CHAPTER 1

OPERATIONS MANAGEMENT

CHAPTER LEARNING OBJECTIVES

1. ***Describe what the operations function is and how it relates to other business functions.*** Operations can be viewed as a transformation process that converts inputs into outputs of greater value. Operations management is the study of processes directly related to the creation and distribution of goods and services. Increasingly, these operations are taking place outside of the boundaries of a traditional enterprise. Thus, while today's managers need to understand how to efficiently manage operations within their own firm, they also need to develop skills in coordinating operations across a global supply chain. This text teaches students how to analyze processes, ensure quality, create value, and manage the flow of information, products, and services across a network of customers, enterprises, and supply chain partners. Operations is the technical core or "hub" of the organization, interacting with the other functional areas and suppliers to produce goods and provide services for customers.

2. ***Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.*** Operations management did not really begin until the Industrial Revolution. Before then, products were made by skilled craftpersons and their apprentices, one at a time. With the rise of factories, though, came an increased division of labour, where workers were only responsible for one small part of the total production process. For many years, factories were dominated by the concept of mass production, but this eventually gave way to the realization that production should be tied to customer demands (the quality revolution). The field of supply chain management was born to manage the flow of information, products, and services across a network of customers, enterprises, and supply chain partners.

3. ***Discuss how and why businesses operate globally and the rolesand the roles China and India play in the current global market.*** Two-thirds of today's businesses operate globally through global markets, global operations, global financing, and global supply chains. Many companies are now outsourcing much of their production and service functions to other countries. China accounts for 20% of the world's population and is the world's largest manufacturer. India, on the other hand, is known as the world's service provider. India has an enormous resource of highly skilled engineers, scientists, and technically trained workers available at less than half the cost of those located in developed countries.

4. ***Calculate and interpret productivity measures used for measuring competitiveness.*** Competitiveness has been defined by the OECD as "the degree to which a nation can produce goods and services that meet the test of international markets while simultaneously maintaining or expanding the real incomes of its citizens." The most common measure of competitiveness is productivity, which is the ratio of input to output.

5. ***Discuss the process of developing, deploying, and monitoring the success of an operations strategy*.** Firms choose to compete in different ways. A firm's *strategy* defines how it will compete in the marketplace—its own best way. Strategy formulation involves defining the primary task, assessing core competencies, determining order winners and order qualifiers, and positioning the firm. An effective strategy meets the order qualifiers and excels on the order winners. A competitive position is not sustainable unless the operating system that supports it is configured and managed effectively.

Policy deployment is a planning system that helps align day-to-day operating decisions with the company's overall strategy. The *balanced scorecard* reinforces a firm's strategy by providing customer-oriented and process-oriented measures of performance, in addition to traditional financial measures.

Decision making for the future can be scary at best. Fortunately, there are quantitative tools available for making decisions under uncertain conditions. The supplement to this chapter reviews several of them.

TRUE-FALSE STATEMENTS

1. Operations management is concerned only with the day-to-day operations of a firm's productive systems.

Answer: False

Difficulty: Easy
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

2. A warehouse operation is an example of a physical transformation process.

Answer: False

Difficulty: Easy
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

3. A retail operation is an example of an exchange transformation process.

Answer: True

Difficulty: Easy
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

4. Operations management designs, operates, and improves productive systems.

Answer: True

Difficulty: Easy
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

5. The four primary functional areas of a firm are marketing, finance, operations, and human resources.

Answer: True

Difficulty: Easy
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

6. A transformation process is a series of activities from supplier to customer that add value to a product or service.

Answer: False

Difficulty: Medium
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Comprehension
AACSB: Reflective Thinking

7. Human resources management provides demand estimates that are used in production decisions.

Answer: False

Difficulty: Medium
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Comprehension
AACSB: Reflective Thinking

8. To be effective an operations manager needs an integrated view of business organizations.

Answer: True

Difficulty: Easy
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Blooms: Knowledge
AACSB: Reflective Thinking

9. The systematic analysis of work methods is known as scientific management.

Answer: True

Difficulty: Easy
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Blooms: Knowledge
AACSB: Reflective Thinking

10. Operations research is concerned with the systematic analysis of work methods.

Answer: False

Difficulty: Medium
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Blooms: Comprehension
AACSB: Reflective Thinking

11. Mass production refers to high-volume production of a standardized product.

Answer: True

Difficulty: Easy
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Blooms: Knowledge
AACSB: Reflective Thinking

12. The adaptation of mass production to emphasize efficiency, rather than quality is known as lean production.

Answer: False

Difficulty: Medium
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Blooms: Comprehension
AACSB: Reflective Thinking

13. The set of activities that create and deliver products to the customer is known as the supply chain.

Answer: True

Difficulty: Medium
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Blooms: Knowledge
AACSB: Reflective Thinking

14. The process of producing high-volume, standardized products for a large market is known as craft production.

Answer: False

Difficulty: Medium
Learning Objective: Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Comprehension
AACSB: Reflective Thinking

15. The European Union requires that strict quality and environmental standards be met before companies can do business with member countries.

Answer: True

Difficulty: Medium
Learning Objective: Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Knowledge
AACSB: Reflective Thinking

16. Globalization has affected both manufacturing and service operations.

Answer: True

Difficulty: Easy
Learning Objective: Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Knowledge
AACSB: Reflective Thinking

17. Two-thirds of today's businesses operate globally.

Answer: True

Difficulty: Medium
Learning Objective: Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Knowledge
AACSB: Reflective Thinking

18. China is reshaping the way firms compete globally.

Answer: True

Difficulty: Easy
Learning Objective: Discuss how and why businesses operate globally and the roles and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Knowledge
AACSB: Reflective Thinking

19. Globalization requires that firms compete on cost and *not* quality, speed, or flexibility.

Answer: False

Difficulty: Medium
Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Knowledge
AACSB: Reflective Thinking

20. Globalization of the supply chain for many products has many pros and few, if any, cons.

Answer: False

Difficulty: Medium
Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Comprehension
AACSB: Reflective Thinking

21. A major challenge and opportunity for many firms is the globalization of the supply chain.

Answer: True

Difficulty: Easy
Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Knowledge
AACSB: Reflective Thinking

22. Productivity increases enable a nation to raise its standard of living.

Answer: True

Difficulty: Easy
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Blooms: Knowledge
AACSB: Reflective Thinking

23. A nation’s productivity is unrelated to its standard of living.

Answer: False

Difficulty: Easy
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Blooms: Knowledge
AACSB: Reflective Thinking

24. Productivity is the most common measure of competitiveness.

Answer: True

Difficulty: Easy
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Blooms: Knowledge
AACSB: Reflective Thinking

25. Single factor productivity compares output to an individual input.

Answer: True

Difficulty: Medium

Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Blooms: Knowledge
AACSB: Reflective Thinking

26. Canadian companies can become globally competitive by emphasizing the strategic importance of operations.

Answer: True

Difficulty: Medium
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Comprehension
AACSB: Reflective Thinking

27. Many companies now find it necessary to have some global presence to remain competitive.

Answer: True

Difficulty: Easy
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Knowledge
AACSB: Reflective Thinking

28. Ensuring good quality underlies all operational decisions.

Answer: True

Difficulty: Easy
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Knowledge
AACSB: Reflective Thinking

29. Emphasizing the strategic role of operations enhances the competitiveness of Canadian companies.

Answer: True

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Knowledge
AACSB: Reflective Thinking

30. Deployment is a step in strategy formulation that evaluates the alignment between core competencies and order winners.

Answer: False

Difficulty: Easy
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Knowledge
AACSB: Reflective Thinking

31. Positioning is a step in strategy formulation that compares core competencies and order winners.

Answer: True

Difficulty: Medium
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Comprehension
AACSB: Reflective Thinking

32. Order qualifiers are the characteristics of a product that have to be satisfied just to be considered for purchase by a customer.

Answer: True

Difficulty: Easy
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Knowledge
AACSB: Reflective Thinking

33. An order qualifier is a customer criterion that wins the order.

Answer: False

Difficulty: Easy

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Knowledge
AACSB: Reflective Thinking

34. Core competencies tend to be processes and *not* products or technologies.

Answer: True

Difficulty: Easy
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Knowledge
AACSB: Reflective Thinking

35. Strategy formulation starts with determining a firm's order winners and order qualifiers.

Answer: False

Difficulty: Easy
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Knowledge
AACSB: Reflective Thinking

36. Order winners and order qualifiers change over time in response to the dynamics of changing market conditions.

Answer: True

Difficulty: Medium
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Comprehension
AACSB: Reflective Thinking

37. To be competitive firms must create and sustain core competencies that are in tune with their customer's order winners.

Answer: True

Difficulty: Medium

Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Comprehension
AACSB: Reflective Thinking

38. Firms compete in the marketplace based on cost, speed, quality, and flexibility.

Answer: True

Difficulty: Easy
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Knowledge
AACSB: Reflective Thinking

MULTIPLE CHOICE QUESTIONS

39. Operations management is concerned with
a) the design of a firm's productive systems.
b) the operation of a firm's productive systems.
c) the improvement of a firm's productive systems.
d) all of the above.

Answer: d

Difficulty: Easy
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

40. The transformation process associated with health care is best described as
a) locational.
b) exchange.
c) physiological.
d) informational.

Answer: c

Difficulty: Easy
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

41. Which of the following is *not* one of the four primary functional areas of a firm?
a) human resources
b) legal
c) marketing
d) operations

Answer: b

Difficulty: Easy
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

42. All of the following are responsibilities of operations managers *except*
a) acquiring financial resources.
b) managing inventories.
c) planning production.
d) scheduling production.

Answer: a

Difficulty: Easy
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

43. Transformation processes are all of the following *except*
a) physiological.
b) locational.
c) exchange.
d) optimal.

Answer: d

Difficulty: Easy
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

44. Linear programming, simulation, and waiting line theory are most closely associated with which era in the historical development of operations management?
a) human relations
b) operations research
c) globalization
d) Internet revolution

Answer: b

Difficulty: Medium
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

N1. Operations provides marketing with information on all except

a) product or service availability.
b) personnel needs.
c) lead-time estimates.
d) order status.

Answer: b

Difficulty: Medium
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Blooms: Knowledge
AACSB: Reflective Thinking

45. Which of the following is *not* an event or concept associated with the quality revolution?
a) TQM (total quality management)
b) PERT/CPM
c) Business process reengineering
d) JIT

Answer: b

Difficulty: Medium
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Blooms: Comprehension
AACSB: Reflective Thinking

46. The work of W. Edwards Deming is most closely associated with
a) MRP.
b) TQM.
c) supply chain management.
d) time and motion studies.

Answer: b

Difficulty: Easy
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Blooms: Knowledge
AACSB: Reflective Thinking

47. Linear programming, waiting line, simulation, and PERT/CPM are all parts of which era of operations management?
a) Quality Research

b) Operations Research
c) Internet Revolution
d) Globalization

Answer: b

Difficulty: Medium
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Blooms: Comprehension
AACSB: Reflective Thinking

48. What are key elements of the division of labour?
a) The production process is broken down into a series of small tasks.
b) Small tasks are performed by different workers.
c) The specialization of the workers on limited, repetitive tasks allows them to become very proficient at those tasks.
d) All of the above.

Answer: d

Difficulty: Easy
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Blooms: Knowledge
AACSB: Reflective Thinking

49. The major factors impacting globalization of the supply chain include all the following *except*
a) creation of the WTO.
b) Regional Trade Agreements.
c) fall of communism.
d) advances in information and transportation technology.

Answer: c

Difficulty: Hard
Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Comprehension
AACSB: Reflective Thinking

50. Companies go global to
a) take advantage of favourable costs.
b) to keep abreast of trends and access new technologies.
c) to build reliable sources of supply.

d) all the above.

Answer: d

Difficulty: Medium
Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Comprehension
AACSB: Reflective Thinking

51. A manager of a global supply chain is concerned with all the following *except*
a) timeliness.
b) quality.
c) social issues.
d) All the above are concerns.

Answer: d

Difficulty: Medium
Learning Objective: Discuss how and why businesses operate globally and the roles China and India play in the current global market.
Section Reference: 1.3 Globalization
Blooms: Comprehension
AACSB: Reflective Thinking

52. The production system that prizes flexibility over efficiency and quality over quantity is known as
a) mass production.
b) craft production.
c) lean production.
d) electronic commerce.

Answer: c

Difficulty: Medium
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Blooms: Comprehension
AACSB: Reflective Thinking

53. Dividing a job into a series of small tasks each performed by a different worker is known as
a) craft production.
b) scientific management.
c) division of labour.
d) interchangeable parts.

Answer: c

Difficulty: Medium
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Blooms: Comprehension
AACSB: Reflective Thinking

54. The ratio of a firm's monthly output to the number of labour hours used in the same month would be a measure of
a) labour productivity.
b) capital productivity.
c) machine productivity.
d) multifactor productivity.

Answer: a

Difficulty: Medium
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Blooms: Knowledge
AACSB: Reflective Thinking

55. The degree of competitiveness in an industry can affect
a) product innovation.
b) technological investment.
c) operating strategy.
d) all of the above.

Answer: d

Difficulty: Easy
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Blooms: Knowledge
AACSB: Reflective Thinking

56. Productivity can be increased by
a) increasing outputs.
b) decreasing labour input.
c) decreasing energy input.
d) All of the above.

Answer: d

Difficulty: Easy
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Blooms: Knowledge
AACSB: Reflective Thinking

57. A firm who is adept at recognizing global windows of opportunity, acting on those very quickly, with tight linkages can be said to be competing on
a) flexibility.
b) speed.
c) quality.
d) cost.

Answer: b

Difficulty: Hard
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Comprehension
AACSB: Reflective Thinking

58. When purchasing a car, what might be order winners?
a) Price.
b) Quality.
c) Design.
d) All of the above.

Answer: e

Difficulty: Easy
Learning Objective: Discuss the process of developing, deploying, and monitoring the success of an operations strategy.
Section Reference: 1.5 Strategy and Operations
Blooms: Knowledge
AACSB: Reflective Thinking

SHORT-ANSWER ESSAY QUESTIONS

59. Briefly describe how operations can be viewed as a transformation process.

Answer:

Difficulty: Easy

Section Reference 1: 1.0 Introduction
Solution: Operations is often defined as a transformation process. Inputs such as raw materials, labour, equipment, and capital are transformed into outputs (goods and services). Customer feedback is used to adjust the transformation process. An objective of the operations manager is to ensure that the transformation process operates efficiently, and the outputs of the process have greater value than the sum of the inputs. In this way the transformation process creates value, making it possible to view the transformation process as a value chain extending from supplier to customer.
Blooms: Comprehension
AACSB: Reflective Thinking

60. Briefly describe the four primary functional areas of a firm. How is operations related to them?

Answer:

Difficulty: Medium
Learning Objective: Describe what the operations function is and how it relates to other business functions.
Section Reference: 1.1 The Operations Function
Solution: The four primary functional areas of a firm are marketing, finance, operations, and human resources. For most firms, operations is the technical core or “hub” of the organization, interacting with the other functional areas and suppliers to produce goods and services for customers. For example, marketing provides sales forecasts to operations and operations provides marketing with product availability information, lead time estimates, and delivery schedules. Operations provides finance with inventory and production data, capital budgeting and equipment requests, and technology plans. Finance provides the capital resources for financing inventory and securing more capital equipment. Operations relies on human resources to meet its personnel needs—hiring, training, and evaluating workers.
Blooms: Comprehension
AACSB: Reflective Thinking

61. What is electronic commerce?

Answer:

Difficulty: Medium
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Solution: Trade that occurs over the Internet (or any other computer network) is called electronic commerce, e-commerce, or e-business. Electronic commerce can take the form of trade between businesses (B2B), between consumers, or between business and consumers (B2C). B2B trade typically involves companies and their suppliers while B2C trade can take the form of online retailing. Companies that integrate both B2B and B2C are said to have a fully integrated value chain.
Blooms: Comprehension
AACSB: Reflective Thinking

62. What are interchangeable parts and their advantages?

Answer:

Difficulty: Medium
Learning Objective: Discuss the key factors that have contributed to the evolution of operations and the initiation of supply chain management.
Section Reference: 1.2 The Evolution of Operations and Supply Chain Management
Interchangeable parts are those which can be used in more than one product. The introduction of interchangeable parts by Eli Whitney (1790s) allowed the manufacture of firearms, clocks, watches, sewing machines, and other goods to shift from customized one-at-a-time production to volume production of standardized parts. This meant the factory needed a system of measurements and inspection, a standard method of production, and supervisors to check the quality of the worker's production.
Blooms: Comprehension
AACSB: Reflective Thinking

63. What is productivity and how is it measured?

Answer:

Difficulty: Easy
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Solution: Productivity is the ratio of output to input. Output can be expressed in units or dollars. Single factor productivity compares output to individual inputs, such as labour hours, investment in equipment, or material usage. Multifactor productivity relates output to a combination of inputs, such as labour + capital. Total factor productivity compares the quantity of goods and services produced with all the inputs used to produce them.
Blooms: Comprehension
AACSB: Reflective Thinking

64. What can lead to increases in productivity?

Answer:

Difficulty: Medium
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Solution: Productivity increases when firms become more efficient, expand, achieve breakthroughs that enable output increases to occur with reduced inputs, downsize while maintaining output with fewer inputs, and retrench with output and inputs decreasing but inputs decreasing at a faster rate than output.
Blooms: Comprehension
AACSB: Reflective Thinking

65. What are some important considerations to make when using the productivity measure?

Answer:

Difficulty: Medium
Learning Objective: Calculate and interpret productivity measures used for measuring competitiveness.
Section Reference: 1.4 Productivity and Competitiveness
Solution:
There are many ways in which productivity statistics can be misleading. Examining the formula for productivity, output/input, it becomes apparent that productivity can be increased in different ways. For example, a country or firm may increase productivity by decreasing input faster than output. Thus, although the company may be retrenching, its productivity is increasing. Seldom is this avenue for increasing productivity sustainable (see Example 1.1).
Productivity statistics also assume that if more input were available, output would increase at the same rate. This may not be true, as there may be limits to output other than those on which the productivity calculations are based. Furthermore, productivity emphasizes output produced, not output sold. If products produced are not sold, inventories pile up and increases in output can actually accelerate a company's decline. Finally, productivity is a relative measure, which is why statistics provided in government reports typically measure percentage changes in productivity from month to month, quarter to quarter, year to year, or over a number of years.
AACSB: Reflective Thinking
Blooms: Comprehension

LEGAL NOTICE

CHAPTER 1 SUPPLEMENT

OPERATIONAL DECISION-MAKING TOOLS: DECISION ANALYSIS

CHAPTER LEARNING OBJECTIVES

S1. ***Appropriately use a variety of quantitative decision analysis techniques.*** In this supplement we have provided a general overview of decision analysis. To a limited extent, we have also shown that the logic of such operational decisions throughout the organization are interrelated to achieve strategic goals.

TRUE-FALSE STATEMENTS

1. In a decision making situation, the events that may occur in the future are known as states of nature.

Answer: True

Difficulty: Easy
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

2. When probabilities are assigned to states of nature, the situation is referred to as decision making under uncertainty.

Answer: False

Difficulty: Easy
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

3. The outcome of a decision in referred to as a payoff.

Answer: True

Difficulty: Easy
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

4. The most widely used decision-making criterion for situations with risk is expected value.

Answer: True

Difficulty: Easy
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

5. A decision criterion in which the decision payoffs are weighted by a coefficient of optimism is known as the Hurwicz criterion.

Answer: True

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

6. The LaPlace criterion is a decision criterion in which each state of nature is weighted equally.

Answer: True

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

7. A sequential decision tree is a graphical method for analyzing decision situations that require a sequence of decisions over time.

Answer: True

Difficulty: Easy
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

8. A decision criterion that results in the maximum of the minimum payoffs is called a maximin criterion.

Answer: True

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

9. Quantitative methods are tools available to operations managers to help make a decision or recommendation.

Answer: True

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

10. Quantitative methods are tools available to operations managers to help make a decision but *not* a recommendation.

Answer: False

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

11. Decision analysis is a quantitative technique supporting decision making with uncertainty.

Answer: True

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

12. A payoff table is a quantitative technique supporting decision making under uncertainty.

Answer: True

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

MULTIPLE CHOICE QUESTIONS

13. When probabilities can be assigned to the occurrence of states of nature in the future, the situation is referred to as
a) decision making under risk.
b) decision making under certainty.
c) decision making under uncertainty.
d) none of the above.

Answer: a

Difficulty: Easy
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

14. Which of the following techniques is the most widely used decision-making criterion under risk?
a) maximax criterion
b) minimax regret criterion
c) expected value criterion
d) Hurwicz criterion

Answer: c

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

15. The maximum value of perfect information to the decision maker is known as
a) the expected value of perfect information.
b) the expected value of imperfect information.
c) the minimum of the minimax regret.
d) none of the above.

Answer: a

Difficulty: Easy
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Knowledge
AACSB: Reflective Thinking

16. A family business is considering making an investment in its manufacturing operation. Three decisions are under consideration: (1) a large investment; (2) a medium investment; and (3) a small investment. The business believes that there are three possible future outcomes for its product: (1) increasing demand; (2) stable demand; and (3) decreasing demand. The following payoff table describes the decision situation:

States of Nature			
Decision	Increasing Demand	Stable Demand	Decreasing Demand
Large Investment	$1,000,000	$400,000	-$600,000
Medium Investment	500,000	300,000	-200,000
Small Investment	250,000	125,000	25,000

The best decision for the business using the maximax criterion would be to
a) make the large investment.
b) make the medium investment.
c) make the small investment.
d) choose increasing demand.

Answer: a

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Application
AACSB: Reflective Thinking

17. A family business is considering making an investment in its manufacturing operation. Three decisions are under consideration: (1) a large investment; (2) a medium investment; and (3) a small investment. The business believes that there are three possible future outcomes for its product: (1) increasing demand; (2) stable demand; and (3) decreasing demand. The following payoff table describes the decision situation:

States of Nature			
Decision	Increasing Demand	Stable Demand	Decreasing Demand
Large Investment	$1,000,000	$400,000	-$600,000
Medium Investment	500,000	300,000	-200,000
Small Investment	250,000	125,000	25,000

The best decision for the business using the maximin criterion would be to
a) make the large investment.
b) make the medium investment.
c) make the small investment.
d) choose stable demand.

Answer: c

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities

Blooms: Application
AACSB: Reflective Thinking

18. A family business is considering making an investment in its manufacturing operation. Three decisions are under consideration: (1) a large investment; (2) a medium investment; and (3) a small investment. The business believes that there are three possible future outcomes for its product: (1) increasing demand; (2) stable demand; and (3) decreasing demand. The following payoff table describes the decision situation:

States of Nature			
Decision	Increasing Demand	Stable Demand	Decreasing Demand
Large Investment	$1,000,000	$400,000	-$600,000
Medium Investment	500,000	300,000	-200,000
Small Investment	250,000	125,000	25,000

The best decision for the business using the minimax regret decision criterion would be to
a) make the large investment.
b) make the medium investment.
c) make the small investment.
d) choose decreasing demand.

Answer: b

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

19. A family business is considering making an investment in its manufacturing operation. Three decisions are under consideration: (1) a large investment; (2) a medium investment; and (3) a small investment. The business believes that there are three possible future outcomes for its product: (1) increasing demand; (2) stable demand; and (3) decreasing demand. The following payoff table describes the decision situation:

States of Nature			
Decision	Increasing Demand	Stable Demand	Decreasing Demand
Large Investment	$1,000,000	$400,000	-$600,000
Medium Investment	500,000	300,000	-200,000
Small Investment	250,000	125,000	25,000

The best decision for the business using the Hurwicz criterion with a coefficient of optimism equal to 0.80 would be to
a) make the large investment.
b) make the medium investment.
c) make the small investment.
d) choose stable demand.

Answer: a

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Application
AACSB: Reflective Thinking

20. A family business is considering making an investment in its manufacturing operation. Three decisions are under consideration: (1) a large investment; (2) a medium investment; and (3) a small investment. The business believes that there are three possible future outcomes for its product: (1) increasing demand; (2) stable demand; and (3) decreasing demand. The following payoff table describes the decision situation:

States of Nature			
Decision	Increasing Demand	Stable Demand	Decreasing Demand
Large Investment	$1,000,000	$400,000	-$600,000
Medium Investment	500,000	300,000	-200,000
Small Investment	250,000	125,000	25,000

The best decision for the business using the equal likelihood criterion would be to
a) make the large investment.
b) make the medium investment.
c) make the small investment.
d) choose increasing demand.

Answer: a

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Application
AACSB: Reflective Thinking

21. A family business is considering making an investment in its manufacturing operation. Three decisions are under consideration: (1) a large investment; (2) a medium investment; and (3) a small investment. The business believes that there are three possible future outcomes for its product: (1) increasing demand; (2) stable demand; and (3) decreasing demand. The business believes that the probability for increasing, stable and decreasing product demand are 0.4, 0.5, and 0.1, respectively. The following payoff table describes the decision situation:

States of Nature			
Decision	Increasing Demand (0.4)	Stable Demand (0.5)	Decreasing Demand (0.1)
Large Investment	$1,000,000	$400,000	-$600,000
Medium Investment	500,000	300,000	-200,000
Small Investment	250,000	125,000	25,000

The expected value for the large investment decision is
a) $700,000.
b) $540,000.
c) $330,000.
d) $165,000.

Answer: b

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

22. A family business is considering making an investment in its manufacturing operation. Three decisions are under consideration: (1) a large investment; (2) a medium investment; and (3) a small investment. The business believes that there are three possible future outcomes for its product: (1) increasing demand; (2) stable demand; and (3) decreasing demand. The business believes that the probability for increasing, stable and decreasing product demand are 0.4, 0.5, and 0.1, respectively. The following payoff table describes the decision situation:

States of Nature			
Decision	Increasing Demand (0.4)	Stable Demand (0.5)	Decreasing Demand (0.1)
Large Investment	$1,000,000	$400,000	-$600,000
Medium Investment	500,000	300,000	-200,000
Small Investment	250,000	125,000	25,000

The expected value for the small investment decision is
a) $540,000.
b) $400,000.
c) $330,000.
d) $165,000.

Answer: d

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

23. A family business is considering making an investment in its manufacturing operation. Three decisions are under consideration: (1) a large investment; (2) a medium investment; and (3) a small investment. The business believes that there are three possible future outcomes for its product: (1) increasing demand; (2) stable demand; and (3) decreasing demand. The business

believes that the probability for increasing, stable and decreasing product demand are 0.4, 0.5, and 0.1, respectively. The following payoff table describes the decision situation:

States of Nature			
Decision	Increasing Demand (0.4)	Stable Demand (0.5)	Decreasing Demand (0.1)
Large Investment	$1,000,000	$400,000	-$600,000
Medium Investment	500,000	300,000	-200,000
Small Investment	250,000	125,000	25,000

The expected value for the medium investment decision is
a) $600,000.
b) $540,000.
c) $330,000.
d) $165,000.

Answer: c

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

24. A family business is considering making an investment in its manufacturing operation. Three decisions are under consideration: (1) a large investment; (2) a medium investment; and (3) a small investment. The business believes that there are three possible future outcomes for its product: (1) increasing demand; (2) stable demand; and (3) decreasing demand. The business believes that the probability for increasing, stable and decreasing product demand are 0.4, 0.5, and 0.1, respectively. The following payoff table describes the decision situation:

States of Nature			
Decision	Increasing Demand (0.4)	Stable Demand (0.5)	Decreasing Demand (0.1)
Large Investment	$1,000,000	$400,000	-$600,000
Medium Investment	500,000	300,000	-200,000
Small Investment	250,000	125,000	25,000

If the expected value criterion is used then the best decision would be to
a) make the large investment.
b) make the medium investment.
c) make the small investment.
d) choose the stable demand.

Answer: a

Difficulty: Medium

Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

25. A family business is considering making an investment in its manufacturing operation. Three decisions are under consideration: (1) a large investment; (2) a medium investment; and (3) a small investment. The business believes that there are three possible future outcomes for its product: (1) increasing demand; (2) stable demand; and (3) decreasing demand. The business believes that the probability for increasing, stable and decreasing product demand are 0.4, 0.5, and 0.1, respectively. The following payoff table describes the decision situation:

States of Nature			
Decision	Increasing Demand (0.4)	Stable Demand (0.5)	Decreasing Demand (0.1)
Large Investment	$1,000,000	$400,000	-$600,000
Medium Investment	500,000	300,000	-200,000
Small Investment	250,000	125,000	25,000

The expected value of perfect information for the family business is
a) $602,500.
b) $540,000.
c) $62,500.
d) $25,000.

Answer: c

Difficulty: Hard
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

26. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand	Low Demand
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The best decision for the manufacturer using the maximax decision criterion is to
a) expand facilities.

b) acquire competitor.
c) subcontract production.
d) select high demand.

Answer: a

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Application
AACSB: Reflective Thinking

27. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand	Low Demand
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The best decision for the manufacturer using the maximin decision criterion is to
a) expand facilities.
b) acquire competitor.
c) subcontract production.
d) select high demand.

Answer: c

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Application
AACSB: Reflective Thinking

28. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand	Low Demand
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000

Subcontract Production	250,000	25,000

The best decision for the manufacturer using the minimax regret decision criterion is to
a) expand facilities.
b) acquire competitor.
c) subcontract production.
d) select high demand.

Answer: b

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

29. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand	Low Demand
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The regret that is associated with the decision to acquire competitor when demand is low is
a) $0.
b) $525,000.
c) $1,250,000.
d) $1,275,000.

Answer: b

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

30. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand	Low Demand
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The best decision for the manufacturer using the Hurwicz decision criterion with a coefficient of optimism equal to 0.3 is to
a) expand facilities.
b) acquire competitor.
c) subcontract production.
d) make no decision.

Answer: c

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Application
AACSB: Reflective Thinking

31. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand	Low Demand
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The value of the Hurwicz decision criterion for subcontract production when the coefficient of optimism is 0.30 is
a) $92,500.
b) $182,500.
c) $250,000.
d) $275,000.

Answer: a

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Application
AACSB: Reflective Thinking

32. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand	Low Demand
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The best decision for the manufacturer using the equal likelihood criterion is to
a) expand facilities.
b) acquire competitor.
c) subcontract production.
d) select high demand.

Answer: a

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

33. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand, with probabilities of 0.6 and 0.4, respectively. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand (0.6)	Low Demand (0.4)
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The expected value for the expand facilities decision is
a) $250,000.
b) $160,000.
c) $700,000.
d) $1,200,000.

Answer: c

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities

Blooms: Analysis
AACSB: Reflective Thinking

34. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand, with probabilities of 0.6 and 0.4, respectively. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand (0.6)	Low Demand (0.4)
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The expected value for the acquire competitor decision is
a) $250,000.
b) $160,000.
c) $700,000.
d) $1,200,000.

Answer: a

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

35. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand, with probabilities of 0.6 and 0.4, respectively. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand (0.6)	Low Demand (0.4)
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The expected value for the subcontract production decision is
a) $250,000.
b) $160,000.
c) $700,000.
d) $1,200,000.

Answer: b

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

36. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand, with probabilities of 0.6 and 0.4, respectively. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand (0.6)	Low Demand (0.4)
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The best decision according to the expected value criterion is
a) acquire competitor.
b) expand facilities.
c) subcontract production.
d) high demand.

Answer: b

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

37. A small parts manufacturer has just engineered a new product for the automotive industry. In order to produce the part the company can expand existing facilities, acquire a competitor, or subcontract production. The company believes the product will either experience high market demand or low market demand, with probabilities of 0.6 and 0.4, respectively. The following payoff table describes the company's decision situation:

	States of Nature	
Decision	High Demand (0.6)	Low Demand (0.4)
Expand Facilities	$2,000,000	-1,250,000
Acquire Competitor	750,000	-500,000
Subcontract Production	250,000	25,000

The expected value of perfect information for the small parts manufacturer is
a) $1,210,000.
b) $700,000.

c) $510,000.
d) $312,500.

Answer c

Difficulty: Hard
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Analysis
AACSB: Reflective Thinking

38. If payoffs are costs rather than profits, then
a) using any quantitative decision making tools is not possible at all.
b) it is necessary to find more financial data of the company to determine the profits.
c) the tools have to be adjusted so that a profit maximization method becomes a cost minimization method, for example.
d) none of the above.

Answer: c

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
Blooms: Comprehension
AACSB: Reflective Thinking

SHORT-ANSWER ESSAY QUESTIONS

38. What is decision analysis?

Answer: Decision analysis is a set of quantitative techniques for decision-making situations in which uncertainty exists. Decision analysis is a generic technique that can be applied to a number of different types of operational decision-making areas. The study of decision analysis is useful because it provides a structured, systematic approach to decision making that many decision makers follow intuitively without ever consciously thinking about it. Thus, decision analysis represents not only a collection of decision-making techniques but also an analysis of the logic underlying decision making.

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
aacsb006; blooms002

N2. Why and how are decision trees being used?

Answer: A payoff table is limited to a single decision situation. If a decision requires a series of decisions, a payoff table cannot be created, and a sequential decision tree must be used. Decision trees are a graphical method for analyzing decision situations that require a sequence of decisions over time. Decision trees allow the decision maker to see the logic of decision making by providing a picture of the decision process. The square nodes represent decisions and the circle nodes reflect different states of nature and their probabilities. The decision analysis process starts at the end of the decision tree and works backward toward a decision at node 1. During this backward pass, at outcome nodes expected values are computed, at decision nodes a decision must be made.

Difficulty: Medium
Learning Objective: Appropriately use a variety of quantitative decision analysis techniques.
Section Reference: S1.1 Decision Analysis with and without Probabilities
aacsb006; blooms002

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