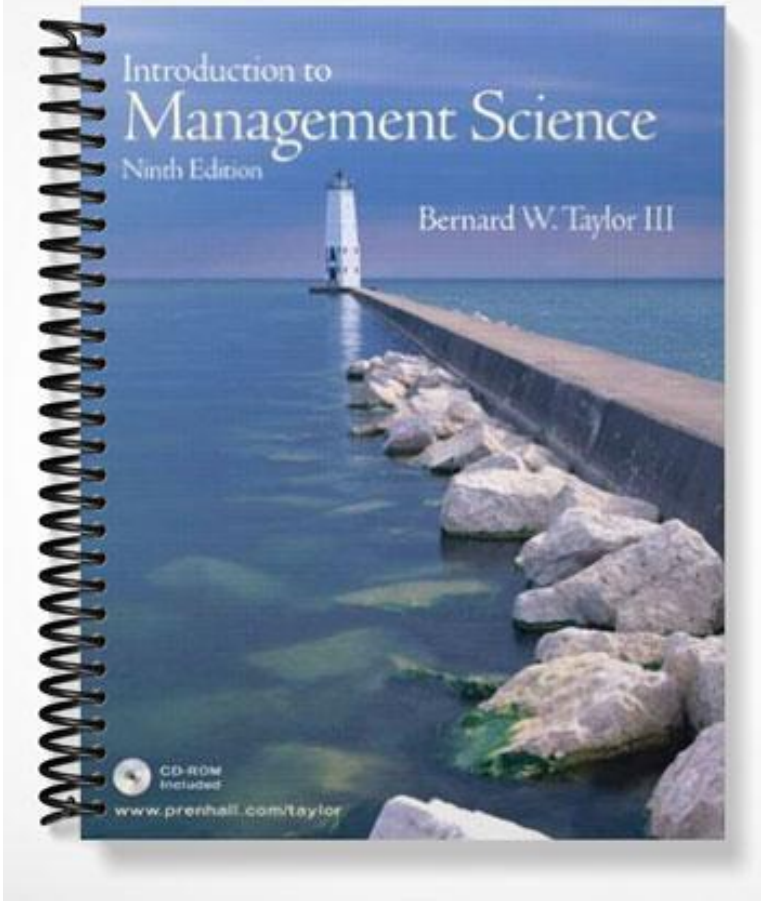
TEST BANK


Introduction to
Management Science
Ninth Edition
Bernard W. Taylor III
CD-ROM
Included
www.prenhall.com/taylor

Test Item File

Introduction to Management Science

Bernard W. Taylor III

Martha Wilson
California State University, Sacramento

Upper Saddle River, New Jersey 07458

Contents

Problem difficulty levels are represented as:
Diff 1 - Easy
Diff 2 - Moderate
Diff 3 - Difficult

Chapter 1
Management Science

True/False

1) Management science involves the philosophy of approaching a problem in a subjective manner.

Answer: FALSE
Diff: 1
Key words: scientific approach

2) Management science encompasses a logical approach to problem solving.

Answer: TRUE
Diff: 1
Key words: scientific approach, problem solving

3) Once management scientist makes his or her decision and recommendation to management, then typically, his or her involvement with the problem is finished.

Answer: FALSE
Diff: 2
Key words: management science, management scientist

4) A variable is a symbol used to represent an item that can take on any value.

Answer: TRUE
Diff: 1
Key words: variable

5) Parameters are unknown, constant values that are not coefficients of variables in equations.

Answer: FALSE
Diff: 1
Key words: parameter

6) Data are pieces of information from the problem environment.

Answer: TRUE
Diff: 1
Key words: data

7) A model is a functional relationship including variables, parameters, and equations.

Answer: TRUE
Diff: 1
Key words: model, management science techniques

8) A management science technique usually applies to a specific model type.

Answer: TRUE
Diff: 1
Key words: models, management science techniques

9) A management science solution can be either a recommended decision or information that helps a manager make a decision.

Answer: TRUE
Diff: 1
Key words: solution, management science solution

10) Management science modeling techniques provide results that are known with certainty.

Answer: FALSE
Diff: 2
Key words: management science modeling techniques, certainty

11) A constraint represents the limitation of management science techniques.

Answer: FALSE
Diff: 2
Key words: constraints, management science techniques

12) The term decision analysis refers to testing how a problem solution reacts to changes in one or more of the model parameters.

Answer: FALSE
Diff: 1
Key words: sensitivity analysis, parameter changes

13) Fixed costs depend on the number of items produced.

Answer: FALSE
Diff: 1
Key words: fixed cost, break–even analysis

14) Variable costs are independent of volume and remain constant.

Answer: FALSE
Diff: 1
Key words: variable cost, break–even analysis

15) Total cost equals the fixed cost plus the variable cost per unit divided by volume.

Answer: FALSE
Diff: 1
Key words: total cost, break–even analysis

16) Profit is the difference between total revenue and total cost.

Answer: TRUE
Diff: 1
Key words: profit, break–even analysis

17) The break–even point is the volume that equates total revenue with total cost and profit is zero.

Answer: TRUE
Diff: 1
Key words: break–even analysis

18) In general, an increase in price increases the break even point if all costs are held constant.

Answer: FALSE
Diff: 1
Key words: break–even analysis

19) If variable costs increase, but price and fixed costs are held constant, the break even point will decrease.

Answer: FALSE
Diff: 2
Key words: break–even analysis

20) Managers utilize spreadsheets to conduct their own analyses in management science studies.

Answer: TRUE
Diff: 2
Key words: spreadsheets

21) Management science techniques focus primarily on 3 specific steps of the management science process (observation, model construction and implementation) to find an appropriate solution to a problem.

Answer: FALSE
Diff: 2
Key words: mgt sci modeling techniques, steps of the scientific method

22) Management science modeling techniques focus on model construction and problem solution.

Answer: TRUE
Diff: 2
Key words: mgt science model techniques, model constr, prob solution

23) Enterprise Resource Planning (ERP) system is a data oriented decision support system that utilizes specific management science solution procedures to solve individual problems such as cost–volume analysis.

Answer: FALSE
Diff: 1
Key words: decision support systems

Fill in the Blank

24) A _____ is a symbol used to represent an item that can take on any value.

Answer: variable
Diff: 1
Key words: variable, management science process

25) _____ are unknown, constant values that are not coefficients of variables in equations.

Answer: Parameters
Diff: 1
Key words: model, parameters

26) _____ are pieces of information from the problem environment.

Answer: Data
Diff: 1
Key words: data

27) A _____ is a functional relationship including variables, parameters, and equations.

Answer: model
Diff: 1
Key words: model

28) _____ techniques consist of models that are represented as diagrams, presenting a pictorial representation of the system being analyzed.

Answer: Network
Diff: 1
Key words: management science, networks

29) _____ techniques provide results that contain uncertainty, unlike mathematical programming techniques which are deterministic.

Answer: Probabilistic
Diff: 1
Key words: management science techniques, probabilistic techniques

30) _____ are independent of volume of goods produced and remain constant.

Answer: Fixed costs
Diff: 1
Key words: fixed cost, break–even analysis

31) _____ depend on the number of items produced.

Answer: Variable costs
Diff: 1
Key words: variable cost, break–even analysis

32) _____ is the difference between total revenue and total cost.

Answer: Profit
Diff: 1
Key words: profit, break–even analysis

33) The _____ is the volume that equates total revenue with total cost and profit is zero.

Answer: break–even point
Diff: 1
Key words: break–even analysis

34) A _____ represents a limitation to achieving maximum profits due to limited resources.

Answer: constraint
Diff: 1
Key words: constraint, model development

35) The _____ can be noted as Z, and represents the goal of the firm.

Answer: objective function
Diff: 1
Key words: objective function, model development

36) A _____ is a computer–based system that helps decision–makers address complex problems that involve different parts of an organization and operations.

Answer: decision support system
Diff: 1
Key words: decision support systems

Problem Solving

37) The relationship d = 5000 – 25p describes what happens to demand (d) as price (p) varies. Price can vary between $10 and $50. How many units can be sold when the price is $10?

Answer: 4750
Diff: 1
Key words: break–even analysis

38) There is a fixed cost of $50,000 to start a production process. Once the process has begun, the variable cost per unit is $25. The revenue per unit is projected to be $45. Write a mathematical expression for total cost.

Answer: $C(x) = 50000 + 25x$
Diff: 1
Key words: break–even analysis

39) There is a fixed cost of $50,000 to start a production process. Once the process has begun, the variable cost per unit is $25. The revenue per unit is projected to be $45. Write an expression for total revenue.

Answer: $R(x) = 45x$
Diff: 1
Key words: break–even analysis

40) There is a fixed cost of $50,000 to start a production process. Once the process has begun, the variable cost per unit is $25. The revenue per unit is projected to be $45. Write an expression for total profit.

Answer: $P(x) = 45x - (50000 + 25x)$
Diff: 1
Key words: break–even analysis

41) There is a fixed cost of $50,000 to start a production process. Once the process has begun, the variable cost per unit is $25. The revenue per unit is projected to be $45. Find the break–even point.

Answer: $X = 2500$
Diff: 2
Key words: break–even analysis

42) Administrators at a university will charge students $150 to attend a seminar. It costs $3000 to reserve a room, hire an instructor, and bring in the equipment. Assume it costs $25 per student for the administrators to provide the course materials. How many students would have to register for the seminar for the university to break even?

Answer: 24
Diff: 2
Key words: break–even analysis

43) Administrators at a university are planning to offer a summer seminar. It costs $3000 to reserve a room, hire an instructor, and bring in the equipment. Assume it costs $25 per student for the administrators to provide the course materials. If we know that 20 people will attend, what price should be charged per person to break even?

Answer: $175
Diff: 2
Key words: break–even analysis

44) A newly opened bed–and–breakfast projects the following:
Monthly fixed costs $6000
Variable cost per occupied room per night $20
Revenue per occupied room per night $75
Write the expression for total cost per month (30 days).

Answer: C(x) = 6000 + 20(30)x
Diff: 2
Key words: break–even analysis

45) A newly opened bed–and–breakfast projects the following:
Monthly fixed costs $6000
Variable cost per occupied room per night $20
Revenue per occupied room per night $75
Write the expression for total revenue per month (30 days).

Answer: R(x) = 75(30)x
Diff: 2
Key words: break–even analysis

46) A newly opened bed–and–breakfast projects the following:
Monthly fixed costs $6000
Variable cost per occupied room per night $20
Revenue per occupied room per night $75
If there are 12 rooms available, what percentage of rooms would have to be occupied, on average, to break even?

Answer: 3.64 = 4 rooms – 4/12 = 33%
Diff: 3
Key words: break–even analysis

47) A script writer has received an advance against royalties of $10000. The royalty rate is $1 for every performance in the US, and $1.35 for every performance outside the US. Define variables for this problem.

Answer: X_1 = # of performances in the U.S.
X_2 = # of performances outside the U.S.
Diff: 3
Key words: break–even analysis

48) A script writer has received an advance against royalties of $10,000. The royalty rate is $1 for every performance in the US, and $1.35 for every performance outside the US. Write an expression that could be used to compute the number of performances in order to cover the advance.

Answer: $10000 = 1x_1 + 1.35x_2$
Diff: 3
Key words: break–even analysis

49) Students are organizing a "Battle of the Bands" contest. They know that at least 100 people will attend. The rental fee for the hall is $150 and the winning band will receive $500. In order to guarantee that they break even, how much should they charge for each ticket?

Answer: $6.50
Diff: 2
Key words: break–even analysis

50) A manufacturer buys peas for vegetable pies from 2 cooperatives. The price per unit is $6 from cooperative A, and $5.50 per unit from cooperative B. Define variables that would tell how many units to purchase from each source.

Answer: X_1 = # of units from cooperative A
X_2 = # of units from cooperative B
Diff: 3
Key words: break–even analysis, variable definition

51) A manufacturer buys peas for vegetable pies from 2 cooperatives. The price per unit is $6 from cooperative A, and $5.50 per unit from cooperative B. Develop an objective function that would minimize the total cost.

Answer: Min $6x_1 + 5.5x_2$
Diff: 3
Key words: objective function, break–even analysis, model development

52) A manufacturer buys peas for vegetable pies from 2 cooperatives. The price per unit is $6 from cooperative A, and $5.50 per unit from cooperative B. The manufacturer needs at least 12000 units of peas. Cooperative A can supply up to 8000 units, and cooperative B can supply at least 6000 units. Develop constraints for these conditions.

Answer: $X_A + X_B \leq 12000$
$X_A \leq 8000$
$X_B \geq 6000$
Diff: 3
Key words: constraints, model development

53) A manager of the cereal bar at the college campus has determined that the profit made for each bowl of Morning Buzz cereal sold, x, is equal to: $Z = \$4x - 0.5x$. Each bowl of Morning Buzz weighs 6 ounces, and the manager has 12 lbs (192 ounces) of cereal available each day, which can be written as the constraint, $6x \leq 192$. How much profit will be made from Morning Buzz if it is all sold in one day?

Answer: $112
Diff: 2
Key words: model development

54) The College Coffee Cafe buys tea from 3 suppliers. The price per pound is $15.00 from supplier A, $17.50 from supplier B, and $21.00 from supplier C. They have budged $175 to purchase the tea. The cafe needs at least 12 pounds of tea, and supplier C can supply no more than 4 pounds. Develop constraints for these conditions.

Answer: $15.00X_A + 17.50\ X_B + 21X_C \leq 175$

$X_A + X_B + X_C \geq 12$

$X_C \leq 4$

Diff: 3
Key words: constraints, model development

55) The College Coffee Cafe receives a profit of $1.25 for each cup of house tea that they sell, $1.40 for each cup of the premium brand, and $1.50 for each cup of their special blend that they sell. Develop an objective that maximizes profit.

Answer: Max $1.25x_1 + 1.40x_2 + 1.50\ x_3$
Diff: 2
Key words: objective function, model development

Multiple Choice

56) The steps of the scientific method are:

A) problem definition, model construction, observation, model solution, implementation.

B) observation, problem definition, model construction, model solution, implementation.

C) model construction, problem definition, observation, model solution, implementation.

D) observation, implementation, problem definition, model construction, model solution.

Answer: B
Diff: 1
Key words: steps of sci method, prob solving approach, mgt sci process

57) A model is a functional relationship and include:

A) variables

B) parameters

C) equations

D) all of the above

Answer: D
Diff: 1
Key words: model

58) Which of the following is an equation or an inequality that expresses a resource restriction in a mathematical model?

A) a decision variable.

B) data

C) an objective function.

D) a constraint.

E) a parameter.

Answer: D
Diff: 2
Key words: model, constraint

59) Which of the following is incorrect with respect to the use of models in decision making?

A) they improve understanding of the problem

B) they promote subjectivity in decision making

C) they are generally easy to use

D) they provide a systematic approach to problem solving

Answer: B
Diff: 3
Key words: model, problem solving

60) The field of management science

A) approaches decision making rationally with techniques based on the scientific method

B) is another name for decision science and for operations research

C) concentrates on the use of quantitative methods to assist managers in decision making

D) all of the above

Answer: D
Diff: 1
Key words: management science, operations research

61) The processes of problem observation

A) cannot be done until alternatives are proposed

B) requires consideration of multiple criteria

C) is the first step of decision making

D) is the final step of problem solving

Answer: C
Diff: 1
Key words: observation, problem observation, management science process

62) The limits of the problem and the degree to which it pervades other units other units in the organization must be included during the _____ step of the management science process.

A) observation

B) definition

C) solution

D) implementation

Answer: B
Diff: 1
Key words: management science process

63) _____ involves determining the functional relationship between variables, parameters and equations

A) Problem observation

B) Problem definition

C) Model construction

D) Model solution

E) Model implementation

Answer: C
Diff: 1
Key words: management science process, model construction

64) Management science _____ can either be a recommended decision or information that helps a manager make a decision.

A) model implementation

B) model construction

C) problem definition

D) model solution

E) problem formulation

Answer: D
Diff: 2
Key words: management science process, model solution

65) The quantitative analysis approach requires

A) mathematical expressions for the relationship

B) uncomplicated problems

C) the manager to have prior experience with similar problems

D) all of the above

Answer: A
Diff: 2
Key words: management science, operations research, quantitative analysis

66) The result of an effective decision making process should be monitored in order to

A) reveal wrong assumptions

B) reveal errors in the implementation

C) insure the achievement of desired results

D) all of the above

Answer: D
Diff: 2
Key words: decision making process

67) Which of the following is not a general approach to decision–making?

A) establishing priorities

B) analysis of tradeoffs

C) an emphasis on subjectivity

D) a system's approach

Answer: C
Diff: 2
Key words: decision making, management science

68) The management science process does not include

A) problem definition

B) feedback

C) implementation

D) subjective preference

E) information

Answer: D
Diff: 2
Key words: management science process

69) The indicator that results in total revenues being equal to total cost is called the

A) marginal cost

B) marginal volume

C) break–even point

D) profit mix

Answer: C
Diff: 1
Key words: break–even analysis

70) Variable cost

A) depends on the number of units produced

B) plus marginal cost equals fixed cost

C) is equal to total cost in deterministic models

D) all of the above

Answer: A
Diff: 2
Key words: break–even analysis

71) The components of break–even analysis are

A) volume, cost and profit

B) volume and cost

C) cost and profit

D) volume and profit

Answer: A
Diff: 1
Key words: break–even analysis

72) _____ are generally independent of the volume of units produced and sold.

A) Fixed costs

B) Variable costs

C) Profits

D) all of the above

Answer: A
Diff: 1
Key words: break–even analysis

73) The purpose of break–even analysis is to determine the number of units of a product to sell that will

A) equal total revenue with total cost

B) be larger than total revenue compared to total cost

C) be smaller than total revenue compared to total cost

D) none of the above

Answer: A
Diff: 2
Key words: break–even analysis