Operations Management, 11e, Global Edition **(Heizer/Render)**
Chapter 2 The Global Environment and Operations Strategy

Section 1   A Global View of Operations and Supply Chains

1) Boeing's development of the 787 Dreamliner is an example of a company obtaining a competitive advantage through product differentiation/innovation.
Answer: TRUE
Diff: 1
Key Term: NAFTA
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

2) NAFTA seeks to phase out all trade and tariff barriers among Canada, Mexico, and the United States.
Answer: TRUE
Diff: 2
AACSB: Multicultural and diversity understanding

3) The World Trade Organization has helped to significantly reduce tariffs around the world.
Answer: TRUE
Diff: 2
Key Term: World Trade Organization (WTO)
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

4) Production processes are being dispersed to take advantage of national differences in labor costs.
Answer: TRUE
Diff: 2
AACSB: Dynamics of the global economy
Objective: LO2
Learning Outcome: Discuss the influences of the global competitive environment on operations management

5) NAFTA seeks to phase out all trade and tariff barriers between the United States and Asia.
Answer: FALSE
Diff: 2
Key Term: NAFTA
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

6) One reason for global operations is to gain improvements in the supply chain.
Answer: TRUE
Diff: 1
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

7) One reason to globalize is to learn to improve operations.
Answer: TRUE
Diff: 1
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

8) To attract and retain global talent, and to expand a product's life cycle, are both reasons to globalize.
Answer: TRUE
Diff: 2
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

9) A product will always be in the same stage of its product life cycle regardless of the country.
Answer: FALSE
Diff: 2
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

10) The World Trade Organization helps provide governments and industries around the world with protection from firms that engage in unethical conduct.
Answer: TRUE
Diff: 2
Key Term: World Trade Organization (WTO)
AACSB: Ethical understanding and reasoning abilities
Learning Outcome: Discuss the role of operations management in corporate social responsibility and sustainability

11) Which of the following statements regarding the Dreamliner 787 is true?
A) Boeing has found partners in over a dozen countries.
B) The new aircraft incorporates a wide range of aerospace technologies.
C) The new aircraft uses engines from not one, but two manufacturers.
D) Boeing will add only 20 to 30 percent of the aircraft's value.
E) All of the above are true.
Answer: E
Diff: 2
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

12) Boeing's new 787 Dreamliner:
A) is assembled in Washington, D.C.
B) uses engines from Japan.
C) has its fuselage sections built in Australia.
D) has increased efficiency from new engine technology.
E) results from a partnership of about a dozen companies.
Answer: D
Diff: 2

13) Cost cutting in international operations can take place because of:
A) lower taxes and tariffs.
B) lower wage scales.
C) lower indirect costs.
D) less stringent regulations.
E) all of the above.
Answer: E
Diff: 1
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

14) Which of the following did the authors NOT suggest as a reason for globalizing operations?
A) reduce costs
B) improve the supply chain
C) pursue stockholder approval ratings
D) understand markets
E) attract and retain global talent
Answer: C
Diff: 2
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

15) Multinational organizations can shop from country to country and cut costs through:
A) lower wage scales.
B) lower indirect costs.
C) less stringent regulations.
D) lower taxes and tariffs.
E) all of the above.
Answer: E
Diff: 2
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

16) The term *maquiladora* is most synonymous with:
A) free trade zones in Mexico.
B) Chinese forced labor camps.
C) home-based or cottage industry.
D) areas that do not meet U.S. standards for workplace safety and pollution.
E) tax breaks provided by some South American countries to other South American countries.
Answer: A
Diff: 2
Key Term: Maquiladoras
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

17) Which of the following is true of maquiladoras?
A) They discourage foreign businesses from outsourcing.
B) They assess tariffs only on the value-added work done.
C) They originated in China.
D) None of the above
E) All of the above
Answer: B
Diff: 2
Key Term: Maquiladoras
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

18) Which of the following represents a reason for globalizing operations?
A) to improve the supply chain
B) to improve operations
C) to expand a product's life cycle
D) to attract and retain global talent
E) all of the above
Answer: E
Diff: 2
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

19) Which of the following does NOT represent a valid reason for globalizing operations?
A) reduce costs
B) improve the supply chain
C) reduce responsiveness
D) attract and retain global talent
E) understand markets
Answer: C
Diff: 2
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

20) The purpose of NAFTA is to:
A) substitute cheap labor in Mexico for expensive labor in the United States.
B) curb illegal immigration from Mexico to the United States.
C) phase out all trade and tariff barriers between North America and South America.
D) phase out all trade and tariff barriers between the United States, Canada, and Mexico.
E) provide fair and equitable tariff rates for trade between the United States, Canada, and Mexico.
Answer: D
Diff: 2
Key Term: NAFTA
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

21) With reference to cultural and ethical issues, the World Trade Organization has:
A) eliminated bribery.
B) made progress in providing equal protection of intellectual property among nations.
C) phased out all trade and tariff barriers between the United States and Mexico.
D) eliminated slave labor and child labor.
E) played little role in addressing cultural and ethical issues among nations.
Answer: B
Diff: 2
Key Term: World Trade Organization (WTO)
AACSB: Ethical understanding and reasoning abilities
Learning Outcome: Discuss the role of operations management in corporate social responsibility and sustainability

22) _____ are areas located along the United States-Mexico border in which factories receive preferential
tariff treatment.
Answer: Maquiladoras
Diff: 2
Key Term: Maquiladoras
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

23) _____ is a free trade agreement among Canada, Mexico, and the United States.
Answer: NAFTA—North American Free Trade Agreement
Diff: 2
Key Term: NAFTA
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

24) _____ and _____ are two issues where significant cultural differences are large, yet progress toward global uniformity is slowly being accepted.
Answer: Bribery, protection of intellectual property
Diff: 3
AACSB: Ethical understanding and reasoning abilities
Learning Outcome: Discuss the role of operations management in corporate social responsibility and sustainability

25) An organization that has worked to achieve global uniformity in cultural and ethical issues such as bribery, child labor, and environmental regulations is _____.
Answer: the World Trade Organization
Diff: 1
Key Term: World Trade Organization (WTO)
AACSB: Ethical understanding and reasoning abilities
Learning Outcome: Discuss the role of operations management in corporate social responsibility and sustainability

26) Identify five countries from which Boeing's 787 Dreamliner has suppliers.
Answer: Any five of: France, Germany, UK, Italy, Japan, China, South Korea, Sweden, and the United States
Diff: 3
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

27) How can global operations improve the supply chain?
Answer: The supply chain can often be improved by locating facilities in countries where unique resources are available.
Diff: 2
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

28) How do global operations attract new markets?
Answer: Because international operations require interaction with foreign customers, suppliers, and other competitive businesses, international firms inevitably learn about opportunities for new products and services.
Diff: 2
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

29) State two examples of cultural and ethical issues that face operations managers in a global environment.
Answer: Student responses will vary, but there are several issues on which there are wide differences from country to country, culture to culture. Among those listed in the text are bribery, child labor, the environment, and intellectual property rights. Students may bring forward from an earlier chapter issues such as environmental regulation or safe work environment, and may raise issues such as product safety.
Diff: 2
AACSB: Ethical understanding and reasoning abilities
Learning Outcome: Discuss the role of operations management in corporate social responsibility and sustainability

30) Since the early 1990s, residents in a number of developing countries have overcome culture, religious, ethnic, and political productivity barriers. These disappearing barriers coupled with simultaneous advances in technology, reliable shipping, and cheap communication have all led to the growth of what three things?
Answer:
1. World trade
2. Global capital markets
3. International movement of people
Diff: 3
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

Section 2   Developing Missions and Strategies

1) An organization's *strategy* is the purpose or rationale for its existence.
Answer: FALSE
Diff: 1
Key Term: Strategy
Objective: LO1

2) Which of the following activities takes place most immediately once the mission has been developed?
A) The firm develops alternative or back-up missions in case the original mission fails.
B) The functional areas develop their functional area strategies.
C) The functional areas develop their supporting missions.
D) The ten OM decision areas are prioritized.
E) Operational tactics are developed.
Answer: C
Diff: 2
Key Term: Mission
Objective: LO1

3) Which of the following statements about organizational missions is FALSE?
A) They reflect a company's purpose.
B) They indicate what a company intends to contribute to society.
C) They are formulated after strategies are known.
D) They define a company's reason for existence.
E) They provide guidance for functional area missions.
Answer: C
Diff: 2
Key Term: Mission
Objective: LO1

4) The fundamental purpose of an organization's mission statement is to:
A) create a good human relations climate in the organization.
B) define the organization's purpose in society.
C) define the operational structure of the organization.
D) generate good public relations for the organization.
E) define the functional areas required by the organization.
Answer: B
Diff: 2
Key Term: Mission
Objective: LO1

5) Which of the following statements is true?
A) Corporate mission is shaped by functional strategies.
B) Corporate strategy is shaped by functional strategies.
C) Functional strategies are shaped by corporate strategy.
D) External conditions are shaped by corporate mission.
E) Functional area missions are merged to become the organizational mission.
Answer: C
Diff: 3
Key Term: Strategy
AACSB: Reflective thinking skills
Objective: LO1

6) According to the authors, which of the following strategic concepts allow firms to achieve their missions?
A) productivity, efficiency, and quality leadership
B) differentiation, cost leadership, and response
C) differentiation, quality leadership, and response
D) distinctive competency, cost leadership, and experience
E) differentiation, distinctive competency, quality leadership, and capacity
Answer: B
Diff: 2
Key Term: Strategy
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

7) A *strategy* is a(n):
A) set of opportunities in the marketplace.
B) broad statement of purpose.
C) simulation used to test various product line options.
D) plan for cost reduction.
E) action plan to achieve the mission.
Answer: E
Diff: 2
Key Term: Strategy
Objective: LO1

8) The _____ is how an organization expects to achieve its missions and goals.
Answer: strategy
Diff: 2
Key Term: Strategy
Objective: LO1

9) What is the difference between a firm's mission and its strategy?
Answer: A firm's mission is the purpose or rationale for its existence; whereas, a firm's strategy is how it expects to achieve its mission and goals.
Diff: 2
Key Term: Mission
Objective: LO1

Section 3   Achieving Competitive Advantage Through Operations

1) Experience differentiation is an extension of product differentiation, accomplished by using people's five senses to create an experience rather than simply providing a service.
Answer: TRUE
Diff: 2
Key Term: Experience differentiation
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

2) Low-cost leadership is the ability to distinguish the offerings of the organization in a way that the customer perceives as adding value.
Answer: FALSE
Diff: 2
Key Term: Achieving competitive advantage through operations
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

3) Which of the following is LEAST likely to be a low-cost leadership competitive advantage?
A) low overhead
B) effective capacity use
C) inventory management
D) broad product line
E) mass production
Answer: D
Diff: 2
Key Term: Low-cost leadership
AACSB: Reflective thinking skills
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

4) A firm can effectively use its operations function to yield competitive advantage through all of the following EXCEPT:
A) customization of the product.
B) setting equipment utilization goals below the industry average.
C) speed of delivery.
D) constant innovation of new products.
E) maintaining a variety of product options.
Answer: B
Diff: 2
Key Term: Competitive advantage
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

5) The ability of an organization to produce goods or services that have some uniqueness in their characteristics is:
A) mass production.
B) time-based competition.
C) competing on productivity.
D) competing on quality.
E) competing on differentiation.
Answer: E
Diff: 2
Key Term: Differentiation
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

6) Which of the following statements best characterizes delivery reliability?
A) a company that always delivers on the same day of the week
B) a company that always delivers at the promised time
C) a company that delivers more frequently than its competitors
D) a company that delivers faster than its competitors
E) a company that has a computerized delivery scheduling system
Answer: B
Diff: 3
Key Term: Response
AACSB: Reflective thinking skills
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

7) Which of the following is an example of competing on the basis of differentiation?
A) A firm manufactures its product with less raw material waste than its competitors do.
B) A firm's products are introduced into the market faster than its competitors' products are.
C) A firm's distribution network routinely delivers its product on time.
D) A firm offers more reliable products than its competitors do.
E) A firm advertises more than its competitors do.
Answer: D
Diff: 2
Key Term: Differentiation
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

8) The ability of an organization to produce services that, by utilizing the consumer's five senses, have some uniqueness in their characteristics is:
A) sensory response.
B) time-based competition.
C) differentiation.
D) flexible response.
E) experience differentiation.
Answer: E
Diff: 2
Key Term: Experience differentiation
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

9) Which of the following best describes *experience differentiation*?
A) immerses consumers in the delivery of a service
B) uses people's five senses to enhance the service
C) complements physical elements with visual and sound elements
D) consumers may become active participants in the product or service
E) All of the above are elements of experience differentiation.
Answer: E
Diff: 1
Key Term: Experience differentiation
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

10) *Experience differentiation*:
A) isolates the consumer from the delivery of a service.
B) is an extension of product differentiation in the service sector.
C) uses only the consumer's senses of vision and sound.
D) keeps consumers from becoming active participants in the service.
E) attempts to make the service experience different for every single customer.
Answer: B
Diff: 2
Key Term: Experience differentiation
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

11) Which of the following is the best example of competing on low-cost leadership?
A) A firm produces its product with less raw material waste than its competitors do.
B) A firm offers more reliable products than its competitors do.
C) A firm's products are introduced into the market faster than its competitors' products are.
D) A firm's research and development department generates many ideas for new products.
E) A firm advertises more than its competitors do.
Answer: A
Diff: 3
Key Term: Low-cost leadership
AACSB: Reflective thinking skills
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

12) Franz Colruyt has achieved low-cost leadership through:
A) effective use of voice mail.
B) plastic, not paper, shopping bags.
C) background music that subtly encourages shoppers to buy more.
D) converting factories, garages, and theaters into retail outlets.
E) exclusive use of the Euro.
Answer: D
Diff: 2
Key Term: Low-cost leadership
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

13) Which of the following is an example of competing on quick response?
A) A firm produces its product with less raw material waste than its competitors do.
B) A firm offers more reliable products than its competitors do.
C) A firm's products are introduced into the market faster than its competitors' products.
D) A firm utilizes its capacity more effectively than its competitors do.
E) A firm advertises more than its competitors do.
Answer: C
Diff: 3
Key Term: Response
AACSB: Reflective thinking skills
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

14) Response-based competitive advantage can be:
A) flexible response.
B) reliable response.
C) quick response.
D) all of the above.
E) none of the above.
Answer: D
Diff: 2
Key Term: Response
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

15) The creation of a unique advantage over competitors is called a(n) _____.
Answer: competitive advantage
Diff: 2
Key Term: Competitive advantage
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

16) Service organizations can immerse the consumer in the service, or have the consumer become a participant in the service, as they practice _____.
Answer: experience differentiation
Diff: 2
Key Term: Experience differentiation
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

17) Competitive advantage through operations can be achieved by _____, _____, and/or _____.
Answer: differentiation, low cost, response
Diff: 2
Key Term: Competitive advantage
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

18) Provide an example of an organization that achieves competitive advantage through experience differentiation. Explain.
Answer: Answers will vary, but Disney and Hard Rock Café are illustrated in the text. Competing on experience differentiation implies providing uniqueness to your service offering through immersion of the consumer into the service, with visual or sound elements to turn the service into an experience.
Diff: 2
Key Term: Experience differentiation
Objective: LO2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

Section 4   Issues in Operations Strategy

1) Before establishing and implementing strategy, a resources view would ensure that which of the following resources are available?
A) financial
B) physical
C) human
D) technological
E) all of the above
Answer: E
Diff: 2
Key Term: Resources view
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

2) Porter's Five Forces Model is used to evaluate competition based on which 5 aspects?
A) research and development, cost, legal regulations, suppliers, customers
B) immediate rivals, potential entrants, customers, suppliers, and substitute products
C) potential entrants, customers, suppliers, legal regulations, and cost
D) immediate rivals, potential entrants, cost, substitute products, and legal regulations
E) cost, legal regulations, advertising effectiveness, potential entrants, and immediate rivals
Answer: B
Diff: 2
Key Term: Five forces analysis
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

3) Porter's Five Forces Model contains which of the following?
A) immediate rivals
B) potential entrants
C) customers
D) suppliers
E) all of the above
Answer: E
Diff: 2
Key Term: Five forces analysis
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

4) Who introduced the concept of value-chain analysis?
A) Ford
B) Toyota
C) Porter
D) Smith
E) Gates
Answer: C
Diff: 2
Key Term: Value-chain analysis
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

5) Value-chain analysis can be used to determine if a business is adding unique value in which of the following areas?
A) product research
B) human resources
C) process innovation
D) quality management
E) all of the above
Answer: E
Diff: 2
Key Term: Value-chain analysis
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

6) Which of the following is not part of value-chain analysis?
A) product research
B) quality management
C) supply chain management
D) marketing
E) human resources
Answer: D
Diff: 2
Key Term: Value-chain analysis
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

7) Which of the following environmental factors has not contributed to Microsoft's changing strategy?
A) Google
B) security issues
C) faster processors
D) the Internet
E) global warming
Answer: E
Diff: 2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

8) Standardization is an appropriate strategy in which stage of the product life cycle?
A) introduction
B) growth
C) maturity
D) decline
E) retirement
Answer: C
Diff: 2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

9) Cost minimization is an appropriate strategy in which stage of the product life cycle?
A) introduction
B) growth
C) adolescence
D) decline
E) retirement
Answer: D
Diff: 2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

10) Which of the following OM strategy/issues should a firm with a product in the maturity stage of its life cycle be LEAST concerned with at the present time?
A) increase capacity
B) long production runs
C) standardization
D) cost cutting
E) fewer rapid product changes
Answer: A
Diff: 2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

11) Given the position of the 3D printer in the growth stage of its life cycle, which of the following OM Strategy/Issues should the makers of 3D printers be least concerned with at the current time?
A) forecasting
B) cost cutting
C) increasing capacity
D) product and process reliability
E) enhancing distribution
Answer: B
Diff: 2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

12) Which of the following has progressed the FURTHEST along its product life cycle?
A) drive-through restaurants
B) Boeing 787
C) iPods
D) 3-D game players
E) Xbox 360
Answer: A
Diff: 2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

13) Which of the following has made the LEAST progress along its product life cycle?
A) drive-through restaurants
B) Boeing 787
C) iPods
D) 3-D game players
E) Xbox 360
Answer: D
Diff: 2
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

14) _____ is the stage in product life cycle at which it is a poor time to change quality.
Answer: Maturity
Diff: 2
Key Term: Issues in operations strategy

Section 5   Strategy Development and Implementation

1) *Key success factors* and *core competencies* are synonyms.
Answer: FALSE
Diff: 2
Key Term: Key success factors (KSFs)
Objective: LO3
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

2) SWOT analysis is a method of determining external strengths and weaknesses and internal opportunities and threats.
Answer: FALSE
Diff: 2
Key Term: SWOT analysis
Objective: LO3
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

3) Key success factors are those activities that are key to achieving competitive advantage.
Answer: TRUE
Diff: 2
Key Term: Key success factors (KSFs)
Objective: LO3
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

4) Which of the following statements is most correct?
A) KSFs are often necessary, but not sufficient for competitive advantage.
B) KSFs are often sufficient, but not necessary for competitive advantage.
C) KSFs are neither necessary nor sufficient for competitive advantage.
D) KSFs are both necessary and sufficient for competitive advantage.
E) None of the above statements is correct.
Answer: A
Diff: 3
Key Term: Key success factors (KSFs)
Objective: LO3
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

5) An SWOT analysis determines:
A) internal strengths and weaknesses and internal opportunities and threats.
B) internal strengths and weaknesses and external opportunities and threats.
C) external strengths and weaknesses and internal opportunities and threats.
D) external strengths and weaknesses and external opportunities and threats.
E) internal strengths and opportunities and external weaknesses and threats.
Answer: B
Diff: 1
Key Term: SWOT analysis
Objective: LO3
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

6) Define *core competencies.*
Answer: A set of skills, talents, and capabilities in which a firm is particularly strong.
Diff: 2
Key Term: Core competencies
Objective: LO3
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

7) What is SWOT analysis? List its four elements and describe its purpose.
Answer: The four elements of SWOT are strengths, weaknesses, opportunities, and threats. Its purpose is to maximize opportunities and minimize threats in the environment, while maximizing the advantages of the organization's strengths and minimizing the weaknesses.
Diff: 2
Key Term: SWOT analysis
Objective: LO3
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

8) Starbucks is one of the best known coffeehouse chains in the world. Each store sells a variety of innovative products to complement the array of coffee choices available. However, 75% of current stores are located in the United States and the expensive nature of the coffee leaves Starbucks vulnerable to changes in consumer spending behavior (such as recessions). Recently Starbucks has begun initiatives to sell its specialty coffee beans for home use, presenting a chance for a large increase in revenue and diversification. However, Starbucks faces fierce competition seeking a piece of its lucrative market share and the threat of consumer behavior changes, given its reputation rides on a singular product. Perform an SWOT analysis for Starbucks.
Answer:
Strengths—High profit specialty coffee, well-known brand image
Weakness—Most stores located in the United States, most profits come from coffee (both are lack of diversification)
Opportunities—Emerging market in coffee beans for home use, chance for global expansion
Threats—Intense competition, consumer behavior changes (less spending during a recession on its luxury coffee, change in beverage preferences)
Diff: 2
Key Term: SWOT analysis
AACSB: Reflective thinking skills
Objective: LO3
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

9) Perform an SWOT analysis of Boeing's 787 Dreamliner using the information presented in the text.
Answer:
Strengths—Technological advances (8% increase in fuel efficiency, electronic maintenance monitoring)
Weaknesses—Diverse suppliers and assembly locations leave Boeing vulnerable to currency exchange rates and make quality control difficult
Opportunities—one of fastest-selling commercial jets ever gives Boeing a chance to increase market share, Boeing can parlay its use of diverse supplier locations into diversifying customer base
Threats—competition from Airbus, divestment of the manufacture process risks losing company trade secrets (competitive advantage)
Diff: 3
Key Term: SWOT analysis
AACSB: Reflective thinking skills
Objective: LO3
Learning Outcome: Discuss operations and operations management as a competitive advantage for the organization

Section 6   Strategic Planning, Core Competencies, and Outsourcing

1) Outsourcing is the practice of transferring a firm's activities that have traditionally been internal to external suppliers.
Answer: TRUE
Diff: 2
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

2) Outsourcing is the practice of moving a business process to a foreign country but retaining control of it.
Answer: FALSE
Diff: 2
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

3) Core competencies are good candidates for outsourcing.
Answer: FALSE
Diff: 1
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

4) The theory of *competitive* advantage implies that you should allow another firm to perform work activities for your company if that company can do it more productively than you can.
Answer: FALSE
Diff: 2
Key Term: Theory of comparative advantage
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

5) The theory of *comparative* advantage implies that you should allow another firm to perform work activities for your company if that company can do it more productively than you can.
Answer: TRUE
Diff: 2
Key Term: Theory of comparative advantage
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

6) The term *renewal* has been created to describe the return of business activity to the originating country.
Answer: FALSE
Diff: 2
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

7) What is the practice of transferring a firm's activities that have traditionally been internal to external suppliers?
A) nearshoring
B) farshoring
C) offshoring
D) outsourcing
E) backsourcing
Answer: D
Diff: 2
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

8) Outsourcing is simply an extension of the long-standing practice of:
A) subcontracting.
B) importing.
C) exporting.
D) postponement.
E) e-procurement.
Answer: A
Diff: 1
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

9) Outsourcing manufacturing is also known as:
A) license manufacturing.
B) sublease manufacturing.
C) concurrent manufacturing.
D) hollow manufacturing.
E) contract manufacturing.
Answer: E
Diff: 2
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

10) What theory implies that you should allow another firm to perform work activities for your company if that company can do it more productively than you can?
A) theory of competitive advantage
B) theory of core competencies
C) theory of comparative advantage
D) theory of outsourcing
E) theory of offshoring
Answer: C
Diff: 2
Key Term: Theory of comparative advantage
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

11) Which of the following statements is most accurate?
A) Nearly all outsourcing relationships do not last beyond two years.
B) Nearly all U.S. firms that outsourced processes to India have backsourced them.
C) Approximately half of all outsourcing agreements fail.
D) Outsourcing is a relatively risk-free activity.
E) More than 90% of outsourcing agreements succeed.
Answer: C
Diff: 2
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

12) Which of the following is not an advantage of outsourcing?
A) cost savings
B) gaining outside expertise
C) improving operations and service
D) outsourcing core competencies
E) accessing outside technology
Answer: D
Diff: 1
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

13) Advantages of outsourcing do NOT include:
A) cost savings.
B) gaining outside expertise.
C) maintaining a focus on core competencies.
D) accessing outside technology.
E) potential creation of future competition.
Answer: E
Diff: 1
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

14) An operations manager is performing a factor-rating analysis to help her choose an outsourcing provider. She is focusing on three factors: A, B, and C, with weights of .50, .20, and .30, respectively. She has scored one potential outsourcer, Ling Services, on each of the factors using a scale of 10-50. Ling Services received a score of 30 for factor A, 46 for factor B, and 22 for factor C. What is the factor-rating score for Ling Services?
A) 98.0
B) 32.7
C) 21.8
D) 29.2
E) 30.8
Answer: E
Diff: 2
AACSB: Analytic skills
Objective: LO4
Learning Outcome: Discuss the influences of the global competitive environment on operations management

15) An operations manager is performing a factor-rating analysis to help him choose an outsourcing provider. He is focusing on two factors: A and B, using a weight of 75% for factor A and 25% for factor B. He has scored five different potential providers on both factors, using a scale of 1-5, with 1 representing the BEST score. Based on the scores provided in the table below, which provider should be chosen?

Provider	Factor A	Factor B
Alpha	1	5
Beta	3	3
Gamma	4	1
Phi	2	1
Omega	3	5

A) Alpha
B) Beta
C) Gamma
D) Phi
E) Omega
Answer: D
Diff: 2
AACSB: Analytic skills
Objective: LO4
Learning Outcome: Discuss the influences of the global competitive environment on operations management

16) _____ is the practice of transferring a firm's activities that have traditionally been internal to external suppliers.
Answer: Outsourcing
Diff: 2
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

17) Outsourcing manufacturing is also known as _____.
Answer: contract manufacturing
Diff: 2
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

18) Outsourcing is an extension of the long-standing practice of _____ production activities.
Answer: subcontracting
Diff: 2
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

19) The theory of _____ implies that you should allow another firm to perform work activities for your company if that company can do it more productively than you can.
Answer: comparative advantage
Diff: 2
Key Term: Theory of comparative advantage
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

20) Identify three factors fueling the continuing growth of outsourcing.
Answer: (1) increased technological expertise, (2) more reliable and cheaper transportation, and (3) the rapid development and deployment of advancements in telecommunications and computers.
Diff: 3
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

21) Identify five main advantages of outsourcing.
Answer: (1) cost savings, (2) gaining outside expertise, (3) improving operations and service, (4) maintaining a focus on core competencies, and (5) accessing outside technology
Diff: 2
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

22) Identify five main disadvantages of outsourcing.
Answer: (1) increased logistics and inventory costs, (2) loss of control (quality, delivery, etc.), (3) potential creation of future competition, (4) negative impact on employees, and (5) risks may not manifest themselves for years
Diff: 2
Key Term: Outsourcing
AACSB: Dynamics of the global economy
Learning Outcome: Discuss the influences of the global competitive environment on operations management

23) A company is choosing an outside firm to provide its payroll services. It has chosen four comparative categories of interest: client reviews, financial condition, IT capabilities, and government stability. These categories have been assigned weights of 30%, 10%, 20%, and 40%, respectively. Three potential providers were scored on each of those factors (see table below) using a scale of 1-10, with a score of 1 meaning worst possible and 10 meaning best possible. Using the factor-rating method, which provider should be chosen?

	Provider A	Provider B	Provider C
Client reviews	2	6	10
Financial condition	8	4	2
IT capabilities	5	8	2
Government stability	3	1	2

Answer: Provider A: 2(.3) + 8(.1) + 5(.2) + 3(.4) = 3.6
Provider B: 6(.3) + 4(.1) + 8(.2) + 1(.4) = 4.2
Provider C: 10(.3) + 2(.1) + 2(.2) + 2(.4) = 4.4
Since a high score implies best performance in this problem, Provider C should be chosen.
Diff: 2
AACSB: Analytic skills
Objective: LO4
Learning Outcome: Discuss the influences of the global competitive environment on operations management

24) A company is deciding between 2 foreign firms to provide its call center services. A factor-rating method is used. Factors are rated on a scale of 1-10, with 10 being the best score.
A: If the factors are weighted equally (respective weights of .3333), which firm is preferred?
B: Suppose a consultant recommended that Factor 2 be twice as important as Factor 1, while Factor 3 should be four times as important as Factor 1. Which firm is best now using a weighted method? (Round your weights to the nearest four decimal places.)

Firm	Factor 1	Factor 2	Factor 3
A	10	7	4
B	5	8	6

Answer: A: Firm A = 10(.3333) + 7(.3333) + 4 (.3333) = 7.00 , Firm B = 5(.3333) + 8(.3333) + 6(.3333) = 6.33, so Firm A is preferred
B: To find the new weights, let X = weight of Factor 1. Then 100% = X + 2X + 4X, or 1 = 7X, or X = .1429. Thus, Factor 1 has a weight of 14.29%, Factor 2 has a weight of 2(14.29%) = 28.58%, and Factor 3 has a weight of 4(14.29%) = 57.16%.
The scores are: Firm A = 10(.1429) + 7(.2858)+ 4(.5716) = 5.72. Firm B = 5(.1429) + 8(.2858) + 6(.5716) = 6.43, so Firm B is preferred.
Diff: 2
AACSB: Analytic skills
Objective: LO4
Learning Outcome: Discuss the influences of the global competitive environment on operations management

Section 7   Global Operations Strategy Options

1) A multinational corporation is a firm with extensive international business involvement.
Answer: TRUE
Diff: 1
Key Term: Multinational corporation (MNC)
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

2) The multidomestic OM strategy maximizes local responsiveness while achieving a significant cost advantage.
Answer: FALSE
Diff: 2
Key Term: Multidomestic strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

3) Firms using the global strategy can be thought of as "world companies."
Answer: FALSE
Diff: 2
Key Term: Global strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

4) Which of the international operations strategies involves high cost reductions and high local responsiveness?
A) international strategy
B) global strategy
C) transnational strategy
D) multidomestic strategy
E) worldwide strategy
Answer: C
Diff: 2
Key Term: Transnational strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

5) Which of the international operations strategies involves low cost reductions and low local responsiveness?
A) international strategy
B) global strategy
C) transnational strategy
D) multidomestic strategy
E) worldwide strategy
Answer: A
Diff: 2
Key Term: International strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

6) Which of the international operations strategies uses import/export or licensing of existing products?
A) international strategy
B) global strategy
C) transnational strategy
D) multidomestic strategy
E) worldwide strategy
Answer: A
Diff: 2
Key Term: International strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

7) Which of the international operations strategies uses the existing domestic model globally?
A) international strategy
B) global strategy
C) transnational strategy
D) multidomestic strategy
E) worldwide strategy
Answer: D
Diff: 2
Key Term: Multidomestic strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

8) The acronym **MNC** stands for
A) Mexican National Committee (for international trade)
B) Maquiladora Negates Competition
C) Maytag-Nestlé Corporation
D) Multinational Corporation
E) Maritime Navigation Company
Answer: D
Diff: 1
Key Term: Multinational corporation (MNC)
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

9) Caterpillar and Texas Instruments are two firms that have benefited from the use of:
A) the multidomestic strategy option.
B) the international strategy option.
C) the transnational strategy option.
D) the maquiladora system in Europe.
E) the global strategy option.
Answer: E
Diff: 2
Key Term: Global strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

10) A(n) _____ is a firm that has extensive involvement in international business, owning or controlling facilities in more than one country.
Answer: multinational corporation (MNC)
Diff: 2
Key Term: Multinational corporation (MNC)
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

11) The _____ strategy utilizes a standardized product across countries.
Answer: global
Diff: 2
Key Term: Global strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

12) The _____ strategy uses exports and licenses to penetrate globally.
Answer: international
Diff: 2
Key Term: International strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

13) The _____ strategy uses subsidiaries, franchises, or joint ventures with substantial independence.
Answer: multidomestic
Diff: 2
Key Term: Multidomestic strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

14) The _____ strategy describes a condition in which material, people, and ideas cross or transgress national boundaries.
Answer: transnational
Diff: 2
Key Term: Transnational strategy
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

15) Identify and explain the four basic global operations strategies. Give an example of each strategy.
Answer: The *multidomestic strategy* decentralizes operating decisions to each country to enhance local responsiveness. An example is Heinz. The *global strategy* centralizes operating decisions, with headquarters coordinating the standardization and learning between facilities. The textbook names Texas Instruments and Caterpillar. The *international strategy* uses exports and licenses to penetrate the global markets. Harley-Davidson is an example. The *transnational strategy* exploits the economies of scale and learning, as well as pressure for responsiveness, by recognizing that core competence does not reside in just the "home" country, but can exist anywhere in the organization. An example is Coca-Cola.
Diff: 3
AACSB: Dynamics of the global economy
Objective: LO5
Learning Outcome: Discuss the influences of the global competitive environment on operations management

Operations Management, 11e, Global Edition (Heizer/Render)
Module A Decision Modeling

Section 1   The Decision Process in Operations

1) Analytic decision making is based on logic and considers all available data and possible alternatives.
Answer: TRUE
Diff: 1

2) The last step in the analytic decision process is to clearly define the problem and the factors that influence it.
Answer: FALSE
Diff: 1

3) Which of the following is NOT considered a step in the decision-making process?
A) Clearly define the problem and the factors that influence it.
B) Select the best alternative.
C) Develop specific and measurable objectives.
D) Evaluate each alternative solution based on its merits and drawbacks.
E) Minimize costs whenever possible.
Answer: E
Diff: 2

4) The first step, and a key element, in the decision-making process is to:
A) consult a specialist.
B) clearly define the problem.
C) develop objectives.
D) monitor the results.
E) select the best alternative.
Answer: B
Diff: 1

5) The last step of the decision-making process is to:
A) develop a model.
B) evaluate each alternative.
C) select the best alternative.
D) implement the decision.
E) check the decision with senior management.
Answer: D
Diff: 2

6) Identify, in order, the six steps of analytical decision making.
Answer:
1. Clearly define the problem and factors that influence it.
2. Develop specific and measurable objectives.
3. Develop a model—that is, a relationship between objectives and variables (which are measurable quantities).
4. Evaluate each alternative solution based on its merits and drawbacks.
5. Select the best alternative.
6. Implement the decision and set a timetable for completion.
Diff: 3

Section 2   Fundamentals of Decision Making

1) A state of nature is an occurrence or a situation over which the decision maker has little or no control.
Answer: TRUE
Diff: 1
Objective: LO1

2) In a decision tree, a square symbol represents a state of nature node.
Answer: FALSE
Diff: 2
Objective: LO1

3) A square node on a decision tree infers that:
A) the node splits into various states of nature, of which only one will occur.
B) there are several alternatives available.
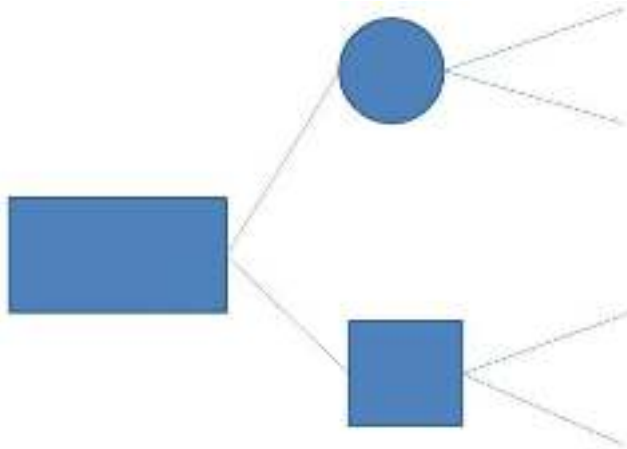C) the manager must choose an alternative.
D) Both B and C
E) A, B, and C
Answer: D
Diff: 2
AACSB: Reflective thinking skills
Objective: LO1

4) The following decision tree has how many state of nature nodes?

A) 0
B) 1
C) 2
D) 3
E) 4
Answer: B
Diff: 2
Objective: LO1

5) In terms of decision theory, an occurrence or situation over which the decision maker has no control is called a(n):
A) decision under uncertainty.
B) decision tree.
C) state of nature.
D) alternative.
E) EMV.
Answer: C
Diff: 2
Objective: LO1

6) A(n) _____ is an occurrence or situation over which the decision maker has little or no control.
Answer: state of nature
Diff: 1
Objective: LO1

7) The square symbol used in drawing a decision trees represents a(n) _____ node.
Answer: decision
Diff: 1
Key Term: Decision tree
Objective: LO1

8) In the context of decision-making, define a state of nature.
Answer: A state of nature is an occurrence or situation over which the decision maker has little or no control.
Diff: 2
Objective: LO1

9) In the context of decision making, define an alternative.
Answer: An alternative is a course of action or strategy that may be chosen by a decision maker.
Diff: 2
Objective: LO1

10) Explain the symbols used in decision tree analysis.
Answer: A decision node from which one or several alternatives may be selected is represented by a square; a state of nature node out of which states of nature will occur is represented by a circle.
Diff: 2
Objective: LO1

Section 3   Decision Tables

1) An example of a conditional value would be the payoff from selecting a particular alternative when a particular state of nature occurs.
Answer: TRUE
Diff: 2
Objective: LO2

2) What is a tabular presentation that shows the outcome for each decision alternative under the various possible states of nature called?
A) isoquant table
B) payback period matrix
C) payoff table
D) feasible region
E) decision tree
Answer: C
Diff: 1
Key Term: Decision table
Objective: LO2

3) What is the outcome of an alternative/state of nature combination called?
A) price
B) conditional value
C) expected value
D) conditional probability
E) conditional expectation
Answer: B
Diff: 2
Objective: LO2

4) Doing nothing would yield how much profit if favorable market conditions prevail according to the following profit decision table?

Alternative	Favorable market	Unfavorable Market
Do Nothing	$20,000	-$10,000

A) $5,000
B) $20,000
C) -$10,000
D) $0
E) $10,000
Answer: B
Diff: 1
Key Term: Decision table
Objective: LO2

5) A retailer is deciding how many units of a certain product to stock. The historical probability distribution of sales for this product is 0 units, 0.2; 1 unit, 0.3; 2 units, 0.4, and 3 units, 0.1. The product costs $8 per unit and sells for $25 per unit. What is the conditional value for the decision alternative "Stock 3" and state of nature "Sell 1"?
A) 1.4 units
B) $1 profit
C) $25 profit
D) $-8 profit
E) $23.80 profit
Answer: B
Diff: 2
AACSB: Analytic skills
Objective: LO2

6) A retailer is deciding how many units of a certain product to stock. The historical probability distribution of sales for this product is 0 units, 0.2; 1 unit, 0.3; 2 units, 0.4, and 3 units, 0.1. The product costs $8 per unit and sells for $25 per unit. What is the largest conditional value (profit) in the entire payoff table for this scenario?
A) $-24 profit
B) $-8 profit
C) $17 profit
D) $51 profit
E) $75 profit
Answer: D
Diff: 2
Key Term: Decision table
AACSB: Analytic skills
Objective: LO2

7) A(n) _____ is a tabular means of analyzing decision alternatives and states of nature.
Answer: decision table
Diff: 1
Key Term: Decision table
Objective: LO2

8) What are decision tables?
Answer: Decision tables are a tabular means of analyzing decision alternatives and states of nature.
Diff: 2
Key Term: Decision table
Objective: LO2

9) What is a conditional value?
Answer: It is an outcome of a particular alternative/state of nature combination.
Diff: 2
Objective: LO2

Section 4   Types of Decision-Making Environments

1) If a decision maker can assign probabilities of occurrences to the states of nature, then the decision-making environment is Decision Making under Uncertainty.
Answer: FALSE
Diff: 2
Objective: LO3

2) The maximax criterion of decision making requires that all decision alternatives have an equal probability of occurrence.
Answer: FALSE
Diff: 2
Key Term: Maximax
Objective: LO3

3) The maximin criterion is pessimistic, while the maximax criterion is optimistic.
Answer: TRUE
Diff: 1

4) If a decision maker knows for sure which state of nature will occur, he/she is making a decision under certainty.
Answer: TRUE
Diff: 2
Objective: LO3

5) The expected value with perfect information assumes that all states of nature are equally likely.
Answer: FALSE
Diff: 1
Key Term: Expected value with perfect information (EVwPI)
Objective: LO3

6) An example of expected monetary value would be the payoff from selecting a particular alternative when a particular state of nature occurs.
Answer: FALSE
Diff: 2
Key Term: Expected monetary value (EMV)
Objective: LO4

7) The expected monetary value of a decision alternative is the sum of all possible payoffs from the alternative, each weighted by the probability of that payoff occurring.
Answer: TRUE
Diff: 1
Key Term: Expected monetary value (EMV)
Objective: LO4

8) If a decision maker has to make a particular decision only once, expected monetary value is a good indication of the payoff associated with the decision.
Answer: FALSE
Diff: 3
Key Term: Expected monetary value (EMV)
AACSB: Reflective thinking skills
Objective: LO4

9) The expected value of perfect information is the same as the expected value with perfect information.
Answer: FALSE
Diff: 2
Objective: LO5

10) What decision criterion would be used by an optimistic decision maker solving a problem under conditions of uncertainty?
A) expected monetary value
B) equally likely
C) maximax
D) maximin
E) minimin
Answer: C
Diff: 2
Key Term: Maximax

11) A decision maker who uses the maximin criterion when solving a problem under conditions of uncertainty is:
A) an optimist.
B) a pessimist.
C) an economist.
D) an optometrist.
E) making a serious mistake; maximin is not appropriate for conditions of uncertainty.
Answer: B
Diff: 2
Key Term: Maximin

12) Expected monetary value is most appropriate for problem solving that takes place:
A) when conditions are average.
B) when all states of nature are equally likely.
C) when all alternatives are equally likely.
D) under conditions of uncertainty.
E) under conditions of risk.
Answer: E
Diff: 2
Key Term: Expected monetary value (EMV)
Objective: LO3

13) There are three equally likely states of nature (High, Medium, and Low demand). If the large factory will post profits of $50,000, $25,000, and - $10,000 under these states of nature, respectively, what is the EMV of the factory?
A) $50,000
B) $25,000
C) $28,333.33
D) $21,666.67
E) $65,000
Answer: D
Diff: 2
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

14) A plant manager wants to know how much he should be willing to pay for perfect market research. Currently there are two states of nature facing his decision to expand or do nothing. Under favorable market conditions the manager would make $100,000 for the large plant and $5,000 for the small plant. Under unfavorable market conditions the large plant would lose $50,000 and the small plant would make $0. If the two states of nature are equally likely, how much should he pay for perfect information?
A) $0
B) $25,000
C) $50,000
D) $100,000
E) $145,000
Answer: B
Diff: 2
Key Term: Expected value of perfect information (EVPI)
AACSB: Analytic skills
Objective: LO5

15) The expected value with perfect information:
A) equals EVPI - Maximum EMV.
B) requires that each decision alternative have a known probability of occurrence.
C) is an input into the calculation of the expected value of perfect information.
D) is the average of the maximax and the maximin.
E) none of the above
Answer: C
Diff: 2
Key Term: Expected value with perfect information (EVwPI)
Objective: LO5

16) What is the difference between the expected payoff under perfect information and the maximum expected payoff under risk?
A) expected monetary value
B) economic order quantity
C) expected value of perfect information
D) PERT
E) expected monetary payoff
Answer: C
Diff: 2
Key Term: Expected value of perfect information (EVPI)
Objective: LO5

17) The likelihood that a decision maker will ever receive a payoff precisely equal to the EMV when making any one decision is:
A) low (near 0%).
B) high (near 100%).
C) dependent upon the number of alternatives.
D) dependent upon the number of states of nature.
E) none of the above
Answer: A
Diff: 2
Key Term: Expected monetary value (EMV)
AACSB: Reflective thinking skills
Objective: LO4

18) The expected value of perfect information (EVPI) is the:
A) payoff for a decision made under perfect information.
B) payoff under minimum risk.
C) average expected payoff.
D) difference between the payoff under perfect information and the payoff under risk.
E) greater of EVwPI and Maximum EMV.
Answer: D
Diff: 2
Key Term: Expected value of perfect information (EVPI)
Objective: LO5

19) A decision maker using the maximax criterion on the problem below would choose Alternative
_____ because the maximum of the row maximums is _____.

	States of Nature		
	1	2	3
Alternative A	50	55	60
Alternative B	30	50	80
Alternative C	70	80	70
Alternative D	-100	-10	140

A) A; 60
B) B; 80
C) C; 70
D) D; -100
E) D; 140
Answer: E
Diff: 2
Key Term: Maximax
AACSB: Analytic skills

20) A decision maker using the maximin criterion on the problem below would choose Alternative
_____ because the maximum of the row minimums is _____.

	States of Nature		
	1	2	3
Alternative A	50	55	60
Alternative B	30	50	80
Alternative C	70	80	70
Alternative D	-100	-10	140

A) A; 55
B) B; 30
C) C; 70
D) D; 140
E) D; 10
Answer: C
Diff: 2
Key Term: Maximin
AACSB: Analytic skills

21) For the following decision table, the highest value for the equally likely criterion is _____; this occurs with alternative _____.

Alternatives	States of Nature	
	S_1	S_2
Option 1	$10,000	$30,000
Option 2	$5,000	$45,000
Option 3	$-4,000	$60,000

A) $20,000; Option 1
B) $25,000; Option 2
C) $28,000; Option 3
D) $32,000; Option 3
E) $60,000; Option 3
Answer: C
Diff: 2
Key Term: Equally likely
AACSB: Analytic skills

22) What is the EMV for Option 1 in the following decision table?

Alternatives	States of Nature	
	S_1	S_2
p	.3	.7
Option 1	15,000	20,000
Option 2	10,000	30,000

A) 15,000
B) 17,000
C) 17,500
D) 18,500
E) 20,000
Answer: D
Diff: 2
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

23) The expected value with perfect information is:
A) the maximum EMV for a set of alternatives.
B) the same as the expected value of perfect information.
C) the difference between the payoff under perfect information and the payoff under risk.
D) the expected return obtained when the decision maker knows which state of nature is going to occur before the decision is made.
E) obtained using conditional probabilities.
Answer: D
Diff: 2
Key Term: Expected value with perfect information (EVwPI)
Objective: LO5

24) What is the EMV for Option 2 in the following decision table?

	States of Nature	
Alternatives	S_1	S_2
p	.3	.7
Option 1	15,000	20,000
Option 2	10,000	30,000

A) 10,000
B) 16,000
C) 20,000
D) 24,000
E) 30,000
Answer: D
Diff: 2
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

25) What is the EMV for Option 1 in the following decision table?

Alternatives	States of Nature	
	S_1	S_2
p	.4	.6
Option 1	10,000	30,000
Option 2	5,000	45,000
Option 3	-4,000	60,000

A) 10,000
B) 18,000
C) 20,000
D) 22,000
E) 30,000
Answer: D
Diff: 2
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

26) What is the EMV for Option 2 in the following decision table?

Alternatives	States of Nature	
	S_1	S_2
p	.4	.6
Option 1	10,000	30,000
Option 2	5,000	45,000
Option 3	-4,000	60,000

A) 5,000
B) 21,000
C) 25,000
D) 29,000
E) 45,000
Answer: D
Diff: 2
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

27) What is the expected value with perfect information of the following decision table?

	States of Nature	
Alternatives	S_1	S_2
p	.4	.6
Option 1	10,000	30,000
Option 2	5,000	45,000
Option 3	-4,000	60,000

A) 5,000
B) 10,000
C) 40,000
D) 60,000
E) 70,000
Answer: C
Diff: 2
Key Term: Expected value with perfect information (EVwPI)
AACSB: Analytic skills
Objective: LO5

28) What is the EMV for Option 1 in the following decision table?

	States of Nature	
Alternatives	S_1	S_2
p	.6	.4
Option 1	200	300
Option 2	50	350

A) 200
B) 240
C) 250
D) 260
E) 300
Answer: B
Diff: 2
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

29) What is the EMV for Option 2 in the following decision table?

	States of Nature	
Alternatives	S_1	S_2
p	.6	.4
Option 1	200	300
Option 2	50	350

A) 50
B) 100
C) 170
D) 200
E) 350
Answer: C
Diff: 2
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

30) What is the expected value with perfect information in the following decision table?

	States of Nature	
Alternatives	S_1	S_2
p	.6	.4
Option 1	200	300
Option 2	50	350

A) 50
B) 200
C) 260
D) 300
E) 350
Answer: C
Diff: 2
Key Term: Expected value with perfect information (EVwPI)
AACSB: Analytic skills
Objective: LO5

31) What is the expected value of perfect information of the following decision table?

Alternatives	States of Nature	
	S_1	S_2
p	.6	.4
Option 1	200	300
Option 2	50	350

A) 0
B) 20
C) 50
D) 150
E) 200
Answer: B
Diff: 3
Key Term: Expected value of perfect information (EVPI)
AACSB: Analytic skills
Objective: LO5

32) _____ is the criterion for decision making under uncertainty that finds an alternative that maximizes the minimum outcome.
Answer: Maximin
Diff: 2
Key Term: Maximin

33) _____ is the criterion for decision making under uncertainty that assigns equal probability to each state of nature.
Answer: Equally likely
Diff: 2
Key Term: Equally likely

34) _____ is the expected payout or value of a variable that has different possible states of nature, each with an associated probability.
Answer: Expected monetary value or EMV
Diff: 2
Key Term: Expected monetary value (EMV)
Objective: LO4

35) _____ is the difference between the payoff under perfect information and the payoff under risk.
Answer: Expected value of perfect information or EVPI
Diff: 2
Key Term: Expected value of perfect information (EVPI)
Objective: LO5

36) How is the expected value of perfect information (EVPI) found?
Answer: It is found by taking the expected value with perfect information and subtracting the maximum expected monetary value (EMV) from it.
Diff: 2
Key Term: Expected value of perfect information (EVPI)
Objective: LO5

37) Identify and describe three methods used for decision making under conditions of uncertainty.
Answer:
(1) Maximax is a criterion that finds an alternative that maximizes the maximum outcome.
(2) Maximin is a criterion that finds an alternative that maximizes the minimum outcome.
(3) Equally likely is a criterion that assigns equal likelihood to each state of nature.
Diff: 2

38) Which decision rule under uncertainty results in an optimistic decision? Why?
Answer: Maximax, because it locates the alternative with the highest possible gain (assumes the best state of nature will occur).
Diff: 1
Key Term: Maximax

39) If a decision maker is a pessimist, what decision-making criterion is appropriate? Why?
Answer: Maximin assumes that the worst state of nature will happen. This decision making criterion selects the best of all possible worst outcomes.
Diff: 1
Key Term: Maximin

40) Define expected monetary value (EMV).
Answer: EMV is the expected value or mean return for an alternative if we were to repeat the decision a large number of times, each time choosing that alternative.
Diff: 2
Key Term: Expected monetary value (EMV)
Objective: LO4

41) Describe the meaning of EVPI.
Answer: EVPI is defined as the expected value of perfect information. It is found by taking the expected value with perfect information and subtracting the maximum expected monetary value (EMV) from it, and it is the maximum amount that we would be willing to pay for additional (perhaps, perfect) information.
Diff: 2
Key Term: Expected value of perfect information (EVPI)
Objective: LO5

42) The construction manager for Acme Construction, Inc. must decide whether to build single family homes, apartments, or condominiums. This is not a product-mix problem, but an all-or-nothing decision. He will hire workers and rent equipment appropriate for one action only. He estimates annual profits (in thousands of dollars) will vary with population trends as follows:

Dwelling type	Population steady	Population grows slowly	Population grows rapidly
Single family	$100	$90	$70
Apartments	50	170	90
Condominiums	-20	100	220

a.   If he uses the maximin criterion, which type of dwellings will he choose to build? Show your supporting calculations.
b.   If he uses the equally likely criterion, which kind of dwellings will he choose to build? Show your supporting calculations.
c.   If the construction manager were an optimist, what criterion would he choose? What would be the choice of dwelling for that criterion? Show your supporting calculations.
Answer:
(a) The pessimistic maximin criterion assumes the worst state of nature will occur and selects the action associated with the best of these worst outcomes. For this problem, the "worsts" for each action are Single family = $70, Apartments = $50, and Condominiums = -20. The best of the worsts is $70, so the manager should choose to build single family homes.
(b) The equally likely criterion calculates the simple average of each action; the results are Single family = $86.7, Apartments = $103.3, and Condominiums = $100. The manager should select the action associated with the largest of these values, and build apartments.
(c) The optimistic criterion is maximax, which assumes that the best outcome will occur for each action. The best outcomes are Single family = $100, Apartments = $170, and Condominiums = $220. The manager chooses the action associated with the best of the bests, or Condominiums.
Diff: 2
AACSB: Analytic skills

43) An operations manager's staff has compiled the information below for four manufacturing alternatives (A, B, C, and D) that vary by production technology and the capacity of the machinery. All choices enable the same level of total production and have the same lifetime. The four states of nature represent four levels of consumer acceptance of the firm's products. Values in the table are net present value of future profits in millions of dollars.

	States of Nature			
	1	2	3	4
Alternative A	50	55	60	65
Alternative B	30	50	80	130
Alternative C	70	80	70	65
Alternative D	-100	-10	150	220

a. Assuming a maximax strategy, which alternative would be chosen?
b. If maximin were used, which would be chosen?
c. If the states of nature were equally likely, which alternative should be chosen?

Answer: (a) The maximax strategy selects the best of the best, which is $220. This happens when Alternative D is selected. (b) The maximin strategy selects the best of the worsts; the worsts are A = 50, B = 30, C = 65, and D = -100. The best of these is 65, associated with Alternative C. (c) The averages for the four alternatives are A = 57.5, B = 72.5, C = 71.25, and D = 65. The highest of these is 72.5, associated with Alternative B.

Diff: 2

AACSB: Analytic skills

44) An operations manager's staff has compiled the information below for four manufacturing alternatives (E, F, G, and H) that vary by production technology and the capacity of the machinery. All choices enable the same level of total production and have the same lifetime. The four states of nature represent four levels of consumer acceptance of the firm's products. Values in the table are net present value of future profits in millions of dollars. Forecasts indicate that there is a 0.1 probability of acceptance level 1, 0.2 chance of acceptance level 2, 0.4 chance of acceptance level 3, and 0.3 change of acceptance level 4.

	States of Nature			
	1	2	3	4
Alternative E	50	50	70	60
Alternative F	30	50	80	130
Alternative G	70	80	70	60
Alternative H	-140	-10	150	220

Using the criterion of expected monetary value, which production alternative should be chosen?
Answer: The expected values are:
E = .1(50) + .2(50) + .4(70) + .3(60) = 5 + 10 + 28 + 18 = 61
F = .1(30) + .2(50) + .4(80) + .3(130) = 3 + 10 + 32 + 39 = 84
G = .1(70) + .2(80) + .4(70) + .3(60) = 7 + 16 + 28 + 18 = 69
H = .1(-140) + .2(-10) + .4(150) + .3(220) = -14 -2 + 60 + 66 = 110
The highest of these occurs with production alternative H.
Diff: 3
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

45) A toy manufacturer has three different mechanisms that can be installed in a doll that it sells. The different mechanisms have three different setup costs (overheads) and variable costs and, therefore, the profit from the dolls is dependent on the volume of sales. The anticipated payoffs are as follows.

	Light Demand	Moderate Demand	Heavy Demand
Probability	0.25	0.45	0.3
Wind-up action	$325,000	$190,000	$170,000
Pneumatic action	$300,000	$420,000	$400,000
Electrical action	-$400,000	$240,000	$800,000

a. What is the EMV of each decision alternative?
b. Which action should be selected?
c. What is the expected value with perfect information?
d. What is the expected value of perfect information?
Answer: (a) Wind-up = .25($325,000) + .45($190,000) + .3($170,000) = $217,750; Pneumatic = .25($300,000) + .45($420,000) + .3($400,000) = $384,000; and Electrical = .25(-$400,000) + .45($240,000) + .3($800,000) = $248,000. (b) Pneumatic has the best EMV, at $384,000. (c) EVwPI is .25($325,000) + .45($420,000) + .3($800,000) = $510,250; (d) EVPI = $510,250 - $384,000 = $126,250.
Diff: 3
AACSB: Analytic skills
Objective: LO5

46) Steve Gentry, the operations manager of Baja Fabricators, wants to purchase a new profiling machine (it cuts compound angles on the ends of large structural pipes used in the fabrication yard). However, because the price of crude oil is depressed, the market for such equipment is down. Steve believes that the market will improve in the near future and that the company should expand its capacity. The table below displays the three equipment options he is currently considering, and the profit he expects each one to yield over a two-year period. The consensus forecast at Baja is that there is about a 30% probability that the market will pick up "soon" (within 3 to 6 months) and a 70% probability that the improvement will come "later" (in 9 to 12 months, perhaps longer).

	Profit from Capacity Investment (in Dollars)	
	Market picks up "soon"	Market picks up "later"
Equipment Option	p = 0.30	p = 0.70
Manual Machine	-120,000	210,000
NC Machine	140,000	160,000
CNC Machine	200,000	-200,000

a. Calculate the expected monetary value of each decision alternative.
b. Which equipment option should Steve take?
Answer: (a) The expected monetary values are: "Manual machine" $111,000, "NC Machine" $154,000, and "CNC Machine" -$80,000. (b) Based upon the EMV criterion, Baja should purchase an NC machine.
Diff: 2
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

47) Miles is considering buying a new pickup truck for his lawn service firm. The economy in town seems to be growing, and he is wondering whether he should opt for a subcompact, compact, or full-size pickup truck. The smaller truck would have better fuel economy, but would sacrifice capacity and some durability. A friend at the Bureau of Economic Research told him that there is a 30% chance of lower gas prices in his area this year, a 20% chance of higher gas prices, and a 50% chance that gas prices will stay roughly unchanged. Based on this information, Miles has developed a decision table that indicates the profit amount he would end up with after a year for each combination of truck and gas prices.

Alternatives	States of Nature		
	Lower gas prices	Gas prices unchanged	Higher gas prices
Probability	.3	.5	.2
Subcompact	$16,000	$21,000	$23,000
Compact	$15,000	$20,000	$22,000
Full size	$18,000	$19,000	$6,000

Calculate the expected monetary value for each decision alternative. Which decision yields the highest EMV?
Answer: The expected values are: subcompact $19,900, compact $18,900, and full size $16,100. The highest EMV is that of the subcompact truck.
Diff: 2
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

48) Earl Shell owns his own Sno-Cone business and lives 30 miles from a beach resort. The sale of Sno-Cones is highly dependent upon his location and upon the weather. At the resort, he will profit $110 per day in fair weather, $20 per day in foul weather. At home, he will profit $70 in fair weather, $50 in foul weather. Assume that on any particular day, the weather service suggests a 60% chance of fair weather.
a. Construct Earl's payoff table.
b. What decision is recommended by the expected monetary value criterion?
c. What is the EVPI?
Answer:
(a)The payoff table is

Profit	Fair weather	Foul weather
	Probability = 0.6	Probability = .4
Sell at the resort	110	20
Sell at home	70	50

(b) the EMV for sell at the resort = .6(110) + .4(20) = 74; The EMV for sell at home = .6(70) + .3(50) = 62. The better value is $74, so Earl should sell at the resort.
(c) EVwPI = .6(110) + .4(50) = $86; EVPI = $86 - $74 = $12.
Diff: 3
AACSB: Analytic skills
Objective: LO5

49) The campus bookstore sells stadium blankets embroidered with the university crest. The blankets must be purchased in bundles of one dozen each. Each blanket in the bundle costs $65, and will sell for $90. Blankets unsold by homecoming will be clearance priced at $20. The bookstore estimates that demand patterns will follow the table below.
a. Build the decision table.
b. What is the maximum expected monetary value?
c. How many bundles should be purchased?

Demand level	Probability
1 bundle	10 percent
2 bundles	30 percent
3 bundles	50 percent
4 bundles	10 percent

Answer:
(a) See the table below; (b) the maximum expected value is $516; (c) the bookstore should order 2 bundles.

Profit	Demand 1	Demand 2	Demand 3	Demand 4		EMV
Probability	0.1	0.3	0.5	0.1		
Order 1	300	300	300	300		300
Order 2	-240	600	600	600	Maximum	516
Order 3	-780	60	900	900		480
Order 4	-1320	-480	360	1200		24

Diff: 3
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

50) Daily sales of bread by Salvador Monella's Baking Company follow the historical pattern shown in the table below. It costs the bakery 50 cents to produce a loaf of bread, which sells for 95 cents. Any bread unsold at the end of the day is sold to the parish jail for 25 cents per loaf. Construct the decision table of conditional payoffs. How many loaves should Sal bake each day in order to maximize contribution?

Demand	400	500	600	700	800
Probability	.20	.20	.40	.15	.05

Answer: The Excel OM decision table and solution appear below. The best expected value is $228, which occurs with the decision to bake 600 loaves.

Profit	Sell 400	Sell 500	Sell 600	Sell 700	Sell 800		EMV
Probability	0.2	0.2	0.4	0.15	0.05		
Bake 400	180	180	180	180	180		180
Bake 500	155	225	225	225	225		211
Bake 600	130	200	270	270	270	Maximum	228
Bake 700	105	175	245	315	315		217
Bake 800	80	150	220	290	360		195.5

Diff: 3
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

51) The campus bookstore sells highlighters that it purchases by the case. Cost per case, including shipping and handling, is $200. Revenue per case is $350. Any cases unsold will be discounted and sold at $175. The bookstore has estimated that demand will follow the pattern below

Demand level	Probability
10 cases	20 percent
11 cases	20 percent
12 cases	40 percent
13 cases	15 percent
14 cases	5 percent

a. Construct the bookstore's payoff table.
b. How many cases should the bookstore stock in order to maximize expected profit?
c. How would your answer differ if the clearance price were not $175 per case but $225 per case? (It is not necessary to re-solve the problem to answer this.)
Answer: (a) The Excel OM table is below. (b) The highest EMV is 1705, from stocking 13 cases. (c) If the clearance price exceeds the case cost, there will be no disincentive to stocking the maximum demand level, 14 cases.

Profit	Demand 10	Demand 11	Demand 12	Demand 13	Demand 14		EMV
Probability	0.2	0.2	0.4	0.15	0.05		
Stock 10	1500	1500	1500	1500	1500		1500
Stock 11	1475	1650	1650	1650	1650		1615
Stock 12	1450	1625	1800	1800	1800		1695
Stock 13	1425	1600	1775	1950	1950	Maximum	1705
Stock 14	1400	1575	1750	1925	2100		1688.75

Diff: 3
Key Term: Expected monetary value (EMV)
AACSB: Analytic skills
Objective: LO4

52) The EMV of a decision with three states of nature is $33,000. If the profit/value under the states of nature A, B, and C is $10,000, $20,000, and $50,000, respectively, and states B and C have equal probabilities, determine the likelihood of state of nature A.

Answer:

Let Y = the probability of state of nature B (and C)

Then the probability of state of nature A = 1 - 2Y

EMV = 10,000(1 - 2Y) + 20,000Y + 50,000Y = 33,000

    70,000Y - 20,000Y = 23,000

    50,000Y = 23,000

    Y = .46

        likelihood of state of nature A = 1 - 2(.46) = .08 or 8%

Diff: 3

Key Term: Expected monetary value (EMV)

AACSB: Analytic skills

Objective: LO4

53) The EMV of a decision with three states of nature is $50. If the profit/value of A is 1/3 of B and B is 1/3 of C, determine the profit from A if all three states of nature are equally likely to occur.

Answer: The total payoff is simply the average of the three payoffs or 1/9 + 1/3 + 1 = 13/27 if the value of C is 1. Solving for 13/27*C = 50 gives C = $103.85. Thus A = $11.54.

Diff: 3

Key Term: Expected monetary value (EMV)

AACSB: Analytic skills

Objective: LO4

54) Suppose a manufacturing plant is considering three options for expansion. The first one is to expand into a new plant (large), the second to add on third-shift to the daily schedule (medium), and the third to do nothing (small) . There are three possibilities for demand. These are high, medium, and low with each having an equal likelihood of occurring. Suppose that the profits for the expansion plans are as follows (respective to high, medium, low demand). The large expansion profits are $100000, $10000, -$10000, the medium expansion choice $40000, $40000, $5000 and the small expansion choice $15000, $15000, $15000. Calculate the EMV of each choice. Which of the expansion plans should the manager choose?

Answer: EMV large expansion is .33(100000) + .33(10000) + .33(-10000) = $33,333.33

EMV medium expansion is .33(40000) + .33 (40000) + .33(5000) = $28,333.33

EMV small expansion is $15,000

The plant manager should choose the large expansion.

Diff: 2

Key Term: Expected monetary value (EMV)

AACSB: Analytic skills

Objective: LO4

Section 5   Decision Trees

1) Decision trees and decision tables can both solve problems requiring a single decision, but decision tables are the preferred method when a sequence of decisions is involved.

Answer: FALSE

Diff: 1

Objective: LO7

2) In a decision tree, the expected monetary values are computed by working from right to left.
Answer: TRUE
Diff: 2
Key Term: Decision tree
Objective: LO7

3) When solving decision trees, what phrase represents the act of dropping an alternative from consideration because it is less favorable than another available option?
A) cut the leaf
B) open the hatch
C) shake the tree
D) punt the ball
E) prune the branch
Answer: E
Diff: 2
Key Term: Decision tree
Objective: LO7

4) Decision trees:
A) give more accurate solutions than decision tables.
B) give less accurate solutions than decision tables.
C) are especially powerful when a sequence of decisions must be made.
D) are rarely used because one needs specialized software to graph them.
E) are too complex to be used by decision makers.
Answer: C
Diff: 2
Key Term: Decision tree
Objective: LO7

5) A decision tree is a(n):
A) algebraic representation of alternatives and states of nature.
B) behavioral representation of alternatives and states of nature.
C) matrix representation of alternatives and states of nature.
D) graphical representation of alternatives and states of nature.
E) tabular representation of alternatives and states of nature.
Answer: D
Diff: 1
Key Term: Decision tree
Objective: LO7

6) All EXCEPT which of the following steps are taken to analyze problems with decision trees?
A) Define the problem.
B) Structure or draw the decision tree.
C) Assign probabilities to the alternatives.
D) Estimate payoffs for each possible alternative/state of nature combination.
E) Solve the problem by computing expected monetary values for each state-of-nature node.
Answer: C
Diff: 2
Key Term: Decision tree
Objective: LO7

7) A primary advantage of decision trees compared to decision tables is that decision trees:
A) are more accurate.
B) are faster.
C) are smaller.
D) are cheaper.
E) can be used for sequential problems.
Answer: E
Diff: 2
Key Term: Decision tree
Objective: LO7

8) A problem that involves a sequence of decisions:
A) cannot be analyzed with expected monetary value.
B) can be better analyzed with a decision tree than by a decision table.
C) must be analyzed in the same order that the decisions are made.
D) cannot be analyzed with decision tree software.
E) can only be analyzed using decision making under certainty.
Answer: B
Diff: 2
Key Term: Decision tree
Objective: LO7

9) A(n) _____ is a graphical means of analyzing decision alternatives and states of nature.
Answer: decision tree
Diff: 1
Key Term: Decision tree
Objective: LO7

10) A branch of a decision tree that is less favorable than other available options may be _____.
Answer: pruned or dropped
Diff: 2
Key Term: Decision tree
Objective: LO7

11) What limitation(s) do decision trees overcome compared to decision tables?
Answer: Decision trees work better when a sequence of decisions must be made.
Diff: 2
Key Term: Decision tree
Objective: LO7

12) A toy manufacturer makes stuffed kittens and puppies that have relatively lifelike motions. There are three different mechanisms which can be installed in these "pets." These toys will sell for the same price regardless of the mechanism installed, but each mechanism has its own variable cost and setup cost. Profit, therefore, is dependent upon the choice of mechanism and upon the level of demand. The manufacturer has in hand a forecast of demand that suggests a 0.2 probability of light demand, a 0.45 probability of moderate demand, and a probability of 0.35 of heavy demand. Payoffs for each mechanism-demand combination appear in the table below.

Demand	Wind-up action	Pneumatic action	Electronic action
Light	$250,000	$90,000	-$100,000
Moderate	400,000	440,000	400,000
Heavy	650,000	740,000	780,000

Construct the appropriate decision tree to analyze this problem. Use standard symbols for the tree. Analyze the tree to select the optimal decision for the manufacturer.
Answer:
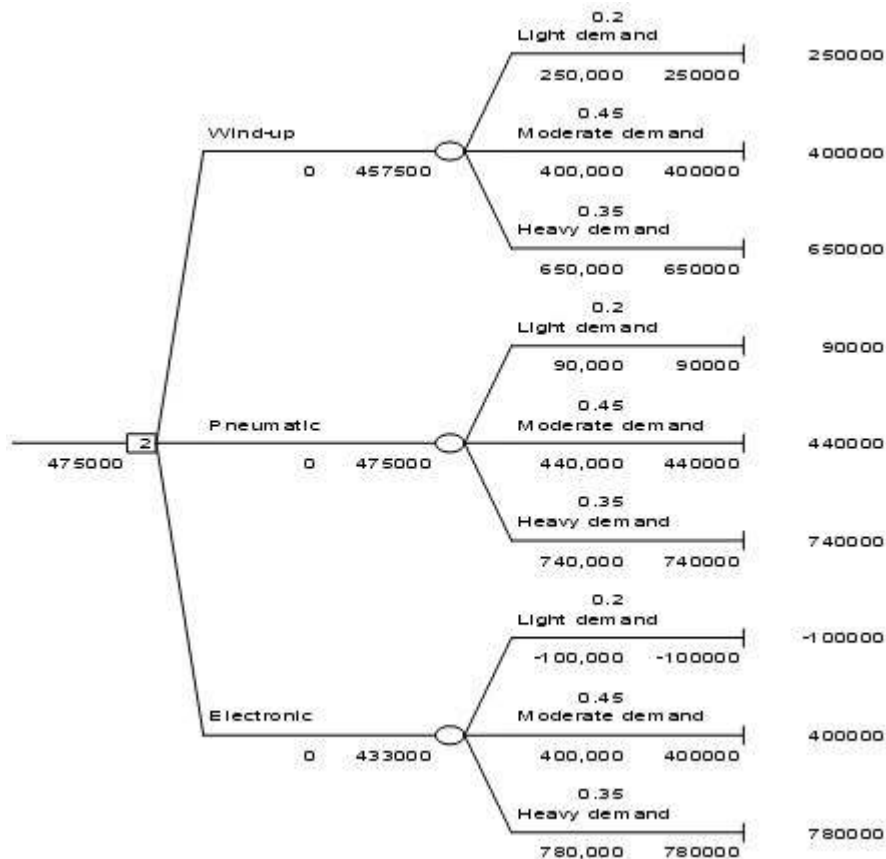
The best choice is Pneumatic, $475,000.
Diff: 3
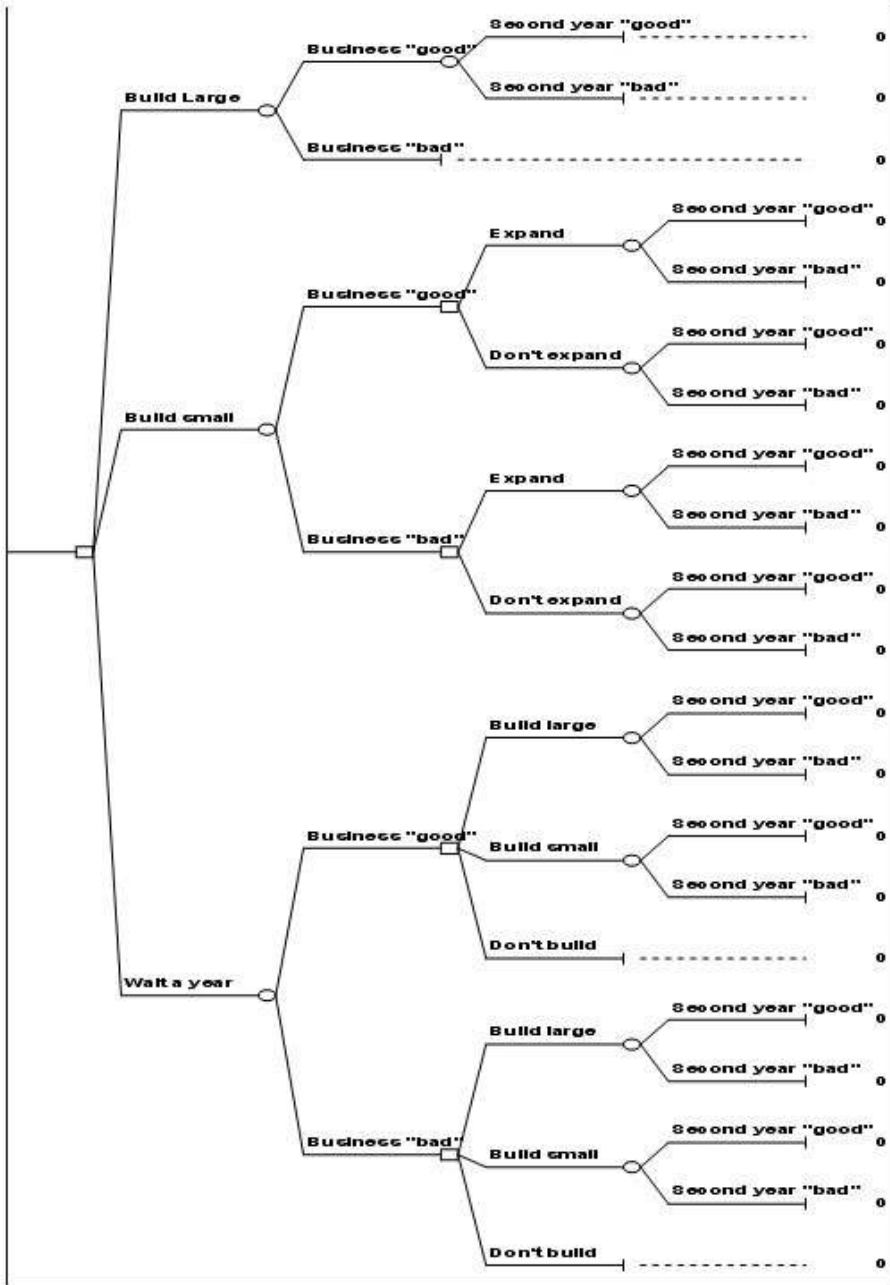Key Term: Decision tree
AACSB: Analytic skills
Objective: LO6

13) A local business owner is a bit uncertain of the demand forecast, and he is timidly approaching the capacity decision for a business he is about to open. Here's how he describes the decisions that confront him over the next two years.

"First, I have to choose between building a large plant initially and building a small one that has room to expand. Or I could rent now and decide whether to build next year. That one, too, could be the large version or the small. If I build small, then after one year, I can review how good business was, and decide whether to expand. If I build large, there is no further option to enlarge."

Do not concern yourself with probabilities or payoff values. Simply draw the tree that illustrates the manager's decision alternatives and the chance events that go along with them. Use standard symbols for decision tree construction, and label all parts of your diagram carefully. To simplify, assume that business in the first year, and in the second, can be only "good" or "bad."
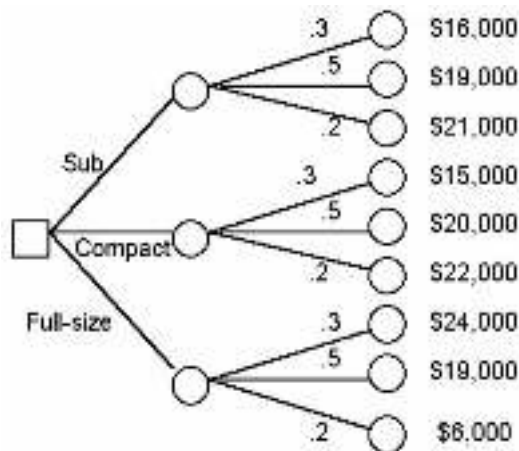
Answer:

Diff: 3
Key Term: Decision tree
AACSB: Analytic skills
Objective: LO7

14) Miles is considering buying a new pickup truck for his lawn service firm. The economy in town seems to be growing, and he is wondering whether he should opt for a subcompact, compact, or full-size pickup truck. The smaller truck would have better fuel economy, but would sacrifice capacity and some durability. A friend at the Bureau of Economic Research told him that there is a 30% chance of lower gas prices in his area this year, a 20% chance of higher gas prices, and a 50% chance that gas prices will stay roughly unchanged. Based on this information, Miles has developed a decision table that indicates the profit amount he would end up with after a year for each combination of truck and gas prices. Develop a decision tree for this situation and indicate which type of truck he should select.

Alternatives	States of Nature		
	Lower gas prices	Gas prices unchanged	Higher gas prices
Probability	.3	.5	.2
Subcompact	16,000	19,000	21,000
Compact	15,000	20,000	22,000
Full size	24,000	19,000	6,000

Answer: The tree appears in the drawing below. The highest expected value decision alternative is the compact truck, at $18,900, as shown in the POM for Windows solution.

Diff: 3
Key Term: Decision tree
AACSB: Analytic skills
Objective: LO6

15) Earl Shell owns his own Sno-Cone business and lives 30 miles from a beach resort. The sale of Sno-Cones is highly dependent upon his location and upon the weather. At the resort, he will profit $120 per day in fair weather, $10 per day in bad weather. At home, he will profit $70 in fair weather, $55 in bad weather. Assume that on any particular day, the weather service suggests a 40% chance of foul weather.
a. Construct Earl's decision tree.
b. What decision is recommended by the expected value criterion?
Answer: Resort has a higher EMV ($76) than Home
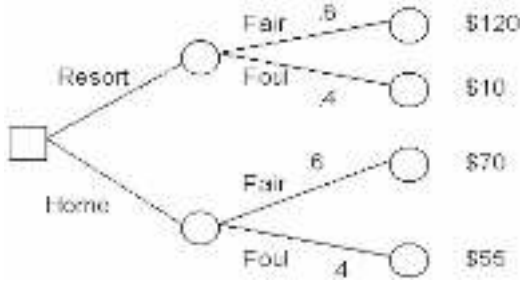
Decision Tree Results

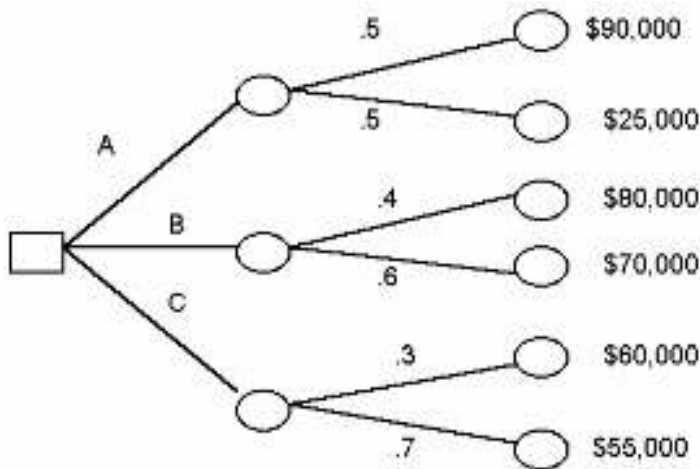|	Start Node	End Node	Branch Probabili	Profit	Use Branch?	End node	Node Type	Node Value
					Earl's Truck Solution			
Start	0.	1.	0.	0.		1.	Decision	76.
Resort	1.	2.	0.	0.	Yes	2.	Chance	76.
Home	1.	3.	0.	0.		3.	Chance	64.
Fair/Resort	2.	4.	0.6	120.		4.	Final	120.
Foul/Resort	2.	5.	0.4	10.		5.	Final	10.
Fair/Home	3.	6.	0.6	70.		6.	Final	70.
Fair/Home	3.	7.	0.4	55.		7.	Final	55.

Diff: 2
Key Term: Decision tree
AACSB: Analytic skills
Objective: LO6

16) Bratt's Bed and Breakfast, in a small historic New England town, must decide how to subdivide (remodel) the large old home that will become an inn. There are three alternatives: Option A would modernize all baths and combine rooms, leaving the inn with four suites, each suitable for two to four adults. Option B would modernize only the second floor; the results would be six suites, four for two to four adults, and two for two adults only. Option C (the status quo option) leaves all walls intact. In this case, there are eight rooms available, but only two are suitable for four adults, and four rooms will not have private baths. Below are the details of profit and demand patterns that will accompany each option. Which option has the highest expected value?

	Annual profit under various demand patterns			
	Capacity	p	Average	p
A (Modernize all)	$90,000	.5	$25,000	.5
B (Modernize 2nd)	$80,000	.4	$70,000	.6
C (Status Quo)	$60,000	.3	$55,000	.7

Answer: Branch 2, which represents Option B-Modernize 2nd floor, has the highest expected value, $74,000. This cannot be done as a decision table. POM for Windows solution follows.

Bratt B and B Solution

	Start Node	End Node	Branch Probabili	Profit	Use Branch?	End node	Node	Node Type	Node Value
Start	0.	1.	0	0.			1.	Decision	74,000.
Branch 1	1.	2.	0	0.			2.	Chance	57,500.
Branch 2	1.	3.	0	0.	Yes		3.	Chance	74,000.
Branch 3	1.	4.	0	0.			4.	Chance	56,500.
Branch 4	2.	5.	0.5	90,000			5.	Final	90,000.
Branch 5	2.	6.	0.5	25,000			6.	Final	25,000.
Branch 6	3.	7.	0.4	80,000			7.	Final	80,000.
Branch 7	3.	8.	0.6	70,000			8.	Final	70,000.
Branch 8	4.	9.	0.3	60,000			9.	Final	60,000.
Branch 9	4.	10.	0.7	55,000			10.	Final	55,000.

Diff: 3
Key Term: Decision tree
AACSB: Analytic skills
Objective: LO6

17) A do-it-yourself homeowner is installing a new toilet. While installing the toilet he must decide on what kind of connecting pipe he will install to the water supply. There are two available options, one that has a shut-off valve in case of a leak and a cheaper one without the shut-off valve. Suppose that the shut-off valve pipe costs an extra ten dollars and that the homeowner must buy one of the two.
a.   Draw a decision tree for this scenario, labeling the cost of a leak as X and the chance of a leak as P.
b.   If the chance of a leak causing household damage is 1%, at what $ amount of household damage is the owner neutral on which pipe to buy?
c.   If the cost of a leak would be $10,000 what is the maximum % chance to leak at which the homeowner would prefer to buy the cheaper pipe?
d.   If the cost of a leak is $1,000 and the chance to flood .1% which pipe should the homeowner buy?
Answer:
a.
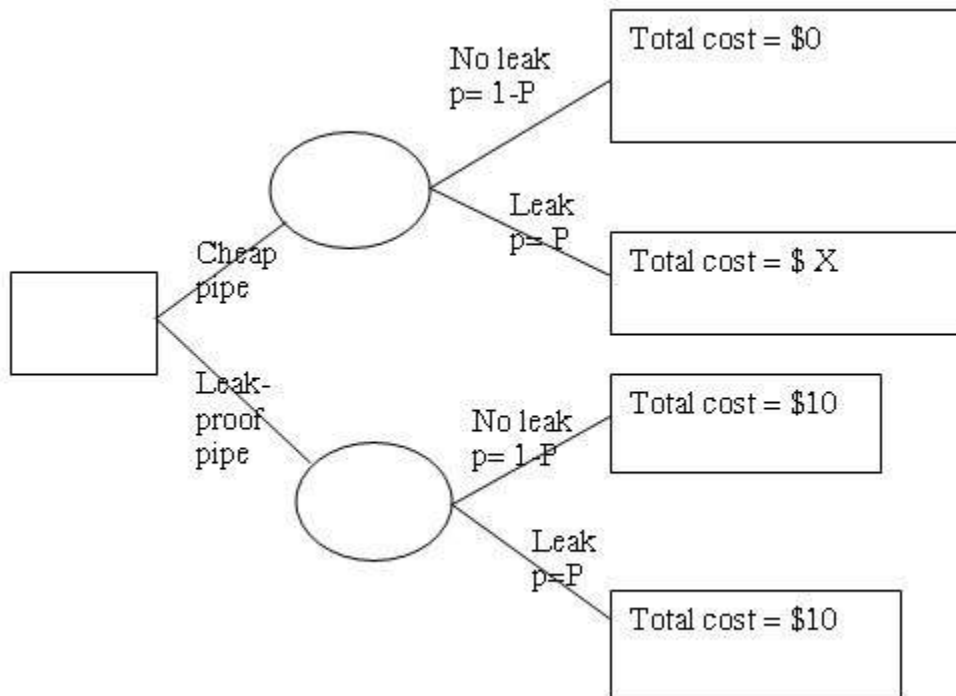
b. EMV of part B for the cheap pipe is .99(0) + .01(X), EMV for the leak-proof pipe is 10, set these equal to find the neutral value of X so .01X = 10 and X = $1000
c. EMV of part C for the cheap pipe is (1 - P)(0) + (P)(10,000), EMV for the leak-proof pipe is 10. Set these equal to find the maximum percent, so 10,000P = 10 with P = .001
d. EMV of the cheap pipe is .999(0) + .001(1,000) which = $1 and the EMV of the leak-proof pipe is 10, so the homeowner should buy the cheaper pipe.
Diff: 3
Key Term: Decision tree
AACSB: Analytic skills
Objective: LO6

18) A poker player is considering three different options after his opponent bet 200 before him. If the player folds, he will lose instantly. If the player calls, he figures he will win half the time. If he raises, he figures that the opposing player will not re-raise him, but rather will either call or fold. He figures the opposing player will call only ¼ of the time, folding the other ¾ of the time. If the opposing player calls his raise, he figures he will never win. The pot size is 1,000 (including the opposing player's bet).
a. Draw a decision tree for this scenario including the information provided in part b.
b. Suppose that the player is thinking of raising to $400 (he will put in 200 to match the opponent's bet and another 200 as a raise, his opponent would then have to put in 200 more to call the raise). Is this the best option or should he instead call or fold?
c. At what raise size is the player's EMV of a raise equivalent to simply calling?
Answer:
a.
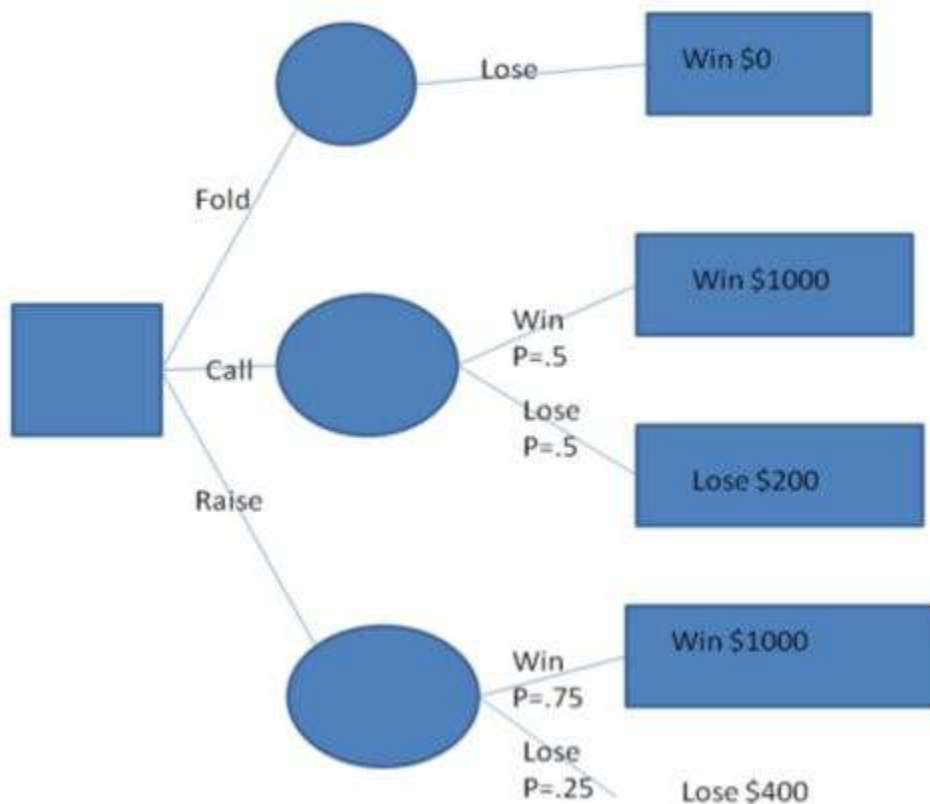
b. EMV of a fold is 0, EMV of a call is .5(1000) - .5(200) = 400, EMV of the raise is .75(1000) - .25 (400) = 650. The player should raise, not call or fold.
c. EMV of a call is 400 from above, EMV of a raise is .75(1000) - .25(Raise Size). Setting these equal so 400 = .75(1000) - .25(Raise size) the raise size comes out to 1400.
Diff: 3
Key Term: Decision tree
AACSB: Analytic skills
Objective: LO6