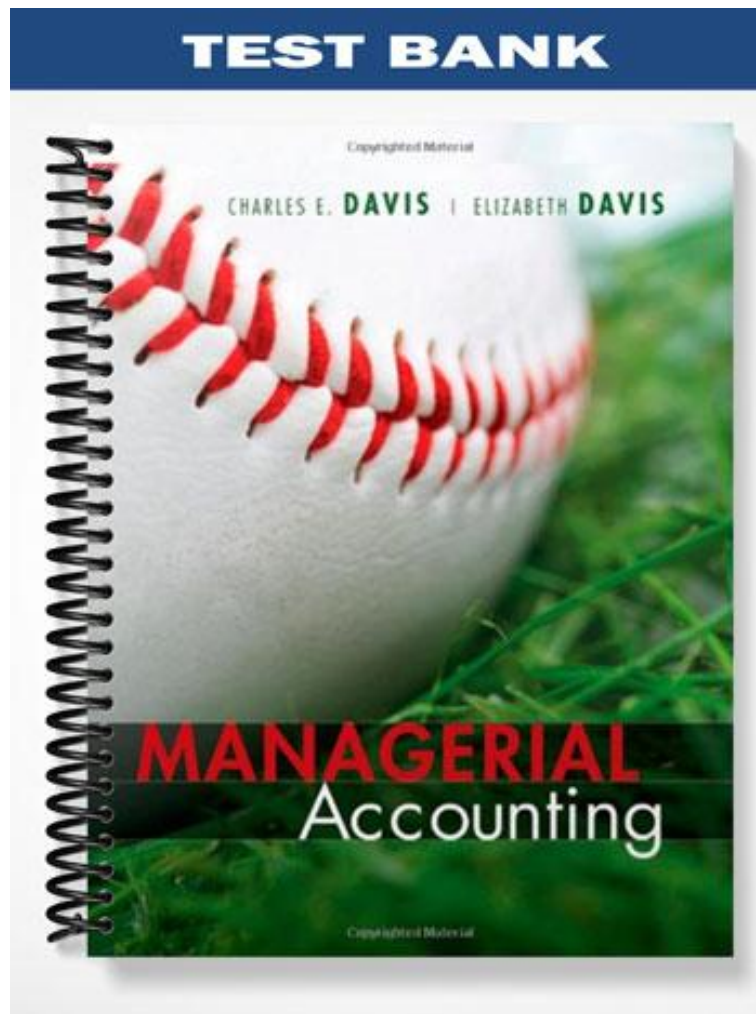


**TEST BANK**



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**MANAGERIAL**  
Accounting

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**Chapter 2**  
**Cost Behavior and Cost Estimation**  
**Summary of Questions by Objectives and Bloom's Taxonomy**

**True-False Questions**

Item	LO	Unit	BT	Item	LO	Unit	BT
1.	1	2-1	K	17.	2	2-2	K
2.	1	2-1	C	18.	2	2-2	C
3.	1	2-1	K	19.	2	2-2	C
4.	1	2-1	C	20.	2	2-2	C
5.	1	2-1	K	21.	2	2-2	K
6.	1	2-1	AP	22.	2	2-2	K
7.	1	2-1	K	23.	3	2-3	K
8.	1	2-1	C	24.	3	2-3	K
9.	1	2-1	K	25.	3	2-3	C
10.	1	2-1	C	26.	3	2-3	K
11.	1	2-1	K	27.	3	2-3	K
12.	1	2-1	AP	28.	3	2-3	C
13.	2	2-2	K	29.	3	2-3	C
14.	2	2-2	K	30.	3	2-3	C
15.	2	2-2	K	31.	3	2-3	C
16.	2	2-2	C	32.	3	2-3	C

**Multiple-Choice**

Item	LO	Unit	BT	Item	LO	Unit	BT	Item	LO	Unit	BT
33.	3	2-1	C	67.	1	2-1	AP	101.	2	2-2	C
34.	3	2-1	K	68.	1	2-1	AP	102.	2	2-2	AP
35.	1	2-1	K	69.	1	2-1	AP	103.	2	2-2	AP
36.	1	2-1	K	70.	1	2-1	AP	104.	2	2-2	K
37.	1	2-1	K	71.	1	2-1	K	105.	2	2-2	K
38.	1	2-1	K	72.	1	2-1	AP	106.	2	2-2	K
39.	1	2-1	K	73.	1	2-1	AP	107.	2	2-2	K
40.	1	2-1	K	74.	1	2-1	AP	108.	2	2-2	AP
41.	1	2-1	K	75.	1	2-1	AP	109.	2	2-2	AP
42.	1	2-1	K	76.	1	2-1	AP	110.	3	2-3	K
43.	1	2-1	K	77.	1	2-1	K	111.	3	2-3	C
44.	1	2-1	K	78.	1	2-1	K	112.	3	2-3	C
45.	1	2-1	K	79.	1	2-1	K	113.	3	2-3	C

46.	1	2-1	K	80.	1	2-1	K	114.	3	2-3	C
47.	1	2-1	K	81.	1	2-1	AP	115.	3	2-3	C
48.	1	2-1	K	82.	1	2-1	AP	116.	3	2-3	K
49.	1	2-1	AP	83.	1	2-1	AP	117.	3	2-3	K
50.	1	2-1	K	84.	1	2-1	AP	118.	3	2-3	AP
51.	1	2-1	K	85.	1	2-1	AP	119.	3	2-3	AP
52.	1	2-1	K	86.	1	2-1	AP	120.	3	2-3	AP
53.	1	2-1	K	87.	1	2-1	AP	121.	3	2-3	K
54.	1	2-1	AP	88.	1	2-1	AP	122.	3	2-3	C
55.	1	2-1	AP	89.	1	2-1	AP	123.	3	2-3	C
56.	1	2-1	AP	90.	2	2-2	AP	124.	3	2-3	K
57.	1	2-1	AP	91.	2	2-2	K	125.	3	2-3	K
58.	1	2-1	K	92.	2	2-2	K	126.	3	2-3	K
59.	1	2-1	C	93.	2	2-2	K	127.	3	2-3	K
60.	1	2-1	K	94.	2	2-2	C	128.	3	2-3	AP
61.	1	2-1	K	95.	2	2-2	K	129.	3	2-3	K
62.	1	2-1	K	96.	2	2-2	K	130.	3	2-3	K
63.	1	2-1	C	97.	2	2-2	AP	131.	3	2-3	C
64.	1	2-1	K	98.	2	2-2	AP	132.	3	2-3	AP
65.	1	2-1	K	99.	2	2-2	C				
66.	1	2-1	K	100.	2	2-2	C				

### Matching

Item	LO	Unit	BT
133.	1,2,3	2-1,2-2,2-3	K

### Brief Exercises

Item	LO	Unit	BT
134.	1	2-1	AP
135.	1	2-1	AP
136.	1	2-1	AP
137.	2	2-2	AP
138.	2	2-2	AP
139.	2	2-2	AP
140.	3	2-3	AP
141.	3	2-3	AP
142.	3	2-3	AP
143.	3	2-3	AP

## Exercises

Item	LO	Unit	BT	Item	LO	Unit	BT
144.	1	2-1	AP	152.	3	2-3	AP
145.	1	2-1	AP	153.	3	2-3	AP
146.	1	2-1	AP	154.	3	2-3	AN
147.	1	2-1	AP	155.	3	2-3	AN
148.	1	2-1	AP	156.	3	2-3	AP
149.	1	2-1	AP	157.	3	2-3	AP
150.	1	2-1	AP	158.	3	2-3	AP
151.	2	2-2	AP				

## Short-Answer

Item	LO	Unit	BT
159.	1	2-1	AN
160.	1	2-1	K
161.	1	2-1	K
162.	1	2-1	C
163.	3	2-3	AP

## Essay

Item	LO	Unit	BT
164.	1	2-1	AN
165.	1	2-1	AN
166.	2	2-2	C
167.	1	2-1	C
168.	3	2-3	C

Note: TF = True-False; M = Matching; MC = Multiple Choice; BE = Brief Exercises; E = Exercises; Ess = Essay; SA = Short Answer

## CHAPTER LEARNING OBJECTIVES

### 1. Identify basic cost behavior patterns and explain how changes in activity level affect total cost and unit cost. (Unit 2.1)

The two basic cost behavior patterns are variable and fixed. Costs that are a combination of these two basic patterns are referred to as mixed. The following table shows how these costs change with changes in activity.

Cost Behavior	As Activity Increases		As Activity Decreases	
	Total Cost	Cost per Unit	Total Cost	Cost per Unit
Variable	Increases	Remains constant	Decreases	Remains constant
Fixed	Remains constant	Decreases	Remains constant	Increases
Mixed	increases	decreases	decreases	increases

### 2. Estimate a cost equation from a set of cost data and predict future total cost from that equation. (Unit 2.2)

Total cost can be expressed in the form  $y=mx+b$ , where  $y$  is the total cost,  $m$  is the variable cost per unit,  $x$  is the number of units, and  $b$  is the total fixed cost. Given a set of costs and activity levels, you can estimate a cost equation using one of the following methods: scattergraph, high-low, or regression.

### 3. Prepare a contribution format income statement. (Unit 2.3)

A contribution format income statement is an income statement that categorizes expenses by their behavior. It follows the structure:

**Sales revenue – variable expenses = contribution margin**

**Contribution margin – Fixed Expenses = Operating income**

Besides showing total sales revenue and expenses, the contribution format statement should also show per unit amounts for sales revenue, variable expenses, and contribution margin.

## Chapter 2 – Cost Behavior And Cost Estimation

True/False

1. A variable cost is one that varies in proportion to a business activity.

Unit 2-1 – True

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

2. With a variable cost, as the level of activity decreases, the total cost remains the same.

Unit 2-1 – False – With a variable cost, as the level of activity increases, the total cost increases by the same proportion.

LO: 1, Bloom: C, Unit: 2-1, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

3. A fixed cost is a cost that does **not** change with the activity level.

Unit 2-1 – True

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

4. With a fixed cost, the cost per unit varies proportionately with changes in the level of activity.

Unit 2-1 – False – With a fixed cost, the cost per unit varies inversely with changes in the level of activity.

LO: 1, Bloom: C, Unit: 2-1, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

5. Discretionary fixed costs are fixed costs that **cannot** be changed over the short run.

Unit 2-1 – False – Discretionary fixed costs are fixed costs that can be changed over the short run.

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

6. An example of a committed fixed cost is when a company signs a 10-year lease on an office building.

Unit 2-1 – True

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

7. A committed fixed cost is one that **cannot** be changed over the short run.

Unit 2-1 – True

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

8. Companies should reduce fixed costs whenever possible during times of falling profits.

Unit 2-1 – False – Companies should be careful about reducing their discretionary fixed costs during times of falling profits. For example, reducing advertising is likely to reduce sales further, exacerbating the problem of falling profits.

LO: 1, Bloom: C, Unit: 2-1, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

9. Step costs are fixed over only a small range of activity.

Unit 2-1 – True

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

10. All costs are either fixed or variable. That is, a cost **cannot** have a fixed and a variable component.  
Unit 2-1 – False – Some costs have both a fixed and a variable component. These costs are referred to as a mixed cost.

LO: 1, Bloom: C, Unit: 2-1, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

11. Since a mixed cost has both a fixed and a variable component, both the total cost and the unit cost will vary with changes in the level of activity.

Unit 2-1 – True

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

12. An example of a step cost is the natural gas bill you receive for heating your apartment.

Unit 2-1 – False – Your natural gas bill would be an example of a mixed cost. The base charge would be fixed and the additional charge per cubic foot of gas would be variable.

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

13. Once you know how a particular cost behaves, estimating the total cost is relatively simple.

Unit 2-2 – True

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

14. Three methods used for estimating the fixed and variable portions of a cost include: cost-cover graphs, the high-low method and regression analysis.

Unit 2-2 – False – Three methods used for estimating the fixed and variable portions of a cost include scattergraphs, the high-low method and regression analysis.

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

15. A scattergraph is simply a graph that shows total costs in relation to volume, or activity level.

Unit 2-2 – True

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

16. The high-low method of estimating the fixed and variable components of a mixed cost is a precise approach that uses a statistical technique.

Unit 2-2 – False – The high-low method is a “quick and dirty” method. It does not use a statistical technique.

LO: 2, Bloom: C, Unit: 2-2, Difficulty: Difficult, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

17. Unlike the scattergraph, the high-low method requires only two data points – the lowest point of activity and the highest point of activity.

Unit 2-2 – True

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

18. To estimate total cost using the high-low method, identify the highest and lowest level of activity and compute the slope of the line.

Unit 2-2 – True

LO: 2, Bloom: C, Unit: 2-2, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

19. Regression is a more precise method of estimating the fixed and variable components of a mixed cost than the high-low method or a scattergraph.

Unit 2-2 – True

LO: 2, Bloom: C, Unit: 2-2, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

20. Like the high-low method of estimating the fixed and variable components of a mixed cost, regression analysis uses a statistical technique that identifies the line of best fit.

Unit 2-2 – False – The high-low method is not a statistical technique.

LO: 2, Bloom: C, Unit: 2-2, Difficulty: Difficult, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

21. Cost behaviors and estimates are valid only within what is referred to as a precision range.

Unit 2-2 – False – Cost behaviors and estimates are valid only within a relevant range.

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

22. The relevant range is the normal level of operating activity.

Unit 2-2 – True

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

23. Operating income = Sales revenue – Variable cost per unit – Total fixed costs.

Unit 2-3 – False – Operating income = Sales revenue – Total variable costs – Total fixed costs.

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

24. A basic tool for making business decisions is the contribution margin.

Unit 2-3 – True

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

25. The contribution margin is the difference between sales and fixed costs.

Unit 2-3 – False – The contribution margin is the difference between sales and variable costs.

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

26. Contribution margin is the amount of revenue that remains to cover fixed costs and provide a profit.

Unit 2-3 – True

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

27. Contribution margin = Sales revenue – Total variable costs.

Unit 2-3 – True

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management



28. Unlike the contribution margin in dollars, the contribution margin ratio **cannot** be used to determine the increase in profits from a given dollar increase in sales revenue.

Unit 2-3 – False – the contribution margin ratio can be used to determine the increase in profits from a given dollar increase in sales revenue.

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

29. The contribution margin income statement allows managers to easily assess the impact of sales volume on operating income.

Unit 2-3 – True

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Easy, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

30. The contribution format income statement presents cost by behavior.

Unit 2-3 – True

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

31. When production and sales are equal, a drawback of the contribution format income statement is that it does **not** produce the same operating income as the traditional functional income statement format.

Unit 2-3 – False – We arrive at the same operating income as in the traditional functional income statement.

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Moderate, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

32. A contribution format income statement just rearranges the individual costs components and produces the same operating income as the traditional functional income statement.

Unit 2-3 – True

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Difficult, Min: 1, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

### Multiple Choice

33. GAAP-based income statements categorize expenses based on

- A. Business function
- B. Cost behavior
- C. Dollar amount
- D. Contribution margin

Unit 2-3 – A

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

34. GAAP-based income statements categorize expenses based on

- a. product, contribution, selling or administrative
- b. product, selling or administrative
- c. contribution, product, administrative
- d. variable costs and fixed costs

Unit 2-3 – B

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

35. If activity level increases, what happens to the total variable cost?

- a. It remains the same.
- b. It decreases.
- c. It increases.
- d. It depends on how much the activity level increases.

Unit 2-1 – C

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

36. If activity level decreases, what happens to the total variable cost?

- a. It remains the same.
- b. It decreases.
- c. It increases.
- d. It depends on how much the activity level increases.

Unit 2-1 – B

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

37. If activity level increases, what happens to the total variable cost?

- a. It decreases.
- b. It increases.
- c. It remains the same.
- d. It depends on how much the activity level increases.

Unit 1-2 – B

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

38. If activity level decreases, what happens to the total variable cost?

- a. It decreases.
- b. It increases.
- c. It remains the same.

- d. It depends on how much the activity level increases.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

39. If activity level increases, what happens to the total fixed cost?
- a. It decreases.
  - b. It increases.
  - c. It remains the same.
  - d. It depends on how much the activity level increases.

Unit 2-1 – C

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

40. If activity level decreases, what happens to the total fixed cost?
- a. It remains the same.
  - b. It decreases.
  - c. It increases.
  - d. It depends on how much the activity level increases.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

41. If activity level increases, what happens to the unit fixed cost?
- a. It decreases.
  - b. It increases.
  - c. It remains the same.
  - d. It depends on how much the activity level increases.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

42. If activity level decreases, what happens to the unit fixed cost?
- a. It decreases.
  - b. It increases.
  - c. It remains the same.
  - d. It depends on how much the activity level increases.

Unit 2-1 – B

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

43. If activity level increases, what happens to the total fixed cost?
- a. It remains the same.
  - b. It decreases.
  - c. It increases.
  - d. It depends on how much the activity level increases.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

44. If activity level decreases, what happens to the total fixed cost?

- a. It remains the same.
- b. It decreases.
- c. It increases.
- d. It depends on how much the activity level increases.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

45. If activity level increases, what happens to the unit variable cost?

- a. It remains the same.
- b. It decreases.
- c. It increases.
- d. It depends on how much the activity level increases.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

46. If activity level decreases, what happens to the unit variable cost?

- a. It remains the same.
- b. It decreases.
- c. It increases.
- d. It depends on how much the activity level increases.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

47. If activity level increases, what happens to the unit fixed cost?

- a. It remains the same.
- b. It decreases.
- c. It increases.
- d. It depends on how much the activity level increases.

Unit 2-1 – B

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

48. If activity level decreases, what happens to the unit fixed cost?

- a. It remains the same.
- b. It decreases.
- c. It increases.
- d. It depends on how much the activity level increases.

Unit 2-1 – C

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

49. Which of the following is an example of a variable cost?

- a. Rent
- b. Insurance
- c. Direct material
- d. Depreciation

### Unit 2-1 – C

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

50. When managers talk about cost behavior, they are referring to
- Period versus product cost.
  - The way in which total costs change in response to changes in the level of activity.
  - The method used to determine whether a cost is accrued or expensed.
  - None of the above.

### Unit 2-1 – B

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

51. When a manager talks about cost behavior, she is referring to
- The way in which total costs change in response to changes in the level of activity.
  - The method used to determine whether a cost is accrued or expensed.
  - Both A and B.
  - None of the above.

### Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

52. Four common cost behavior patterns that serve as the foundation for cost-volume-profit analysis are
- Variable cost, fixed cost, selling cost, and administrative cost.
  - Variable cost, fixed cost, mixed cost, and step cost.
  - Variable cost, fixed cost, period cost, and other cost.
  - Selling cost, administrative cost, cost of goods sold, and depreciation.

### Unit 2-1 – B

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

53. Four common cost behavior patterns that serve as the foundation for cost-volume-profit analysis are
- Variable cost, fixed cost, mixed cost, and step cost.
  - Variable cost, fixed cost, selling cost, and administrative cost.
  - Cost of goods sold, period cost, other cost, and depreciation.
  - Selling cost, administrative cost, cost of goods sold, and depreciation.

### Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

54. Assume you are planning a spring break ski trip to Colorado. You are preparing a budget of your costs. You are staying at a lodge that has a special where the lodge charges you \$2 for each ski lift ride. You believe you will ride the ski lift 40 times during the week, so you budget \$80. The ski lift charge is an example of a
- Fixed cost.
  - Variable cost.
  - Mixed cost.
  - Step cost.

### Unit 2-1 – B

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 2, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

55. Assume you are planning a spring break ski trip to Colorado. You are preparing a budget of your costs. You are staying at a lodge that has a special where the lodge charges you \$80 per week for the ski lift regardless of how many times you ride. You believe you will ride the ski lift 40 times during the week. The ski lift charge is an example of a
- Fixed cost.
  - Variable cost.
  - Mixed cost.
  - Step cost.

### Unit 2-1 – A

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 2, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

56. Assume you are planning a spring break ski trip to Colorado. You are preparing a budget of your costs. You are staying at a lodge that has a special where the lodge charges you \$25 for the first 30 ski lift ride and an additional charge of \$5 for each ride in excess of 30. You believe you will ride the ski lift 40 times during the week, so you budget \$75. The ski lift charge is an example of a
- Fixed cost.
  - Variable cost.
  - Mixed cost.
  - Step cost.

### Unit 2-1 – C

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 2, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

57. Assume you are planning a spring break ski trip to Colorado. You are preparing a budget of your costs. You are staying at a lodge that has a special where the lodge charges you a flat fee of \$25 for up to ten ski lift rides. You believe you will ride the ski lift 40 times during the week, so you budget \$100. The ski lift charge is an example of a
- Fixed cost.
  - Variable cost.
  - Mixed cost.
  - Step cost.

### Unit 2-1 – D

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 2, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

58. Any cost that varies in proportion to a business activity is a
- Fixed cost.
  - Variable cost.
  - Mixed cost.
  - Step cost.

### Unit 2-1 – B

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

59. An example of a variable cost is

- a. Units sold.
- b. Units produced.
- c. Minutes talked.
- d. All of the above are examples of a variable cost.

Unit 2-1 – D

LO: 1, Bloom: C, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

60. As the level of activity increases, the total variable cost increases
- a. Proportionally.
  - b. Inversely.
  - c. Conversely.
  - d. Remains the same.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

61. A characteristic of a variable cost is
- a. The total cost varies in proportion to changes in the level of activity.
  - b. The cost per unit remains constant, regardless of the level of activity.
  - c. Both A and B.
  - d. Neither A nor B.

Unit 2-1 – C

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

62. A 10 percent increase in sales volume will result in
- a. A 10 percent decrease in total variable cost.
  - b. A 10 percent decrease in unit variable cost.
  - c. A 10 percent increase in total variable costs.
  - d. A 10 percent increase in unit variable costs.

Unit 2-1 – C

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

63. A 10 percent increase in sales volume will result in
- a. A 10 percent decrease in unit fixed cost.
  - b. A 10 percent increase in total fixed costs.
  - c. A 10 percent increase in unit fixed costs.
  - d. No change in total fixed costs.

Unit 2-1 – D

LO: 1, Bloom: C, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

64. A 10 percent decrease in sales volume will result in
- a. A 10 percent decrease in total variable cost.
  - b. A 10 percent decrease in unit variable cost.
  - c. A 10 percent increase in total variable costs.
  - d. A 10 percent increase in unit variable costs.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

65. In contrast to a variable cost

- a. The total amount of a fixed cost does not change with activity level.
- b. The total amount of a fixed cost increased as activity increases.
- c. The per unit amount of a fixed cost does not change with activity level.
- d. The per unit amount of a fixed cost increases as activity increases.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

66. Which of the following is a characteristic of a fixed cost?

- a. The total cost remains constant, regardless of changes in the level of activity.
- b. The cost per unit varies inversely with changes in the level of activity.
- c. Both A and B.
- d. Neither A nor B.

Unit 2-1 – C

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

67. You and two friends decide to rent an apartment off campus. You have found an apartment for \$750 per month. You and your two friends will share the rent equally. This is an example of a

- a. Fixed cost.
- b. Variable cost.
- c. Mixed cost.
- d. Step cost.

Unit 2-1 – A

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

68. You are considering moving off campus. You have found a two-bedroom apartment for \$1,200 per month, but you cannot afford that much rent. You are considering inviting up to three of your friends to become your roommates. The relationship between the number of roommates, the total cost, and the cost per person is:

<b>Number of Roommates</b>	<b>Total Cost</b>	<b>Cost per Person</b>
1	\$1,200	\$1,200
2	\$1,200	\$ 600
3	\$1,200	\$ 400
4	\$1,200	\$ 300

This is an example of

- a. A fixed cost.
- b. A variable cost.
- c. A mixed cost.
- d. A step cost.

Unit 2-1 – A

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management



69. You are considering moving off campus. However, you do not want to live alone. You have found a two-bedroom apartment very near campus that is clean and safe. A two-bedroom apartment is roomy enough to have two or three roommates. The manager discourages having more than one roommate in an apartment and therefore charges \$200 additional rent for each person over two. The relationship between the number of roommates, the total cost, and the cost per person is:

<b>Number of Roommates</b>	<b>Total Cost</b>	<b>Cost per Person</b>
1	\$1,000	\$1,000
2	\$1,000	\$ 500
3	\$1,200	\$ 400
4	\$1,400	\$ 350

You find three friends willing to share the apartment. You feel comfortable that the three friends will make very good roommates. The four of you rent the apartment. This is an example of

- A fixed cost.
- A variable cost.
- A mixed cost.
- A step cost.

Unit 2-1 – C

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

70. You are considering moving off campus. You have found a one-bedroom apartment very near campus that is clean and safe. However, you do not want to live alone. A one-bedroom apartment is roomy enough to have one or two roommates. The manager discourages having more than one individual in an apartment and so charges rent per person. The relationship between the number of roommates, the total cost, and the cost per person is:

<b>Number of Roommates</b>	<b>Total Cost</b>	<b>Cost per Person</b>
1	\$ 600	\$600
2	\$1,200	\$600
3	\$1,800	\$600

This is an example of

- A fixed cost.
- A variable cost.
- A mixed cost.
- A step cost.

Unit 2-1 – B

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

71. A discretionary fixed cost
- Remains the same regardless of the level of activity.
  - Increases as the level of activity increases.
  - Can be changed in the short run.
  - Can be changed over the long run.

Unit 2-1 – C

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

72. An example of a committed fixed cost is
- An annual contract for television advertising cost.
  - A 10-year lease on an office building.
  - Direct material.
  - None of the above.

Unit 2-1 – B

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

73. An example of a discretionary fixed cost is
- An annual contract for television advertising cost.
  - A 10-year lease on an office building.
  - Direct material.
  - None of the above.

Unit 2-1 – A

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

74. Suppose your cell phone company offers a plan under which you can buy time in blocks of 100 minutes. Every 100-minute block costs \$15. If you use 101 minutes you will pay \$30. This is an example of a
- Variable cost
  - Mixed cost.
  - Fixed cost.
  - Step cost.

Unit 2-1 – D

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

75. Suppose your cell phone company offers a plan under which you buy time per minutes. A one-minute call costs you \$0.10. If you talk 100 minutes it costs you \$10. This is an example of a
- Variable cost
  - Mixed cost.
  - Fixed cost.
  - Step cost.

Unit 2-1 – A

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

76. Suppose your cell phone company offers a plan under which you pay \$15 for a 100-minute block. For each minute over 100 minutes you have to pay \$0.10 per minute. This is an example of a
- Variable cost
  - Mixed cost.
  - Fixed cost.
  - Step cost.

Unit 2-1 – B

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

77. Which of the following is a true statement relating to step costs.

- a. Step costs remain constant over only a small range of activity.
- b. Step costs do not contain a fixed component.
- c. Step costs are also referred to as fixed costs.
- d. None of the above is a true statement.

Unit 2-1 – A

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

78. Step costs are fixed over only a small range of activity. Once that level of activity has been exceeded, total cost
- a. Increases because the excess costs become variable.
  - b. Increases and remains constant over another small range of activity.
  - c. Remains the same regardless of activity.
  - d. None of the above.

Unit 2-1 – B

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

79. Some costs have both a fixed and a variable component. These costs are referred to as
- a. Period costs.
  - b. Product costs.
  - c. Mixed costs.
  - d. Step costs.

Unit 2-1 – C

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

80. Since a mixed cost has both a fixed and a variable component,
- a. Neither total cost nor unit cost will vary with changes in the level of activity.
  - b. Total cost will vary with changes in the level of activity, but unit cost will not.
  - c. Unit cost will vary with changes in the level of activity, but total cost will not.
  - d. Both the total cost and the unit cost will vary with changes in the level of activity.

Unit 2-1 – D

LO: 1, Bloom: K, Unit: 2-1, Difficulty: Easy, Min: 2, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

81. Suppose you are charged a \$10 per month base charge for your electrical service. You are also charged an additional \$0.08 for every kwh of electricity you use. The cost is an example of a
- a. Variable cost.
  - b. Fixed cost.
  - c. Mixed cost.
  - d. Step cost.

Unit 2-1 – C

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

82. Suppose you are charged a \$10 per month base charge for your electrical service. You are also charged an additional \$0.08 for every kwh of electricity you use. Which of the following statement is **not** true?
- a. The \$10 base charge is a fixed cost.

- b. The \$0.08 charge per kwh is a variable cost.
- c. The total cost is an example of a step cost.
- d. The total cost is an example of a mixed cost.

Unit 2-1 – C

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

83. The formula, Electricity cost = \$10 + (\$0.08 x kwh used) is the formula for a
- a. Mixed cost.
  - b. Fixed cost.
  - c. Step cost.
  - d. None of the above.

Unit 2-1 – A

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

84. Mounce Corporation leases a color copier for a monthly fee of \$75 plus a charge of \$0.02 per copy. Mounce's copy cost is classified as a:
- a. Variable cost.
  - b. Fixed cost.
  - c. Step variable cost.
  - d. Mixed cost.

Unit 2-1 – D

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

85. Mike Mounts has a membership at the Marigold Men's Fitness Club. The membership costs \$30 per month regardless of how many times the facility is used. The membership cost is classified as a:
- a. Variable cost.
  - b. Fixed cost.
  - c. Step variable cost.
  - d. Mixed cost.

Unit 2-1 – B

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

86. Which of the following is **not** an example of a variable cost?
- a. Direct material
  - b. Indirect material
  - c. Direct labor.
  - d. President of the company's salary.

Unit 2-1 – D

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

87. Which of the following is **not** an example of a fixed cost?
- a. Rent on factory warehouse
  - b. Insurance on factory equipment
  - c. Indirect material
  - d. Advertising costs

### Unit 2-1 – C

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

88. An example of a committed fixed cost is

- a. Advertising.
- b. Lease on warehouse space.
- c. Sales commissions.
- d. All of the above.

### Unit 2-1 – B

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

89. An example of a discretionary fixed cost is

- a. Research and development costs.
- b. Lease on warehouse space.
- c. Sales commissions.
- d. All of the above.

### Unit 2-1 – A

LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

90. Total cost is a combination of fixed and variable costs. The algebraic equation, where T = total costs, v = variable costs, x = units produced, and f = fixed costs, for total cost is:

- a.  $T = v(x) + f$
- b.  $T = v + f$
- c.  $T = v(x) - f$
- d.  $T = f(x) + v$

### Unit 2-2 – A

LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

91. Which of the following is **not** a method of estimating costs?

- a. Scattergraphs
- b. Bar charts
- c. The high-low method
- d. Regression analysis

### Unit 2-2 – B

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

92. Which of the following is **not** a method of estimating costs?

- a. Scattergraphs
- b. The high-low method
- c. Regression analysis
- d. All of the above are methods of estimating costs.

### Unit 2-2 – D

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

93. Which of the following is the simplest method for estimating the fixed and variable components of a mixed cost?
- Regression analysis
  - Scattergraphs
  - The high-low method
  - Break-even analysis

Unit 2-2 – B

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

94. A scattergraph is a simple graph that shows
- Total costs in relation to volume.
  - The fixed portion of a total cost.
  - The variable portion of a total cost.
  - The point where revenue equals total costs.

Unit 2-2 – A

LO: 2, Bloom: C, Unit: 2-2, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

95. On a scattergraph, once the individual points have been plotted,
- Enter the information into a statistical calculator to calculate the total cost.
  - Count the points and divide by variable cost per unit.
  - Draw a line through them to estimate the cost relationship.
  - Multiply the high point by the variable cost per unit to calculate the total cost.

Unit 2-2 – C

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

96. On a scattergraph, you must “fit” a line to the plotted points. Once the line is drawn,
- Calculate the fixed and variable costs using basic algebra.
  - You must use a statistical technique to identify the fixed and variable costs.
  - You must choose more than one point to calculate the fixed and variable costs.
  - Use regression analysis to calculate the fixed and variable components of the total cost.

Unit 2-2 – A

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

97. Assume a scattergraph shows \$500 at no activity and \$2,500 at an activity level of 1,000 units. The variable cost per unit is:
- \$2
  - \$1.40
  - \$2.50
  - \$5.00

Unit 2-2 – A  $(\$2,500 - \$500)/(1,000 - 0)$

LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

98. Assume a scattergraph shows \$100 at no activity and \$1,500 at an activity level of 1,000 units. The variable cost per unit is:
- \$2

- b. \$1.40
- c. \$2.50
- d. \$5.00

Unit 2-2 – B  $(\$1,500 - \$100)/(1,000 - 0)$

LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

99. A limitation of using the scattergraph method to estimate the cost components of total cost is:
- a. The scattergraph method is complex and costly to use.
  - b. The scattergraph method requires the use of statistical software.
  - c. The scattergraph method is not an accepted method for many companies.
  - d. The choice of the line used to estimate the cost components is subjective.

Unit 2-2 – D

LO: 2, Bloom: C, Unit: 2-2, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

100. The high-low method differs from the scattergraph in that the high-low method
- a. Is simple to prepare and interpret whereas the scattergraph requires the use of statistical techniques.
  - b. Is less costly than the scattergraph method.
  - c. Uses a statistical technique to estimate the cost components.
  - d. Requires only two data points – the lowest point of activity and the highest point of activity.

Unit 2-2 – D

LO: 2, Bloom: C, Unit: 2-2, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

101. Which of the following is **not** a step in estimating total cost using the high-low method?
- a. Identify the highest and lowest levels of activity
  - b. Visually “fit” a line to the plotted points
  - c. Compute the variable cost per unit
  - d. Calculate the fixed cost using either the high point or the low point.

Unit 2-2 – B

LO: 2, Bloom: C, Unit: 2-2, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

102. Determine the fixed cost given the following information:

Highest level of activity – 880 units at a total cost of \$4,800

Lowest level of activity – 240 units at a total cost of \$1,600

- a. \$229
- b. \$400
- c. \$2,600
- d. \$3,200

Unit 2-2 – B  $(\$4,800 - \$1,600) \div (880 - 240) = \$5 \text{ VC}; (880 \times \$5) - \$4,800 = \$400 \text{ fixed cost}$

LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

103. Determine the fixed cost given the following information:

Lowest level of activity – 200 units at a total cost of \$600

Highest level of activity – 800 units at a total cost of \$1,800

- a. \$200

- b. \$360
- c. \$480
- d. \$600

Unit 2-2 – A  $(\$1,800 - \$600) \div (800 - 200) = \$2 \text{ VC}; (800 \times \$2) - \$1,800 = \$200 \text{ FC}$

LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

104. A limitation of the high-low method is that
- a. It is costly to use because it uses a statistical technique to estimate the cost components.
  - b. It is complex to calculate.
  - c. It can only be used if the levels of activity cover a wide range.
  - d. Because it is based on only two extreme points, the high and low activity levels, the cost equation may not be truly representative of the cost relationship.

Unit 2-2 – D

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

105. An advantage of using regression analysis over the high-low and scattergraph methods is that
- a. Regression analysis is less costly to implement than high-low or scattergraph methods.
  - b. Regression analysis is a more precise approach than the high-low or scattergraph methods.
  - c. Both A and B are advantages of using regression analysis.
  - d. Neither A nor B are advantages of using regression analysis.

Unit 2-2 – B

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

106. A statistical technique that identifies the line of best fit for the points plotted in a scattergraph is called
- a. Regression analysis
  - b. Break-even analysis
  - c. High-low method
  - d. ERP

Unit 2-2 – A

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

107. Cost behaviors and estimates are valid only within the normal level of operating activity. This range is referred to as the
- a. Normal range
  - b. Activity range
  - c. Relevant range
  - d. Cost range

Unit 2-2 – C

LO: 2, Bloom: K, Unit: 2-2, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management



108. Children's World Toy Shop is an on-line toy store specializing in hand made stuffed animals. Children's World sold 4,000 Donny the Dragon stuffed toys during April and 6,000 during May. Shipping costs for the two months were \$12,000 and \$16,800 respectively. Using these two months' data, the shipping cost function is best estimated as
- $(\$2 \times \text{number of books sold}) + \$70,000$
  - $(\$2.40 \times \text{number of books sold}) + \$2,400$
  - $(\$3 \times \text{number of books sold}) + \$2,880$
  - $(\$0.50 \times \text{number of books sold}) + \$10,000$

Unit 2-2 – B

LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

109. Chocolate Delight sells chocolate dipped fruit to local restaurants. Chocolate Delight delivered 30,000 chocolate dipped strawberries to customers in May and 24,000 in June. Delivery costs for the two months were \$1,500 and \$1,200, respectively. Using these two months' data, the delivery cost function is best estimated as
- $(\$2 \times \text{number of strawberries}) + \$800$
  - $(\$0.02 \times \text{number of strawberries}) + \$900$
  - $(\$0.05 \times \text{number of strawberries}) + \$0$
  - $(\$0.05 \times \text{number of strawberries}) + \$600$

Unit 2-2 – C

LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

110. If an organization wants to make a profit, it must generate more sales revenue than the total costs it incurs. This relation can be expressed using which of the following profit equations?
- Operating income =  $[(\text{Sales price per unit} - \text{Variable cost per unit}) \times \# \text{ units sold}] - \text{Fixed cost}$
  - Operating income =  $[\text{Sales price per unit} - \text{Fixed cost per unit}] \times \# \text{ units produced} - \text{Variable cost}$
  - Operating income = Sales revenue – Total variable costs – Period costs
  - Operating income = Sales revenue – Product costs – Fixed costs

Unit 2-3 – A

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

111. If an organization wants to make a profit, it must generate more sales revenue than the total costs it incurs. Which of the following is **not** a correct expression of the profit equation?
- Operating income = Sales revenue – Total variable costs – Total fixed costs
  - Operating income = Sales revenue – Product costs – Fixed costs
  - Operating income =  $[(\text{Sales price per unit} - \text{Variable cost per unit}) \times \# \text{ units sold}] - \text{Fixed cost}$
  - Operating income =  $[\text{Contribution margin per unit} \times \# \text{ units sold}] - \text{Fixed costs}$

Unit 2-3 – B

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

112. If an organization wants to make a profit, it must generate more sales revenue than the total costs it incurs. This relation can be expressed using which of the following profit equations?
- Operating income =  $[\text{Sales price per unit} - \text{Fixed cost per unit}] \times \# \text{ units produced} - \text{Variable cost}$

- b. Operating income = [Contribution margin per unit x # units sold] – Fixed costs
- c. Operating income = Sales revenue – Total variable costs – Period costs
- d. Operating income = Sales revenue – Product costs – Fixed costs

Unit 2-3 – B

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

113. There is an important relation between contribution margin and profit. Which of the following statements is **not** true?
- a. As the number of units sold increases, total contribution margin increases, but fixed costs remain the same.
  - b. As the number of units sold rises, profit increases by the additional contribution margin per unit.
  - c. As the number of units sold increases, total contribution margin and fixed costs increase.
  - d. As the number of units sold decreases, total contribution margin decreases, but fixed costs remain the same.

Unit 2-3 – C

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Difficult, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

114. There is an important relation between contribution margin and profit. Which of the following statements is **not** true?
- a. As the number of units sold rises, profit increases by the variable cost per unit.
  - b. As the number of units sold increases, total contribution margin increases, but fixed costs remain the same.
  - c. As the number of units sold rises, profit increases by the additional contribution margin per unit.
  - d. As the number of units sold decreases, total contribution margin decreases, but fixed costs remain the same.

Unit 2-3 – A

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Difficult, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

115. There is an important relation between contribution margin and profit. Which of the following statements is **not** true?
- a. As the number of units sold increases, total contribution margin increases, but fixed costs remain the same.
  - b. As the number of units sold rises, profit increases by the additional contribution margin per unit.
  - c. As the number of units sold decreases, total contribution margin decreases, but fixed costs remain the same.
  - d. All of the above statements are true.

Unit 2-3 – D

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Difficult, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

116. The formula for the contribution margin ratio is
- a. Contribution margin divided by sales
  - b. Contribution margin divided by net income
  - c. Contribution margin divided by gross profit
  - d. Contribution margin divided by (sales less variable costs)

Unit 2-3 – A

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

117. The contribution margin ratio can be used to
- Determine the increase in profits from a given dollar increase in sales revenue.
  - Impact of fixed costs on contribution margin.
  - Both A and B.
  - Neither A nor B.

Unit 2-3 – A

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

118. Pam's Puppy Parlor is a pet grooming parlor and boutique. Pam sells personalized puppy blankets at \$20 each. Her contribution margin is \$5. If Pam sells an additional \$100 in blanket sales, how much will her profit increase?
- \$5
  - \$25
  - \$50
  - \$100

Unit 2-3 – B  $\$100 \div \$5 = 5$  additional units x \$5 contribution margin = \$25

LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

119. Pam's Puppy Parlor is a pet grooming parlor and boutique. Pam sells personalized puppy blankets at \$20 each. Her contribution margin is \$5. If Pam sells an additional \$100 in blanket sales, how much additional contribution margin will this produce?
- \$5
  - \$25
  - \$50
  - \$100

Unit 2-3 – B  $\$100 \div \$5 = 5$  additional units x \$5 contribution margin = \$25

LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

120. If selling price is \$100 per unit, variable cost is \$70 per unit, and fixed cost is \$200, calculate the contribution margin ratio.
- 14%
  - 30%
  - 200%
  - 50%

Unit 2-3 – B  $(\$100 - \$70) \div \$100 = 30\%$

LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Easy, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

121. A traditional GAAP income statement does **not** help managers to predict the financial results of their decisions. Which of the following is a reason for this shortcoming?
- The GAAP statement is based on cost function rather than cost behavior.
  - The GAAP statement is based on classification rather than function.
  - The GAAP statement is based on cost behavior rather than cost function.
  - The GAAP statement is based on function rather than classification.

Unit 2-3 – A

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

122. A traditional GAAP income statement does **not** help managers predict the financial results of their decisions because the format of the statement is based on cost function rather than cost behavior. Which of the following is not classified as a cost function?
- Product
  - Sales
  - Administration
  - Variable

Unit 2-3 – D

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

123. A traditional GAAP income statement does **not** help managers predict the financial results of their decisions because the format of the statement is based on cost function rather than cost behavior. Which of the following is not classified as a cost behavior?
- Product
  - Fixed
  - Variable
  - All of the above are classified as cost behaviors.

Unit 2-3 – A

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Difficult, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

124. A contribution format income statement classifies costs by
- Behavior
  - Function
  - Constraints
  - Product

Unit 2-3 – A

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

125. A contribution format income statement allows a manager to
- Assess the impact of product costs on net profit.
  - Assess the impact of sales volume on gross margin.
  - Assess the impact of sales volume on operating income.
  - Assess the impact of profit margin on product costs.

Unit 2-3 – C

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

126. A contribution margin format income statement
- Is based on cost function rather than on cost behavior.
  - Allows managers to assess the impact of sales volume on operating income.
  - Both A and B.
  - Neither A nor B.

Unit 2-3 – B

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

127. The formula for a contribution format income statement is
- Sales revenue – Product costs = Contribution margin– Fixed costs = Operating income.
  - Sales revenue – Cost of goods sold – Period costs = Operating income.
  - Sales revenue – Product costs = Gross profit – Period costs = Operating income.
  - Sales revenue – Variable costs = Contribution margin – Fixed costs = Operating income.

Unit 2-3 – D

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

128. Assume sales of \$10,000, variable costs of \$7,000, fixed costs of \$2,000, product costs of \$5,000, and period costs of \$4,000. Calculate contribution margin and operating income.
- Contribution margin - \$3,000; Operating income = \$1,000
  - Contribution margin - \$5,000; Operating income = -\$1,000
  - Contribution margin - \$8,000; Operating income = \$1,000
  - Contribution margin - \$6,000; Operating income = \$1,000

Unit 2-3 – A     \$10,000 - \$7,000 = \$3,000 contribution margin;  
                           \$10,000 - \$7,000 - \$2,000 = \$1,000 operating income

LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

129. A contribution format income statement presents all costs
- By behavior rather than by function.
  - By function rather than behavior.
  - By cost classification rather than by behavior.
  - None of the above.

Unit 2-3 – A

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Moderate, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

130. The contribution margin is calculated as
- Sales revenue less cost of goods sold.
  - Sales revenue less discretionary costs.
  - Sales revenue less committed costs.
  - Sales revenue less total variable costs.

Unit 2-3 – D

LO: 3, Bloom: K, Unit: 2-3, Difficulty: Easy, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

131. The amount of income presented on a functional income statement
- Will always be greater than that shown on a traditional GAAP income statement.
  - Will always be less than that shown on a traditional GAAP income statement.
  - Will always be the same as that shown on a traditional GAAP income statement.
  - May or may not differ from that shown on a traditional GAAP income statement depending on the level of production and sales.

Unit 2-3 – D

LO: 3, Bloom: C, Unit: 2-3, Difficulty: Difficult, Min: 2, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

132. Mounce's Market operates with a 20% contribution margin. If Mounce's sales decrease by \$10,000, operating income will decrease by
- a. \$200
  - b. \$250
  - c. \$2,000
  - d. \$2,500

Unit 2-3 – C

LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 3, Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

## Matching

133. Match the following terms to the appropriate statement by placing the letter to the left of each statement.

- |                                         |                        |
|-----------------------------------------|------------------------|
| a. Committed fixed cost                 | g. Mixed cost          |
| b. Contribution format income statement | h. Regression analysis |
| c. Contribution margin                  | i. Relevant range      |
| d. Contribution margin ratio            | j. Scattergraph        |
| e. Discretionary fixed cost             | k. Step cost           |
| f. High-low method                      | l. Variable cost ratio |

- \_\_\_ 1. A statistical technique that identifies the line of best fit for the points plotted in a scattergraph.
- \_\_\_ 2. The difference between sales and variable costs.
- \_\_\_ 3. Fixed costs that cannot be changed over the short run.
- \_\_\_ 4. The ratio of the contribution margin to sales.
- \_\_\_ 5. One minus the contribution margin ratio.
- \_\_\_ 6. A statement that allows easy assessment of the impact of sales volume on operating income.
- \_\_\_ 7. The normal level of operating activity.
- \_\_\_ 8. Fixed costs that can be changed over the short run.
- \_\_\_ 9. A cost that has both a fixed and variable component.
- \_\_\_ 10. A cost that is fixed over only a small range of activity.
- \_\_\_ 11. A graph that shows total costs in relation to volume, or activity level.
- \_\_\_ 12. A method of estimating the fixed and variable cost components of a mixed cost that requires using only two data points, the lowest point of activity and the highest point of activity.

### Solution:

1. H – Regression analysis
2. C – Contribution margin
3. A – Committed fixed cost
4. D – Contribution margin ratio
5. L – Variable cost ratio
6. B – Contribution margin income statement
7. I – Relevant range
8. E – Discretionary fixed cost
9. G – mixed cost
10. K – step cost
11. J – Scattergraph
12. F – High-low method





**Brief Exercises**

134. Indicate which of the following costs are classified as mixed or step costs.

	Mixed	Step
a. Electrical charge for the month		
b. Factory overhead		
c. Wages of quality control employee who gets paid a bonus for every 10 defects found		
d. Charges for an employee development seminar where the cost includes a speaker fee and cost of supplies for each attendee		
e. Phone plan where you purchase 10-minute increments of time		

**Solution:**

	Mixed	Step
a. Electrical charge for the month	X	
b. Factory overhead	X	
c. Wages of quality control employee who gets paid a bonus for every 10 defects found		X
d. Charges for an employee development seminar where the cost includes a speaker fee and cost of supplies for each attendee	X	
e. Phone plan where you purchase 10-minute increments of time		X

Ans: N/A, LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 10, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

135. Indicate which of the following costs are classified as mixed or step costs.

	Mixed	Step	Variable
a. Phone plan where you are charged for each minute used			
b. Factory overhead			
c. Plan that pays \$5 for every 100 soda cans recycled			
d. Charges for gasoline purchased for your car			
e. A phone plan where the user purchases 10-minute increments of time			

**Solution:**

	Mixed	Step	Variable
a. Phone plan where you are charged for each minute used			X
b. Factory overhead	X		
c. Plan that pays \$5 for every 100 soda cans recycled		X	
d. Charges for gasoline purchased for your car			X
e. A phone plan where the user purchases 10-minute increments of time		X	

Ans: N/A, LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 10, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management



136. Complete the following table, identifying the following as fixed, variable or mixed cost.

	Activity level			Cost Behavior F, V, M
	5,000 Units	6,000 units	7,000 units	
Cost A	\$15,000	\$16,000	\$17,000	
Cost B	\$5,000	\$6,000	\$7,000	
Cost C	\$15,000	\$15,000	\$15,000	
Cost D	\$10,000	\$12,000	\$14,000	
Cost E	\$1,200	\$1,300	\$1,400	

**Solution:**

	Activity level			Cost Behavior F, V, M
	5,000 Units	6,000 units	7,000 units	
Cost A	\$15,000	\$16,000	\$17,000	M
Cost B	\$5,000	\$6,000	\$7,000	V
Cost C	\$15,000	\$15,000	\$15,000	F
Cost D	\$10,000	\$12,000	\$14,000	V
Cost E	\$1,200	\$1,300	\$1,400	M

Ans: N/A, LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

137. King Comics is a wholesaler of popular comic books. The company's records indicate the following financial results:

Units Sold	Current Year 50,000	Previous Year 40,000
Sales revenue	\$250,000	\$200,000
Cost of Goods Sold	<u>175,500</u>	<u>140,000</u>
Gross margin	74,500	60,000
Operating expenses	<u>23,500</u>	<u>20,000</u>
Net operating income	<u>\$ 51,000</u>	<u>\$ 40,000</u>

Using the high-low method, what is the company's estimated variable and fixed component of operating expenses?

**Solution:**

$$(\$23,500 - \$20,000) \div (50,000 - 40,000) = \$0.35 \text{ variable cost per unit}$$

$$\$23,500 = \$0.35(50,000) + FC$$

$$\text{Fixed Cost} = \$23,500 - 17,500$$

$$\text{Fixed Cost} = \$6,000$$

Ans: N/A, LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Difficult, Min: 10, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

138. Vest Construction Company's cost of renting a crane for the last four months is as follows:

Month	Hours of Operation	Rental Cost
January	35	\$1,200
February	42	\$1,350
March	45	\$1,400
April	40	\$1,290

Using the high-low method, what is the company's estimated variable and fixed component of operating expenses?

**Solution:**

$$(\$1,400 - \$1,200) \div (45 - 35) = \$20 \text{ variable cost per hour}$$

$$\$1,400 = \$20(45) + FC$$

$$\text{Fixed Cost} = \$1,400 - \$900$$

$$\text{Fixed Cost} = \$500$$

Ans: N/A, LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Moderate, Min: 10, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

139. Data concerning Engel Company's activity for the first three months are shown below.

Month	Machine Hours	Repair Cost
January	4,000	\$3,100
February	4,800	\$3,500
March	3,600	\$2,900

Using the high-low method of analysis, determine the estimated variable cost per machine hour and the total fixed cost.

Solution:

$$(\$3,500 - \$2,900) \div (4,800 - 3,600) = \$0.50 \text{ variable cost per machine hour}$$

$$\$3,500 = \$0.50(4,800) + \text{FC}$$

$$\text{Fixed Cost} = \$3,500 - \$2,400$$

$$\text{Fixed Cost} = \$1,100$$

Ans: N/A, LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Moderate, Min: 10, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

140. Assume a selling price of \$20 per unit, variable cost per unit of \$12, total fixed cost of \$500, product cost of \$1,500 and period cost of \$1,400. If 200 units are sold, calculate the contribution margin and the operating income.

Solution:

Sales (200 x \$20)	\$4,000
Variable costs (200 x \$12)	<u>2,400</u>
<b>Contribution margin</b>	<b>1,600</b>
Fixed costs	<u>500</u>
<b>Operating income</b>	<b><u>\$1,100</u></b>

Ans: N/A, LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Difficult, Min: 10, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

141. Assume a selling price of \$20 per unit, variable cost per unit of \$12, total fixed cost of \$500, product cost of \$1,500 and period cost of \$1,400. If 200 units are sold, calculate the contribution margin ratio.

Solution:

Sales (200 x \$20)	\$4,000
Variable costs (200 x \$12)	<u>2,400</u>
Contribution margin	\$1,600

$$\text{Contribution margin ratio} = \$1,600 \div \$4,000 = 40\%$$

Ans: N/A, LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 8, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

142. Suppose Lentz Company sells hand tatted lace for \$25 per yard. Her materials cost \$4 per yard and labor costs her \$10 per yard. She also estimates her fixed cost to be \$50 per month. If she sells 2,000 yards of lace during the month, what is her contribution margin ratio?

**Solution:**

$$\begin{aligned} \$25 - (\$4 + \$10) &= \$11 \text{ contribution margin} \\ \$11 \div \$25 &= 44\% \text{ contribution margin ratio} \end{aligned}$$

Ans: N/A, LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 8, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

143. Restate the following income statement in contribution margin format.

Sales (\$20 per unit)		\$14,000
Less cost of goods sold (\$14 per unit)		<u>9,800</u>
Gross margin		4,200
Less Operating costs:		
Salaries	2,100	
Advertising	200	
Rent	1,000	
Delivery charges (\$0.20 per unit)	<u>140</u>	<u>3,440</u>
Operating Income		<u>\$ 760</u>

**Solution:**

Sales (\$20 per unit)		\$14,000
Less variable costs		
Cost of goods sold (\$14 per unit)		9,800
Delivery charges (\$0.20 per unit)		<u>140</u>
Contribution margin		4,060
Less fixed costs		
Salaries	2,100	
Advertising	200	
Rent	1,000	<u>3,300</u>
Operating Income		<u>\$ 760</u>

Ans: N/A, LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

## Exercises

144. Pangle Health Food Store sells a variety of herbal supplements and natural skin care items. Pangle purchases the items from leading manufacturers. Identify each of the following costs incurred by Pangle in terms of its cost behavior – variable, fixed, mixed, or step.

- a. Dried fruits for making “All natural trail mix”
- b. Salary for sales clerk who is paid \$8 per hour
- c. Weight loss supplements packaged in bottles of 100 pills per bottle
- d. Shipping charges for vitamin tablets (billed in 100 pound increments)
- e. Telephone charges (base rate plus usage)
- f. Advertising (annual contract with newspaper for one ad per week)
- g. Salary for Cindi Pangle (president of company)
- h. Sales bonus on body lotions of \$1 per 100 sales
- i. Sales bonus on body power of \$0.10 per item sold
- j. Straight line depreciation on store fixtures

## Solution:

- a. Variable
- b. Fixed
- c. Variable
- d. Step
- e. Mixed
- f. Fixed
- g. Fixed
- h. Step
- i. Variable
- j. Fixed

Ans: N/A, LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 15, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management



145. Curtis Unique Toys has an on-line business where he sells a variety of hand made toys Curtis purchases the items from local wood workers and artisans and ships them all over the world. Identify each of the following costs incurred by Curtis in terms of its cost behavior – variable, fixed, mixed, or step.

- a. Replacement wheels for toy wagons
- b. Salary for sales clerks who are paid for the number of orders they ship
- c. Webmaster fee which bills Curtis a base fee plus a small charge for every update made
- d. Shipping charges for bulk shipments (billed in 100 pound increments)
- e. Telephone charges (base rate plus usage)
- f. Rental for warehouse space
- g. Salary for Curtis (president of company)
- h. Sales bonuses to on-line order clerks of \$1 for each clearance item sold
- i. Straight line depreciation on store fixtures
- j. Boxes for shipping toys

**Solution:**

- a. Variable
- b. Variable
- c. Mixed
- d. Step
- e. Mixed
- f. Fixed
- g. Fixed
- h. Variable
- i. Fixed
- j. Variable

Ans: N/A, LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 15, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

146. Identify each of the following costs in terms of its cost behavior – variable, fixed, mixed, or step.

- a. The cost of ice cream at Baskin-Robbins
- b. Electricity costs at Starbucks (base rate plus usage)
- c. Sales manager who is paid a base salary plus a commission on sales over a specified amount
- d. Depreciation on factory equipment
- e. The cost of fabric in making children's pajamas at Carter's
- f. The cost of paint in manufacturing garden art
- g. Wages of day care workers, assuming a ratio of one worker for every 15 children
- h. Store managers salaries at Wal-Mart
- i. Telephone plan with a base rate plus a specified amount per minute
- j. Shipping charges based on 100 point increments

**Solution:**

- a. Variable
- b. Mixed
- c. Mixed
- d. Fixed
- e. Variable
- f. Variable
- g. Step
- h. Fixed
- i. Mixed
- j. Step

Ans: N/A, LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Moderate, Min: 15, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

147. Gabbard and Fink CPA firm leases tax software from BGG Tax Software Company to prepare federal and state income tax returns. The lease agreement calls for a base charge of \$5,000 per year plus \$100 per year for each state for which returns are prepared. In addition, Gabbard and Fink are charged \$2 (\$1 for federal and \$1 for state) for each tax return prepared. All of their clients have federal returns prepared, with 60 percent in Arkansas and 40 percent in Oklahoma.

Required:

- a. What is the firm's total annual cost for the software if a total 2,500 returns are prepared?
- b. What is the firm's cost per unit at a level of 2,500 returns?
- c. What is the firm's cost per return if 2,000 are prepared?
- d. Besides software lease cost, list five other costs that Gabbard and Fink must consider when they set the price they will charge their clients.

**Solution:**

- a.  $\$5,000 + (\$100 \times 2) + \$2(2,500) = \$10,200$
- b.  $\$10,200 \div 2,500 = \$4.08$
- c.  $\$5,000 + (\$100 \times 2) + \$2(2,000) = \$9,200 \div 2,000 = \$4.60$
- d. Answers will vary. Possible answers include: Salary for Gabbard and Fink, equipment such as computer, telephone, etc., supplies such as paper, toner, envelopes, etc. employee salaries, postage, training for preparers, or rent on office space.

Ans: N/A, LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 20, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

148. FastPrint Company leases a machine that stuffs, seals, and stamps envelopes in one process. FastPrint's lease agreement calls for a base charge of \$4,000 per year plus \$0.25 for every envelope over 1,000 the machine processes per month.

Required:

- a. What is the firm's total annual cost for the lease if a total 2,500 envelopes are processed each month?
- b. What is the firm's total processing cost per envelope at a level of 2,500 envelopes processed each month?
- c. What is the firm's processing cost per envelope if only 1,500 envelopes are processed each month?

**Solution:**

- a.  $\$4,000 + \$0.25(18,000) = \$8,500$
- b.  $\$8,500 \div 30,000 = \$0.28$
- c.  $\$4,000 + \$0.25(6,000) = \$5,500 \div 18,000 = \$0.31$

Ans: N/A, LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

149. Welk's Weekend Spa charges \$75 for a two-hour all natural facial treatment. She pays a \$500 annual charge plus \$10 per hour for a facial massage machine used during the treatment.

Required:

- a. What is Welk's total annual cost for the facial machine if 30 facials are sold? If 40 are sold? If 50 are sold?
- b. What is the company's cost per facial for the machine if 30 facials are sold? If 40 are sold? If 50 are sold?
- c. Why does the machine's cost per facial differ at the three levels of activity?

**Solution**

- a.  $\$500 + (\$10 \times 2 \times 30) = \$1,100$   
 $\$500 + (\$10 \times 2 \times 40) = \$1,300$   
 $\$500 + (\$10 \times 2 \times 50) = \$1,500$
- b.  $\$1,100 \div 30 = \$36.67$   
 $\$1,300 \div 40 = \$32.50$   
 $\$1,500 \div 50 = \$30.00$

- c. The cost varies because the cost contains some fixed and some variable cost. The variable portion of the cost remains the same per facial. However, as more facials are sold, the fixed cost per facial decreases.

Ans: N/A, LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

150. Feel Good Massage offers customized sports massages. Feel Good charges \$75 for a one-hour massage session that includes a ten-minute session in a therapeutic spa. The spa is leased at a cost of \$3,000 per year plus \$10 per hour of use. Feel Good pays the massage therapist's \$20 per session.

Required:

- a. What is Feel Good's total annual costs of massages if 60 massages are sold? If 70 are sold? If 80 are sold?
- b. What is the company's total cost per massage if 30 massages are sold? If 40 are sold? If 50 are sold?
- c. Should Feel Good consider raising the price charged for the sports massage? Why?

**Solution**

a.  $\$3,000 + (\$30 \times 60) = \$4,800$   
 $\$3,000 + (\$30 \times 70) = \$5,100$   
 $\$3,000 + (\$30 \times 80) = \$5,400$

b.  $\$4,800 \div 60 = \$80$   
 $\$5,100 \div 70 = \$72.86$   
 $\$5,400 \div 80 = \$67.50$

- c. Yes. The current price charged of \$75 is not sufficient to cover fixed and variable cost unless the company sells more than 70 massages.

Ans: N/A, LO: 1, Bloom: AP, Unit: 2-1, Difficulty: Difficult, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

151. Upton, Inc. has collected the following information on its costs of copying costs for the month.

	<u>Number of copies</u>	<u>Total copying costs</u>
Week 1	700	\$290
Week 2	575	\$260
Week 3	280	\$150
Week 4	200	\$100

Required:

- a. Using the high-low-method, compute the variable cost per copy.
- b. Compute the total fixed cost per week.
- c. Represent the copy cost function in equation form.
- d. What is the expected cost if 800 copies are made?

Solution:

- a.  $(\$290 - \$100) - (700 - 200) = \$0.38$
- b.  $\$290 - (700 \times \$0.38) = \$24$
- c.  $Y = \$0.38x + \$24$
- d.  $(800 \times \$0.38) + \$24 = \$328$

Ans: N/A, LO: 2, Bloom: AP, Unit: 2-2, Difficulty: Moderate, Min: 20, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

152. Restate the following income statement in contribution format.

Sales (\$10 per unit)	\$5,000
Less cost of goods sold (\$6 per unit)	<u>3,000</u>
Gross margin	2,000
Less operating expenses	
Commissions (\$.60 per unit)	300
Salaries	<u>800</u> <u>1,100</u>
Operating Income	<u>\$ 900</u>

Solution:

Sales (\$10 per unit)	\$5,000
Less variable costs	<u>3,300</u>
Contribution margin	1,700
Less fixed costs	
Salaries	<u>800</u>
Operating Income	<u>\$ 900</u>

Ans: N/A, LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management



153. Restate the following income statement in contribution format.

Sales (\$20 per unit)		\$20,000
Less cost of goods sold (\$6 per unit)		<u>6,000</u>
Gross margin		14,000
Less operating expenses		
Shipping charges (\$2 per unit)	2,000	
Salaries	3,000	
Utilities	<u>4,000</u>	<u>9,000</u>
Operating Income		<u>\$5,000</u>

**Solution:**

Sales (\$20 per unit)		\$20,000
Less variable costs		<u>8,000</u>
Contribution margin		12,000
Less fixed costs		
Salaries	3,000	
Utilities	<u>4,000</u>	<u>7,000</u>
Operating Income		<u>\$5,000</u>

Ans: N/A, LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

154. Complete each of the following contribution format income statements by supplying the missing numbers.

	Year 1	Year 2
Sales revenue	?	\$45,000
Variable costs	<u>21,000</u>	<u>?</u>
Contribution margin	9,000	25,000
Fixed costs	<u>?</u>	<u>12,000</u>
Operating income	2,500	?
Income taxes	<u>?</u>	<u>4,000</u>
Net income	<u>\$1,750</u>	<u>?</u>

**Solution:**

	Year 1	Year 2
Sales revenue	<b>\$30,000</b>	\$45,000
Variable costs	<u>21,000</u>	<u><b>20,000</b></u>
Contribution margin	9,000	25,000
Fixed costs	<u><b>6,500</b></u>	<u>12,000</u>
Operating income	2,500	<b>13,000</b>
Income taxes	<u><b>750</b></u>	<u>4,000</u>
Net income	<u>\$1,750</u>	<u><b>\$9,000</b></u>

Ans: N/A, LO: 3, Bloom: AN, Unit: 2-3, Difficulty: Easy, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

155. Complete each of the following contribution format income statements by supplying the missing numbers.

	Year 1	Year 2
Sales revenue	?	\$60,000
Variable costs	<u>9,000</u>	<u>?</u>
Contribution margin	?	40,000
Fixed costs	<u>12,000</u>	<u>?</u>
Operating income	?	?
Income taxes	<u>1,600</u>	<u>4,000</u>
Net income	<u><u>\$4,800</u></u>	<u><u>\$16,000</u></u>

**Solution:**

	Year 1	Year 2
Sales revenue	<b>\$27,400</b>	\$60,000
Variable costs	<u>9,000</u>	<b><u>20,000</u></b>
Contribution margin	18,400	40,000
Fixed costs	<u>12,000</u>	<b><u>20,000</u></b>
Operating income	<b>6,400</b>	<b>20,000</b>
Income taxes	1,600	4,000
Net income	<u><u>\$4,800</u></u>	<u><u>\$16,000</u></u>

Ans: N/A, LO: 3, Bloom: AN, Unit: 2-3, Difficulty: Easy, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

156. Assume University Athletic Booster Club sells T-shirts for \$20 and anticipates selling 5,000 shirts during football season. The club purchases the shirts from a local dealer for \$14.50. Budgeted period cost of \$18,000 is made up of \$2,000 of selling expense and the remainder is administrative expense. The selling expenses include a sales commission of \$0.05 per shirt. All other period costs are fixed. Prepare an income statement in the contribution format.

<b>University Athletic Booster Club</b>	
<b>Income Statement</b>	
Sales (\$20 x 5,000)	\$100,000
Variable costs [(\$14.50 + \$.05) x 5,000]	<u>72,750</u>
Contribution margin	27,250
Fixed cost [\$18,000 – (.05 x 5,000)]	<u>17,750</u>
Operating income	<u><u>\$ 9,500</u></u>

Ans: N/A, LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Difficult, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

157. MousePad Computer Company, in addition to its retail sales, conducts night classes in computer technology. MousePad has provided you the following information:

Number of students	120
Revenue per student	\$450
Student-related variable costs	\$100 per student
Salary for three instructors	\$1,800 each
Administrative costs	\$30 per student
Maintenance on building	\$15,000 per year

*Required:*

Construct a Contribution margin format income statement.

Solution:

Revenue		\$54,000
Variable costs		
Student related costs	\$12,000	
Administrative costs	3,600	<u>15,600</u>
Contribution margin		38,400
Fixed costs		
Instructor salaries	5,400	
Maintenance on building	15,000	<u>20,400</u>
Operating income		<u>\$18,000</u>

Ans: N/A, LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

158. Nancy's Nursery provides and maintains live plants in office buildings. The company's 120 customers are charged \$90 per month for this service, which includes weekly watering visits. The variable cost to service a customer's location is \$22 per month. The company incurs \$2,000 each month to maintain its equipment and service vans and \$3,000 each month in salaries. Nancy pays a CPA firm \$5 per customer for accounting services.

Required:

- a. Prepare Nancy's contribution format income statement for the month.
- b. What is the expected monthly operating income if 10 customers are added?

**Solution:**

a.

Revenue (\$90 x 120)	\$10,800
Variable costs (\$27 x 120)	<u>3,240</u>
Contribution margin	7,560
Fixed costs	<u>5,000</u>
Operating income	<u>\$2,560</u>

b.

Revenue (90 x 130)	\$11,700
Variable costs (\$27 x 130)	<u>3,510</u>
Contribution margin	8,190
Fixed costs	<u>5,000</u>
Operating income	<u>\$3,190</u>

Ans: N/A, LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Moderate, Min: 15-20, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

**Short Answer:**

159. To calculate the unit cost of the Neoprene stockingfoot waders he sells, Gary Guinn added up all his costs and divided by the number of waders he sold during the year. He then used this unit cost to estimate total costs for the coming year. Explain why Gary's method is not useful in predicting total costs for the coming year.

**Solution:**

Gary did not consider what portion of his total cost is fixed versus variable. Gary should analyze his total cost to estimate the variable cost per unit and total fixed cost and then apply these amounts to his estimated sales for the coming year.

Ans: N/A, LO: 1, Bloom: AN, Unit: 2-1, Difficulty: Moderate, Min: 10, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

160. What is a mixed cost? What happens to a mixed cost as the level of activity changes?

**Solution:**

A mixed cost is a cost that contains both a fixed and a variable component. Both the total cost and the unit cost will vary with changes in level of activity. Total cost will increase as the level of activity increases. Unit cost will decrease as activity increases since the fixed component is being spread among a larger number of units.

Ans: N/A, LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 10, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

161. Express the relationship between total cost (TC), variable cost per unit (VC), sales volume (X), and fixed cost (FC) in equation form.

**Solution:**

$$TC = VC(X) + FC$$

Ans: N/A, LO: 1, Bloom: K, Unit: 2-1, Difficulty: Moderate, Min: 10, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

162. When managers talk about cost behavior, they are referring to the way in which total costs change in response to changes of the level of activity. List the four common cost behavior patterns that serve as the foundation for cost-volume-profit analysis and give an example of each.

**Solution:**

Variable cost – direct material

Fixed cost – rent on your apartment

Mixed cost – phone plan with a base charge and an amount charged for minutes used

Step cost – phone plan where you buy airtime in blocks of 500 minutes

Ans: N/A, LO: 1, Bloom: C, Unit: 1-1, Difficulty: Easy, Min: 10, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

163. Assume sales revenue of \$50,000, variable costs of \$22,000, fixed costs of \$25,000, period costs of \$18,000 and product costs of \$29,000. Prepare a contribution format income statement.

**Solution:**

Revenue	\$50,000
Variable costs	<u>22,000</u>
Contribution margin	28,000
Fixed costs	<u>25,000</u>
Operating income	<u>\$3,000</u>

Ans: N/A, LO: 3, Bloom: AP, Unit: 2-3, Difficulty: Easy, Min: 10, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

**Essay:**

164. Walker Boat Company produces bass boats. The following comments were found in the “Management’s Discussion and Analysis” section of the annual report’s.

“Bass boat production includes a significant amount of robotic manufacturing costs, a portion of which do not vary with production rates.”

As industry practice, Walker spreads its robotic costs over the estimated number of boats that are expected to be produced for each type of bass boat. At the end of the previous year, the number of boats produced was 2,400 while the expected number of boats to be produced in the current year is 2,700.

Required:

- a. What effect would the change in level of boats produced have on the total robotic costs?
- b. What effect would the change in level of boats produced have on the unit costs of the boats?

**Solution:**

- a. Robotic costs are classified as fixed costs since the cost does not change with the level of activity. Therefore, if the level of activity increases from 2,400 to 2,700 boats, the total robotic costs will remain the same. There will be no effect on the total robotic costs.
- b. Although robotic costs remain the same in total, they change inversely with the level of activity per unit. Therefore, the more boats that are produced the less robotic cost will be allocated to each unit.

Ans: N/A, LO: 1, Bloom: AN, Unit: 2-1, Difficulty: Moderate, Min: 10, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

165. Fixed costs are those costs that do not change as the level of activity increases or decreases. However, fixed costs may be classified as discretionary or committed. Explain the differences in these classifications and give an example of each. Discuss why managers should consider the impact of these costs in the decision making process in times of falling profits.

**Solution:**

Discretionary fixed costs can be changed over the short run while committed fixed costs cannot. For example, an advertising contract with the local newspaper may easily be reduced or canceled while a 10-year lease on a building may have severe consequences if the contract is broken. Managers should be cautious about reducing their discretionary fixed costs during times of falling profits since doing so may reduce sales even further. Managers, in their strategic planning (long-range planning) should consider the impact of committed fixed cost and what consequences will arise if profits fall since these costs generally cannot be changed over the short run.

Ans: N/A, LO: 1, Bloom: AN, E, Unit: 2-1, Difficulty: Moderate, Min: 15, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

166. Three popular methods of identifying variable and fixed components of a cost are the scattergraph method, the high-low method and regression analysis. Compare and contrast these three methods.

**Solution:**

All three methods are used to estimate the fixed and variable components of mixed costs. These methods can be used for estimating total costs at various levels of activity. Scattergraphs are the simplest method. The scattergraph shows total costs in relation to volume. The data needed to create the scattergraph can be gathered from weekly or monthly reports. Once you have plotted the individual points, draw a line through them to estimate the cost relationship. The high-low method is similar to the scattergraph, but unlike the scattergraph, the high-low method requires only two data points – the lowest point of activity and the highest point of activity. Regression analysis is a more precise approach to separating a mixed cost. It is a statistical technique that identifies the line of best fit for the points plotted in the scattergraph. Spreadsheet software makes regression analysis easy.

Ans: N/A, LO: 2, Bloom: C, Unit: 2-2, Difficulty: Moderate, Min: 10, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management

167. There are four common cost behavior patterns that serve as the foundation for cost-volume-profit analysis.

**Required:**

- a. Explain the term, cost behavior.
- b. List the four common cost behavior patterns that serve as the foundation for cost-volume-profit analysis and give an example of each type of cost classified by behavior.
- c. Explain the relationship between level of activity and each of the four types of cost behavior.

**Solution:**

- a. Cost behavior refers to the way in which total costs change in response to changes in the level of activity.
- b. Variable cost – direct material  
Fixed cost – rent on factory building  
Mixed cost – utility charge with a base rate and per unit of activity charge  
Step cost – shipping charge based on 100 pound increments.
- c. A variable cost changes in total as activity changes, but remains the same per unit. A fixed cost remains the same in total as activity changes within the relevant range, while the per unit cost has an inverse relationship to activity. As the level of activity increases, the fixed cost per unit decreases. A mixed cost has both a fixed and variable component. The total cost and the unit cost will vary with changes in the level of activity. Step costs are fixed over only a small range of



activity. Once the level of activity has been exceeded, total cost increases and remains constant over another small range of activity.

Ans: N/A, LO: 1, Bloom: C, Unit: 2-1, Difficulty: Easy, Min: 15, AACSB: Analytic, AICPA FN: Reporting, AICPA PC: Communication, IMA: Cost Management

168. You have been hired by University Bike Shop as the controller. The CEO has been using a traditional GAAP income statement for internal decision making. However the CEO has just completed an MBA program where she covered the contribution format income statement. She has asked you to explain the contribution format income statement to the other managers of the company with emphasis on the differences between the two income statements and how the contribution format income statement can help all the managers.

**Solution:**

The traditional GAAP income statement organizes cost by function whereas the contribution margin income statement organizes cost by cost behavior. The GAAP income statement classifies cost as product costs, selling costs and administrative costs while the contribution format income statement classifies costs by their behavior, variable and fixed. The contribution format income statement highlights the contribution margin (sales less variable costs) and the traditional income statement focuses on gross margin (sales less product costs). Gross margin represents the amount available to cover non-product costs (selling and administrative) while the contribution margin represents the amount available to cover fixed costs and profit.

The GAAP income statement does not help managers to predict the financial results of their decisions. The contribution format income statement allows managers to easily access the impact of sales volume on operating income.

Ans: N/A, LO: 3, Bloom: C, Unit: 2-3, Difficulty: Moderate, Min: 15, AACSB: Analytic, AICPA FN: Measurement, AICPA PC: Problem Solving and Decision Making, IMA: Cost Management