

## CHAPTER 2

### MANAGERIAL COST CONCEPTS AND COST BEHAVIOUR ANALYSIS

#### SUMMARY OF QUESTION TYPES BY LEARNING OBJECTIVES AND LEVEL OF DIFFICULTY

Item	LO	BT	LOD	AACSB	CPA	Item	LO	BT	LOD	AACSB	CPA	Item	LO	BT	LOD	AACSB	CPA
<b>True-False Statements</b>																	
1.	1	K	E	AN	MA	4.	3	K	E	AN	MA	7.	4	C	E	AN	MA
2.	1	K	E	AN	MA	5.	3	K	E	AN	MA	8.	4	K	E	AN	MA
3.	2	C	E	AN	MA	6.	4	K	E	AN	MA						
<b>Multiple Choice Questions</b>																	
9.	1	K	M	AN	MA	36.	1	K	E	AN	MA	63.	2	C	E	AN	MA
10.	1	K	E	AN	MA	37.	1	C	E	AN	MA	64.	2	C	E	AN	MA
11.	1	C	E	AN	MA	38.	1	C	E	AN	MA	65.	2	C	E	AN	MA
12.	1	C	E	AN	MA	39.	1	C	E	AN	MA	66.	2	C	E	AN	MA
13.	1	AP	E	AN	MA	40.	1	K	E	AN	MA	67.	2	C	E	AN	MA
14.	1	K	E	AN	MA	41.	1	C	M	AN	MA	68.	2	C	E	AN	MA
15.	1	K	E	AN	MA	42.	1	AP	E	AN	MA	69.	2	K	E	AN	MA
16.	1	C	E	AN	MA	43.	1	C	M	AN	MA	70.	2	K	E	AN	MA
17.	1	K	E	AN	MA	44.	1	C	E	AN	MA	71.	3	K	E	AN	MA
18.	1	C	E	AN	MA	45.	1	C	E	AN	MA	72.	3	K	E	AN	MA
19.	1	C	E	AN	MA	46.	1	C	E	AN	MA	73.	3	AP	E	AN	MA
20.	1	C	E	AN	MA	47.	1	AP	E	AN	MA	74.	3	AP	E	AN	MA
21.	1	K	E	AN	MA	48.	1	C	E	AN	MA	75.	3	AP	E	AN	MA
22.	1	C	E	AN	MA	49.	1	C	E	AN	MA	76.	3	C	M	AN	MA
23.	1	C	E	AN	MA	50.	1	C	E	AN	MA	77.	3	AP	E	AN	MA
24.	1	C	E	AN	MA	51.	1	C	E	AN	MA	78.	3	AP	E	AN	MA
25.	1	K	E	AN	MA	52.	2	K	E	AN	MA	79.	3	AP	M	AN	MA
26.	1	C	E	AN	MA	53.	2	C	E	AN	MA	80.	3	AP	E	AN	MA
27.	1	C	E	AN	MA	54.	2	C	M	AN	MA	81.	3	AP	E	AN	MA
28.	1	K	E	AN	MA	55.	2	K	M	AN	MA	82.	4	C	E	AN	MA
29.	1	AP	E	AN	MA	56.	2	C	E	AN	MA	83.	4	K	E	AN	MA
30.	1	AP	E	AN	MA	57.	2	C	E	AN	MA	84.	4	K	E	AN	MA
31.	1	C	E	AN	MA	58.	2	C	E	AN	MA	85.	4	C	E	AN	MA
32.	1	C	E	AN	MA	59.	2	C	E	AN	MA	86.	4	C	E	AN	MA
33.	1	K	E	AN	MA	60.	2	C	E	AN	MA	87.	4	C	E	AN	MA
34.	1	C	E	AN	MA	61.	2	C	E	AN	MA	88.	4	K	E	AN	MA
35.	1	C	E	AN	MA	62.	2	C	E	AN	MA	89.	4	C	E	AN	MA

Bloom's: AN = Analysis    AP = Application    C = Comprehension    K = Knowledge  
 LOD: E = Easy    M = Medium    H = Hard  
 AACSB: AN = Analytic  
 CPA: MA = Management Accounting

## SUMMARY OF QUESTION TYPES BY LEARNING OBJECTIVE, BLOOM'S TAXONOMY, LEVEL OF DIFFICULTY, AACSB CODES, AND CPA CODES (CONT'D)

Item	LO	BT	LOD	AACSB	CPA	Item	LO	BT	LOD	AACSB	CPA	Item	LO	BT	LOD	AACSB	CPA
<b>Multiple Choice Questions (Cont'd)</b>																	
90.	4	AP	M	AN	MA	97.	4	K	E	AN	MA	104.	4	K	E	AN	MA
91.	4	AP	M	AN	MA	98.	4	AP	M	AN	MA	105.	4	C	E	AN	MA
92.	4	AP	M	AN	MA	99.	4	AP	M	AN	MA	106.	4	K	E	AN	MA
93.	4	AP	M	AN	MA	100.	4	AN	M	AN	MA	107.	4	C	E	AN	MA
94.	4	AP	M	AN	MA	101.	4	C	E	AN	MA	108.	4	C	E	AN	MA
95.	4	C	E	AN	MA	102.	4	C	E	AN	MA						
96.	4	C	E	AN	MA	103.	4	K	E	AN	MA						
<b>Brief Exercises</b>																	
109.	1	C	E	AN	MA	115.	2	AP	M	AN	MA	121.	4	AN	M	AN	MA
110.	1	C	E	AN	MA	116.	3	AP	M	AN	MA	122.	4	AP	M	AN	MA
111.	1	C	E	AN	MA	117.	3	AP	M	AN	MA	123.	4	C	E	AN	MA
112.	1	C	E	AN	MA	118.	4	AN	M	AN	MA	124.	4	AP	M	AN	MA
113.	1	C	E	AN	MA	119.	4	AP	M	AN	MA						
114.	2	AP	E	AN	MA	120.	4	AN	M	AN	MA						
<b>Exercises</b>																	
125.	1	C	E	AN	MA	132.	2	AP	M	AN	MA	139.	4	AP	M	AN	MA
126.	1	C	E	AN	MA	133.	2,3	AP	M	AN	MA	140.	4	AP	M	AN	MA
127.	1	K	M	AN	MA	134.	3	AP	M	AN	MA	141.	4	AP	M	AN	MA
128.	1	C	E	AN	MA	135.	3	AP	M	AN	MA	142.	4	AP	M	AN	MA
129.	1	C	E	AN	MA	136.	4	AP	M	AN	MA	143.	4	AP	M	AN	MA
130.	1,4	AP	M	AN	MA	137.	4	AP	M	AN	MA	144.	4	AP	M	AN	MA
131.	1,4	AP	M	AN	MA	138.	4	AP	M	AN	MA	145.	4	AP	M	AN	MA
<b>Completion Statements</b>																	
146.	1	K	E	AN	MA	150.	2	K	E	AN	MA	154.	4	K	E	AN	MA
147.	1	K	E	AN	MA	151.	3	K	E	AN	MA	155.	4	K	E	AN	MA
148.	1	K	E	AN	MA	152.	3	K	E	AN	MA	156.	4	K	E	AN	MA
149.	2	K	E	AN	MA	153.	4	K	E	AN	MA	157.	4	K	E	AN	MA
<b>Matching</b>																	
158.	1,2	K	E	AN	MA												
<b>Short-Answer Essay</b>																	
159.	3	C	E	AN	MA	160.	4	AN	M	AN	MA						
<b>Multi-Part Question</b>																	
161.	1,2	AN	H	AN	MA												

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## SUMMARY OF LEARNING OBJECTIVES BY QUESTION TYPE

Item	Type	Item	Type	Item	Type	Item	Type	Item	Type	Item	Type	Item	Type
<b>Learning Objective 1</b>													
1.	TF	16.	MC	25.	MC	34.	MC	43.	MC	109.	BE	129.	Ex
2.	TF	17.	MC	26.	MC	35.	MC	44.	MC	110.	BE	130.	Ex
9.	MC	18.	MC	27.	MC	36.	MC	45.	MC	111.	BE	131.	Ex
10.	MC	19.	MC	28.	MC	37.	MC	46.	MC	112.	BE	146.	C
11.	MC	20.	MC	29.	MC	38.	MC	47.	MC	113.	BE	147.	C
12.	MC	21.	MC	30.	MC	39.	MC	48.	MC	125.	Ex	148.	C
13.	MC	22.	MC	31.	MC	40.	MC	49.	MC	126.	Ex	158.	Ma
14.	MC	23.	MC	32.	MC	41.	MC	50.	MC	127.	Ex	161.	MP
15.	MC	24.	MC	33.	MC	42.	MC	51.	MC	128.	Ex		
<b>Learning Objective 2</b>													
3.	TF	56.	MC	61.	MC	66.	MC	114.	BE	150.	C		
52.	MC	57.	MC	62.	MC	67.	MC	115.	BE	124.	Ex		
53.	MC	58.	MC	63.	MC	68.	MC	132.	Ex	158.	Ma		
54.	MC	59.	MC	64.	MC	69.	MC	133.	Ex	161.	MP		
55.	MC	60.	MC	65.	MC	70.	MC	149.	C				
<b>Learning Objective 3</b>													
4.	TF	73.	MC	77.	MC	81.	MC	134.	Ex	152.	C		
5.	TF	74.	MC	78.	MC	116.	BE	135.	Ex	159.	SAE		
71.	MC	75.	MC	79.	MC	117.	BE	173.	C				
72.	MC	76.	MC	80.	MC	133.	Ex	151.	C				
<b>Learning Objective 4</b>													
6.	TF	87.	MC	95.	MC	103.	MC	120.	BE	137.	Ex	145.	Ex
7.	TF	88.	MC	96.	MC	104.	MC	121.	BE	138.	Ex	153.	C
8.	TF	89.	MC	97.	MC	105.	MC	122.	BE	139.	Ex	154.	C
82.	MC	90.	MC	98.	MC	106.	MC	123.	BE	140.	Ex	155.	C
83.	MC	91.	MC	99.	MC	107.	MC	124.	BE	141.	Ex	156.	C
84.	MC	92.	MC	100.	MC	108.	MC	130.	Ex	142.	Ex	157.	C
85.	MC	93.	MC	101.	MC	118.	BE	131.	Ex	143.	Ex	160.	SAE
86.	MC	94.	MC	102.	MC	119.	BE	136.	Ex	144.	Ex		

Note: TF = True-False      C = Completion      BE = Brief Exercise  
 MC = Multiple Choice      Ex = Exercise      SAE = Short-Answer Essay  
 Ma = Matching      MP = Multi-Part

## CHAPTER LEARNING OBJECTIVES

### **1. Define the three classes of manufacturing costs and differentiate between product costs and period costs.**

Manufacturing costs are typically classified as either (1) direct materials, (2) direct labour, or (3) manufacturing overhead. Raw materials that can be physically and directly associated with the finished product during the manufacturing process are called direct materials. The work of factory employees that can be physically and directly associated with converting raw materials into finished goods is considered direct labour. Manufacturing overhead consists of costs that are indirectly associated with the manufacture of the finished product.

Product costs are costs that are a necessary and integral part of producing the finished product. Product costs are also called inventoriable costs. Under the matching principle, these costs do not become expenses until the inventory to which they attach is sold. Period costs are costs that are identified with a specific time period rather than with a saleable product. These costs relate to nonmanufacturing costs and therefore are not inventoriable costs. Prime costs and conversion costs are two other terms that manufacturing accounting systems use. Prime costs are the sum of all direct materials costs and direct labour costs. These are all direct manufacturing costs. Conversion costs are the sum of all direct manufacturing labour costs and manufacturing overhead costs, which are the costs of converting raw materials into a final product in a manufacturing firm.

### **2. Explain variance, fixed, and mixed costs and the relevant range.**

Variable costs are costs that vary in total directly and proportionately with changes in the activity index. Fixed costs are costs that remain the same in total regardless of changes in the activity index.

The relevant range is the range of activity in which a company expects to operate during a year. Mixed costs increase in total but not proportionately with changes in the activity level. One method that management may use to determine the variable and fixed components of a mixed cost is the high-low method.

### **3. Apply the high-low method to determine the components of mixed costs.**

Determine the variable costs per unit by dividing the change in total costs at the highest and lowest levels of activity by the difference in activity at those levels. Then, determine fixed costs by subtracting total variable costs from the amount of total costs at either the highest or lowest level of activity.

### **4. Demonstrate how to calculate cost of goods manufactured and prepare financial statements for a manufacturer.**

The cost of the beginning work in process is added to the total manufacturing costs for the current year to arrive at the total cost of work in process for the year. The ending work in process is then subtracted from the total cost of work in process to arrive at the cost of goods manufactured.

The difference between merchandising and manufacturing income statements is in the cost of goods sold section. A manufacturing cost of goods sold section shows the beginning and ending finished goods inventories and the cost of goods manufactured.

The difference between merchandising and manufacturing balance sheets is in the current assets section. In the current assets section of a merchandising company's balance sheet, one merchandise inventory account is presented. However, in the current assets section of a manufacturing company's balance sheet, three inventory accounts are presented: finished goods inventory, work in process inventory, and raw materials inventory.

## TRUE-FALSE STATEMENTS

1. Manufacturing costs that cannot be classified as direct material or direct labour are classified as operating expenses.
2. Raw materials are equal to direct materials.
3. Fixed costs may jump (rather than remaining fixed) at incremental levels of activity.
4. The high-low method is a quick means of separating fixed and variable costs.
5. What the high-low method may lack in precision, it makes up for in efficiency and ease of use.
6. Total product costs are deducted from total cost of work in process to calculate cost of goods manufactured.
7. If the ending work in process inventory is less than the beginning work in process inventory, then the cost of goods manufactured will be less than total manufacturing costs for the period.
8. Raw materials inventory is **not** an asset until it is used to make a product.

## ANSWERS TO TRUE-FALSE STATEMENTS

Item	Ans.	Item	Ans.	Item	Ans.	Item	Ans.
1.	F	3.	F	5.	T	7.	F
2.	F	4.	T	6.	F	8.	F

## MULTIPLE CHOICE QUESTIONS

9. In which of the following categories do indirect materials belong?

	<u>Product</u> <u>Cost</u>	<u>Manufacturing</u> <u>Overhead</u>	<u>Period</u> <u>Cost</u>
a)	No	No	Yes
b)	Yes	No	No
c)	Yes	Yes	No
d)	Yes	Yes	Yes

10. Which one of the following is indirect labour considered?

- a) product cost
- b) nonmanufacturing cost
- c) period cost
- d) raw material cost

11. Which one of the following costs would be included in manufacturing overhead of a lawn mower manufacturer?

- a) the cost of the wheels
- b) the cost of the fuel lines that run from the motor to the gas tank
- c) depreciation on the testing equipment
- d) the wages earned by motor assemblers

12. Which of the following would most likely be included in manufacturing overhead?

- a) rent on the company's store
- b) insurance on a delivery truck
- c) rent on the company's factory
- d) an oil change on a delivery truck

13. For 2020, Sparkman Company has cost of goods manufactured of \$500,000, beginning finished goods inventory of \$25,000, and ending finished goods inventory of \$20,000. How much is cost of goods sold?

- a) \$505,000
- b) \$495,000
- c) \$545,000
- d) \$455,000

Solution:  $(\$25,000 + \$500,000 - \$20,000) = \$505,000$

14. Which beginning and ending inventories appear on a cost of goods manufactured schedule?

- a) raw materials only
- b) raw materials and work in process only
- c) raw materials, work in process, and finished goods
- d) work in process only



15. Which of the following represents the correct order in which inventories are reported on a manufacturer's balance sheet?

- a) raw materials, work in process, finished goods
- b) work in process, finished goods raw materials
- c) finished goods, work in process, raw materials
- d) work in process, raw materials, finished goods

16. Into which one of the following accounts would the work of factory employees, that can be physically and directly associated with converting raw materials into finished goods, be categorized?

- a) direct labour
- b) indirect labour
- c) manufacturing overhead
- d) indirect materials

17. Which one of the following would **not** be classified as manufacturing overhead?

- a) indirect materials
- b) insurance on factory building
- c) indirect labour
- d) direct materials

18. Which one of the following is a product cost?

- a) indirect labour
- b) office salaries
- c) sales person's salaries
- d) advertising costs

19. A company uses sandpaper in its production process. How is the cost of the sandpaper classified?

- a) an insignificant expense that can be ignored
- b) a direct material
- c) a period cost
- d) a product cost

20. In which classification would the wages of a factory payroll clerk be classified?

- a) raw materials
- b) indirect labour
- c) period cost
- d) direct labour

21. Which one of the following is **not** a manufacturing cost?

- a) advertising costs
- b) cost of goods sold
- c) manufacturing overhead
- d) direct materials

22. What criteria must be met in order to consider the work of factory employees to be direct labour?

- a) It must be promptly associated with converting materials into products.
- b) It must be physically associated with converting materials into products.
- c) It must be materially associated with converting materials into products.
- d) It must be periodically associated with converting materials into products.

23. Which one of the following is classified as direct labour?

- a) flour in a bakery
- b) wages of factory janitors
- c) bottlers of cola in a bottling company
- d) copy machine costs at a copy shop

24. In what category are lubricants that are used for wheel bearings on skateboards produced by a manufacturer categorized?

- a) selling expense
- b) indirect materials
- c) miscellaneous expense
- d) direct materials

25. Which one of the following is **not** another name for the term *manufacturing overhead*?

- a) period costs
- b) factory overhead
- c) indirect manufacturing costs
- d) burden

26. Which product cost is most difficult to associate with a product?

- a) direct labour
- b) advertising
- c) direct materials
- d) manufacturing overhead

27. A company incurred manufacturing costs that were product costs, but they are **not** classified as either direct materials or direct labour. What are these called?

- a) manufacturing overhead
- b) selling and administrative expenses
- c) period costs
- d) marketing costs

28. Inventoriable costs are also referred to as

- a) product costs.
- b) administrative costs.
- c) period costs.

d) recorded costs.

29. Zirk, Inc. incurred cost of goods manufactured totalling \$700,000, manufacturing overhead of \$320,000, and direct materials totalling \$40,000. How much is the amount of direct labour?

- a) Cannot be determined from the information provided.
- b) \$340,000
- c) \$660,000
- d) \$700,000

Solution:  $(\$700,000 - \$320,000 - \$40,000) = \$340,000$

30. Ranger Company reported total manufacturing costs of \$65,000, manufacturing overhead totalling \$13,000, and direct materials totalling \$16,000. How much is direct labour cost?

- a) Cannot be determined from the information provided.
- b) \$94,000
- c) \$29,000
- d) \$36,000

Solution: Both beginning and ending work in process would be required to determine.

31. Which of the following are period costs?

- a) income taxes and indirect materials
- b) selling and administrative expenses
- c) indirect labour
- d) advertising and factory depreciation

32. How does a manufacturing company classify sales commissions?

- a) as indirect labour
- b) as product costs
- c) as manufacturing overhead
- d) as period costs

33. Which of the following are considered product costs?

- a) period costs and administrative expenses
- b) selling and administrative expenses
- c) inventoriable costs and plant assets
- d) direct labour costs and manufacturing overhead

34. When are period costs recorded on the income statement?

- a) when they occur
- b) when the product that they are associated with is sold
- c) at the discretion of management
- d) none of the above

35. What must occur for inventoriable costs to become expenses under the matching principle?

- a) The product must be completed and ready to sell.

- b) The product must be sold.
- c) All of the costs associated with manufacturing a product must be incurred.
- d) The product must have incurred labour.

36. Which of the following could be considered either a product or a period cost depending on the purpose?

- a) manufacturing overhead
- b) direct labour
- c) indirect materials
- d) depreciation

37. Where would you expect to find depreciation on factory equipment?

- a) included with depreciation expense on the income statement
- b) in the manufacturing overhead section of the Costs of Goods Manufactured schedule
- c) only on the income statement as part of cost of goods sold
- d) as a period cost in the operating expense section of the income statement

38. Which one of the following represents a period cost?

- a) company advertisement
- b) depreciation of plant equipment
- c) production manager's salary
- d) direct materials

39. Which one of the following is most likely a direct material?

- a) sawdust used to soak up spills in a paint factory
- b) lubricants for factory machinery
- c) paper used in the photocopy machine in the sales office
- d) circuit boards in a computer

40. Manufacturing overhead can be categorized as

- a) a prime cost and a period cost.
- b) a conversion cost and a period cost.
- c) a prime cost and a product cost.
- d) a conversion cost and a product cost.

41. Which one of the following is **not** considered a 'material' cost?

- a) partially completed motor engines for a motorcycle plant
- b) bolts used in manufacturing the compressor of an engine
- c) rivets for the wings of a new commercial jet aircraft
- d) lumber used to build tables

42. As production manager, Mr. B is asked to track the manufacturing cost per unit on the factory floor. Total manufacturing costs were \$100,000 before considering factory maintenance salaries of \$12,000 and \$50,000 of factory depreciation. How much is the calculation of

manufacturing cost per unit if 500 units had been produced in the current quarter?

- a) \$224
- b) \$300
- c) \$200
- d) \$324

Solution:  $(\$100,000 + \$12,000 + \$50,000)/500 \text{ units} = \$324$

43. Which one of the following is an example of a period cost?

- a) a change in benefits for the union workers who work in the Toronto plant of a Fortune 1000 manufacturer
- b) workers' compensation insurance on factory workers wages allocated to the factory
- c) a processor used to produce computers
- d) a manager's salary for work performed in the corporate head office

44. Which of the following would most likely be viewed as indirect materials?

- a) ball bearings associated with an industrial tractor wheel
- b) axle grease associated with the suspension of a new car
- c) new tires for a commercial truck
- d) cost of boring a cylinder in assembly

45. As plant controller, you are trying to determine the costs over which you have the most control on a day-to-day basis. Your goal is to achieve better profitability. The plant operations manager suggests that overhead is the easiest area to directly reduce costs. Which of the following items would be classified as manufacturing overhead?

- a) factory janitor
- b) general corporate liability insurance
- c) cost of landscaping the corporate office
- d) the western division's vice president's salary

46. Which of the following is considered manufacturing overhead?

- a) depreciation on the press that moulds the plastic into work in process
- b) the line worker's Christmas bonus designated by management
- c) tools that were originally utilized for production but are currently being used by management to fix a copier in the upstairs corporate office
- d) the courier charge for delivering a new ball bearing joint for a robotic paint arm

47. A company loses its opening financial records in a fire. During the following year, it incurred costs of production of \$250,000 and sold \$300,000 in merchandise. It took an inventory count and found that it had \$100,000 in product on hand. What should the company's opening inventory show before the fire?

- a) \$50,000
- b) \$100,000
- c) \$150,000
- d) Cannot be determined from the above information.

Solution:  $(\$300,000 - \$250,000 + \$100,000) = \$150,000$

48. Salaries of sales people who only sell one product should best be shown as

- a) fixed overhead.
- b) variable overhead.
- c) direct selling costs.
- d) indirect selling costs.

49. Which of the following is a direct cost of a hotel?

- a) meals in the restaurant
- b) room cleaning
- c) room service
- d) cleaning the lobby

50. Which of the following are period costs?

- a) workers wages in the shipping department
- b) factory workers wages paid for statutory holidays
- c) workers wages in the plant maintenance department
- d) workers wages on an assembly line

51. Which of the following statements is true?

- a) Advertising is a product cost and a plant manager's salary is a period cost.
- b) Advertising is a period cost and a plant manager's salary is a manufacturing overhead cost.
- c) Advertising is a period cost and a plant manager's salary is a period cost.
- d) Advertising is a product cost and a plant manager's salary is a manufacturing overhead cost.

52. Which of the following is true?

- a) Within the relevant range a valid argument can be made for the assumption of linearity of variable costs.
- b) At the upper and lower limits of the relevant range of company activity, linearity of variable costs is a given.
- c) The relevant range is reflective of the relevant range of products a company offers to its customers.
- d) Fixed costs vary in total within the relevant range.

53. Which of the following is **not** true?

- a) Mixed costs are comprised of both fixed costs and variable costs, and as a result, mixed costs increase proportionately with an increase in activity level.
- b) Mixed costs change in total, but not proportionately with the change in activity level.
- c) An electricity bill is an example of mixed costs. The fixed portion represents the cost of having the service available and the variable cost is reflective of actual customer usage.
- d) Mixed costs are also known as semi-variable costs.

54. Examples of fixed costs include all but one of the following:

- a) cost of factory rent for the 12 month contract term.
- b) cost of Janet's apartment rent during her 3<sup>rd</sup> year of university.

- c) cost of a car rental which includes a fee per km driven.
- d) a one-week rental of a carpet cleaning machine.

55. Variable costs

- a) vary in total as activity varies.
- b) vary on a per unit basis as activity varies.
- c) are unpredictable.
- d) none of the above.

56. Which of the following would most likely be considered direct labour?

- a) a worker installing components in a computer
- b) a maintenance worker
- c) a security guard
- d) a sales person

57. The cost of the management accountant working in the front office of a company is a

- a) direct, variable, product cost.
- b) fixed period cost.
- c) fixed product cost.
- d) indirect period cost.

58. Indirect labour is a

- a) direct, variable, product cost.
- b) direct, variable, period cost.
- c) indirect, variable, product cost.
- d) indirect, fixed or variable, product cost.

59. Which of the following would most likely be considered direct material?

- a) wood used to make a chair
- b) lubrication for factory machines
- c) glue used to make a chair
- d) cleaning products used in a factory

60. Manufacturing overhead is a

- a) direct, variable, product cost.
- b) direct, variable period costs.
- c) indirect, variable, product cost.
- d) indirect, fixed or variable, product cost.

61. Fees for office cleaning and maintenance in a factory are

- a) neither direct nor indirect.
- b) fixed product costs.
- c) variable product costs.
- d) fixed or variable product costs.

62. Fees for office telephones are

- a) fixed period costs.
- b) mixed period costs.
- c) variable period costs.
- d) direct, fixed, or variable period costs.

63. Property taxes for the entire manufacturing facility, including the front office and factory area are

- a) both fixed and variable product costs.
- b) both direct and indirect costs.
- c) both a product and a period cost.
- d) none of the above.

64. The relevant range can be commonly understood to mean

- a) the normal range of output (activity) within which the company operates.
- b) the range wherein fixed costs are always fixed.
- c) the range wherein variable costs are strictly curvilinear.
- d) the range wherein fixed costs are strictly proportional to the level of activity.

65. Where there is a linear relationship between two variables,

- a) the change in the dependent variable yields a predictable, constant change in the independent variable.
- b) the change in the independent variable yields a predictable, constant change in the dependent variable.
- c) there is seldom a linear relationship between two variables.
- d) a change in the "Y" variable yields a predictable, constant change in the "X" variable.

66. Which of the following statements is true?

- a) In real life, the curvilinear nature of variable costs is questionable.
- b) In real life, fixed costs are fixed in total and do not change at various activity levels.
- c) Within the relevant range, there is rarely a straight-line relationship for both variable and fixed costs.
- d) Within the relevant range the linear assumption is valid and useful for cost behaviour analysis.

67. Outside of the relevant range, which of the following outcomes is unlikely?

- a) It may be difficult for management to change all fixed costs.
- b) Achieving cost efficiency may be difficult.
- c) Total fixed costs will not change.
- d) At a 0% activity level all fixed costs will cease.

68. A curvilinear relationship between variable costs and changes in activity levels suggests what?



- a) A strictly linear relationship between fixed costs and activity levels is implausible.
- b) A strictly curvilinear relationship between changes in activity levels and variable costs is possible only within the relevant range.
- c) Since the relationship between activity levels and variable costs is linear within the relevant range and less linear at lower and higher levels outside the relevant range, the straight-line (linear) relationship takes on a curvature in the real world.
- d) none of the above

69. Mixed costs are

- a) costs with both indirect and direct elements.
- b) costs with both product and period elements.
- c) costs with both fixed and variable elements.
- d) none of these.

70. Mixed costs

- a) change in proportion to changes in activity level.
- b) change in total in response to changes in activity level.
- c) change proportionately and in total as a result of changes in activity level.
- d) none of these.

71. To be useful to management accountants for planning and predictive purposes, mixed costs

- a) must be classified into their fixed and variable elements.
- b) must be classified into their direct and indirect elements.
- c) must be classified into their product and period elements.
- d) none of these.

72. The high-low method

- a) is a useful means of predicting the highest cost a company will incur in the operating period.
- b) is a useful means of separating fixed and variable elements from a mixed cost.
- c) is more time-consuming than the scatter diagram method.
- d) is more complex than the use of linear regression analysis.

73. Critical inputs in using the high-low method include all of the following **except**

- a) actual activity levels (production levels) for an operating period.
- b) actual mixed costs (total costs) corresponding to the various activity levels.
- c) a calculator.
- d) a hypothesis for the slope.

Use the following information for questions 74–77.

<u>Month</u>	<u># Machine Hours (X)</u>	<u>Maintenance Costs (Y)</u>
Jan	3,000	\$440
Feb	4,500	\$690
Mar	8,000	\$510
Apr	7,000	\$600

May	6,000	\$550
Jun	9,000	\$980
Jul	3,500	\$840
Aug	5,500	\$600

74. Which of the following choices represents the highest and lowest respective coordinates of activity level and corresponding total costs?

- a) (3,000 hours, \$440), (9,000 hours, \$980)
- b) (9,000 hours, \$980), (3,000 hours, \$440)
- c) (\$3,000, 440 hours), (\$9,000, 980 hours)
- d) (\$9,000, 980 hours), (\$3,000, 440 hours)

Solution: 9,000 hours is the highest activity level at \$980 and 3000 hours is the lowest activity at \$440.

75. Using the high-low method, what is the slope for this set of data?

- a) \$9
- b) \$0.09
- c) \$11.11
- d) \$540

Solution:  $(\$980 - \$440) / (9,000 - 3,000) = \$0.09$

76. What does the slope represent?

- a) the rate at which the X variable changes as a result of the Y variable
- b) the rate at which the Y variable changes as a result of the X variable
- c) the rate at which the dependent variable changes as a result of the fixed cost component
- d) the rate at which the independent variable changes as a result of changes in the dependent variable

77. What is the equation of the line using the high-low method and this data?

- a)  $\$980 = 170 + (0.09X)$
- b)  $Y = \$170 + (0.09 \times 9,000)$
- c)  $Y = 170 + (\$0.09 X)$
- d)  $X = 170 + (\$0.09 Y)$

Solution:  $Y = \$170 + \$0.09X$

78. A high-low approach to establishing fixed and variable components of costs is most effective when information available is

- a) curvilinear.
- b) erratic and highly fluctuating.
- c) outside of the relevant range.
- d) linear.

Use the following information for questions 79–81.

<u>Month</u>	<u>Labour Hours (X)</u>	<u>Overhead Costs (Y)</u>
Jan	200	\$415
Feb	175	\$385

Mar	290	\$520
Apr	300	\$534
May	185	\$403
Jun	265	\$490
Jul	160	\$372
Aug	320	\$564

79. What is the slope of this data, using the high-low method?

- a) \$1.76
- b) \$180
- c) \$1.20
- d) \$0.83

Solution:  $(\$564 - \$372) / (320 - 160) = \$192/160 = \$1.2$

80. Which of the following choices represents the highest and lowest respective coordinates of activity level and corresponding total overhead costs?

- a) (\$372, 160 labour hours), (\$564, 320 labour hours)
- b) (\$564, 320 labour hours), (\$372, 160 labour hours)
- c) (160 labour hours, \$372), (320 labour hours, \$564)
- d) (320 labour hours, \$564), (160 labour hours, \$372)

Solution: 320 labour hours is the highest level of activity at \$564 and 160 labour hours is the lowest level of activity at \$372.

81. What is the equation of the line using the high-low method and this data?

- a)  $\$564 = 180 + (1.2X)$
- b)  $X = 180 + (\$1.20Y)$
- c)  $Y = \$180 + (\$1.2 X)$
- d)  $Y = \$180 + (1.20 \times 320)$

Solution:  $Y = \$180 + \$1.2X$

82. Ending finished goods inventory

- a) appears on a cost of goods manufactured schedule.
- a) for a manufacturing company is equivalent to merchandise inventory for a merchandising company.
- c) represents the cost of completed goods available for sale to customers.
- d) is calculated by adding beginning finished goods inventory to cost of goods sold and subtracting cost of goods manufactured.

83. Which one of the following is the correct calculation of cost of goods sold for a manufacturing company?

- a) beginning FG inventory – cost of goods manufactured – ending FG inventory
- b) ending FG inventory – cost of goods manufactured + beginning FG inventory
- c) beginning FG inventory + cost of goods purchased – ending FG inventory
- d) beginning FG inventory + cost of goods manufactured – ending FG inventory

84. How does a manufacturing company report cost of goods manufactured?

- a) as a current asset on the balance sheet

- b) as a component of the raw materials inventory on the balance sheet
- c) as a component in the calculation of cost of goods sold on the income statement
- d) as an administrative expense on the income statement

85. If you want to know the amounts a company used to calculate, 'cost of goods manufactured,' where would you look?

- a) on the income statement
- b) on the Balance Sheet
- c) on both the Balance Sheet and income statement
- d) only in the managerial accounting records

86. A merchandising company includes cost of goods purchased in its calculation of cost of goods sold. What is the counterpart used by a manufacturing company?

- a) ending inventory
- b) beginning inventory
- c) cost of goods available for sale
- d) cost of goods manufactured

87. Cost of goods sold applies to

- a) only merchandisers' Income Statements.
- b) only manufacturers' Income Statements.
- c) both manufacturers' and merchandisers' Income Statements.
- d) manufacturers, merchandisers, and service companies.

88. How is the cost of goods manufactured calculated?

- a) beginning WIP + direct materials used + direct labour + manufacturing overhead + ending WIP
- b) direct materials used + direct labour + manufacturing overhead – beginning WIP + ending WIP
- c) beginning WIP + direct materials used + direct labour + manufacturing overhead – ending WIP
- d) direct materials used + direct labour + manufacturing overhead – ending WIP – beginning WIP

89. During 2020, "cost of goods manufactured" was less than the amount of "Total manufacturing costs" for the period. Which statement is true?

- a) Ending work in process inventory is greater than beginning work in process inventory.
- b) Ending work in process is less than beginning work in process inventory.
- c) Ending work in process is equal to the cost of goods manufactured.
- d) Ending work in process is less than beginning finished goods inventory.

90. Hardigan Manufacturing Company reported the following year-end information: beginning work in process inventory, \$80,000; cost of goods manufactured, \$980,000; beginning finished goods inventory, \$50,000; ending work in process inventory, \$70,000; and ending finished goods inventory, \$40,000. How much is Haridgan's cost of goods sold for the year?

- a) \$980,000
- b) \$990,000
- c) \$970,000
- d) \$1,000,000

Solution:  $(\$50,000 + \$980,000 - \$40,000) = \$990,000$

Use the following information for questions 91–93.

Caltreck Manufacturing Inc.'s accounting records reflect the following inventories:

	<u>Dec. 31, 2019</u>	<u>Dec. 31, 2020</u>
Raw materials inventory	\$100,000	\$ 80,000
Work in process inventory	130,000	145,000
Finished goods inventory	125,000	115,000

During 2020, Caltreck purchased \$950,000 of raw materials, incurred direct labour costs of \$125,000, and incurred manufacturing overhead totalling \$160,000.

91. How much raw materials is transferred to production during 2020 for Caltreck Manufacturing?

- a) \$1,240,000
- b) \$970,000
- c) \$950,000
- d) \$930,000

Solution:  $(\$100,000 + \$950,000 - \$80,000) = \$970,000$

92. How much is total manufacturing costs incurred during 2020 for Caltreck?

- a) \$1,240,000
- b) \$1,255,000
- c) \$1,235,000
- d) \$1,250,000

Solution:  $(\$100,000 + \$950,000 - \$80,000 + \$125,000 + \$160,000) = \$1,255,000$

93. Assume Caltreck Manufacturing's cost of goods manufactured for 2020 amounted to \$1,200,000. How much would it report as cost of goods sold for the year?

- a) \$1,210,000
- b) \$1,250,000
- c) \$1,325,000
- d) \$1,190,000

Solution:  $(\$125,000 + \$1,200,000 - \$115,000) = \$1,210,000$

94. Hooter Manufacturing Company reported the following year-end information:

Beginning work in process inventory ....	\$75,000
Beginning raw materials inventory .....	20,000
Ending work in process inventory .....	73,000
Ending raw materials inventory .....	23,000
Raw materials purchased .....	220,000
Direct labour .....	170,000
Manufacturing overhead .....	80,000

How much is Hooter Manufacturing's cost of goods manufactured for the year?

- a) \$470,000
- b) \$465,000
- c) \$469,000
- d) \$472,000

Solution:  $(\$75,000 + \$20,000 + \$220,000 - \$23,000 + \$170,000 + \$80,000 - \$73,000) = \$469,000$

95. What amount is given by the sum of direct materials, direct labour, and manufacturing overhead incurred?

- a) total cost of work in process
- b) cost of goods available for sale
- c) total manufacturing costs
- d) cost of goods manufactured

96. What amount is given by the sum of the cost of the beginning work in process and the total manufacturing costs for the current year?

- a) cost of goods manufactured
- b) cost of goods available for sale
- c) total cost of work in process
- d) cost of goods sold

97. What are the components of total manufacturing costs?

- a) direct materials and direct labour only
- b) direct labour and manufacturing overhead only
- c) manufacturing overhead only
- d) direct materials, direct labour, and manufacturing overhead

98. Rezell Combines, Inc. has \$4,000 of finished goods inventory as of December 31, 2020. If beginning finished goods inventory was \$2,000 and cost of goods sold was \$8,000, how much would Rezell report for cost of goods manufactured?

- a) \$9,000
- b) \$2,000
- c) \$10,000
- d) \$6,000

Solution:  $(\$8,000 - \$2,000 + \$4,000) = \$10,000$

99. At May 31, 2020, Smythe Inc. has \$4,500 in beginning raw materials, \$6,000 of direct labour. If manufacturing overhead was \$10,500, total manufacturing costs was \$50,500, and total raw material purchases were \$36,000, how much is ending amount of raw materials?

- a) \$36,000
- b) \$21,000
- c) \$40,500
- d) \$6,500

Solution:  $(\$6,000 + \$10,500 + \$4,500 + \$36,000 - \$50,500) = \$6,500$

100. Costs of goods manufactured of SuperK Company are shown below:

**SUPERK COMPANY**  
**Cost of Goods Manufactured**  
**Year Ending December 31, 2020**

Beginning work in process: .....		\$15,000
Direct materials:		
Beginning raw materials.....	\$14,000	
Raw material purchases.....	<u>22,000</u>	
Total raw materials available for use .....	36,000	
Ending raw materials.....	<u>5,500</u>	
Direct materials used .....		30,500
Direct Labour .....		6,000
Total manufacturing overhead.....		<u>10,500</u>
Ending work in process .....		<u>18,000</u>
Cost of Goods Manufactured .....		<u>\$44,000</u>

How much is the total manufacturing cost?

- a) \$20,500
- b) \$23,000
- c) \$47,000
- d) \$44,000

Solution: (\$30,500 + \$6,000 + \$10,500) = \$47,000

101. In a manufacturing company, the cost of direct labour is treated as an expense when

- a) products are sold.
- b) products are transferred into work in process inventory.
- c) wages are paid to the employees.
- d) at month end with accruals for wages.

102. What occurs when inventoriable costs are removed from the balance sheet?

- a) They increase operating expenses.
- b) They become cost of goods sold.
- c) They are reported as selling expenses.
- d) They are deducted from the sales account.

103. Where would you expect to find ending raw materials inventory?

- a) on the costs of goods manufactured schedule as an addition to raw materials purchases, and on the Balance Sheet
- b) on the costs of goods manufactured schedule as a subtraction from raw materials available for use, and on the Balance Sheet
- c) only on the Balance Sheet
- d) only the costs of goods manufactured schedule

104. Which one of the following does **not** appear on the balance sheet of a manufacturing company?

- a) finished goods inventory
- b) raw materials inventory
- c) cost of goods manufactured

d) work in process inventory

105. What amount would you find on financial statements of merchandising companies that is referred to as finished goods inventory for a manufacturing company?

- a) purchases
- b) cost of goods purchased
- c) merchandise inventory
- d) raw materials inventory

106. How would you expect to see manufacturing inventories listed on a company's balance sheet?

- a) in alphabetical order
- b) in order of liquidity
- c) in order from largest to smallest
- d) any order the company desires

107. Which of the following is a manufacturing activity?

- a) finished goods being sold directly to the public
- b) developing new products through research and development
- c) converting raw materials into finished goods
- d) all of the above

108. What is work in process inventory generally described as?

- a) costs applicable to units that have been started in production but are only partially completed
- b) costs associated with the end stage of manufacturing that are almost always complete and ready for customers
- c) costs strictly associated with direct labour
- d) beginning stage production costs associated with labour costs dealing with bringing in raw materials from the shipping docks



**ANSWERS TO MULTIPLE CHOICE QUESTIONS**

Item	Ans.	Item	Ans.	Item	Ans.	Item	Ans.	Item	Ans.
9.	c	29.	b	49.	b	69.	c	89.	a
10.	a	30.	a	50.	a	70.	b	90.	b
11.	c	31.	b	51.	b	71.	a	91.	b
12.	c	32.	d	52.	a	72.	b	92.	b
13.	a	33.	d	53.	a	73.	c	93.	a
14.	b	34.	a	54.	c	74.	b	94.	c
15.	a	35.	b	55.	a	75.	b	95.	c
16.	a	36.	d	56.	a	76.	b	96.	c
17.	d	37.	b	57.	b	77.	c	97.	d
18.	a	38.	a	58.	d	78.	d	98.	c
19.	d	39.	d	59.	a	79.	c	99.	d
20.	b	40.	d	60.	d	80.	d	100.	c
21.	a	41.	a	61.	a	81.	c	101.	a
22.	b	42.	d	62.	b	82.	b	102.	b
23.	c	43.	d	63.	c	83.	d	103.	b
24.	b	44.	b	64.	a	84.	c	104.	c
25.	a	45.	a	65.	b	85.	d	105.	c
26.	d	46.	a	66.	c	86.	d	106.	b
27.	a	47.	c	67.	c	87.	c	107.	c
28.	a	48.	c	68.	c	88.	c	108.	a

## BRIEF EXERCISES

### Brief Exercise 109

Presented below are Truck Company's monthly manufacturing cost data related to its personal computer products:

- a) Utilities for manufacturing equipment      \$570,000
- b) Raw material (CPU, chips, etc.)              73,000
- c) Depreciation on manufacturing building    320,000
- d) Wages for production workers                770,000

Enter each cost item in the following table, placing an "X" under the appropriate headings.

	Product Costs		
	Direct Materials	Direct Labour	Factory Overhead
a)			
b)			
c)			
d)			

### Solution 109

	Product Costs		
	Direct Materials	Direct Labour	Factory Overhead
a)			X
b)	X		
c)			X
d)		X	

### Brief Exercise 110

Determine whether each of the following costs should be classified as direct materials (DM), direct labour (DL), or manufacturing overhead (MO).

- a) \_\_\_ Depreciation on equipment
- b) \_\_\_ Table legs used in manufacturing tables
- c) \_\_\_ Wages paid to factory workers
- d) \_\_\_ Factory rent

### Solution 110

- a) MO
- b) DM
- c) DL
- d) MO

**Brief Exercise 111**

Indicate whether each of the following costs would be classified as prime or conversion costs:

- a) \_\_\_ Raw materials used to make the product
- b) \_\_\_ Direct labour used in the manufacturing of the product
- c) \_\_\_ Factory utilities
- d) \_\_\_ Direct labour used to unload raw materials from the supplier's truck
- e) \_\_\_ Cleaning staff that work only in the factory
- f) \_\_\_ Factory machinery maintenance
- g) \_\_\_ Lubricants for the factory machinery
- h) \_\_\_ Supervisor of the production process

**Solution 111**

- a) prime
- b) prime or conversion
- c) conversion
- d) prime
- e) conversion
- f) conversion
- g) conversion
- h) conversion

**Brief Exercise 112**

Presented below are EKP Inc.'s monthly manufacturing cost data related to its wooden furniture products:

- a) Security                      \$75,000
- b) Factory wages              \$120,000
- c) Factory Utilities            \$85,000
- d) Wood                          \$210,000

Enter each cost item in the following table, placing an 'X' under the appropriate headings.

	Product Costs		
	Direct Materials	Direct Labour	Factory Overhead
a)			
b)			
c)			
d)			

**Solution 112**

	Product Costs		
	Direct Materials	Direct Labour	Factory Overhead
a)			X
b)		X	
c)			X
d)	X		

**Brief Exercise 113**

Describe the main difference between direct materials and indirect materials that are used in any given production process.

**Solution 113**

The main difference is measurability. For most products, measuring materials used is important because it can be translated into a per unit measurement. This assists management in keeping track of the main amount of materials that are used in manufacturing the products themselves. Should any discrepancies occur in these measurements, management can take action to correct problems.

Indirect materials are generally those items that are used in the process but cannot be easily assigned to each unit manufactured. Such items are adhesives, screws, washers and some covering materials such as paint.

Management finds it more efficient to monitor such items on a volume rather than a per unit basis.

**Brief Exercise 114**

Great Motors Ltd. incurred the following costs in 2020 at two different levels of production:

	<u>2500 Units</u>	<u>3500 units</u>
Direct Materials .....	\$50,000	\$70,000
Labour.....	\$25,000	\$35,000
Office Costs .....	\$15,000	\$17,500
Depreciation.....	\$5,000	\$5,000
Rent .....	\$14,000	\$14,000
Utilities .....	\$7,500	\$8,500

Classify each cost as variable, fixed, or mixed.

**Solution 114**

Variable Costs – Direct Materials, Labour

Fixed Costs – Depreciation, Rent

Mixed Costs – Office Costs, Utilities

**Brief Exercise 115**

Anne’s Cupcakes incurred the following costs in 2020 at two different levels of production:

	<u>50,000 Units</u>	<u>75,000 units</u>
Direct Materials	\$50,000	\$75,000

Selling Costs	\$5,000	\$7,500
Depreciation	\$7,000	\$7,000
Rent	\$17,000	\$17,000
Labour	\$25,000	\$37,500
Utilities	\$7,500	\$8,500

Calculate total variable, fixed and mixed costs.

**Solution 115**

	50,000 units	70,000 units
Variable Costs = Direct Materials + Labour	\$75,000	\$112,500
Fixed Costs = Depreciation + Rent	24,000	24,000
Mixed Costs = Selling costs + Utilities	12,500	16,000

**Brief Exercise 116**

The following data was gathered by RGB Industries for the first 6 months of 2020 (expressed in thousands):

Machine	Overhead	
<u>Month</u>	<u>Hours (X)</u>	<u>Costs (Y)</u>
Jan	125	\$380
Feb	80	\$329
Mar	95	\$340
Apr	115	\$380
May	130	\$394
Jun	100	\$349

Using the high-low method, determine the cost equation for overhead costs.

**Solution 116**

$$\text{Slope} = (\$394 - \$329) / (130 - 80) = \$1.30 \text{ per machine hour}$$

$$\text{Fixed costs} = \$394 - (\$1.30 \times 130) = \$225 \times \$1000 = \$225,000$$

$$Y = \$225,000 + \$1.3X$$

\*Alternative calculation for fixed costs: Fixed costs = \$329 – (\$1.30 x 80) = \$225

**Brief Exercise 117**

Presented below are data related to the shipping costs for the Almond Factory:

<u>Month</u>	Distribution <u>Costs (Y)</u>	Number of <u>Shipments (X)</u>
Jan	\$4,918	3500
Feb	\$4,245	2650
Mar	\$5,205	3850
Apr	\$4,532	2999
May	\$4,544	3002

Jun                    \$5,025                    3650

Using the high-low method, determine the cost equation for distributions costs.

**Solution 117**

$$\text{Slope} = (\$5205 - \$4245) / (3850 - 2650) = \$0.80$$

$$\text{Fixed costs} = \$5205 - (\$0.80 \times 3850) = \$2125$$

$$Y = \$225 + \$1.3X$$

\*Alternative calculation for fixed costs: Fixed costs = \$4245 – (\$0.80 x 2650) = \$2125

**Brief Exercise 118**

Presented below are incomplete 2020 manufacturing cost data for Supreme Corporation. Determine the missing amounts.

	Direct Materials Used	Direct Labour Overhead	Factory Overhead	Total Manufacturing Costs
a)	\$17,000	\$89,000	\$23,000	?
b)	?	\$64,000	\$72,000	\$336,000
c)	\$117,000	?	\$32,000	\$278,000

**Solution 118**

	Direct Materials Used	Direct Labour Overhead	Factory Overhead	Total Manufacturing Costs
a)	\$17,000	\$89,000	\$23,000	\$129,000
b)	\$200,000	\$64,000	\$72,000	\$336,000
c)	\$117,000	\$129,000	\$32,000	\$278,000

**Brief Exercise 119**

Criba Manufacturing Company has the following data: direct labour \$320,000, direct materials used \$749,000, total manufacturing overhead \$475,000, and beginning work in process \$36,000. Calculate a) total manufacturing costs and b) total cost of work in process.

**Solution 119**

a)		
	Direct labour.....	\$ 320,000
	Direct materials used .....	749,000
	Total manufacturing overhead.....	<u>475,000</u>
	Total manufacturing costs .....	<u>\$1,544,000</u>
b)		
	Beginning work in process .....	\$ 36,000
	Total manufacturing costs .....	<u>1,544,000</u>
	Total cost of work in process.....	<u>\$1,580,000</u>

**Brief Exercise 120**

Presented below are incomplete 2020 manufacturing cost data for Swartnez Corporation. Determine the missing amounts.

	Direct Materials <u>Used</u>	Direct Labour <u>Labour</u>	Factory Overhead <u>Overhead</u>	Total Manufacturing Costs <u>Costs</u>
a)	\$35,000	\$72,000	\$27,000	?
b)	?	\$57,000	\$231,000	\$730,000
c)	\$28,000	?	\$186,000	\$632,000

**Solution 120**

a)	Direct materials used .....	\$35,000
	Direct labour.....	72,000
	Factory overhead .....	<u>27,000</u>
	Total manufacturing costs .....	<u>\$134,000</u>
b)	Total manufacturing costs .....	\$730,000
	Less Direct labour .....	(57,000)
	Less Factory overhead.....	<u>(231,000)</u>
	Equals Direct materials used.....	<u>\$442,000</u>
c)	Total manufacturing costs .....	\$632,000
	Less Direct materials used .....	(28,000)
	Less Factory overhead.....	<u>(186,000)</u>
	Equals Direct labour .....	<u>\$418,000</u>

**Brief Exercise 121**

Presented below are incomplete 2020 manufacturing cost data for Spondo Corporation. Determine the missing amounts.

	Direct Materials Used	Direct Labour Overhead	Factory Overhead	Total Manufacturing Costs	Work in Process (1/1)	Work in Process (12/31)	Cost of Goods Manufactured
a)	\$38,000	\$72,000	\$43,000	?	\$120,000	\$86,000	?
b)	\$149,000	\$53,000	\$90,000	\$292,000	?	\$98,000	\$321,000
c)	\$53,000	\$116,000	\$121,000	\$290,000	\$463,000	?	\$715,000

**Solution 121**

	Total Manufacturing Costs	Work in Process (1/1)	Work in Process (12/31)	Cost of Goods Manufactured
a)	\$153,000	\$120,000	\$86,000	\$187,000
b)	\$292,000	\$127,000	\$98,000	\$321,000
c)	\$290,000	\$463,000	\$38,000	\$715,000

**Brief Exercise 122**

Raynor Manufacturing Company has the following data:

Direct labour.....	\$46,000
Direct materials used .....	84,000
Total manufacturing overhead.....	60,000
Ending work in process .....	30,000
Beginning work in process .....	40,000

Calculate a) total manufacturing costs and b) cost of goods manufactured.

**Solution 122**

a)

Direct labour.....	\$46,000
Direct materials used .....	84,000
Total manufacturing overhead.....	<u>60,000</u>
Total manufacturing costs .....	<u>\$190,000</u>

b)

Beginning work in process .....	\$ 40,000
Total manufacturing costs .....	190,000
Less ending work in process .....	<u>(30,000)</u>
Cost of goods manufactured .....	<u>\$200,000</u>

**Brief Exercise 123**

Distinguish between the main components of the income statement for a manufacturing company which makes clothing and a retail company that only buys and sells clothing.

**Solution 123**

The main difference lies in the manner in which products sold are highlighted in the income statement on the cost of goods section. The manufacturer shows the costs of goods that it sells as Cost of Goods Manufactured while the retail company shows its costs as Purchases. Where inventories are shown, the manufacturer shows its ending inventory as Finished Goods Inventory while the retailer shows it as Ending Merchandise Inventory.

**Brief Exercise 124**

In alphabetical order below are current asset items for Sudler Company as of December 31, 2020. Prepare the current assets section of the company's balance sheet as of the same date.

Accounts receivable .....	\$73,000
Cash .....	102,000
Finished goods.....	64,000
Prepaid expenses .....	15,000
Raw materials .....	46,000
Work in process .....	37,000



**Solution 124**

Current Assets

Cash .....		\$ 102,000	
Accounts receivable .....		73,000	
Inventories			
Raw materials .....	\$46,000		
Work in process .....	37,000		
Finished goods.....	<u>64,000</u>	147,000	
Prepaid expenses .....		<u>15,000</u>	
Total current assets .....			<u>\$337,000</u>

## EXERCISES

### Exercise 125

The following categories are used by manufacturing companies for costs:

- DM Direct Materials
- DL Direct Labour
- MO Manufacturing Overhead

Presented below is a list of costs and expenses incurred in the factory by Bates Corporation, a manufacturer of recreational vehicles.

- \_\_\_ a) Property taxes on the factory land
- \_\_\_ b) Rubber used in manufacturing
- \_\_\_ c) Welder's wages
- \_\_\_ d) Sandpaper used in production
- \_\_\_ e) Factory supervisors' salaries
- \_\_\_ f) Depreciation on factory machines
- \_\_\_ g) Factory electric
- \_\_\_ h) Carpeting for the recreational vehicles
- \_\_\_ i) Tissue paper for the factory workers' washrooms
- \_\_\_ j) Insurance on factory equipment

### Instructions

Select the category to which each cost or expense belongs and write the abbreviation of the cost in the space provided.

### Solution 125 (4 min.)

- a) MO
- b) DM
- c) DL
- d) MO
- e) MO
- f) MO
- g) MO
- h) DM
- i) MO
- j) MO

**Exercise 126**

Presented below are labels associated with costs:

1. Product Cost
2. Period Cost
3. Inventoriable Cost

**Instructions**

For each cost listed below, identify all applicable cost labels by writing the number in the space provided.

- |                                |       |
|--------------------------------|-------|
| a) Advertising                 | _____ |
| b) Direct materials used       | _____ |
| c) Sales salaries              | _____ |
| d) Indirect factory labour     | _____ |
| e) Repairs to office equipment | _____ |
| f) Factory manager's salary    | _____ |
| g) Direct labour used          | _____ |
| h) Indirect materials          | _____ |

**Solution 126** (3–4 min.)

- |                                |             |
|--------------------------------|-------------|
| a) Advertising                 | <u>2</u>    |
| b) Direct materials used       | <u>1, 3</u> |
| c) Sales salaries              | <u>2</u>    |
| d) Indirect factory labour     | <u>1, 3</u> |
| e) Repairs to office equipment | <u>2</u>    |
| f) Factory manager's salary    | <u>1, 3</u> |
| g) Direct labour used          | <u>1, 3</u> |
| h) Indirect materials          | <u>1, 3</u> |

**Exercise 127**

Assume you have just taken a position as controller for a new company that manufactures and sells wrought iron wall hangings. Although the founder of the company, who is the president and CEO, is a great artisan, she has very limited knowledge of accounting.

**Instructions**

To help your new boss better understand accounting for a manufacturing organization, write a memo to her in which you: (1) identify, (2) describe, and (3) provide examples of the three manufacturing costs and the three inventory accounts used in accounting for a manufacturing company.

**Solution 127** (8–10 min.)

The three manufacturing costs are: Direct Materials, Direct Labour, and Manufacturing

Overhead.

Raw materials that can be physically and directly associated with the finished product during the manufacturing process are called direct materials. The iron used in making the wall hangings is an example of direct materials.

The work of factory employees that can be physically and directly associated with converting raw materials to finished goods is considered direct labour.

Manufacturing overhead consists of costs that are indirectly associated with the manufacture of the finished product. These costs may also be manufacturing costs that cannot be classified as direct materials or direct labour. Manufacturing overhead includes indirect materials, indirect labour, and depreciation on factory buildings, and machinery, utilities, insurance, taxes and maintenance on factory facilities.

The three inventory accounts are: Raw Materials, Work in Process, and Finished Goods.

Raw materials inventory represents the cost of the materials and parts that are to be used in the manufacturing process. The iron purchased to make the wall hangings would be considered raw materials until the time it was put into production.

Work in process is the cost applicable to units that have been started into production but are only partially complete. Wall hangings on the assembly line that are in various stages of completion would be work in process.

The finished goods inventory represents the cost of completed goods that have not been sold. The cost of wall hangings that are completed but have not been sold would be finished goods.

### Exercise 128

Costs are often identified as either an inventoriable product cost or a period cost.

#### Instructions

For each item listed below, indicate in the space to the left whether the item would be considered an inventoriable cost or a period cost for a manufacturing company. Use the following codes:

- I Inventoriable cost
- P Period cost

- \_\_\_ a) Factory supervisory salaries
- \_\_\_ b) Sales commissions
- \_\_\_ c) Income tax expense
- \_\_\_ d) Indirect materials used
- \_\_\_ e) Indirect labour
- \_\_\_ f) Office salaries expense
- \_\_\_ g) Property taxes on factory building
- \_\_\_ h) Sales manager's salary
- \_\_\_ i) Factory wages
- \_\_\_ j) Direct materials used

#### Solution 128 (2–3 min.)

- a) I
- b) P
- c) P

- d) I
- e) I
- f) P
- g) I
- h) P
- i) I
- j) I

**Exercise 129**

Payne Manufacturing Company incurs the following manufacturing costs and expenses during the month of June:

- a) Assembly line wages
- b) Raw materials used directly in product
- c) Depreciation on office equipment
- d) Property taxes on factory building
- e) Rent on factory building
- f) Sales commissions
- g) Depreciation on factory equipment
- h) Factory utilities
- i) Wages for factory maintenance workers
- j) Advertising
- k) Indirect materials used in production
- l) Factory manager's salary

**Instructions**

Complete the following matrix by placing an X under the appropriate headings.

Cost Item	Direct Materials	Direct Labour	Manufacturing Overhead	Period Costs
a)				
b)				
c)				
d)				
e)				
f)				
g)				
h)				
i)				

j)				
k)				
l)				

**Solution 129** (3–4 min.)

Cost Item	Direct Materials	Direct Labour	Manufacturing Overhead	Period Costs
a)		X		
b)	X			
c)				X
d)			X	
e)			X	
f)				X
g)			X	
h)			X	
i)			X	
j)				X
k)			X	
l)			X	

**Exercise 130**

Arc Industries has the following components of its accounting information:

Variable costs: Direct Production \$500,000; Other Operating \$300,000

Fixed costs: Direct Production \$200,000; Other Operating \$800,000

Sales for the year: \$3,000,000

**Instructions**

Assist the controller in preparing a statement that shows operating income while offering the most effective way of attaining information about the company’s activities and its ultimate operating income.

**Solution 130** (8–10 min.)

Sales.....		\$3,000,000
Cost of sales:		
Variable.....	\$500,000	
Fixed .....	<u>200,000</u>	<u>700,000</u>
Gross profit .....		\$2,300,000
Other operating expenses		
Variable.....	\$300,000	
Fixed .....	<u>800,000</u>	<u>1,100,000</u>
Operating Income .....		\$1,200,000

**Exercise 131**

Safety Supply Services Ltd. has the following components of its accounting information:

Merchandise inventory: Beginning of Month \$100,000, End of Month \$180,000

Purchases of merchandise: \$2,050,000

Sales in month: \$3,000,000

Selling and administrative expenses: Selling \$250,000, Administrative \$300,000

**Instructions**

Assist the controller in preparing a statement that shows operating income while offering the most effective way of attaining information about the company's activities and its ultimate operating income.

**Solution 131 (8–10 min.)**

Sales.....	\$3,000,000
Cost of goods sold:	
Beginning merchandise inventory .....	\$100,000
Add: Purchases.....	<u>2,050,000</u>
Goods available for sale.....	2,150,000
Less: Ending merchandise inv.....	<u>180,000</u> <u>1,970,000</u>
Gross Margin .....	\$1,030,000
Selling and administrative expenses	
Selling .....	\$250,000
Administrative .....	<u>300,000</u> <u>550,000</u>
Operating Income .....	\$480,000

**Exercise 132**

M&H Ltd. has recorded the following costs:

<u>Month</u>	<u>Units produced</u>	<u>Cost A</u>	<u>Cost B</u>	<u>Cost C</u>
January	10,000	\$50,000	\$100,000	\$32,000
February	9,000	45,000	100,000	31,000
March	12,000	60,000	100,000	34,000

**Instructions**

If M&H Ltd. produces 15,000 units in April, what would be the expected total cost for each of Cost A, Cost B and Cost C? If the cost is a mixed cost, use the high-low method to determine April's cost.

**Solution 132 (6–8 min.)**

Cost A

Total cost is changing as activity changes, but the cost per unit is constant. Therefore Cost A is a variable cost.

Cost per unit = \$50,000/10,000 units or \$5/unit.

Therefore if 15,000 units are produced, Cost A = 15,000 X \$5 = \$75,000

Cost B

Total cost is constant as activity changes. Therefore Cost B is a fixed cost. Cost in April should equal \$100,000.

Cost C

Total cost is changing as activity changes, and cost per unit is changing as activity changes.

Therefore Cost C is a mixed cost.

Using the high-low method:

$$(\$34,000 - \$31,000) / (12,000 - 9,000 \text{ units}) = \$1/\text{unit}$$

$$\$1(10,000 \text{ units}) + \text{FC} = \$32,000$$

$$\text{FC} = \$32,000 - \$10,000 = \$22,000$$

For April:

$$\text{Total Cost} = \$22,000 + \$1 \times 15,000 \text{ units} = \$37,000$$

### Exercise 133

Riley Corporation's income statements for the last two years are presented below. Riley manufactured 7,500 and 10,500 school desks in 2020 and 2019, respectively and had no beginning or ending inventories.

	<u>2020</u>	<u>2019</u>
Sales	\$3,750,000	\$5,250,000
Cost of Goods Sold	<u>258,000</u>	<u>332,850</u>
Gross profit	3,492,000	4,917,185
Operating expenses	<u>2,095,200</u>	<u>2,278,695</u>
Net profit	<u>\$1,396,800</u>	<u>\$2,638,490</u>

### Instructions

- Estimate the company's total variable cost per unit and its total fixed costs per year using the high-low method.
- What is the equation of the line using the high-low method?

### Solution 133

- Total variable cost per unit of COGS
  - = Change in total costs/Change in activity levels
  - =  $(\$332,850 - \$258,000)/(10,500 - 7,500)$
  - = \$24.95

$$\begin{aligned} \text{Total fixed cost} &= \text{Total cost} - \text{total variable cost at high or level activity level} \\ &= \$332,850 - \$24.95 (10,500) = \$70,875 \\ &\text{OR} \\ &= \$258,000 - \$24.95 (7,500) = \$70,875 \end{aligned}$$

- $Y = \$24.95x + \$70,875$

### Exercise 134

The Nick's Hotel has the following monthly costs:

<u>Rooms Rented</u>	<u>Costs</u>
75	\$6,825
80	7,200
65	6,075
72	6,600
85	7,575



**Instructions**

Identify the fixed and variable cost elements using the high-low method.

**Solution 134** (5–6 min.)

Variable:

$$\frac{\$7,575 - \$6,075}{85 - 65} = \$75 \text{ per room}$$

$$\$75 \times (65) + FC = \$6,075$$

$$\text{Fixed costs} = \$1,200$$

**Exercise 135**

Alpha Romeo fraternity has an annual alumni golf outing. A local caterer provides lunch and a tent. The fraternity pays a flat fee for the tent and an additional amount for each fraternity brother served. However, in the past the brothers have never been able to determine how much the caterer is going to charge. In an effort to determine how much the caterer will charge this year, the brothers have tracked the cost and attendance data over the past four years:

<u>Attendance</u>	<u>Caterer Cost</u>
210	\$6,000
175	4,800
240	6,800
250	6,600

**Instructions**

- a) Use the high-low method to calculate the food cost per person.
- b) How much is the charge for the tent?

**Solution 135** (6–8 min.)

a) Variable:

$$\frac{\$6,600 - \$4,800}{250 - 175} = \$24 \text{ per person}$$

$$b) \quad \$24 (250) + FC = \$6,600$$

$$FC = \$600$$

**Exercise 136**

Spawn Manufacturing Company has the following data at June 30, 2020:

Inventories: .....	<u>June 30</u>	<u>June 1</u>
Raw materials inventory .....	\$25,000	\$30,000
Work in process inventory .....	84,000	75,000
Finished goods inventory .....	23,000	20,000

Other information for June:

Total manufacturing costs .....	\$754,000
Manufacturing overhead.....	72,000

Direct labour incurred .....	342,000
Sales .....	990,000

**Instructions**

- a) Prepare a schedule of cost of goods manufactured for the month of June.
- b) Indicate the Balance Sheet presentation of the June 30 inventories.

**Solution 136** (10–12 min.)

a)

**SPAWN MANUFACTURING COMPANY**  
**Cost of Goods Manufactured**  
**For the Month Ended June 30, 2020**

Beginning work in process (given).....		\$75,000
Direct materials:		
Beginning raw materials (given) .....	\$30,000	
Raw material purchases.....	<u>335,000</u>	
(365,000 – 30,000)		
Total raw materials available for use .....	365,000	
(340,000 + 25,000)		
Ending raw materials (given) .....	<u>25,000</u>	
Direct materials used .....	340,000	
(754,000 – 342,000 – 72,000)		
Direct labour (given).....	342,000	
Manufacturing overhead (given).....	<u>72,000</u>	
Total manufacturing costs (given) .....		754,000
Less ending work in process (given) .....		<u>84,000</u>
Cost of goods manufactured .....		<u><u>\$745,000</u></u>
(75,000 + 754,000 – 84,000)		

b)

Current assets

Raw materials inventory .....	\$25,000
Work in process inventory .....	84,000
Finished goods inventory .....	<u>23,000</u>
Total inventories .....	<u><u>\$132,000</u></u>

**Exercise 137**

Account balances from Jolly B Manufacturing Company’s accounting records for the month ended December 31, 2020 appear below:

Finished Goods Inventory, December 31 .....	\$ 75,350
Factory Supervisory Salaries .....	80,000
Income Tax Expense .....	40,000
Raw Materials Inventory, December 1 .....	16,500
Work in process Inventory, December 31.....	57,000
Sales Salaries Expense .....	25,000
Factory Depreciation Expense .....	5,400
Finished Goods Inventory, December 1 .....	32,400

Raw Materials Purchases .....	475,000
Work in process Inventory, December 1.....	72,000
Factory Utilities Expense.....	5,700
Direct Labour .....	130,000
Raw Materials Inventory, December 31 .....	23,000
Sales Returns and Allowances.....	2,700
Indirect Labour .....	15,700

**Instructions**

Prepare a schedule of cost of goods manufactured for Jolly B Manufacturing Company for the month ended December 31, 2020.

**Solution 137** (10–12 min.)

**JOLLY B MANUFACTURING COMPANY**  
**Cost of Goods Manufactured**  
**For the Month Ended December 31, 2020**

Beginning work in process .....		\$ 72,000
Direct materials:		
Beginning raw materials .....	\$ 16,500	
Raw material purchases.....	<u>475,000</u>	
Total raw materials available for use .....	491,500	
Ending raw materials.....	<u>23,000</u>	
Direct materials used .....		\$ 468,500
Direct labour .....		130,000
Manufacturing overhead:		
Factory supervisor's salary.....	\$80,000	
Indirect labour .....	15,700	
Factory utilities expense.....	5,700	
Factory Depreciation expense.....	<u>5,400</u>	
Total manufacturing overhead.....		<u>106,800</u>
Total manufacturing costs .....		705,300
Less ending work in process .....		<u>57,000</u>
Cost of goods manufactured .....		<u>\$ 720,300</u>

**Exercise 138**

Manufacturing costs for Fantasia Company for two consecutive months are as follows:

	<u>June 30, 2020</u>	<u>July 31, 2020</u>
Beginning work in process .....	\$ 36,000	e)
Direct materials used .....	157,000	\$ 143,000
Direct labour.....	89,000	72,000
Manufacturing overhead.....	115,000	66,000
Total manufacturing costs .....	a)	f)
Ending work in process .....	43,000	g)
Cost of goods manufactured .....	b)	289,000
Beginning finished goods .....	c)	h)
Cost of goods available for sale .....	658,000	i)

Ending finished goods .....	d)	49,000
Cost of goods sold .....	515,000	j)

**Instructions**

Indicate the missing amounts. (Show computations.)

**Solution 138** (8–10 min.)

- a)  $\$115,000 + 157,000 + \$89,000 = \$361,000$
- b)  $\$36,000 + \$361,000 - \$43,000 = \$354,000$
- c)  $\$658,000 - \$354,000 = \$304,000$
- d)  $\$658,000 - \$515,000 = \$143,000$
- e) Equal to ending from June =  $\$43,000$
- f)  $\$143,000 + \$72,000 + \$66,000 = \$281,000$
- g)  $\$281,000 + \$43,000 - \$289,000 = \$35,000$
- h) Equal to ending from June =  $\$143,000$
- i)  $\$143,000 + \$289,000 = \$432,000$
- j)  $\$432,000 - \$49,000 = \$383,000$

**Exercise 139**

A partial cost of goods manufactured schedule appears below for R Kelly Manufacturing:

**R KELLY MANUFACTURING COMPANY**  
**Cost of Goods Manufactured Schedule**  
**For the Year Ended December 31, 2020**

Work in process .....		\$76,000
Direct materials		
Raw materials inventory .....	\$?	
Raw materials purchases .....	<u>186,000</u>	
Raw materials available for use.....	?	
Raw materials inventory .....	<u>23,000</u>	
Direct materials used .....		\$203,000
Direct labour .....		<u>?</u>
Manufacturing overhead		
Indirect labour .....	\$15,000	
Factory depreciation.....	27,000	
Factory utilities .....	<u>7,000</u>	
Total overhead .....		<u>?</u>
Total manufacturing costs .....		<u>?</u>
Total cost of work in process.....		<u>?</u>
Less: Work in process .....		<u>57,000</u>

Cost of goods manufactured ..... \$475,000

**Instructions**

Fill in the missing information on the cost of goods manufactured schedule of R Kelly Manufacturing Company.

**Solution 139** (6–9 min.)

**R KELLY MANUFACTURING COMPANY  
Cost of Goods Manufactured Schedule  
For the Year Ended December 31, 2020**

Work in process .....		\$76,000
Direct materials		
Raw materials inventory .....	\$ 40,000	
Raw materials purchases .....	<u>186,000</u>	
Raw materials available for use .....	226,000	
Raw materials inventory .....	<u>23,000</u>	
Direct materials used .....		203,000
Direct labour .....		204,000
Manufacturing overhead		
Indirect labour .....	15,000	
Factory depreciation .....	27,000	
Factory utilities .....	<u>7,000</u>	
Total overhead .....		<u>49,000</u>
Total manufacturing costs .....		<u>456,000</u>
Total cost of work in process .....		532,000
Less: Work in process .....		<u>57,000</u>
Cost of goods manufactured .....		<u>\$475,000</u>

**Exercise 140**

Data for the cost of direct materials for Landley, Inc. for the month ended March 31, 2020, are as follows:

Materials inventory, March 1, 2020.....	\$43,000
Materials inventory, March 31, 2020.....	41,000

During March, the company purchased \$140,000 of raw materials on account from Earle Company and \$52,000 of raw materials for cash from Shrink Company. In addition, \$100,000 was paid on the Earle account balance.

**Instructions**

Calculate the cost of direct materials used during March.

**Solution 140** (5–7 min.)

Raw materials inventory, March 1 .....	\$ 43,000
Raw materials purchases .....	<u>192,000</u>
(\$140,000 + \$52,000)	
Total raw materials available for use .....	235,000
Less: Raw materials inventory, March 31 .	<u>41,000</u>
Direct materials used during March .....	<u>\$194,000</u>

Note: Payment on account is irrelevant to the direct materials used calculation.

### Exercise 141

The following costs and inventory data were taken from the accounts of Winsto Company for 2020:

Inventories:	<u>January 1, 2020</u>	<u>December 31, 2020</u>
Raw materials .....	\$8,000	\$ 7,000
Work in process .....	15,000	13,000
Finished goods.....	16,000	12,000

### Costs incurred:

Raw materials purchases .....	\$88,000
Direct labour.....	42,000
Factory rent.....	8,000
Factory utilities .....	2,000
Indirect materials.....	4,000
(inventoried separately from other materials)	
Indirect labour .....	6,000
Selling expenses .....	5,000
Administrative expenses .....	12,000

### Instructions

- Prepare a schedule showing the amount of direct materials used in production during the year.
- Calculate the amount of manufacturing overhead incurred during the year.
- Prepare a schedule of Cost of Goods Manufactured for Winsto Company for the year ended December 31, 2020 in good form.
- Prepare the Cost of Goods Sold section of the income statement for Winsto Company for the year ended December 31, 2020 in good form.

### Solution 141 (12–15 min.)

a)		
	Raw materials inventory, beginning.....	\$ 8,000
	Raw materials purchases .....	<u>88,000</u>
	Raw materials available for use.....	96,000
	Raw materials inventory, ending .....	<u>7,000</u>
	Direct materials used .....	<u>\$ 89,000</u>

b)		
	Manufacturing overhead:	
	Factory rent.....	\$ 8,000
	Factory utilities .....	2,000
	Indirect materials.....	4,000
	Indirect labour .....	<u>6,000</u>
	Total manufacturing overhead.....	<u>\$20,000</u>

c)

**WINSTO COMPANY**  
**Schedule of Cost of Goods Manufactured**  
**Year Ending December 31, 2020**

Work in process beginning .....		\$15,000
Direct materials		
Raw materials inventory beginning .....	\$ 8,000	
Raw materials purchases.....	<u>88,000</u>	
Raw materials available for use .....	96,000	
Raw materials inventory ending .....	<u>7,000</u>	
Direct materials used .....		\$89,000
Direct labour .....		42,000
Manufacturing overhead .....		<u>20,000</u>
Total manufacturing costs .....		<u>151,000</u>
Total cost of work in process.....		166,000
Less: Work in process ending .....		<u>13,000</u>
Cost of goods manufactured .....		<u>\$153,000</u>

d)

**WINSTO COMPANY**  
**Partial Income Statement**  
**Year Ending December 31, 2020**

Finished goods inventory, January 1 .....	\$ 16,000	
Cost of goods manufactured .....	<u>153,000</u>	
Cost of goods available for sale .....	169,000	
Finished goods inventory, December 31 .....	<u>12,000</u>	
Cost of goods sold .....		<u>\$157,000</u>

**Exercise 142**

Starwood Company reported the following amounts for 2020:

Raw materials purchased.....	\$120,000	
Beginning raw materials inventory.....	16,000	
Ending raw materials inventory .....	5,000	
Beginning finished goods inventory .....	11,000	
Ending finished goods inventory.....	8,000	
Administrative expenses .....	12,000	
Direct labour used.....	44,000	
Selling and administrative expenses .....	21,000	
Beginning work in process inventory .....	17,000	
Ending work in process inventory.....	16,000	
Manufacturing overhead costs .....	36,000	

**Instructions**

- a) Calculate the cost of materials used in production.
- b) Calculate the cost of goods manufactured.

**Solution 142**

a)		
	Beginning raw materials inventory.....	\$ 16,000
	Raw materials purchased.....	<u>120,000</u>
	= Materials available for use.....	136,000
	Less ending raw materials inventory .....	<u>5,000</u>
	= Materials used in production .....	<u>\$131,000</u>
b)		
	Materials used in production (part A).....	\$131,000
	Direct labour used.....	44,000
	Manufacturing overhead costs .....	<u>36,000</u>
	Total manufacturing costs .....	211,000
	Add beginning work in process.....	17,000
	Less ending work in process .....	<u>(16,000)</u>
	Cost of goods manufactured .....	<u>\$212,000</u>

**Exercise 143**

Halsey, the manufacturer of inexpensive printers, was organized in May, 2020. Halsey purchases toner cartridges used in the printers from a local distributor. Early in May, Halsey bought 41,000 cartridges at a cost of \$20 each. During May, 36,000 cartridges were transferred from Raw Materials Inventory. Of the 36,000 cartridges withdrawn from Raw Materials Inventory, 4,000 were given to sales personnel to be given to customers as an incentive to buy a large quantity of printers. Another 1,000 cartridges were transferred to the corporate office to be used by members of the clerical staff. The remaining cartridges were transferred to production. Of the units started into production during May, 85 percent of them were completed. Eighty percent of the units completed during May were sold and shipped to customers.

**Instructions**

Determine the cost of cartridges to be found in each of the following accounts:

- Raw Materials Inventory
- Work in process Inventory
- Finished Goods Inventory
- Cost of Goods Sold
- Selling Expenses
- Administrative Expenses

**Solution 143** (8–10 min.)

a)	Raw Materials Inventory (41,000 – 36,000) × \$20	\$100,000
b)	Work in process Inventory (31,000 × .15) × \$20	93,000
c)	Finished Goods Inventory [(31,000 × .85) – (26,350 × .80)] × \$20	105,400
d)	Cost of Goods Sold (26,350 × .80 × \$20)	421,600
e)	Selling Expenses (4,000 × \$20)	80,000



f) Administrative Expenses (1,000 × \$20)	<u>20,000</u>
	<u>\$820,000</u>

**Exercise 144**

Gooly, Inc. manufactures calculators. During June, Gooly's transactions and accounts included the following:

Work in process inventory, beginning.....	\$8,800
Work in process inventory, ending .....	7,500
Indirect materials issued to production from raw materials	3,600
Raw materials inventory, beginning.....	4,600
Raw materials inventory, ending .....	5,800
Sales.....	42,000
Direct labour cost.....	55,000
Manufacturing overhead.....	49,600
Raw materials purchased.....	143,500
Finished goods inventory, beginning .....	12,300
Finished goods inventory, ending.....	11,600

**Instructions**

- a) How much is the cost of direct materials issued to production during June?
- b) Calculate the cost of goods manufactured.
- c) How much is the cost of inventory on the May 31 Balance Sheet?

**Solution 144**

a)	
Materials:	
Beginning inventory.....	\$ 4,600
Add Raw material purchases.....	143,500
Less Indirect materials issued .....	(3,600)
Available to use.....	144,500
Less ending raw materials.....	(5,800)
Cost of materials used.....	\$138,700
b)	
Direct materials (part a).....	\$138,700
Direct labour.....	55,000
Manufacturing overhead.....	49,600
Total manufacturing costs .....	243,300
Add beginning work in process.....	8,800
Less ending work in process .....	(7,500)
Cost of goods manufactured .....	\$244,600
c)	
Raw materials .....	\$ 4,600
Work in process .....	8,800
Finished goods.....	12,300
Total inventory at May 31 .....	\$25,700

**Exercise 145**

Listed below are current asset items for Dre Company at December 31, 2020. Prepare the current assets section of the balance sheet. (Include a complete heading.)

Finished goods inventory .....	\$14,000	Short-term investments .....	\$22,000
Cash .....	15,000	Raw materials inventory .....	11,000
Prepaid expenses .....	3,000	Work in process inventory ....	16,000
Accounts receivable .....	2,100	Supplies on hand .....	1,400

**Solution 145 (5–8 min.)**

**DRE COMPANY  
(Partial) Balance Sheet  
December 31, 2020**

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Current assets			
Cash .....		\$15,000	
Short-term investments .....		22,000	
Accounts receivable .....		2,100	
Inventories:			
Raw materials .....	\$11,000		
Work in process.....	16,000		
Finished goods.....	<u>14,000</u>	41,000	
Prepaid expenses .....		3,000	
Supplies on hand .....		<u>1,400</u>	
Total current assets.....		<u>\$84,500</u>	

## COMPLETION STATEMENTS

146. The work of factory employees that can be physically and directly associated with converting raw materials into products is classified as \_\_\_\_.
147. Indirect materials and indirect labour are classified as \_\_\_\_.
148. Direct materials and direct labour are referred to as \_\_\_\_ costs while direct labour and manufacturing overhead are often referred to as \_\_\_\_ costs.
149. \_\_\_\_ is added to direct labour and manufacturing overhead to get total manufacturing costs for the current period.
150. \_\_\_\_ costs vary in total but remain the same on a per unit basis.
151. Costs that have both a variable and fixed element are referred to as \_\_\_\_ costs.
152. A cost estimation technique using the highest and lowest level of activity and the highest and lowest cost is referred to as the \_\_\_\_ method.
153. When using the high-low method of cost estimation the change in \_\_\_\_ is divided by the change in \_\_\_\_ to determine the variable cost per activity.
154. A major difference between the income statements of a merchandising company and a manufacturing company is that the cost of goods section of a merchandising company shows cost of goods \_\_\_\_, whereas a manufacturing company shows cost of goods \_\_\_\_.
155. The ending work in process inventory is subtracted from the total cost of work in process to calculate \_\_\_\_.
156. A manufacturing company calculates cost of goods sold by adding cost of goods manufactured to the \_\_\_\_ and subtracting the \_\_\_\_.
157. A manufacturing company usually has three inventory accounts which are (1) \_\_\_\_, (2) \_\_\_\_, and (3) \_\_\_\_.

## ANSWERS TO COMPLETION STATEMENTS

- 146. direct labour
- 147. manufacturing overhead
- 148. prime, conversion
- 149. direct materials used
- 150. variable costs
- 151. mixed
- 152. high-low
- 153. costs, activity
- 154. purchased, manufactured
- 155. cost of goods manufactured
- 156. beginning finished goods inventory, ending finished goods inventory
- 157. finished Goods Inventory, Work in process Inventory, Raw Materials Inventory

## MATCHING

158. A list of managerial accounting terms appears below:

- a) Prime Costs
- b) Inventoriable costs
- c) Cost behaviour analysis
- d) Activity index
- e) Conversion costs
- f) Period costs

### Instructions

Match each of the terms with the statement that best describes the term.

- 1. \_\_\_ Costs that are matched with the revenue of a specific time period and charged to expenses as incurred.
- 2. \_\_\_ The sum of direct manufacturing labour costs and manufacturing overhead costs.
- 3. \_\_\_ The study of how specific costs respond to changes in the level of business activity.
- 4. \_\_\_ Costs that are a necessary and integral part of producing the finished product.
- 5. \_\_\_ The sum of direct materials cost and direct labour costs.
- 6. \_\_\_ An activity that causes changes in the behaviour of costs.

### Solution 158

- 1. f
- 2. e
- 3. c
- 4. b
- 5. a
- 6. d

## SHORT-ANSWER ESSAY QUESTIONS

### SAE 159

Explain how management would use the high-low method to classify mixed costs into their fixed and variable components. Does the high-low method produce a precise measurement of the fixed and variable elements in a mixed cost? Explain.

### Solution 159

The high-low method uses the total costs incurred at the high and low levels of *activity*. The difference in costs between the high and low levels represents variable costs, since only the variable cost element can change as activity levels change. The steps in calculating fixed and variable costs under this method are as follows:

1. Determine the variable cost per unit by using the below formula:

$$\begin{array}{c} \text{Change in} \\ \text{Total Costs} \end{array} \div \begin{array}{c} \text{Change in} \\ \text{Activity Levels} \end{array} = \begin{array}{c} \text{Variable Cost} \\ \text{per Unit} \end{array}$$

2. Determine the fixed cost by subtracting the total variable cost at either the high or the low activity level from the total cost at that activity level.

The high-low method generally produces a reasonable estimate for analysis. However, it does not produce a precise measurement of the fixed and variable elements in a mixed cost, because other activity levels are ignored in the calculation.

### SAE 160

A manufacturing company makes the products that it sells. Briefly identify and define the cost elements that are incurred in making a product. After product cost elements are identified, how is the cost of goods manufactured for a period determined?

### Solution 160

Costs incurred to manufacture a product include direct materials which can be physically and directly associated with the finished product; direct labour, which is the work of factory employees which can be physically and directly associated with the finished product; and manufacturing overhead, those manufacturing costs which are indirectly associated with production of the finished product.

Cost of goods manufactured is calculated by adding the cost of direct materials used, direct labour, and manufacturing overhead to the beginning Work in Process, and subtracting the ending Work in Process.

**MULTI-PART QUESTION**

161. Culpepper Computer Ltd. manufactures a laptop and has the following results for its recent year end:

<u>Laptop per Unit Sales Data</u>		
Selling price .....		\$1,500
Manufacturing Costs:		
Variable materials .....	\$500	
Variable labour .....	128	
Manufacturing overhead.....	<u>480</u>	<u>1,108</u>
Gross Margin .....		\$392
Selling, general, and administrative expenses		
Variable.....	\$50	
Fixed .....	<u>150</u>	<u>200</u>
Profit per unit .....		\$192

Each laptop requires approximately 240 minutes of highly skilled labour time for assembly and testing. The bottleneck resource in the operation is labour hours. Workers are paid \$32 per hour and no additional labour hours are available.

Factory overhead, of which 25% is variable, is allocated to laptops using labour hours since all the work in the factory is labour paced. The company sells 10,000 laptops a year, which is the capacity dictated by labour hours availability.

Recently Zucchini Computers offered to purchase 2,000 laptops from Culpepper but with a custom feature. This feature will require 45 minutes of additional labour time and incur an additional \$50 in materials for each laptop. Selling, general, and administrative costs would not change with this order.

**Instructions**

- a) Compute the minimum price that Culpepper should charge Zucchini for each laptop in this order.
- b) What other factors should Culpepper consider before it agrees to the order?

**Solution 161 (20–25 min.)**

a)

Variable cost of special order (\$500 + 128 + 50 + 50 +120) .....	\$848.00
Additional time required (.75 hours x (128 + 120) / 4).....	46.50
Contribution margin foregone:	
Hours required for special order 2,000 x 4.75 =	9,500
Regular units lost 9,500 / 4 =	2,375
CM / regular unit \$1,500 – 500 – 128 – 120 – 50 =	\$702
CM foregone (2,375 x \$702) / 2,000 .....	<u>833.63</u>
Minimum price of each unit of custom order .....	\$1,728.13

b) On the surface this looks like a good arrangement for Culpepper. But the company needs to look at the strategic aspects of the order. Can it take out 2,000 laptops from its regular customer orders and expect to regain them once the special order is complete? Will its cost estimates be accurate, considering that there will be a learning curve from its workers who will have to adapt to making the new products? It appears that labour hours are already maxed out and any

difficulties with the new order could set back its own production schedules for its regular products.

Alternatively, could this be a breakthrough into a whole new market for Culpepper and if so, would there be other companies that would wish to have custom orders made for them? Culpepper currently appears to be a manufacturer of one or two products and is set up to operate in this fashion; changing to a specialty manufacturer requires it to view its production capabilities in more of a job-order manner. This may mean more pressure on its sales force as well as on its production operations.



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