding inputs constant.
Diff: 2
Topic: The productivity challenge
Objective: LO1-6

11) Identify three or more operations-related tasks carried out by Hard Rock Café. Answer: Providing custom meals; designing, testing, and costing meals; acquiring, receiving, and storing supplies; recruiting and training employees; preparing employee schedules; designing efficient restaurant layouts.
Diff: 1
Topic: Global company profile
Objective: no LO
12) Identify two operations-related tasks carried out by Hard Rock Café. Match each to its area of the Ten Critical Decisions.
Answer: Providing custom meals–design of goods and services; designing, testing, and costing meals–design of goods and services; acquiring, receiving, and storing supplies–supply chain management; recruiting and training employees–human resources; job design and work measurement; preparing employee schedules–intermediate and short-term scheduling; designing efficient restaurant layouts–layout strategy.
Diff: 2
Topic: Global company profile
Objective: no LO

13) Define operations management. Will your definition accommodate both manufacturing and service operations?
Answer: Operations management can be defined as the management of all activities directly related to the creation of goods and/or services through the transformation of inputs into outputs. Yes.
Diff: 1
Topic: What is operations management?
Objective: LO1-1

14) Identify the items that Fredrick W. Taylor believed management should be more responsible for.
Answer: He believed that management should be more responsible for matching employees to the right job, providing the proper training, providing proper work methods and tools, and establishing legitimate incentives for work to be accomplished.
Diff: 2
Topic: The heritage of operations management
Objective: LO1-1

15) Operations managers should be well versed in what disciplines in order to make good decisions?
Answer: Management science, information technology, and often one of the biological or physical sciences.
Diff: 2
Topic: The heritage of operations management
Objective: LO1-1

16) Why are services typically more difficult to standardize, automate, and make
efficient?
Answer: Services typically require customer interaction, which makes it difficult to standardize, automate, and make efficient.
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2
17) How do services differ from goods? Identify five ways.
Answer: Pick from the following: a service is usually intangible; it is often produced and consumed simultaneously; often unique; it involves high customer interaction; product definition is inconsistent; often knowledge-based; and frequently dispersed.
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2

18) Services are often knowledge-based. Provide two examples, and explain why they are knowledge-based.
Answer: Answer will vary, but the textbook used educational, medical, and legal services.
Diff: 2
Topic: Operations in the service sector
Objective: LO1-2

19) Why are organizations changing from batch (large) shipments to just-in-time (JIT) shipments?
Answer: Organizations are switching to JIT shipments because inventory requires a large financial investment, and impedes the responsiveness to changes in the marketplace.
Diff: 2
Topic: Exciting new trends in operations management
Objective: LO1-1

20) Why are organizations becoming more global?
Answer: Organizations are becoming more global with the decline in the cost of communication and transportation. Additionally, resources—capital, material, talent, and labor—are also becoming more global.
Diff: 2
Topic: Exciting new trends in operations management
Objective: LO1-1

21) Identify the three productivity variables used in the text.
Answer: The three common variables are labor, capital, and management.
Diff: 2
Topic: Productivity variables
Objective: LO1-6

22) What is a knowledge society?
Answer: A knowledge society is one in which much of the labor force has migrated from manual work to work based on knowledge.

Diff: 2
Topic: The productivity challenge
Objective: LO1-6
23) Why are operations managers faced with ethical and social challenges?
Answer: Businesses have diverse stakeholders, which include owners, employees, lenders, and distributors. These stakeholders hold conflicting perspectives.
Diff: 1
Topic: Ethics and social responsibility
AACSB: Ethical Reasoning
Objective: LO1-1

24) What are some of the ethical and social challenges faced by operations managers?
Answer: Efficiently developing and producing safe quality products; maintaining a clean environment; providing a safe workplace; honoring community commitments.
Diff: 1
Topic: Ethics and social responsibility
AACSB: Ethical Reasoning
Objective: LO1-1

25) As the administrative manager in a law office, you have been asked to develop a system for evaluating the productivity of the 15 lawyers in the office. What difficulties are you going to have in doing this, and how are you going to overcome them?
Answer: Productivity measures for a law office are difficult. Simple criteria, like number of cases processed, fail to consider complexity of the case. Even counting wins is difficult, as many cases are settled with some sort of compromise. External elements such as the quality of the opposing counsel and the tenacity of the opposition also make counting look rather silly.

Categories of cases can help—(i.e., uncontested divorce, no personal injury auto case, etc.) However, many firms end up counting hours billed. This in turns leads to other problems, as noted by the number of false billing cases.
Diff: 2
Topic: The productivity challenge
AACSB: Reflective Thinking
Objective: LO1-6
Essay

1) Susan has a part-time "cottage industry" producing seasonal plywood yard ornaments for resale at local craft fairs and bazaars. She currently works 8 hours per day to produce 16 ornaments.
   a. What is her productivity?
   b. She thinks that by redesigning the ornaments and switching from use of a wood glue to a hot-glue gun she can increase her total production to 20 ornaments per day. What is her new productivity?
   c. What is her percentage increase in productivity?
   Answer:
   a. 16 ornaments/8 hours = 2 ornaments/hour
   b. 20 ornaments/8 hours = 2.5 ornaments/hour
   c. Change in productivity = 0.5 ornaments/hour; percent change = 0.5/2 = 25%

2) A firm cleans chemical tank cars in the Bay St. Louis area. With standard equipment, the firm typically cleaned 70 chemical tank cars per month. They utilized 10 gallons of solvent, and two employees worked 20 days per month, 8 hours a day. The company decided to switch to a larger cleaning machine. Last April, they cleaned 60 tank cars in only 15 days. They utilized 12 gallons of solvent, and the two employees worked 6 hours a day.
   1. What was their raw material and their labor productivity with the standard equipment?
   2. What is their raw material and their labor productivity with the larger machine?
   3. What is the change in each productivity measure?
   Answer:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Standard Equipment</th>
<th>Larger Machine</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvent</td>
<td>( \frac{70}{10} = 7 )</td>
<td>( \frac{60}{12} = 5 )</td>
<td>( \frac{5 - 7}{7} = -28.57% )</td>
</tr>
<tr>
<td>Labor</td>
<td>( \frac{70}{320} = 0.22 )</td>
<td>( \frac{60}{180} = .33 )</td>
<td>( \frac{.33 - .22}{.22} = 50% )</td>
</tr>
</tbody>
</table>

Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4
3) The Dulac Box plant produces wooden packing boxes to be used in the local seafood industry. Current operations allow the company to make 500 boxes per day, in two 8-hour shifts (250 boxes per shift). The company has introduced some small changes in equipment, and conducted appropriate job training, so that production levels have risen to 300 boxes per shift. These changes did not require any change in the amount of capital spending or energy use. What is the firm's new labor productivity?

Answer: 600 boxes per day / 16 hours = 37.5 boxes per hour

Diff: 2

Topic: The productivity challenge

AACSB: Analytic Skills

Objective: LO1-4

4) Mark's Ceramics spent $4000 on a new kiln last year in the belief that it would cut energy usage 25% over the old kiln. This kiln is an oven that turns "greenware" into finished pottery. Mark is concerned that the new kiln requires extra labor hours for its operation. Mark wants to check the energy savings of the new oven, and also to look over other measures of their productivity to see if the change really was beneficial. Mark has the following data to work with:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Last Year</th>
<th>This Year</th>
<th>Change</th>
<th>Pct. Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>4000</td>
<td>4000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenware</td>
<td>5000</td>
<td>5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor</td>
<td>350</td>
<td>375</td>
<td>-0.76</td>
<td>-6.7%</td>
</tr>
<tr>
<td>Capital</td>
<td>15000</td>
<td>19000</td>
<td>-0.060</td>
<td>-22.2%</td>
</tr>
<tr>
<td>Energy (kWh)</td>
<td>3000</td>
<td>2600</td>
<td>0.21</td>
<td>15.4%</td>
</tr>
</tbody>
</table>

Were the modifications beneficial?

Answer: The energy modifications did not generate the expected energy savings; also, labor and capital productivity decreased.
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-5
5) Martin Manufacturing has implemented several programs to improve its productivity. They have asked you to evaluate the firm's productivity by comparing this year's performance with last year's. The following data are available:

<table>
<thead>
<tr>
<th>Last Year</th>
<th>This Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output 10,500 units</td>
<td>12,100 units</td>
</tr>
<tr>
<td>Labor Hours 12,000</td>
<td>13,200</td>
</tr>
<tr>
<td>Utilities $7,600</td>
<td>$8,250</td>
</tr>
<tr>
<td>Capital $83,000</td>
<td>$88,000</td>
</tr>
</tbody>
</table>

Has Martin Manufacturing improved its productivity during the past year?
Answer: Productivity improved in all three categories this year; utilities showed the greatest increase, and labor the least.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Last Year</th>
<th>This Year</th>
<th>Change</th>
<th>Pct. Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>10500 / 12000 = 0.88</td>
<td>12100 / 13200 = 0.9</td>
<td>0.04</td>
<td>4.8%</td>
</tr>
<tr>
<td>Capital</td>
<td>10500 / 7600 = 1.38</td>
<td>12100 / 8250 = 1.47</td>
<td>0.09</td>
<td>6.2%</td>
</tr>
<tr>
<td>Energy</td>
<td>10500 / 83000 = 0.13</td>
<td>12100 / 88000 = 0.14</td>
<td>0.01</td>
<td>7.69%</td>
</tr>
</tbody>
</table>

Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-5

6) Felicien grows mirlitons (that's Cajun for Chayote squash) in his 100 by 100 foot garden. He then sells the crop at the local farmers' market. Two summers ago, he was able to produce and sell 1200 pounds of mirlitons. Last summer, he tried a new fertilizer that promised a 50% increase in yield. He harvested 1900 pounds. Did the fertilizer live up to its promise?
Answer: Since the productivity gain was 58.3%, not 50%, the fertilizer was at least as good as advertised.

<table>
<thead>
<tr>
<th>Two Summers ago</th>
<th>Last Summer</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200 ÷ 10,000 = .12 lbs/sq. ft</td>
<td>1900 ÷ 10,000 = .19 lbs/sq. ft</td>
<td>(.19 - .12) ÷ .12 = 58.3%</td>
</tr>
</tbody>
</table>
Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4
7) The Dulac Box plant produces wooden packing boxes to be used in the local seafood industry. Current operations allow the company to make 500 boxes per day, in two 8-hour shifts (250 boxes per shift). The company has introduced some moderate changes in equipment, and conducted appropriate job training, so that production levels have risen to 300 boxes per shift. Labor costs average $10 per hour for each of the 5 full-time workers on each shift. Capital costs were previously $3,000 per day, and rose to $3,200 per day with the equipment modifications. Energy costs were unchanged by the modifications, at $400 per day. What is the firm's multifactor productivity before and after the changes?
Answer: MFP before: \[ \frac{500 \text{ boxes}}{30 \text{ workers} \times 8 \text{ hours} + 3,000 \text{ dollars} + 400 \text{ dollars}} = \frac{500}{4200} = 0.119 \text{ boxes/dollar} \]
MFP after: \[ \frac{600 \text{ boxes}}{30 \text{ workers} \times 8 \text{ hours} + 3,200 \text{ dollars} + 400 \text{ dollars}} = \frac{600}{4400} = 0.136 \text{ boxes/dollar} \]
Diff: 0.017

8) Gibson Products produces cast bronze valves for use in offshore oil platforms. Currently, Gibson produces 1600 valves per day. The 20 workers at Gibson work from 7 a.m. until 4 p.m., with 30 minutes off for lunch and a 15 minute break during the morning work session and another at the afternoon work session. Gibson is in a competitive industry, and needs to increase productivity to stay competitive. They feel that a 20 percent increase is needed.

Gibson's management believes that the 20 percent increase will not be possible without a change in working conditions, so they change work hours. The new schedule calls on workers to work from 7:30 a.m. until 4:30 p.m., during which workers can take one hour off at any time of their choosing. Obviously, the number of paid hours is the same as before, but production increases, perhaps because workers are given a bit more control over their workday. After this change, valve production increased to 1800 units per day.

a. Calculate labor productivity for the initial situation
b. Calculate labor productivity for the hypothetical 20 percent increase
c. What is the productivity after the change in work rules?
d. Write a short paragraph analyzing these results.
Answer:
(a) Workers are active for eight hours per day; labor productivity is 10 valves/hour
(b) If Productivity rises by 20 percent, to 12 valves/hour; output would be 12x8x20 = 1920
(c) New productivity is \( \frac{1800}{20 \times 8} = 11.25 \) valves/hour

(d) Gibson did not gain the desired 20 percent increase in productivity, but they did gain over 11 percent, without extra equipment or energy, and without increasing the labor cost.

Diff: 2

Topic: The productivity challenge

AACSBS: Analytic Skills

Objective: LO1-4
9) A local university is considering changes to its class structure in an effort to increase professor productivity. The old schedule had each professor teaching 5 classes per week, with each class meeting an hour per day on Monday, Wednesday, and Friday. Each class contained 20 students. The new schedule has each professor teaching only 3 classes, but each class meets daily for an hour. New classes contain 50 students.

a. Calculate the labor productivity for the initial situation (students/hour).
b. Calculate the labor productivity for the schedule change (students/hour).
c. Are there any ethical considerations that should be accounted for?
d. Suppose that each teacher also is required to have 2 hours of Office Hours each day he/she taught class. Is the schedule change a productivity increase?

Answer:
(a) Professors teach 100 students in 15 hours or 6.67 students/hour.
(b) Professors teach 150 students in 15 hours or 10 students/hour.
(c) Responses should focus on honoring stakeholder commitment and can include students per professor ratio, class sizes, quality of education, etc.
(d) Initial productivity is 100 students in 21 hours or 4.76 students/hour. New productivity is 150 students in 25 hours or 6 students/hour, an increase of 1.24 students/hour.

10) A grocery chain is considering the installation of a set of 4 self-checkout lanes. The new self-checkout lane setup will replace 2 old cashier lanes that were staffed by a cashier and bagger on each lane. One cashier mans all 4 self-checkouts (answering questions, checking for un-scanned items, taking coupons, etc). Checkout on the new lanes takes 2 minutes (customers bag their own orders) while checkout with the old lanes took only 45 seconds. In addition the electricity costs for both setups are $.05 per checkout while bagging (material) costs are $.1 per checkout with the old system and $.15 for the new system. The new lanes also require $100 in capital costs. Assume that the lanes are always in use for 8 hours per day (1 shift) and that a worker makes $10/hour.

a. How many checkouts did the old system provide in a shift?
b. How many checkouts does the new system provide?
c. What is the multifactor productivity for each system?

Answer:
(a) 2 lanes * 8 hours * 3600 seconds/hour * 1 checkout/45 seconds = 1280 checkouts
(b) 4 lanes * 8 hours * 60 minutes/hour * 1 checkout/2 min = 960 checkouts

(c) Cost for the old system: 4 workers * 8 hours * $10/hour + $.1 * 1280 + $.05 * 1280 = $512. Cost for the new system: 1 worker * 8 hours * $10/hour + $.15 * 960 + $.05 * 960 + $100 = $372. Multifactor productivity for old system = 1280 checkouts / $512 = 2.5 checkouts/$. Multifactor productivity for new system = 960 checkouts / $372 = 2.6 checkouts/$.

Diff: 3

Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-5
11) A swimming pool company has 100,000 labor hours available per summer and with a labor productivity of 5 pools per 6,000 hours.
   a. How many pools can the company install this summer?
   b. Suppose the multifactor productivity was one pool per $25,000. How much should the company expect to spend this summer constructing the pools?
   Answer:
   (a) \(100,000 \text{ hours} \times \frac{5 \text{ pools}}{6000 \text{ hours}} = 83.33 \text{ or 83 pools}\)
   (b) \(83 \text{ pools} \times \frac{$25,000}{\text{pool}} = $2,075,000\)

12) An industrial plant needs to make 100,000 parts per month to meet demand. Each month contains 20 working days, each of which allows for 3 separate 8 hour shifts.
   a. If a worker can produce 10 parts/hour, how many workers are needed on each shift?
   b. If each shift has 100 workers, what is the productivity of an individual worker?
   c. If material costs are $10/part, capital costs are $100,000 and labor costs are $10/hour, what is the multifactor productivity of the plant from part A?
   Answer:
   a. \(100,000 \text{ parts} \times \frac{1 \text{ hour}}{10 \text{ parts}} \times \frac{1 \text{ shift}}{8 \text{ hours}} \times \frac{1 \text{ worker}}{60 \text{ shifts}} = 20.83 = 21 \text{ workers}\)
   b. \(100,000 \text{ parts} \div (60 \text{ shifts/worker} \times 100 \text{ workers} \times 8 \text{ hours/shift}) = 2.08 \text{ parts/hour}\)
   c. \(100,000 \text{ parts} \div ($10/\text{part} \times 100,000 \text{ parts} + $100,000 + 21 \text{ workers} \times 60 \text{ shifts/worker} \times 8 \text{ hours/shift}\times$10/hour) = .083 \text{ parts/$1}\)

13) The local fast food store experienced the following number of customers on the night shift
   Hour-------------------Customers
   12 AM 23
   1 AM 20
   2 AM 15
   3 AM 5
If the store was staffed by two workers, what was the average productivity per worker, in customers/hour?

Answer: \[
\frac{23+20+15+5+2+1}{2 \text{ workers} \times 6 \text{ hours/worker}} = 5.5 \text{ customers/hour}
\]

Diff: 2
Topic: The productivity challenge
AACSB: Analytic Skills
Objective: LO1-4
Brandon Production is a small firm focused on the assembly and sale of custom computers. The firm is facing stiff competition from low-priced alternatives, and is looking at various solutions to remain competitive and profitable. Current financials for the firm are shown in the table below. In the first option, marketing will increase sales by 50%. The next option is Vendor (Supplier) changes, which would result in a decrease of 10% in the cost of inputs. Finally there is an OM option, which would reduce production costs 25%. Which of the options would you recommend to the firm if it can only pursue one option? In addition, comment on the feasibility of each option.

<table>
<thead>
<tr>
<th>Business Function</th>
<th>Current Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Inputs</td>
<td>$50,000</td>
</tr>
<tr>
<td>Production Costs</td>
<td>$25,000</td>
</tr>
<tr>
<td>Revenue</td>
<td>$80,000</td>
</tr>
</tbody>
</table>

Answer: Marketing would increase sales to $120,000 ($80,000 * 1.5) but increase cost of inputs and production costs to $112,500 (($50,000+$25,000)*1.5). This would net an additional $2500 of profit ($120,000-$112,500-current profit of $5000). Vendor (Supplier) Changes would decrease cost of inputs to $45,000 ($50,000*.9), resulting in $5,000 of additional profit (savings) ($50,000-$45,000). Finally, the OM option would save $6250 ($25,000 - $25,000*.75), resulting in an additional $6250 of profit. Thus the OM option is the most profitable. Comments on feasibility should center on the near impossibility of increasing revenue by 50%, while noting the other two options are difficult but not impossible.

Diff: 2
Topic: Why study OM?
AACSB: Analytic Skills
Objective: LO1-1