

**TEST BANK**



**MANAGEMENT  
ACCOUNTING**

FIFTH EDITION

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## CHAPTER 2

# COST MANAGEMENT CONCEPTS AND COST BEHAVIOR

### TRUE/FALSE

1. Management accountants focus on historical cost.
  - a. True
  - b. False
  
2. The role of the management accountant is to determine the cost of a product based on the current decision situation.
  - a. True
  - b. False
  
3. A cost that is useful for one decision may not be useful information for another decision.
  - a. True
  - b. False
  
4. In most organizations, managing selling, general and administrative costs as well as manufacturing costs are important for financial success.
  - a. True
  - b. False
  
5. The cost of a customized machine only used in the production of a single product would be classified as a product cost.
  - a. True
  - b. False
  
6. The cost of utilities for the factory building would be classified as a period cost.
  - a. True
  - b. False
  
7. The salary of the company president is a fixed manufacturing cost.
  - a. True
  - b. False
  
8. For external reporting, generally accepted accounting principles require that costs be classified as either variable or fixed costs.
  - a. True
  - b. False
  
9. Knowing whether a cost is a period or a product cost helps to estimate total cost at a new level of activity.
  - a. True
  - b. False

10. Variable costs are always direct costs.
  - a. True
  - b. False
11. Fixed costs vary with the level of production or sales volume.
  - a. True
  - b. False
12. Currently, most personnel costs are classified as fixed costs.
  - a. True
  - b. False
13. Some fixed costs might be classified as direct manufacturing costs.
  - a. True
  - b. False
14. Fixed costs depend on the resources used, not the resources acquired.
  - a. True
  - b. False
15. Break-even point is NOT an important concept since the goal of business is to make a profit.
  - a. True
  - b. False
16. To perform cost-volume-profit analysis, a company must be able to separate costs into fixed and variable components.
  - a. True
  - b. False
17. Cost-volume-profit analysis may be used for single-product and multiproduct analysis but not in a service environment.
  - a. True
  - b. False
18. Selling price per unit is \$30, variable cost per unit is \$15, and fixed cost per unit is \$10. When this company operates above the break-even point, the sale of one more unit will increase net income by \$5.
  - a. True
  - b. False
19. A company with sales of \$100,000, variable costs of \$70,000, and fixed costs of \$50,000 will reach its break-even point if sales are increased by \$20,000.
  - a. True
  - b. False

20. In multiproduct situations when the sales mix shifts toward the product with the lowest contribution margin per unit, the break-even quantity will decrease.
  - a. True
  - b. False
21. Opportunity costs are implicit costs.
  - a. True
  - b. False
22. When a firm maximizes profits it will simultaneously minimize opportunity costs.
  - a. True
  - b. False
23. Even when the only constraint limiting production is machine time, a company should be most concerned with maximizing contribution margin per unit.
  - a. True
  - b. False
24. The time over which a decision maker can adjust capacity is referred to as the short run.
  - a. True
  - b. False
25. For general customers, the price charged for a product must cover its long-run cost to the organization.
  - a. True
  - b. False
26. In recent years, fixed costs have increased as a proportion of total manufacturing costs.
  - a. True
  - b. False
27. Customer-sustaining costs are independent of the volume of products or services sold to the customer.
  - a. True
  - b. False
28. The benefits of classifying activities using the broader framework of unit-related, batch-related, product-sustaining, customer-sustaining, and business-sustaining activities are there are generally more costs that are directly traceable to cost objects.
  - a. True
  - b. False
29. Utilities expense is generally a unit-level cost electricity used for machines is unit-level water-use is unit-level.
  - a. True
  - b. False

## MULTIPLE CHOICE

30. An example of a cost object is:
- a bicycle
  - an individual fast food franchise
  - the produce department of a grocery store
  - All of the above are correct.
31. Manufacturing costs for a leather La-Z Boy recliner include:
- cost of leather
  - design costs
  - depreciation on machinery used inside of factory
  - salary paid to La-Z Boy Vice-President of Sales
32. Manufacturing costs for a can of Sunkist tuna include all of the following EXCEPT:
- depreciation on fishing boats
  - cost of labels for cans
  - salary of financial accountant
  - wages paid to line workers who make the product
33. Nonmanufacturing costs:
- include only fixed costs
  - seldom influence financial success or failure
  - include the cost of selling, distribution, and after-sales costs for customers
  - are considered by GAAP to be an element of product costs
34. Product costs for a wool carpet:
- include the cost of television advertising
  - include only direct materials such as the wool and direct labor such as the wages paid to the workers who run the machines that weave the carpets
  - include indirect costs such as depreciation on the manufacturing facility
  - include nonmanufacturing costs such as sales commissions
35. For external reporting:
- costs are classified as either product or period costs
  - costs reflect current values
  - there are no prescribed rules since no one is exactly sure how the investors and creditors will use these numbers
  - expenses include amounts that reflect current and future benefits
36. Product costs are expensed on the income statement when:
- raw materials for the product are purchased
  - raw materials are requisitioned for the product
  - the product completes the manufacturing process
  - the product is sold

37. The salaries paid for supervisory labor in the multi-product factory are classified as a(n)\_\_\_\_\_ when the cost object is:
- product
  - direct labor cost
  - indirect manufacturing cost
  - general and administrative cost
38. The cost of inventory reported on the balance sheet of Lands' End may include the cost of all the following EXCEPT:
- cost of mailing catalogues
  - cost of material used in the manufacture of clothing
  - depreciation on the manufacturing equipment
  - wages of manufacturing facility is maintenance staff
39. A plant manufactures several different products. The wages of the maintenance staff in the plant can be classified as a (an):
- direct cost
  - product cost
  - opportunity cost
  - nonmanufacturing cost
40. Period costs, such as administrative salaries:
- are expensed in the period they are incurred
  - are allocated to products
  - include indirect manufacturing labor
  - are also referred to as direct costs
41. Which of the following is NOT a period cost?
- depreciation on sales staff's Blackberrys
  - depreciation on the copier in the company president's office
  - depreciation on the research and development facility
  - depreciation on the manufacturing equipment
42. Sales staff employee benefits expense is an example of a \_\_\_\_\_ cost expensed on the income statement in the accounting period incurred.
- direct
  - manufacturing
  - period
  - product
43. (CMA adapted, June 1992) The terms "direct cost" and "indirect cost" are commonly used in cost accounting. Classifying a cost as either direct or indirect depends upon:
- the behavior of the cost in response to volume changes
  - whether the cost is expensed in the period in which it is incurred
  - whether the cost can be related readily to resources consumed for a cost object
  - whether an expenditure is unavoidable because it cannot be changed regardless of any action taken

44. Indirect manufacturing costs:
- can be traced to the product that created the costs
  - may have a cause-and-effect relationship with capacity rather than with individual units of production
  - generally include the cost of material and the cost of labor
  - are included in period costs
45. A manufacturing plant for Vanguard produces two product lines: Optimist sailboats and 420 sailboats. An indirect cost for the Optimist line is the:
- cloth used to make Optimist sails
  - labor to pour 420 hull molds
  - shift supervisor for the Optimist line
  - plant supervisor
46. A manufacturing plant for Vanguard produces two product lines: Optimist sailboats and 420 sailboats. Direct costs for the 420 sailboats include the:
- snacks provided daily in the plant break room
  - monthly lease payments for a specialized piece of equipment needed to manufacture the 420 sailboats
  - salaries of the clerical staff that work in the company's administrative offices
  - depreciation on the manufacturing plant facility

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 47 THROUGH 53.

The Bowley Company manufactures several different products. Unit costs associated with product ICT101 are as follows:

Direct materials	\$ 60
Direct labor	10
Variable support costs	18
Fixed manufacturing support costs	32
Sales commissions (2% of sales)	4
Administrative salaries	<u>16</u>
Total	<u>\$140</u>

47. Total product costs associated with product ICT101 are:
- \$ 50
  - \$ 88
  - \$120
  - \$140
48. Total period costs associated with product ICT101 are:
- \$ 4
  - \$16
  - \$20
  - \$52

49. Total variable costs associated with product ICT101 are:
- \$18
  - \$22
  - \$88
  - \$92
50. Total fixed costs associated with product ICT101 are:
- \$16
  - \$32
  - \$48
  - \$52
51. Total nonmanufacturing costs associated with product ICT101 are:
- \$ 4
  - \$16
  - \$20
  - \$52
52. Total manufacturing costs associated with product ICT101 are:
- \$70
  - \$88
  - \$120
  - \$140
53. Direct manufacturing costs associated with product ICT101 are:
- \$70
  - \$88
  - \$92
  - \$108
54. Cost behavior refers to:
- how costs react to a change in the level of activity
  - whether a cost is incurred in a manufacturing, merchandising, or service company
  - classifying costs as either product or period costs
  - whether a particular expense has been ethically incurred
55. Which statement is FALSE?
- All variable costs are direct costs.
  - Because of a cost-benefit tradeoff, some direct costs may be treated as indirect costs.
  - All fixed costs are indirect costs.
  - Direct costs may be variable or fixed.



56. An understanding of the underlying behavior of costs helps in all of the following EXCEPT:
- sales volume can be better estimated
  - costs can be better estimated as volume expands and contracts
  - true costs of processes can be better evaluated
  - process inefficiencies can be better identified and, as a result, reduced
57. Fixed costs:
- may be either direct or indirect costs
  - vary with production or sales volume
  - include parts and materials used to manufacture a product
  - can be adjusted in the short run to meet actual demands
58. Fixed costs depend on:
- the amount of resources used
  - the amount of resources acquired
  - the volume of production
  - the volume of sales
59. Currently, most companies consider annual labor costs as:
- a fixed cost
  - a variable cost
  - an opportunity cost
  - a period cost
60. Which of the following does NOT describe a variable cost?
- Variable cost are always indirect costs.
  - Variable costs increase in total when the actual level of activity increases.
  - Variable costs include most personnel costs and depreciation on machinery.
  - Variable costs can always be traced directly to the cost object.
61. Cost-volume-profit analysis is used PRIMARILY by management:
- as a planning tool
  - for control purposes
  - to establish a target net income for next year
  - to attain extremely accurate financial results
62. Contribution margin equals revenues minus:
- product costs
  - period costs
  - variable costs
  - fixed costs

63. The break-even point is the level at which revenues:
- equal fixed costs
  - equal variable costs
  - equal fixed costs minus flexible costs
  - equal variable costs plus capacity-related costs
64. The break-even point in units is:
- total costs divided by variable costs per unit
  - contribution margin per unit divided by revenue per unit
  - fixed costs divided by contribution margin per unit
  - (fixed costs plus variable costs) divided by contribution margin per unit
65. Cost-volume-profit analysis assumes all of the following EXCEPT:
- all costs are purely variable or fixed
  - units manufactured equal units sold
  - total variable costs remain the same over the relevant range
  - total fixed costs remain the same over the relevant range
66. All of the following are assumed in a cost-volume-profit analysis EXCEPT:
- a constant product mix
  - fixed costs increase when activity increases
  - revenue per unit does not change as volume changes
  - all costs can be classified as either fixed or variable
67. In multiproduct situations, when the sales mix shifts toward the product with the highest contribution margin per unit, then:
- total revenues will decrease
  - breakeven quantity will increase
  - total contribution margin will decrease
  - operating income will increase

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 68 THROUGH 71.

Sammy's Salsa, Inc. sells a single product. This year, 10,000 units were sold resulting in \$65,000 of sales revenue, \$30,000 of variable costs, and \$17,500 of fixed costs.

68. The contribution margin per unit is:
- \$6.50
  - \$3.50
  - \$3.00
  - \$1.75.
69. The break-even point in units for a year is:
- 2,000 units
  - 3,000 units
  - 5,000 units
  - 10,000 units.

70. The number of units that must be sold annually to achieve \$52,500 of profits is:
- a. 20,000 units
  - b. 15,000 units
  - c. 10,000 units
  - d. 5,000 units.
71. If sales increase by \$19,500 in a year (from \$65,000), profits will increase by:
- a. \$10,500
  - b. \$17,500
  - c. \$19,500
  - d. \$35,000

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 72 THROUGH 74.  
EJL Herbal Remedies sells several products for an average price of \$17 per unit. Average variable costs per unit are as follows:

Direct material	\$5.00
Direct labor	\$1.00
Indirect manufacturing costs	\$0.50
Selling commissions	\$3.00

EJL's annual fixed costs total \$82,500.

72. The contribution margin per unit is:
- a. \$7.50
  - b. \$10.50
  - c. \$12
  - d. \$14
73. The number of units that EJL must sell each year to break even is:
- a. 4,853 units
  - b. 7,857 units
  - c. 11,000 units
  - d. 13,000 units
74. The number of units that EJL must sell annually to make a profit of \$75,000 is:
- a. 7,500 units
  - b. 18,000 units
  - c. 21,000 units
  - d. 30,000 units

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 75 THROUGH 79.

The following annual information is for Barnett Corporation:

	<u>Product X</u>	<u>Product Y</u>	
Revenue per unit:	\$10.00	\$15.00	
Variable cost per unit:	\$ 2.50	\$ 5.00	
Total fixed costs:			\$50,000

75. If the sales mix consists of two units of Product X and one unit of Product Y, what is the weighted revenue per unit of composite product?
- \$10.00
  - \$11.66
  - \$13.33
  - \$15.00
76. If the sales mix consists of two units of Product X and one unit of Product Y, what is the break-even point in units for a year?
- 1,000 units of Y and 2,000 units of X
  - 1012.5 units of Y and 2,025 units of X
  - 2012.5 units of Y and 4,025 units of X
  - 2,000 units of Y and 4,000 units of X
77. What is the operating income for a year, assuming actual sales total 150,000 units, and the sales mix is two units of Product X and one unit of Product Y?
- \$1,200,000
  - \$1,250,000
  - \$1,750,000
  - None of the above is correct.
78. If the sales mix shifts to one unit of Product X and two units of Product Y, then the contribution margin per unit of composite product will:
- increase per unit
  - stay the same
  - decrease per unit
  - be undeterminable
79. If the sales mix shifts to one unit of Product X and two units of Product Y, then the break-even point in units for a year will:
- increase
  - stay the same
  - decrease
  - be undeterminable

80. The opportunity cost(s):
- of a resource with excess capacity is zero
  - should be maximized by organizations
  - are recorded as an expense in the accounting records
  - are most important to financial accountants
81. A recent college graduate has the choice of buying a new auto for \$20,000 or to invest the money for four years with a 12% expected rate of return per year. If the graduate decides to purchase the auto, the BEST estimate of the opportunity cost of that decision is:
- \$2,400
  - \$11,740
  - \$20,000
  - There is no opportunity cost for this decision.

THE FOLLOWING INFORMATION APPLIES TO QUESTIONS 82 THROUGH 86.

Brenda's Brakes manufactures three different product lines, Model X, Model Y, and Model Z. Considerable market demand exists for all models. The following per unit data apply:

	<u>Model X</u>	<u>Model Y</u>	<u>Model Z</u>
Selling price	\$50	\$60	\$70
Direct materials	6	6	6
Direct labor (\$12 per hour)	12	12	24
Variable support costs (\$4 per machine hour)	4	8	8
Fixed costs	10	10	10

82. Which model has the greatest contribution margin per unit?
- Model X
  - Model Y
  - Model Z
  - both Models X and Y
83. Which model has the greatest contribution margin per machine hour?
- Model X
  - Model Y
  - Model Z
  - both Models Y and Z
84. If there is excess capacity, which model is the most profitable to produce?
- Model X
  - Model Y
  - Model Z
  - both Models X and Y
85. If there is a machine breakdown, which model is the most profitable to produce?
- Model X
  - Model Y
  - Model Z
  - both Models Y and Z

86. How can Brenda encourage her salespeople to promote the more profitable model?
- Put all sales persons on salary.
  - Provide higher sales commissions for higher priced items.
  - Provide higher sales commissions for items with the greatest contribution margin per constrained resource.
  - Both (b) and (c) are correct.
87. Which statement is FALSE? Short run costs:
- are actually variable costs
  - affect long-run capacity
  - are included in the calculation of long-run costs
  - increase when one more unit is produced or served
88. To sustain the profitability of a product, the list price of a product must cover its:
- variable costs
  - fixed costs
  - indirect costs
  - long-run costs
89. Compared to the early 1900s, \_\_\_\_\_ costs now comprise a much higher share of total product costs.
- direct labor
  - direct materials
  - variable
  - fixed
90. In recent years, the manufacturing cost structure has changed as a result of:
- greater automation
  - better customer service
  - the proliferation of multiple products
  - All of the above are correct.
91. Cost distortion is common in conventional costing systems because:
- of the recent change in cost structure
  - the number of products being manufactured is increasing
  - fixed costs are allocated using a volume measure
  - fixed costs create higher risks for a company
92. Costs that must be allocated to products for external reporting purposes include:
- selling and marketing costs
  - direct material and direct labor costs
  - the cost of equipment used to manufacture several different products
  - All of the above are correct.

93. The benefits of classifying activities using the broader framework of unit, batch, product, customer, and business-sustaining activities are that there are generally more costs:
- directly traceable to cost objects
  - treated as indirect costs
  - arbitrarily allocated to cost objects
  - There is no major difference regarding costs.
94. For budgeting purposes, product-sustaining activity costs should be:
- allocated to individual units
  - allocated to individual customers
  - assigned directly to individual product lines
  - assigned directly to individual batches
95. Which of the following activities is a unit-related activity?
- preparing and filing the annual tax return for the organization
  - machine setups for each production run
  - quality inspections of 2% of the items produced
  - obtaining patents and regulatory approval for each product produced
96. Which of the following activities is a batch-related activity?
- preparing and filing the annual tax return for the organization
  - machine setups for each production run
  - quality inspections of 2% of the items produced
  - obtaining patents and regulatory approval for each product produced
97. Which of the following activities is a product-sustaining activity?
- preparing and filing the annual tax return for the organization
  - machine setups for each production run
  - quality inspections of 2% of the items produced
  - obtaining patents and regulatory approval for each product produced
98. Which of the following activities is a business-sustaining activity?
- preparing and filing the annual tax return for the organization
  - machine setups for each production run
  - making sales calls
  - obtaining patents and regulatory approval for each product produced
99. Which of the following activities is a customer-sustaining activity?
- preparing and filing the annual tax return for the organization
  - machine setups for each production run
  - making sales calls
  - obtaining patents and regulatory approval for each product produced

100. Batch-related activities include:
- research and development
  - administration
  - machine set-ups
  - direct labor
101. Unit-related activities include:
- research and development
  - administration
  - machine set-ups
  - direct labor
102. Customer-sustaining activities include:
- shipping
  - technical support provided to individual customers
  - direct labor
  - advertising
103. Channel-sustaining activities include:
- trade shows
  - administration
  - research and development
  - plant management

### **EXERCISE/PROBLEM**

104. Highlands Paint Manufacturing Company produces several different products. Classify each of their following costs as direct materials, direct labor, indirect manufacturing costs, or nonmanufacturing costs.
- Wages paid to production facility's maintenance staff.
  - Depreciation on Controller's office furniture.
  - Lease for Company President's Lexus.
  - Mailroom clerk.
  - Toilet paper in manufacturing facility bathrooms.
  - Supplies used in small quantities, such as glue, to complete assembly work.
  - Depreciation on factory equipment.
  - Parts used in assembly.
  - Employee benefits of the assembly-line workers.
  - Life insurance policy on Company's President.
  - Depreciation on laptop computers for sales staff.
  - Salaries of Executives' Assistants in the company.
  - Wages of the canning department's workers.
  - Sales commissions.
  - Depreciation on executives' parking lot lighting.



105. Benny's Best reported the following for 2007:

Revenues	\$16,000
Variable manufacturing costs	\$8,000
Variable nonmanufacturing costs	\$2,000
Fixed manufacturing costs	\$4,000
Fixed nonmanufacturing costs	\$1,200

**Required:**

- a. Compute the contribution margin.
- b. Compute the gross margin.
- c. Compute the operating income.

106. In 2007, SSPC Company has sales of 8,000 units at \$10 each, variable costs totaling \$20,000, and fixed costs of \$30,000. In 2008, the company expects annual insurance costs to increase by \$4,000 to \$9,000.

**Required:**

- a. Calculate operating income and the break even point in units for 2007.
- b. Calculate the break even point in units for 2008.

107. Sunshine, Inc., sells a single product. The company's most recent income statement is given below.

Sales (4,000 units)	\$120,000
Less variable expenses	<u>(68,000)</u>
Contribution margin	52,000
Less fixed expenses	<u>(40,000)</u>
Net income	<u>\$ 12,000</u>

**Required:**

- a. Contribution margin per unit is \$ \_\_\_\_\_ per unit
- b. If sales are doubled to \$240,000, total variable costs will equal \$ \_\_\_\_\_
- c. If sales are doubled to \$240,000, total fixed costs will equal \$ \_\_\_\_\_
- d. If Sunshine is past the breakeven point and 10 more units are sold, profits will increase by \$ \_\_\_\_\_
- e. Compute how many units must be sold to break even. # \_\_\_\_\_
- f. Compute how many units must be sold to achieve a profit of \$20,000. # \_\_\_\_\_

108. Jeffrey's, Inc., sells a single product. The company's most recent income statement is given below.

Sales	\$200,000
Less variable expenses	<u>(120,000)</u>
Contribution margin	80,000
Less fixed expenses	<u>(50,000)</u>
Net income	<u>\$ 30,000</u>

**Required:**

- a. Contribution margin ratio is \_\_\_\_\_ %
- b. Break-even point in total sales dollars is \$ \_\_\_\_\_
- c. To achieve \$40,000 in net income, sales must total \$ \_\_\_\_\_
- d. If sales increase by \$50,000 from a \$200,000 level, net income will increase by \$ \_\_\_\_\_

109. Yurus Manufacturing Company produces two products, X and Y. The following information is presented for both products:

	<u>X</u>	<u>Y</u>	
Selling price per unit	\$36	\$24	
Variable cost per unit	28	12	
Total fixed costs			\$234,000

**Required:**

Assume the sales mix is 3 units of X for every unit of Y:

- a. What is the weighted revenue per unit of composite average product, the weighted average variable cost, and the weighted contribution margin per unit of composite average product?
  - b. What is the break-even point in units of both X and Y?
110. Bob's Textile Company sells shirts for men and boys. The average selling price and variable cost for each product are as follows:

	<u>Men's</u>	<u>Boys</u>	
Selling price	\$28.80	\$24.00	
Variable cost	\$20.42	\$16.80	
Total fixed costs			\$38,400

**Required:**

Assume the sales mix is 2 men's shirts for each boy's shirt:

- a. What is the weighted revenue per unit of composite average product, the weighted average variable cost, and the weighted contribution margin per unit of average product?
  - b. What is the break-even point in units for each type of shirt?
  - c. What is the operating income, assuming sales total 9,000 shirts?
111. Charlie's Chairs manufactures two models, Standard and Premium. Weekly demand is estimated to be 120 units of the Standard Model and 70 units of the Premium Model. Only 420 machine hours are available per week. The following per unit data apply:

	<u>Standard</u>	<u>Premium</u>
Contribution margin per unit	\$12	\$15
Number of machine hours required	2	3

**Required:**

- a. For each model, compute the contribution margin per machine hour.
- b. To maximize weekly production profits, how many machine hours would you recommend of each model? How many units of each model?
- c. If there are 500 machine hours available per week (instead of only 420 machine hours per week), how many chairs of each model should Charlie's produce to maximize profits?

112. *Sasita's Surfboard Company*: Sasita has researched and decided to produce and sell surfboards. For start-up costs she will use the \$10,000 she currently has invested in a money-market account earning interest at a rate of 6% annually. She has a garage that was constructed at a cost of \$4,000 several years ago that will be used for production purposes. The garage will be depreciated over a 10-year life. Sasita has determined that each surfboard will require \$30 in materials. She will hire students to do most of the work and pay \$35 for each surfboard completed. She will rent machinery needed at a cost of \$200 per month. An ad agency will handle advertising at a cost of \$100 per month. Sasita will hire students to sell the surfboards and pay a commission of \$20 per board.

**Required:**

From the above information, identify all of the following types of costs.

- a. Period costs
- b. Variable costs
- c. Product costs
- d. Direct manufacturing costs
- e. Indirect manufacturing costs
- f. Unit-related costs
- g. Opportunity costs of starting the Sasita's Surfboard Company
- h. Which costs should be considered over the long run?

113. *Kevin's Karate Studio*: Kevin is currently earning \$20,000 annually working at a karate studio on the east side of town. He has a loyal following of students, and therefore, is investigating opening his own facility. His idea is to open a small gym with a workout area equipped with free-weights and an exercise mat. He will also hold weekly karate classes. Kevin is the sole family wage earner. He, his wife, and three young children live in Green Bay, Wisconsin, a city with a population of approximately 150,000. Kevin has found an appropriate building to rent on the west side of town near his home, and he estimates the following revenues/costs of opening his new facility:

\$600/month	Rent (includes utilities) for a room about the size of a college classroom (30' x 50') on the west side of town in a strip mall. There are no shower facilities, but there will be changing rooms with lockers.
\$10,000	Initial costs include new carpet, an exercise mat, and exercise equipment. Useful life of these items is 5 years.
\$50/year	Members will pay an annual fee for the use of the facility. Kevin estimates that he can attract and accommodate 200 members annually.
\$40/class	For a basic 4-week karate class for all levels except black belt. Kevin anticipates 15 students per month. Classes will meet every week of the year. \$40 fee covers 4 weeks of karate classes.
\$1,000/class	For a black belt class and testing. Kevin anticipates two students per year.

**Required:**

Kevin has come to you for advice.

- a. Based on the above information, would you recommend Kevin start this company? Why or why not? Provide commentary as well as computations to support your response.
- b. What are some of the questions you would ask Kevin to help him think through this decision? List at least five relevant questions.

114. *Miss Carol's Swimming Hole*: Carol has been a swimming instructor for the local Park-and-Rec for over 20 years. She has a loyal following of students, and therefore, is investigating opening her own pool. Her idea is to open a small, indoor pool and provide weekly swimming lessons during the day and offer recreational swimming for members in the evenings. Carol and her husband live in Des Moines, Iowa, a city with a population of over 300,000. Carol's husband is employed full-time and provides medical insurance for the family. Their children are grown and live away from home. Carol has found a lot in a residential area zoned for commercial use, and a contractor who will construct the pool, building, and parking lot for a total cost of \$750,000. Carol estimates the following revenues/costs of opening her new facility:

\$750,000	Cost of constructing the building, a small pool, and parking lot. Estimated useful life of the facility is 20 years.
\$300/year	Members will pay an annual fee for the use of the pool. Carol estimates that she can attract and accommodate 200 members annually.
\$40/class	For a basic 4-week swimming class. Carol anticipates 50 students per month. Classes will meet every week of the year.
\$25,000/year	Lifeguard salary. A lifeguard is required by law to be on duty whenever the pool is open.
\$10,000/year	Part-time swimming instructor salary.
\$5,000/month	Utilities. One of the major operating expenses for a pool is utilities to heat and filter the water and power for the immediate areas.
\$5,000/year	General maintenance and repairs.

**Required:**

Carol has come to you for advice.

- Based on the above information, would you recommend Carol open this pool? Why or why not? Provide commentary as well as computations to support your response.
- What are some of the questions you would ask Carol to help her think through this decision? List at least five relevant questions.

115. Classify each of the following activities as unit-related, batch-related, product-sustaining, or business-sustaining activities.

- Plant security
- Scheduled machine maintenance
- Product development
- Supervision of direct labor
- Accounting
- Production scheduling
- Engineering change
- Materials handling

## CRITICAL THINKING/ESSAY

116. How is cost information used in financial accounting and in management accounting?
117. What are the differences between product costs and period costs? Give an example of each.
118. Describe a variable cost. Describe a fixed cost. Explain why the distinction between variable and fixed costs is important in management accounting.
119. What is meant by the term *break-even point*? Why should a manager be concerned about the *break-even point*?
120. Explain when a manager would use cost-volume-profit analysis.
121. Which costs are relevant for making decisions that affect the short-term? The long-term? Why?
122. Manufacturing costs have shifted from direct labor to fixed manufacturing costs. What implication does this have for management accounting?
123. What are the differences between unit-related and batch related activities? Give an example of each.
124. What is the benefit of classifying costs using the broader framework of unit, batch, product, customer, and business-sustaining activities (rather than as variable or fixed costs)?
125. What are the differences between product-sustaining and customer-sustaining activities? Give an example of each.

**CHAPTER 2 SOLUTIONS**  
**COST MANAGEMENT CONCEPTS AND COST BEHAVIOR**

**TRUE/FALSE**

- LO4 1. b
- LO4 2. a
- LO1 3. a
- LO1 4. a
- LO1 5. a
  
- LO1 6. b
- LO1 7. b
- LO1 8. b
- LO2 9. b
- LO2 10. b
  
- LO3 11. b
- LO3 12. a
- LO3 13. a
- LO3 14. b
- LO3 15. b
  
- LO3 16. a
- LO3 17. b
- LO3 18. b
- LO3 19. b
- LO3 20. b
  
- LO5 21. a
- LO5 22. a
- LO5 23. b
- LO6 24. b
- LO6 25. a
  
- LO7 26. a
- LO7 27. a
- LO7 28. a
- LO7 29. a

**MULTIPLE CHOICE**

- LO1 30. d
  
- LO1 31. a,c
- LO1 32. c
- LO1 33. c
- LO1 34. c,b
- LO4 35. a
  
- LO4 36. d
- LO1 37. c
- LO4 38. a
- LO1 39. b
- LO1 40. a
  
- LO1 41. d
- LO1 42. c
- LO2 43. c
- LO2 44. b
- LO2 45. d
  
- LO2 46. b
- LO1 47. c
- LO1 48. c
- LO1 49. d
- LO1 50. c
  
- LO1 51. c
- LO1 52. c
- LO2 53. a
- LO3 54. a
- LO3 55. c,a

- LO3 56. a
- LO3 57. a
- LO3 58. b
- LO3 59. a
- LO3 60. c,  
a,  
d
  
- LO3 61. a
- LO3 62. c
- LO3 63. d
- LO3 64. c
- LO3 65. c
  
- LO3 66. b
- LO3 67. d
- LO3 68. b
- LO3 69. c
- LO3 70. a
  
- LO3 71. a
- LO3 72. a
- LO3 73. c
- LO3 74. c
- LO3 75. b
  
- LO3 76. d
- LO3 77. a
- LO3 78. a
- LO3 79. c
- LO5 80. a

- LO5 81. b
- LO5 82. b
- LO5 83. a
- LO5 84. b
- LO5 85. a
  
- LO5 86. c
- LO6 87. b
- LO6 88. d
- LO7 89. d
- LO7 90. d
  
- LO7 91. c
- LO7 92. c
- LO7 93. a
- LO7 94. c
- LO7 95. c
  
- LO7 96. b
- LO7 97. d
- LO7 98. a
- LO7 99. c
- LO7 100. c
  
- LO7 101. d
- LO7 102. b
- LO7 103. a



## MULTIPLE CHOICE

47.  $\$60 + \$10 + \$18 + \$32 = \$120$
48.  $\$4 + \$16 = \$20$
49.  $\$60 + \$10 + \$18 + \$4 = \$92$
50.  $\$32 + \$16 = \$48$
51.  $\$4 + \$16 = \$20$
52.  $\$60 + \$10 + \$18 + \$32 = \$120$
53.  $\$60 + \$10 = \$70$
- 
68.  $(\$65,000 / 10,000 \text{ units}) - (\$30,000 / 10,000 \text{ units}) = \$6.5 - \$3 = \$3.50$
69.  $\$17,500 / \$3.50 = 5,000 \text{ units}$
70.  $(\$17,500 + \$52,500) / \$3.50 = 20,000 \text{ units}$
71.  $\$19,500 / \$6.50 = 3,000 \text{ units}$   $\$3.50 = \$10,500$
- 
72.  $\$17.00 - (\$5.00 + \$1.00 + \$0.50 + \$3.00) = \$7.50$
73.  $\$82,500 / \$7.50 = 11,000 \text{ units}$
74.  $(\$75,000 + \$82,500) / \$7.50 = 21,000 \text{ units}$
- 
75.  $[\$10 (2) + \$15 (1)] / 3 = \$11.66$
76. Variable cost per average unit  $[\$2.5 (2) + \$5 (1)] / 3 = \$3.33$   
 $\$11.66(C) - \$3.33(C) - \$50,000 = 0$ ;  $C = 6,000$  total units, which are 2,000 of Y and 4,000 of X
77.  $(\$10 - \$2.50) (150,000 \times 2/3) + (\$15 - \$5) (150,000 \times 1/3) - 50,000 = \$1,250,000$
- 
81.  $[\$20,000 \times 1.12^{(4)}] - \$20,000 = \$11,470$
- 
82. Model X  $\$50 - (\$6 + \$12 + \$4) = \$28$ ; **Model Y  $\$60 - (\$6 + \$12 + \$8) = \$34$** ; Model Z  $\$70 - (\$6 + \$24 + \$8) = \$32$
83. Model X  $\$50 - (\$6 + \$12 + \$4) = \$28 / (1 \text{ mh per unit}) = \$28 \text{ per mh}$ ; **Model Y  $\$60 - (\$6 + \$12 + \$8) = \$34 / (2 \text{ mh per unit}) = \$17 \text{ per mh}$** ; Model Z  $\$70 - (\$6 + \$24 + \$8) = \$32 / (2 \text{ mh per unit}) = \$16 \text{ per mh}$
84. Model Y with the greatest contribution margin per unit
85. Model X with the greatest contribution margin per machine hour

## EXERCISE/PROBLEM

### LO1

104. a. Indirect manufacturing costs      Wages paid to production facility's maintenance staff
- b. Nonmanufacturing cost      Depreciation on office furniture
- c. Nonmanufacturing cost      Lease for company president Lexus
- d. Nonmanufacturing cost      Mailroom clerk
- e. Indirect manufacturing costs      Toilet Paper
- f. Indirect manufacturing costs      Supplies used in small quantities, such as glue, to complete assembly work
- g. Indirect manufacturing costs      Depreciation on factory equipment
- h. Direct materials cost      Parts used in assembly
- i. Direct labor cost      Employee benefits of the assembly-line workers
- j. Nonmanufacturing cost      Life insurance policy on company president
- k. Nonmanufacturing cost      Depreciation on laptop computers for sales staff
- l. Nonmanufacturing cost      Salaries of executive assistants in the company
- m. Direct labor cost      Wages of the canning department workers
- n. Nonmanufacturing cost      Sales commissions
- o. Nonmanufacturing cost      Depreciation on executive parking lot lighting \$10,000

### LO2

105. a. Contribution margin \$16,000
- b. Gross margin  $\$16,000 - (\$8,000 + \$4,000) = \$4,000$
- c. Operating income  $\$6,000 - (\$4,000 + \$1200) = \$800$

### LO2,3

106. a. In 2007, operating income equals  $\$30,000 = \$80,000$  sales revenue -  $\$20,000$  flexible costs -  $\$30,000$  fixed costs.

The break even point for 2007 is 4,000 units:  $\$30,000 / \$7.5$  CM

- b. The break even point for 2008 is 4,667 units:  $(\$30,000 + 5,000) / \$7.5$  CM

### LO2,3

107. a. Contribution margin per unit is  $\$13 = (120,000/4,000) - (68,000/4,000) = \$30 - \$17$
- b.  $\$136,000 = \$68,000 \times 2$
- c.  $\$40,000$  (remain unchanged)
- d.  $\$130 =$  Contribution margin  $\$13 \times 10$  units
- e.  $3,077$  units = fixed costs  $\$40,000 /$  Contribution margin per unit  $\$13$
- f.  $4,616$  units = (fixed costs  $\$40,000 + \$20,000$  Profit) / CM per unit  $\$13$

**LO2,3**

108. a. Contribution margin ratio is 40% =  $\$80,000 / \$200,000$   
 b.  $\$125,000$  in sales = Fixed costs  $\$50,000 / 0.40$  CM%  
 c.  $\$225,000$  in sales =  
      $[\text{Fixed costs } \$50,000 + \$40,000 \text{ Net income}] / 0.40$  CM%  
 d. Net income will increase by  $\$20,000 = \$50,000 \times 0.40$  CM%

**LO2,3**

109. a.  $\$36 (0.75) + \$24(0.25) = \$33$  weighted revenue per unit of composite product  
 $\$28 (0.75) + \$12(0.25) = \underline{\$24}$  weighted average variable cost  
 $\$ 9$  contribution margin per unit of composite product
- b.  $\$234,000/\$9 = 26,000$  units  
 X:  $26,000$  units  $\times 0.75 = 19,500$  units  
 Y:  $26,000$  units  $\times 0.25 = 6,500$  units

**LO2,3**

110. a.  $\$28.80 (0.67) + \$24.00(0.33) = \$27.22$  revenue per unit of average product  
 $\$20.42 (0.67) + \$16.80(0.33) = \underline{\$19.22}$  weighted flexible cost  
 $\$ 8.00$  CM per unit of average product
- b.  $\$38,400/\$8 = 4,800$  units  
 Men's:  $4,800$  shirts  $\times 0.67 = 3,216$  shirts  
 Boy's:  $4,800$  shirts  $\times 0.33 = 1,584$  shirts

	<u>Men's</u>	<u>Boy's</u>	<u>Total</u>
c. Sales in units	<u>6,000</u>	<u>3,000</u>	<u>9,000</u>
Revenue	\$172,800	\$72,000	\$244,800
Variable costs	<u>122,520</u>	<u>50,400</u>	<u>172,920</u>
Contribution margin	<u>\$50,280</u>	<u>\$21,600</u>	\$71,880
Fixed costs			<u>38,400</u>
Operating income			<u>\$33,480</u>

**LO2,3,4**

111. a. Contribution margin per machine hour is \$6 for the Standard chair, and \$5 for the Premium chair.
- b. To maximize profits, 240 machine hours should be used to manufacture 120 units of the Standard chair, and 180 machine hours should be used to manufacture 60 units of the Premium chair. (240 mh + 180 mh = 420 mh available per week.)
- c. If there are 500 machine hours available per week, there is excess capacity. Demand for both types of chairs can be met and Charlie's Chairs should manufacture 120 Standard chairs and 70 Premium chairs per week.

**LO1,2,4,5,6**

112. a. Period costs include sales commissions of \$20 per board plus advertising costs of \$100 per month.
- b. Variable costs include the \$30 in materials, the \$35 in labor, and the \$20 in commissions for each surfboard.
- c. Product costs include the variable costs (\$30 in materials and \$35 in labor) plus the fixed costs that include the \$200 per month for machinery and the \$400 of depreciation for the garage.
- d. Since only one product is being manufactured, all of the product costs mentioned in (c) above relate directly to the surfboard product and are considered direct manufacturing costs.
- e. There are no indirect manufacturing costs since there is only one product being manufactured.
- f. Unit-related costs include the \$30 in materials, the \$35 in labor, and the \$20 in commissions for each surfboard.
- g. The opportunity costs of starting the Sasita Surfboard Company include the 6% interest foregone annually on the amount withdrawn from savings.
- h. All of the above variable and fixed costs should be considered over the long run.

## LO1,2,5

113a. <i>Kevin's Karate Studio:</i>	<u>Estimated revenues per year</u>
Memberships (200 members x \$50 each)	\$10,000
Basic karate classes (15 students x \$40 per class x 12 months)	7,200
Black belt class and testing (2 students per year x \$1,000)	<u>2,000</u>
Total estimated revenues	<u>\$19,200</u>
	<u>Estimated costs per year</u>
Rent (\$600/month x 12 months)	\$7,200
Allocated portion of initial costs (\$10,000 / 5 years)	<u>2,000</u>
Total estimated costs	<u>\$9,200</u>

Based on the monetary information given above, no, I would not recommend that Kevin open his own facility. These amounts suggest that Kevin would earn approximately \$10,000 per year from the operation of his new karate studio, whereas he is currently earning \$20,000 at his current place of employment. Because Kevin has a wife and three children to support, the \$10,000 income does not seem adequate.

113b. Other questions and thoughts you may want to pose to Kevin include:

- How certain are the estimated numbers that Kevin provided you?
- Why does he estimate 200 members? Can the classroom-size facility really accommodate 200 members? Are 200 members going to be attracted to a small gym that does not offer showers?
- How did he arrive at the estimate of 15 persons per month for the basic karate class? For the estimate of two students for the black belt class?
- Is the west-side location of his new facility a smart choice? Since Kevin is currently teaching on the east side of town and has a following, will his loyal class members travel to the west side of town for a karate class?
- What is the demand for karate on the west side of town? What is his competition? Will he realistically be able to attract a membership of 200 on the west side of town?
- What will be the hours of operation? Are additional staff going to be needed? What about lunch breaks and other times when Kevin is away from the studio; who will run the operation?
- What other operating costs should Kevin consider? Kevin has not estimated amounts for liability and other types of insurance.
- There are no amounts estimated for advertising. What type of advertising would be most effective for his new karate studio? What are the estimated costs of this advertising?
- Over the next five years, are there other revenues and expenses that he anticipates?

- If Kevin opens this karate studio he will be self-employed. What are the benefits he received while employed that he will now have to purchase: for example, the estimated cost for medical insurance, social security taxes, and a retirement account, etc.

**LO1,2,5**

114a. <i>Miss Carol's Swimming Hole:</i>	<u>Estimated revenues per year</u>
Memberships (200 members x \$300 each)	\$60,000
Swimming classes (50 students x \$40 per class x 12 months)	<u>24,000</u>
Estimated annual revenues	<u>\$84,000</u>
	<u>Estimated costs per year</u>
Facility (\$750,000 / 20 years)	\$37,500
Life guard salary	25,000
Part-time swimming instructor salary	10,000
Utilities (\$5,000 x 12 months)	60,000
General maintenance and repairs	<u>5,000</u>
Estimated annual costs	<u>\$137,500</u>

Based on the monetary information given above, no, I would not recommend that Carol open her own facility. These amounts suggest that Carol would lose approximately \$53,500 per year from the operation of the pool although \$37,500 of that amount is non-cash depreciation expense. Carol's estimated cash costs would be \$100,000 per year.

114b. Other questions and thoughts you may want to pose to Carol include:

- How certain are the estimated numbers that Carol provided you?
- Why does she estimate 200 members? Can the small pool really accommodate 200 members? Are 200 members going to be attracted to a small pool that does not offer other recreational facilities?
- How did she arrive at the estimate of 50 persons per month for swimming classes?
- What is the demand for swimming lessons? What is her competition?
- What other operating costs should Carol consider? Carol has not estimated amounts for liability and other types of insurance.
- There are no amounts estimated for advertising. What type of advertising would be most effective for the new pool? What are the estimated costs of this advertising?
- Over the next five years, are there other revenues and expenses that she anticipates?
- If Carol opens this pool she will be self-employed. What are the benefits she received while employed that she will now have to purchase: for example, the estimated costs of social security taxes that will need to be paid and contributions to a retirement account.
- How does Carol plan to finance the purchase of the pool?

## LO7

- |         |                              |                               |
|---------|------------------------------|-------------------------------|
| 115. a. | Business-sustaining activity | Plant security                |
| b.      | Unit-related activity        | Scheduled machine maintenance |
| c.      | Product-sustaining activity  | Product development           |
| d.      | Unit-related activity        | Supervision of direct labor   |
| e.      | Business-sustaining activity | Accounting                    |
| f.      | Batch-related activity       | Production scheduling         |
| g.      | Product-sustaining activity  | Engineering change            |
| h.      | Batch-related activity       | Materials handling            |

## CRITICAL THINKING/ESSAY

### LO1

116. How is cost information used in financial accounting and in management accounting?  
*Solution:* In *financial accounting*, GAAP requires that costs be reported as either product costs or period costs on the financial statements. Cost allocation helps determine the value of cost of goods sold on the income statement and inventory on the balance sheet. *Management accounting* uses cost information for two broad purposes: planning and evaluation. Planning includes preparing strategies and budgets and pricing products and services. Evaluation includes comparing actual results to the budgeted results and judging whether a process is efficient compared with the costs of similar internal or external processes.

### LO1

117. What are the differences between product costs and period costs? Give an example of each.  
*Solution:* Product costs include all manufacturing costs: direct materials, direct labor and manufacturing overhead. These costs are charged to the inventory account and then expensed when the product is sold. For a can of corn, product costs would include the corn, the label, and the can. Period costs are nonmanufacturing costs, such as selling, general and administrative costs, that are expensed in the period when incurred. Administrative salaries are period costs.

### LO2

118. Describe a variable cost. Describe a fixed cost. Explain why the distinction between variable and fixed costs is important in management accounting.  
*Solution:* *Variable* costs vary with production or sales volume. *Fixed* costs are not influenced by fluctuations in production or sales volumes. Without the knowledge of cost behaviors, budgets and other forecasting tools can be inaccurate and unreliable. Understanding whether a cost behaves as a variable or a fixed costs is essential to estimating and planning for business success. Also important for control and evaluation.

### LO3

119. What is meant by the term *break-even point*? Why should a manager be concerned about the *break-even point*?

*Solution:* The break-even point is the level of production and sales at which total revenues equal total costs. Managers should be concerned about the break-even point because it helps determine when a business venture will be profitable. The break-even point shows a company how far sales can decline before a net loss will be incurred. It helps to assess the risk of loss.

### LO3

120. Explain when a manager would use cost-volume-profit analysis.

*Solution:* Cost-volume-profit analysis is helpful for evaluating the profit impact of management decisions that affect production and sales volume. Also use for planning purposes to determine affects on costs and profits if change costs or selling price.

### LO5

121. Which costs are relevant for making decisions that affect the short-term? The long-term? Why?

*Solution:* Relevant costs for making decisions that affect the short term include variable costs, since these are the only costs that can be adjusted in the short term. All costs are relevant for making decisions that affect the long term, because in the long term all costs can be adjusted.

### LO7

122. Manufacturing costs have shifted from direct labor to fixed manufacturing costs. What implication does this have for management accounting?

*Solution:* Historically, direct material and direct labor comprised the greatest portion of total costs for a manufacturing firm and, therefore, they were the primary focus of cost systems. Now that costs have shifted from direct labor to fixed manufacturing costs, traditional systems are inadequate. As a result, new management accounting and control systems need to be implemented in organizations to accommodate their current information needs.

### LO7

123. What are the differences between unit-related and batch-related activities? Give an example of each.

*Solution:* *Unit-related* activities relate directly to the number of units produced and sold. Examples of unit-related activities include the cost of parts and assembly for each unit, supervision of direct labor, preventive maintenance on machines, and quality inspections that vary according to how many units are produced. *Batch-related* activities are those associated with the production batches rather than individual products. Examples include the costs of machine set ups, materials handling (to move batches), and shipping (if based on number of batches).



## LO7

124. What is the benefit of classifying costs using the broader framework of unit, batch, product, customer, and business-sustaining activities (rather than as variable or fixed costs)?

*Solution:* By classifying activities using the broader framework of unit, batch, product, customer, and business-sustaining activities, more costs can be traced directly to a cost object. As a result, improved estimates of true costs can be determined. This information helps management to do a better job of planning, controlling, and evaluating business operations.

## LO7

125. What are the differences between product-sustaining and customer-sustaining activities? Give an example of each.

*Solution:* *Product-sustaining* activities support the production and sale of products. Examples include engineering efforts to design and test process routines for products and to perform individual product enhancements. *Customer-sustaining* activities enable the company to sell to an individual customer but are independent of the volume and mix of the products sold. They are those designed to support an individual customer. Examples include technical support provided to individual customers and sales calls.