Chapter 2

Cost Concepts

Solutions to Questions

**2-1** Cost behaviour refers to how a cost will react or respond to changes in the level of business activity.

**2-2** No. A variable cost is a cost that varies, in total, in direct proportion to changes in the level of activity. A variable cost is constant per unit of the activity level (e.g., number of beds occupied). A fixed cost is fixed in total, but will vary inversely on a per-unit basis with changes in the level of activity.

**2-3** When fixed costs are involved, the cost per unit of activity will depend on the activity volume (or level). For example, as production increases, the cost per unit will fall because the fixed cost is spread over more units. Conversely, as production declines, the cost per unit will rise since a constant fixed cost figure will be spread over fewer units.

**2-4** The cost of direct materials included in a product is a variable cost; similarly, sales commissions paid out on a per unit basis or as a percentage of sales dollars is a variable cost. On the other hand, costs such as building rent and the salary of a general manager are fixed costs.

**2-5** Fixed costs *in total* do not vary with volume within a relevant range. However, fixed costs per unit of volume decrease as volume increases and increases as volume decreases. Therefore, an inverse relationship exists between volume and fixed costs per unit of volume.

**2-6** Manufacturing overhead is an indirect cost since these costs cannot be easily and conveniently traced to individual products.

**2-7** A differential cost is a cost that differs between alternatives in a decision. An opportunity cost is the potential benefit that is given up when one alternative is selected over another. A sunk cost is a cost that has already been incurred and cannot be altered by any decision taken now or in the future.

**2-8** No; differential costs can be either variable or fixed. For example, the alternatives might consist of purchasing one computer software program over another to simplify the accounts receivable process. The difference in the fixed costs of purchasing the two programs would be a differential cost.

**2-9** The three major elements of product costs in a manufacturing company are direct materials, direct labour, and manufacturing overhead.

**2-10**

**a.** Direct materials: Direct materials are an integral part of a finished product and can be conveniently traced into it.

**b.** Indirect materials: Indirect materials are generally small items of material such as glue and nails. They may become an integral part of a finished product but are traceable into the product only at great cost or inconvenience. Indirect materials are ordinarily classified as part of manufacturing overhead.

**c.** Direct labour: Direct labour includes those labour costs that can be easily traced to particular products. Direct labour is also called “touch labour.”

**d.** Indirect labour: Indirect labour includes the labour costs of workers who do not directly work on products but provide a support function. Examples of such labour include janitors, supervisors, materials handlers, and other factory workers that cannot be conveniently traced directly to particular products.

**e.** Manufacturing overhead: Manufacturing overhead includes all manufacturing costs except direct materials and direct labour.

**2-11** PC = DM + DL

CC = DL + MOH

PC = DM + CC - MOH

**2-12** A product cost is any cost incurred for the purchase or the manufacture of goods. In the case of manufactured goods, these costs consist of direct materials, direct labour, and manufacturing overhead. A period cost is a cost that is taken directly to the income statement as an expense in the period in which it is incurred. Examples include selling (marketing) and administrative expenses.

**2-13** The income statement of a manufacturing firm differs from the income statement of a merchandising firm in the cost of goods sold section. The merchandising firm sells finished goods that it has purchased from a supplier. These goods are listed as “Purchases” in the cost of goods sold section. Since the manufacturing firm produces its goods rather than buying them from a supplier, it lists “Cost of Goods Manufactured” in place of “Purchases.” Also, the manufacturing firm identifies its inventory in this section as “Finished Goods Inventory,” rather than as “Merchandise Inventory.”

**2-14** The schedule of cost of goods manufactured is used to list and organize the manufacturing costs that have been incurred. These costs are organized under the three major headingsof direct materials, direct labour, and manufacturing overhead. The total costs incurred are adjusted for any change in the Work in Process inventory to determine the cost of goods manufactured (i.e., finished) during the period.

The schedule of cost of goods manufactured ties into the income statement through the Cost of Goods Sold section. The cost of goods manufactured is added to the beginning Finished Goods inventory to determine the goods available for sale. In effect, the cost of goods manufactured takes the place of the “Purchases” account in a merchandising firm.

**2-15** A manufacturing firm has three inventory accounts: Raw Materials, Work in Process, and Finished Goods. The merchandising firm generally identifies its inventory account simply as Merchandise Inventory.

**2-16** Since product costs follow units of product into inventory, they are sometimes called inventoriable costs. The flow is from direct materials, direct labour, and manufacturing overhead into Work in Process. As goods are completed, their cost is removed from Work in Process and transferred into Finished Goods. As goods are sold, their cost is removed from Finished Goods and transferred into Cost of Goods Sold. Cost of Goods Sold is an expense on the income statement.

**2-17** Yes, costs such as salaries anddepreciationcan end up as assets on the balance sheet if these are manufacturing costs. Manufacturing costs are inventoried until the associated finished goods are sold. Thus, such costs may be part of either Work in Process inventory or Finished Goods inventory at the end of a period if there are unsold units.

Solutions to Foundational 15

The Foundational 15 (LO1 – CC1; LO2 – CC2; LO3 – CC3; LO4 – CC4, 5, 6, 7)

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | Direct materials | $  6.00 |  |
|  | Direct labour | 3.50 |  |
|  | Variable manufacturing overhead | 1.50 |  |
|  | Variable manufacturing cost per unit | $11.00 |  |
|  |  |  |  |
|  | Variable manufacturing cost per unit (a) | $11.00 |  |
|  | Number of units produced (b) | 10,000 |  |
|  | Total variable manufacturing cost (a) × (b) |  | $110,000 |
|  | Fixed manufacturing overhead per unit (c) | $4.00 |  |
|  | Number of units produced (d) | 10,000 |  |
|  | Total fixed manufacturing cost (c) × (d) |  | 40,000 |
|  | Total product (manufacturing) cost |  | $150,000 |

|  |  |  |  |
| --- | --- | --- | --- |
| 2. | Sales commissions | $1.00 |  |
|  | Variable administrative expense | 0.50 |  |
|  | Variable selling and administrative per unit | $1.50 |  |
|  |  |  |  |
|  | Variable selling and admin. per unit (a) | $1.50 |  |
|  | Number of units sold (b) | 10,000 |  |
|  | Total variable selling and admin. expense  (a) × (b) |  | $15,000 |
|  | Fixed selling and administrative expense per unit ($3 fixed selling + $2 fixed admin.) (c) | $5.00 |  |
|  | Number of units sold (d) | 10,000 |  |
|  | Total fixed selling and administrative expense (c) × (d) |  | 50,000 |
|  | Total period (nonmanufacturing) cost |  | $65,000 |

|  |  |  |  |
| --- | --- | --- | --- |
| 3. | Direct materials | $  6.00 |  |
|  | Direct labour | 3.50 |  |
|  | Variable manufacturing overhead | 1.50 |  |
|  | Sales commissions | 1.00 |  |
|  | Variable administrative expense | 0.50 |  |
|  | Variable cost per unit sold | $12.50 |  |

The Foundational 15 (continued)

|  |  |  |
| --- | --- | --- |
| 4. | Direct materials | $  6.00 |
|  | Direct labour | 3.50 |
|  | Variable manufacturing overhead | 1.50 |
|  | Sales commissions | 1.00 |
|  | Variable administrative expense | 0.50 |
|  | Variable cost per unit sold | $12.50 |
| 5. | Variable cost per unit sold (a) | $12.50 |
|  | Number of units sold (b) | 8,000 |
|  | Total variable costs (a) × (b) | $100,000 |
| 6. | Variable cost per unit sold (a) | $12.50 |
|  | Number of units sold (b) | 12,500 |
|  | Total variable costs (a) × (b) | $156,250 |
| 7. | Total fixed manufacturing cost (see requirement 1) (a) | $40,000 |
|  | Number of units produced (b) | 8,000 |
|  | Average fixed manufacturing cost per unit produced (a) ÷ (b) | $5.00 |
| 8. | Total fixed manufacturing cost (see requirement 1) (a) | $40,000 |
|  | Number of units produced (b) | 12,500 |
|  | Average fixed manufacturing cost per unit produced (a) ÷ (b) | $3.20 |
| 9. | Total fixed manufacturing cost (see requirement 1) | $40,000 |
| 10. | Total fixed manufacturing cost (see requirement 1) | $40,000 |

The Foundational 15 (continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 11. | Variable overhead per unit (a) | $1.50 | | |  | |
|  | Number of units produced (b) | 8,000 | | |  | |
|  | Total variable overhead cost (a) × (b) |  | | | $12,000 | |
|  | Total fixed overhead (see requirement 1) |  | | | 40,000 | |
|  | Total manufacturing overhead cost |  | | | $52,000 | |
| Total manufacturing overhead cost (a) | |  | | $52,000 | | |
| Number of units produced (b) | |  | | 8,000 | | |
| Manufacturing overhead per unit (a) × (b) | |  | | $6.50 | | |
| 12. | Variable overhead per unit (a) | $1.50 | | |  | |
|  | Number of units produced (b) | 12,500 | | |  | |
|  | Total variable overhead cost (a) × (b) |  | | | $18,750 | |
|  | Total fixed overhead (see requirement 1) |  | | | 40,000 | |
|  | Total manufacturing overhead cost |  | | | $58,750 | |
| Total manufacturing overhead cost (a) | |  | | $58,750 | | |
| Number of units produced (b) | |  | | 12,500 | | |
| Manufacturing overhead per unit (a) × (b) | |  | | $4.70 | | |
| 13. | Sales revenue (@$22.00 per unit) | | $220,000 | |
|  | Less: Cost of goods sold (same as product costs in requirement 1) | | 150,000 | |
|  | Gross margin | | $ 70,000 | |
| 14. | Direct materials per unit | $6.00 | | |  | |
|  | Direct labour per unit | 3.50 | | |  | |
|  | Direct manufacturing cost per unit (a) | $9.50 | | |  | |
|  | Number of units produced (b) | 11,000 | | |  | |
|  | Total direct manufacturing cost (a) × (b) | $104,500 | | |  | |
| Variable overhead per unit (a) | | $1.50 | | |  |
| Number of units produced (b) | | 11,000 | | |  |
| Total variable overhead cost (a) × (b) | |  | | | $16,500 | | |
| Total fixed overhead (see requirement 1) | |  | | | 40,000 | | |
| Total indirect manufacturing cost | |  | | | $56,500 | | |

The Foundational 15 (continued)

|  |  |  |
| --- | --- | --- |
| 15. | Direct materials per unit | $6.00 |
|  | Direct labour per unit | 3.50 |
|  | Variable manufacturing overhead per unit | 1.50 |
|  | Incremental manufacturing cost per unit | $11.00 |

Solutions to Brief Exercises

**Brief Exercise 2-1**(LO3 CC3) (10 minutes)

The cost concept that best applies to Bill’s response is the concept of opportunity cost. Bill’s response of “no free lunch” suggests that the cost of the lunch is the time foregone which he could have utilized in completing the report. For Bill, the alternatives are time required to complete the financial performance report and time required to attend the company lunch. If Bill attends the lunch he will have less time available to finish the report and if he stays to finish the report he would miss the company lunch.

**Brief Exercise 2-2**(LO1 CC1) (15 minutes)

Note to the instructor: A few of these costs may generate lively debate. For example, some may argue that the cost of advertising a U2 rock concert is a variable cost since the number of people who come to the rock concert depends on the amount of advertising. However, one can argue that if the price is within reason, any U2 rock concert in Vancouver will be sold out, and the function of advertising is simply to let people know the event will be happening. Moreover, while advertising may affect the number of people who ultimately buy tickets, the causation is in one direction. If more people buy tickets, the advertising costs don’t go up.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Cost Behaviour | |
|  |  | Variable | Fixed |
| 1. | The costs of advertising a U2 rock concert in Vancouver ………………………………………….. |  | X |
| 2. | Depreciation on the Hard Rock Cafe building in Ottawa |  | X |
| 3. | The electrical costs of running a roller coaster at the West Edmonton Mall | X |  |
| 4. | Property taxes on your local cinema |  | X |
| 5. | The costs of synthetic materials used to make Reebok running shoes | X |  |
| 6. | The costs of shipping Apple iPods to retail stores | X |  |
| 7. | The cost of leasing a CT-scan diagnostic machine at the American Hospital in Paris |  | X |

**Brief Exercise 2-3**(LO3 CC3) (15 minutes)

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Differential Cost | Opportunity Cost | Sunk Cost |
| 1. Cost of the old printing machine |  |  | X |
| 1. The salary of the head of the Printing Department |  |  |  |
| 1. The salary of the head of the Finance Department |  |  |  |
| 1. Rent on the space occupied by the Printing department |  |  |  |
| 1. The cost of maintaining the old printer | X |  |  |
| 1. Benefits from a new state-of-the-art scanner |  | X |  |
| 1. Cost of electricity to run the printing machine | X |  |  |

Note: The costs of the salaries of the heads of the Printing and the Finance Departments and the rent on the space occupied by Printing are neither differential costs, nor opportunity costs, nor sunk costs. These are costs that do not differ between the alternatives and are therefore irrelevant in the decision, but they are not sunk costs since they occur in the future. The opportunity cost of the foregone benefit from a new state-of-the-art scanner is not a differential cost in the decision to replace the old printer with a new printer, but if the decision were instead whether to acquire a scanner or a printer, this opportunity cost would also be a differential cost.

**Brief Exercise 2-4** (LO4 CC4, 5, 6) (15 minutes)

1. Monthly salary of the company’s accountant: Administrative cost.
2. The cost of a fan installed in a computer: Direct Materials cost.
3. Rental on equipment used to assemble computers: Manufacturing Overhead
4. The cost of advertising in the local community newspaper: Marketing and Selling cost.
5. Monthly charge paid to an outside company for quality testing (20% of the computers assembled are sent for testing): Manufacturing Overhead
6. The wages of employees who assemble computers from components: Direct Labourcost.
7. The salary of the assembly shop’s supervisor: Manufacturing Overhead.
8. Sales commissions paid to the company’s salespeople: Marketing and Sellingcost.

9.Rent on the facility: Manufacturing Overhead.

**Brief Exercise 2-5**(LO4 CC7) (15 minutes)

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Product  (Inventoriable) Cost | Period  (Non-inventoriable) Cost |
| 1. | Depreciation on salespersons’ cars |  | X |
| 2. | Rent on equipment used in the factory | X |  |
| 3. | Lubricants used for maintenance of factory equipment | X |  |
| 4. | Salaries of finished goods warehouse personnel |  | X |
| 5. | Soap and paper towels used by factory workers at the end of a shift | X |  |
| 6. | Salessupervisors’ salaries |  | X |
| 7. | Property taxes on the factory building | X |  |
| 8. | Materials used in boxing units of finished product for shipment overseas (units are not normally boxed) |  | X |
| 9. | Advertising outlays |  | X |
| 10. | Workers’ compensation insurance on factory employees | X |  |
| 11. | Depreciation on chairs and tables in the administrative boardroom |  | X |
| 12. | The salary of the production quality supervisor for the company |  | X |
| 13. | Depreciation on a Learjet used by the company's executives |  | X |
| 14. | Rent on rooms at a Florida resort for manufacturing conference | X |  |
| 15. | Attractively designed box for packaging breakfast cereal | X |  |

**Brief Exercise 2-6**(LO5 CC9, 10; LO6 CC 11) (15 minutes)

|  |  |  |
| --- | --- | --- |
| Bims Income Statement | | |
|  |  |  |
| Sales |  | $3,000,000 |
| Cost of goods sold: |  |  |
| Beginning merchandise inventory | $   250,000 |  |
| Add: Purchases | 950,000 |  |
| Goods available for sale | 1,200,000 |  |
| Deduct: Ending merchandise inventory | 100,000 | 1,100,000 |
| Gross margin |  | 1,900,000 |
| Less operating expenses: |  |  |
| Selling expense | 315,000 |  |
| Administrative expense | 385,000 | 700,000 |
| Net income |  | $1,200,000 |

**Brief Exercise 2-7**(LO6 CC11, 12) (15 minutes)

|  |  |  |
| --- | --- | --- |
| Lompac Products  Schedule of Cost of Goods Manufactured | | |
|  |  |  |
| Direct materials: |  |  |
| Beginning raw materials inventory | $170,000 |  |
| Add: Purchases of raw materials | 870,000 |  |
| Raw materials available for use | $1,040,000 |  |
| Deduct: Ending raw materials inventory | 150,000 |  |
| Raw materials used in production |  | $  890,000 |
| Direct labour |  | 245,000 |
| Manufacturing overhead |  | 560,000 |
| Total manufacturing costs |  | $1,695,000 |
| Add: Beginning work in process inventory |  | 210,000 |
|  |  | $1,905,000 |
| Deduct: Ending work in process inventory |  | 340,000 |
| Cost of goods manufactured |  | $ 1,565,000 |

Solutions to Exercises

**Exercise 2-1**(LO1 CC1; LO3 CC3; LO4 CC4, 5, 6, 7) (45 minutes)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Product Cost | | | Period (Selling and  Admin.) Cost |  |  |
| Name of the Cost | Variable Cost | Fixed Cost | Direct Materials | Direct Labour | Mfg. Overhead | Opportunity Cost | Sunk Cost |
| Rental revenue foregone, $50,000 per year |  |  |  |  |  |  | X |  |
| Direct materials cost, $60 per unit | X |  | X |  |  |  |  |  |
| Rental cost of warehouse, $1,000 per month |  | X |  |  |  | X |  |  |
| Rental cost of equipment, $15,000 per month |  | X |  |  | X |  |  |  |
| Direct labour cost, $80 per unit | X |  |  | X |  |  |  |  |
| Depreciation of the annex space, $5,000 per year |  | X |  |  | X |  |  | X |
| Advertising cost, $150,000 per year |  | X |  |  |  | X |  |  |
| Supervisor's salary, $3,500 per month |  | X |  |  | X |  |  |  |
| Electricity for machines, $1.80 per unit | X |  |  |  | X |  |  |  |
| Shipping cost, $12 per unit | X |  |  |  |  | X |  |  |
| Return earned on investments, $5,000 per year |  |  |  |  |  |  | X |  |

**Exercise 2-2**(LO1 CC1; LO3 CC3; LO4 CC7) (15 minutes)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. | Product; variable |  | 6. | Period; variable |
| 2. | Conversion |  | 7. | Product; period; fixed |
| 3. | Opportunity |  | 8. | Product |
| 4. | Prime |  | 9. | Period |
| 5. | Sunk |  | 10. | Fixed; product; conversion |

**Exercise 2-3**(LO1 CC 1; LO2 CC2) (15 minutes)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Cost Behaviour | |  | To Quantity of Baked Goods Produced | |
|  | Cost Item | Variable | Fixed |  | Direct | Indirect |
| 1. | Account manager’s salary |  | X |  |  | X |
| 2. | Rent on building |  | X |  |  | X |
| 3. | Flour used in the making of croissants | X |  |  | X |  |
| 4. | Bakery manager’s salary |  | X |  |  | X |
| 5. | Wages of bakers | X |  |  | X |  |
| 6. | Depreciation of commercial ovens used in baking |  | X |  |  | X |
| 7. | Insurance on the building |  | X |  |  | X |

**Exercise 2-4**(LO1 CC1; LO4 CC7) (30 minutes)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Selling and  Admini-strative  Cost |  | Product  Cost |
|  |  | Cost Behaviour | |  |  |
|  | Cost Item | Variable | Fixed |  |  |
| 1. | Advertising by a dental office |  | X |  | X |  |  |
| 2. | Shipping canned apples from a Del Monte plant to customers | X |  |  | X |  |  |
| 3. | Apples processed and canned by Del Monte Corporation | X |  |  |  |  | X |
| 4. | Insurance on IBM’s corporate headquarters |  | X |  | X |  |  |
| 5. | Commissions paid to *Future Shop* salespersons | X |  |  | X |  |  |
| 6. | Hamburger buns in a McDonald’s outlet | X |  |  |  |  | X |
| 7. | Depreciation of factory lunchroom facilities at a General Electric plant |  | X |  |  |  | X |
| 8. | Insurance on a Bausch & Lomb factory producing contact lenses |  | X |  |  |  | X |
| 9. | Salary of a supervisor overseeing production of circuit boards at Hewlett-Packard |  | X |  |  |  | X |
| 10. | Steering wheels installed in BMWs | X |  |  |  |  | X |

**Exercise 2-5**(LO5 CC10; LO6 CC11, 12) (45 minutes)

1.

|  |  |  |
| --- | --- | --- |
| Mason Company Schedule of Cost of Goods Manufactured | | |
| Direct materials: |  |  |
| Raw materials inventory, beginning | $18,000 |  |
| Add: Purchases of raw materials | 120,000 |  |
| Raw materials available for use | 138,000 |  |
| Deduct: Raw materials inventory, ending | 12,500 |  |
| Raw materials used in production |  | $125,500 |
| Direct labour |  | 70,000 |
| Manufacturing overhead: |  |  |
| Indirect labour | 45,000 |  |
| Maintenance, factory equipment | 6,000 |  |
| Insurance, factory equipment | 1,900 |  |
| Rent, factory facilities | 24,000 |  |
| Supplies | 3,600 |  |
| Depreciation, factory equipment | 17,000 |  |
| Total overhead costs |  | 97,500 |
| Total manufacturing costs |  | 293,000 |
| Add: Work in process, beginning |  | 10,300 |
|  |  | 303,300 |
| Deduct: Work in process, ending |  | 15,150 |
| Cost of goods manufactured |  | $288,150 |

2. The cost of goods sold section of Mason Company’s income statement:

|  |  |  |
| --- | --- | --- |
| Finished goods inventory, beginning |  | $ 23,000 |
| Add: Cost of goods manufactured |  | 288,150 |
| Goods available for sale |  | 311,150 |
| Deduct: Finished goods inventory, ending |  | 18,100 |
| Cost of goods sold |  | $293,050 |

**Exercise 2-6**(LO4 CC8) (30 minutes)

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | a) | Bolts of polyester purchased | 10,000 |
|  |  | Bolts drawn from inventory | 9,200 |
|  |  | Bolts remaining in inventory | 800 |
|  |  | Cost per bolt | × $80 |
|  |  | Cost in Raw Materials Inventory at June 30 | $ 64,000 |
|  |  |  |  |
|  | b) | Bolts of polyester used in production (9,200 – 200) | 9,000 |
|  |  | Linens completed and transferred to Finished Goods (90% × 9,000) | 8,100 |
|  |  | Linens still in Work in Process at June 30 | 900 |
|  |  | Cost per bolts | × $80 |
|  |  | Cost in Work in Process Inventory at June 30 | $ 72,000 |
|  |  |  |  |
|  | c) | Linens completed and transferred to Finished Goods (above) | 8,100 |
|  |  | Linens sold during the month (70% × 8,100) | 5,670 |
|  |  | Linens still in Finished Goods at June 30 | 2,430 |
|  |  | Cost per bolts | × $80 |
|  |  | Cost in Finished Goods Inventory at June 30 | $194,400 |
|  |  |  |  |
|  | d) | Linens sold during the month (above) | 5,670 |
|  |  | Cost per bolts | × $80 |
|  |  | Cost in Cost of Goods Sold at April 30 | $453,600 |
|  |  |  |  |
|  | e) | Bolts used for customer samples | 200 |
|  |  | Cost per bolts | × $80 |
|  |  | Cost in Selling Expense at June 30 | $ 16,000 |

2. a) Raw Materials Inventory—balance sheet

b) Work in Process Inventory—balance sheet

c) Finished Goods Inventory—balance sheet

d) Cost of Goods Sold—income statement

e) Selling Expense—income statement

**EXERCISE 2-7** (LO6 CC12) (15 minutes)

Direct material used = $ 62,000

Direct labour costs = $ 15,000

Manufacturing overhead = $ 6,500

Total Manufacturing costs= $ 83,500

Opening inventory of work in process = $ 3,000

Less:Ending inventory of work in process = $ 12,000

Cost of goods manufactured = $ 74,500

**EXERCISE 2-8** (LO5 CC10; LO6 CC11, 12) (7 minutes)

Cost of goods sold = Sales – Gross margin

= $1,700,000 – (40% × $1,700,000)

= $1,700,000 - $680,000

= $1,020,000

**Cost of goods manufactured** = Cost of goods sold + Ending inventory of finished goods – Opening inventory of finished goods

= $1,020,000 + $85,000 – $130,000 = $975,000

Solutions to Problems

**Problem 2-1** (LO1 CC1; LO4 CC4, 5, 7)(30 minutes)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1.** |  |  | Product Cost | | | Period  (Selling and  Admin.) Cost | Oppor-tunity  Cost |  |
| Name of the Cost | Variable Cost | Fixed Cost | Direct Materials | Direct Labour | Mfg. Overhead | Sunk Cost |
| Staci's present salary, $70,000/year |  |  |  |  |  |  | X |  |
| Building rent, $2,500/ month |  | X |  |  | X |  |  |  |
| Clay and glaze, $3.50/pot | X |  | X |  |  |  |  |  |
| Wages of production workers, $12/pot | X |  |  | X |  |  |  |  |
| Advertising, $2,600/month |  | X |  |  |  | X |  |  |
| Sales commission, $4/pot | X |  |  |  |  | X |  |  |
| Rent of production equipment, $1,300/month |  | X |  |  | X |  |  |  |
| Legal and filing fees, $5,0001 |  | X |  |  |  | X |  | X |
| Rent of sales office, $1,250/month |  | X |  |  |  | X |  |  |
| Phone for taking orders, $40/month |  | X |  |  |  | X |  |  |
| Interest lost on savings account, $1,200/year |  |  |  |  |  |  | X |  |

1 Not a fixed cost per se because they are not a recurring expense.

2. The $5,000 cost of incorporating the business is not a differential cost. Even though the cost was incurred to start the business, it is a sunk cost. Whether Staci produces pottery or stays in her present job, she will have incurred this cost.

**Problem 2-2** (LO1 CC 1; LO2 CC2; LO4 CC4, 5, 6) (30 minutes)

Note to the instructor: There may be several exceptions to the answers below. The purpose of this problem is to get the students to start *thinking* about cost behaviour and cost purposes; therefore, try to avoid lengthy discussions about how a particular cost is classified.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Variable  or  Fixed | Selling  Cost | Adminis-  trative  Cost | Manufacturing  (Product) Cost | |
|  | Cost Item | Direct | Indirect |
| 1. | Property taxes, factory | F |  |  |  | X |
| 2. | Boxes used for packaging detergent | V |  |  | X |  |
| 3. | Salespersons’ commissions | V | X |  |  |  |
| 4. | Supervisor’s salary, factory | F |  |  |  | X |
| 5. | Depreciation, executive automobiles | F |  | X |  |  |
| 6. | Wages of workers assembling computers | V |  |  | X |  |
| 7. | Packing supplies for out-of-province shipment | V | X |  |  |  |
| 8. | Insurance, finished goods warehouses | F | X |  |  |  |
| 9. | Lubricants for machines | V |  |  |  | X |
| 10. | Advertising costs | F | X |  |  |  |
| 11. | “Chips” used in producing calculators | V |  |  | X |  |
| 12. | Shipping costs on merchandise sold | V | X |  |  |  |
| 13. | Magazine subscriptions, factory lunchroom | F |  |  |  | X |
| 14. | Thread in a garment factory | V |  |  |  | X |

**Problem 2-2** (continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Variable  or  Fixed | Selling  Cost | Adminis-  trative  Cost | Manufacturing  (Product) Cost | |
|  | Cost Item | Direct | Indirect |
| 15. | Billing costs | V | X\* |  |  |  |
| 16. | Executive life insurance | F |  | X |  |  |
| 17. | Ink used in textbook production | V |  |  |  | X |
| 18. | Fringe benefits, assembly line workers | V |  |  | X\*\* |  |
| 19. | Yarn used in sweater production | V |  |  | X |  |
| 20. | Wages of receptionist, executive offices | F |  | X |  |  |

\* Could be administrative cost.

\*\* Could be indirect cost.

**Problem 2-3**(LO1 CC1; LO2 CC2; LO4 CC4, 6) (60 minutes)

1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Cost Behaviour | | Selling or Administrative | Product Cost | |
| Cost Item | Variable | Fixed | Cost | Direct | Indirect |
| Factory labour, direct | $168,000 |  |  | $168,000 |  |
| Advertising |  | $ 50,000 | $ 50,000 |  |  |
| Factory supervision |  | 50,000 |  |  | $50,000 |
| Property taxes, factory building |  | 4,500 |  |  | 4,500 |
| Sales commissions | 80,000 |  | 80,000 |  |  |
| Insurance, factory |  | 3,500 |  |  | 3,500 |
| Depreciation, office equipment |  | 14,000 | 14,000 |  |  |
| Lease cost, factory equipment |  | 6,000 |  |  | 6,000 |
| Indirect materials, factory | 6,000 |  |  |  | 6,000 |
| Depreciation, factory building |  | 8,000 |  |  | 8,000 |
| General office supplies (billing) | 4,000 |  | 4,000 |  |  |
| General office salaries |  | 50,000 | 50,000 |  |  |
| Direct materials used (wood, bolts, etc.) | 114,000 |  |  | 114,000 |  |
| Utilities, factory | 30,000 |  |  |  | 30,000 |
| Total costs | $402,000 | $186,000 | $198,000 | $282,000 | $108,000 |

**Problem 2-3** (continued)

2.

|  |  |
| --- | --- |
| Direct | $282,000 |
| Indirect | 108,000 |
| Total | $390,000 |
| $390,000 ÷ 2,000 sets = $195 per set |  |

3. The average product cost per set would increase. This is because the fixed costs would be spread over fewer units, causing the cost per unit to rise.

4. a) Yes, the president may expect a minimum price of $195, which is the average cost to manufacture one set. He might expect a figure even higher than this to cover a portion of the administrative costs as well. The brother-in-law probably will be thinking of “cost” as including only direct materials used, or, at most, direct materials and direct labour. Direct materials alone would be only $57 per set, and direct materials and direct labour would be only $141.

b) The term is opportunity cost. The full, regular price of a set might be appropriate here, since the company is operating at full capacity, and this is the amount that must be given up (benefit foregone) in order to sell a set to the brother-in-law.

**Problem 2-4** (LO4 CC7) (30 minutes)

1. The controller is correct in his viewpoint that the salary cost should be classified as a selling (marketing) cost. The duties described in the problem have nothing to do with the manufacture of a product, but rather deal with movement of *finished units* from the factory to distribution warehouses. As stated in the text, selling costs would include all costs necessary to secure customer orders and get the finished product into the hands of customers. Coordination of shipments of finished units from the factory to distribution warehouses fall in this category.

2. No, the president is not correct; from the point of view of the reported net income for the year, it does make a difference how the salary cost is classified. If the salary cost is classified as a selling expense, all of it will appear on the income statement as a period cost. However, if the salary cost is classified as a manufacturing (product) cost, then it will be added to Work in Process Inventory along with other manufacturing costs for the period. To the extent that goods are still in process at the end of the period, part of the salary cost will remain with these goods in the Work in Process Inventory account. Only that portion of the salary cost that has been assigned to finished units will leave the Work in Process Inventory account and be transferred into the Finished Goods Inventory account. In like manner, to the extent that goods are unsold at the end of the period, part of the salary cost will remain with these goods in the Finished Goods Inventory account. Only the portion of the salary that has been assigned to finished units *that are sold during the period* will appear on the income statement as an expense (part of Cost of Goods Sold) for the period.

**Problem 2-5** (LO5 CC10; LO6 CC11, 12) (45 minutes)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Case 1 |  | Case 2 |  | Case 3 |  | Case 4 |  |
| Direct materials | $ 14,500 |  | $ 60,000 |  | $ 5,000 |  | $ 23,000 |  |
| Direct labour | 19,000 | \* | 23,000 |  | 7,000 |  | 14,000 |  |
| Manufacturing overhead | 25,000 |  | 44,000 |  | 8,000 | \* | 19,000 |  |
| Total manufacturing costs | 58,500 |  | 127,000 | \* | 20,000 |  | 56,000 | \* |
| Beginning work in process inventory | 3,500 |  | 8,000 | \* | 3,000 |  | 0 | \* |
| Ending work in process inventory | (4,000) | \* | (4,000) |  | (4,000) |  | (8,500) |  |
| Cost of goods manufactured | $58,000 |  | $131,000 |  | $19,000 | \* | $47,500 | \* |
| Sales | $80,000 |  | $201,000 |  | $36,000 |  | $90,000 |  |
| Beginning finished goods inventory | 10,000 |  | 12,500 |  | 3,500 | \* | 12,000 |  |
| Cost of goods manufactured | 58,000 | \* | 131,000 | \* | 19,000 | \* | 47,500 |  |
| Goods available for sale | 68,000 | \* | 143,500 | \* | 22,500 | \* | 59,500 | \* |
| Ending finished goods inventory | (1,000) | \* | (11,500) |  | (4,000) |  | (3,500) |  |
| Cost of goods sold | 67,000 |  | 132,000 | \* | 18,500 |  | 56,000 | \* |
| Gross margin | 13,000 |  | 69,000 | \* | 17,500 |  | 34,000 | \* |
| Operating expenses | (9,000) | \* | (33,500) |  | (12,500) | \* | (25,000) | \* |
| Net income | $ 4,000 |  | $ 35,500 | \* | $ 5,000 |  | $ 9,000 |  |

\* Missing data in the problem.

**Problem 2-6** (LO5 CC9, 10; LO6 CC11, 12) (75 minutes)

1.

|  |  |  |
| --- | --- | --- |
| SWIFT COMPANY  Schedule of Cost of Goods Manufactured  For the Month Ended August 31 | | |
| Direct materials: |  |  |
| Raw materials inventory, August 1 | $  31,000 |  |
| Add: Purchases of raw materials | 226,000 |  |
| Raw materials available for use | 257,000 |  |
| Deduct: Raw materials inventory, August 31 | 78,000 |  |
| Raw materials used in production |  | $179,000 |
| Direct labour |  | 80,000 |
| Manufacturing overhead: |  |  |
| Indirect labour cost | 9,000 |  |
| Utilities (50% × $25,000) | 12,500 |  |
| Depreciation, factory equipment | 21,000 |  |
| Insurance (80% × $8,000) | 6,400 |  |
| Rent on facilities (75% × $80,000) | 60,000 |  |
| Total overhead costs |  | 108,900 |
| Total manufacturing costs |  | 367,900 |
| Add: Work in process inventory, August 1 |  | 18,000 |
|  |  | 385,900 |
| Deduct: Work in process inventory, August 31 |  | 10,000 |
| Cost of goods manufactured |  | $375,900 |

**Problem 2-6** (continued)

2.

|  |  |  |
| --- | --- | --- |
| SWIFT COMPANY Income Statement For the Month Ended August 31 | | |
| Sales |  | $530,000 |
| Less cost of goods sold: |  |  |
| Finished goods inventory, August 1 | $ 55,000 |  |
| Add: Cost of goods manufactured | 375,900 |  |
| Goods available for sale | 430,900 |  |
| Deduct: Finished goods inventory, August 31 | 50,000 | 380,900 |
| Gross margin |  | 149,100 |
| Less operating expenses: |  |  |
| Utilities (50% × $25,000) | 12,500 |  |
| Depreciation, sales equipment | 8,000 |  |
| Insurance (20% × $8,000) | 1,600 |  |
| Rent on facilities (25% × $80,000) | 20,000 |  |
| Selling and administrative salaries | 22,000 |  |
| Advertising | 65,000 | 129,100 |
| Net income (loss) |  | $ 20,000 |

3. In preparing the income statement for August, Sam failed to distinguish between product costs and period costs, and he also failed to recognize the changes in inventories between the beginning and end of the month. Once these errors have been corrected, the financial condition of the company looks much better (although the income is still only marginally above zero) and selling the company may not yet be advisable.

**Problem 2-7** (LO1 CC1; LO5 CC10; LO6 CC11, 12) (75 minutes)

1.

|  |  |  |
| --- | --- | --- |
| MERIWELL COMPANY Schedule of Cost of Goods Manufactured  For the year just completed | | |
| Direct materials: |  |  |
| Raw materials inventory, beginning | $  9,000 |  |
| Add: Purchases of raw materials | 125,000 |  |
| Raw materials available for use | 134,000 |  |
| Deduct: Raw materials inventory, ending | 6,000 |  |
| Raw materials used in production |  | $128,000 |
| Direct labour |  | 70,000 |
| Manufacturing overhead: |  |  |
| Depreciation, factory | 27,000 |  |
| Utilities, factory | 8,000 |  |
| Maintenance, factory | 40,000 |  |
| Supplies, factory | 11,000 |  |
| Insurance, factory | 4,000 |  |
| Indirect labour | 15,000 |  |
| Total overhead costs |  | 105,000 |
| Total manufacturing costs |  | 303,000 |
| Add: Work in process inventory, beginning |  | 17,000 |
|  |  | 320,000 |
| Deduct: Work in process inventory, ending |  | 30,000 |
| Cost of goods manufactured |  | $290,000 |

**Problem 2-7** (continued)

2.

|  |  |  |
| --- | --- | --- |
| MERIWELL COMPANY Income Statement For the year just completed | | |
| Sales |  | $500,000 |
| Cost of goods sold: |  |  |
| Finished goods inventory, beginning | $ 20,000 |  |
| Add: Cost of goods manufactured | 290,000 |  |
| Goods available for sale | 310,000 |  |
| Deduct: Finished goods inventory, ending | 40,000 | 270,000 |
| Gross margin |  | 230,000 |
| Less operating expenses: |  |  |
| Selling expenses | 80,000 |  |
| Administrative expenses | 110,000 | 190,000 |
| Net income |  | $ 40,000 |

3. Direct materials: $128,000 ÷ 10,000 units = $12.80 per unit.  
Factory Depreciation: $27,000 ÷ 10,000 units = $2.70 per unit.

4. Direct materials:  
 Average cost per unit: $12.80 (unchanged)  
 Total cost: 15,000 units × $12.80 per unit = $192,000.

Factory Depreciation:  
 Average cost per unit: $27,000 ÷ 15,000 units = $1.80 per unit.  
 Total cost: $27,000 (unchanged)

5. Average cost per unit for depreciation dropped from $2.70 to $1.80, because of the increase in production between the two years. Since fixed costs do not change *in total* as the activity level changes, they will decrease on a per unit basis as the activity level rises.

The average cost per unit for direct materials remained the same because a direct material is variable cost which remains constant on a per-unit basis.

**Problem 2-8** (LO1 CC1; LO5 CC9, 10; LO6 CC11, 12) (90 minutes)

1.

|  |  |  |  |
| --- | --- | --- | --- |
| SUPERIOR COMPANY  Schedule of Cost of Goods Manufactured  For the Year Ended December 31 | | | |
| Direct materials: |  |  |  |
| Raw materials inventory, beginning | $ 30,000 |  |  |
| Add: Purchases of raw materials | 390,000 |  |  |
| Raw materials available for use | 420,000 |  |  |
| Deduct: Raw materials inventory, ending | 10,000 |  |  |
| Raw materials used in production |  | $410,000 |  |
| Direct labour |  | 73,000 | \* |
| Manufacturing overhead: |  |  |  |
| Insurance, factory | 8,000 |  |  |
| Utilities, factory | 65,000 |  |  |
| Indirect labour | 60,000 |  |  |
| Cleaning supplies, factory | 7,000 |  |  |
| Rent, factory building | 90,000 |  |  |
| Maintenance, factory | 40,000 |  |  |
| Total overhead costs |  | 270,000 |  |
| Total manufacturing costs |  | 753,000 | (given) |
| Add: Work in process inventory, beginning |  | 37,000 | \* |
|  |  | 790,000 |  |
| Deduct: Work in process inventory, ending |  | 20,000 |  |
| Cost of goods manufactured |  | $770,000 |  |

The cost of goods sold section of the income statement follows on the next page.

**Problem 2-8** (continued)

|  |  |  |  |
| --- | --- | --- | --- |
| Finished goods inventory, beginning |  | $ 20,000 |  |
| Add: Cost of goods manufactured |  | 770,000 | \* |
| Goods available for sale |  | 790,000 | (given) |
| Deduct: Finished goods inventory, ending |  | 50,000 | \* |
| Cost of goods sold |  | $740,000 | (given) |

\* These items must be computed by working backwards up through the statements. An effective way of doing this is to place the form and known balances on the chalkboard, and then to work toward the unknown figures.

2. Direct materials: $410,000 ÷ 40,000 units = $10.25 per unit.  
Rent, factory building: $90,000 ÷ 40,000 units = $2.25 per unit.

3.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Per Unit | | Total | |
|  | Direct materials | $10.25 | (Same) | $512,500 | \*\* (Changed) |
|  | Rent, factory building | $ 1.80 | \* (Changed) | $ 90,000 | (Same) |

\* $90,000 ÷ 50,000 units = $1.80 per unit.

\*\* $10.25 × 50,000 units = $512,500.

1. The average cost per unit for rent dropped from $2.25 to $1.80, because of the increase in production between the two years. Since fixed costs do not change *in total* as the activity level changes, they will decrease on a per unit basis as the activity level rises.

The average cost per unit for direct materials remained the same because direct materials is a variable cost which remains constant on a per-unit basis.The total changeis in relation to amount of goods produced.

PROBLEM 2-9 (LO1 – CC1; LO2 – CC2; LO4 – CC5, CC6, CC7; **LO5** – CC9) (40 minutes)

1.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | **Behaviour** | | **Function** | | |
|  |  | **VARIABLE** | **FIXED** | **MFG** | **SALES/MKT** | **ADMIN** |
| Direct materials & components |  | $ 3,200,000 |  | $3,200,000 |  |  |
| Direct production wages |  | $ 1,448,000 |  | $1,448,000 |  |  |
| Production supervisory salaries |  |  | $ 261,400 | $ 261,400 |  |  |
| Salaries paid to sales representatives |  | $ 348,000 | $ 200,000 |  | $ 548,000 |  |
| Advertising |  |  | $ 675,300 |  | $ 675,300 |  |
| Insurance |  |  | $ 115,670 | $ 75,186 |  | $ 40,484 |
| Building rent |  |  | $ 258,640 | $155,184 | $ 38,796 | $ 64,660 |
| Other salaries |  |  | $1,160,000 | $ 580,000 | $ 232,000 | $348,000 |
| Honorarium to the members of the Board |  |  | $ 430,200 |  |  | $430,200 |
| Production quality control |  | $ 52,260 | $ 78,390 | $ 130,650 |  |  |
| Market research |  |  | $ 346,200 |  | $ 346,200 |  |
| Depreciation |  |  | $1,326,700 | $ 796,020 | $ 265,340 | $265,340 |
| Facilities management |  |  | $ 884,230 | $353,692 |  | $530,538 |
| Legal |  |  | $ 685,600 |  |  | $685,600 |
| Personnel department |  |  | $196,500 |  |  | $196,500 |
| Utilities - production |  | $ 554,190 | $ 298,410 | $ 852,600 |  |  |
| Utilities - other |  | $ 144,136 | $ 216,204 |  | $ 180,170 | $180,170 |
| Customer service |  | $ 137,610 | $ 779,790 |  | $ 917,400 |  |
|  |  |  |  |  |  |  |
|  |  | $5,884,196 | $7,913,234 | $7,852,732 | $ 3,203,206 | $2,741,492 |
|  |  | $13,797,430 | | $ 13,797,430 | | |

Note that the amounts are calculated using the percentage breakdowns given in the data.

**Problem 2-9** (continued)

2.

Product costs (manufacturing costs from table in Part 1)

= $7,852,732

Period costs (sales/marketing + administration from table in Part 1)

= $3,203,206 + $2,741,492 = $5,944,698

Product costs are classified as direct and indirect as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Product costs** |  | **Direct** | **Indirect** |
| Direct materials & components |  | √ |  |
| Direct production wages |  | √ |  |
| Production supervisory salaries |  |  | √ |
| Insurance |  |  | √ |
| Building rent |  |  | √ |
| Other salaries |  |  | √ |
| Production quality control |  |  | √ |
| Depreciation |  |  | √ |
| Facilities management |  |  | √ |
| Utilities - production |  |  | √ |

**Problem 2-9** (continued)

3.



Gross margin per unit = $15,347,269 ÷ 40,000 ≈ $383.68

**PROBLEM 2-10** (LO4 CC7; LO5 CC10) (30 minutes)

**1.** The income statement includes several conceptual errors including:

* The amount of purchases instead of direct materials used
* Inventories do not seem to have been considered in computing the cost of goods manufactured and goods sold
* Annual insurance amount included rather than a quarterly amount
* Format of the income statement does not follow the conventional classification of the cost of goods sold, gross margin and selling & administrative costs

**2.**



**Problem 2-10** (continued)

Notes:

1. Purchase of direct materials = $245,640 × 80%
2. Indirect materials = $245,640 × 20%
3. Direct labour = $266,786 × 70%
4. Indirect labour = $266,786 × 30%
5. Facility rental = $90,000 × 90%
6. Depreciation = $63,500 × 75%
7. Management salaries = $388,000 × 40%

**3.**



Notes:

1. Facility rental = $90,000 × 10%
2. Depreciation = $63,500 × 25%
3. Management salaries = $388,000 ×60%

**Problem 2-11** (LO4 CC5; LO5 CC 9, 10; LO6 CC11, 12) (20 minutes)

1.

Discon Corporation

Income Statement

For the Year Ended December 31, XXXX

Sales (242,000 dolls @ $20 per doll) $4,840,000

Cost of goods sold (242,000 @ $12 per doll) 2,904,000

Gross margin 1,936,000

Selling and administrative expenses:

Commissions ($2 per doll) $484,000

Advertising 350,000

Administration 270,000 1,104,000

Net income $832,000

Note: The number of dolls sold is computed as:

Beginning finished goods inventory 10,000

+ Number of units produced 240,000

* Ending finished goods inventory 8,000

= 242,000

2 a. Prime cost ($2.00 + $0.50) $2.50

b. Conversion cost ($0.50 + $2.50 + $7.00) $10.00

c. Variable cost ($2.00 + $0.50 + $2.50 + 2.00) $7.00

**Comprehensive Problem** (LO1 CC1; LO3 CC3; LO4 CC4, 5, 6, 7) (60 minutes)

1.



2.



3.



Note that all the variable costs are incremental costs; however, fixed costs areassumed to remain constant within a certain relevant range. The only issue is that currently the capacity is 2,000 units and producing additional 300 units will result in a capacity utilization of 105% (2,100 ÷ 2,000 units). This in turn means that production is outside of the relevant range and may require the incurrence of additional fixed costs.

**Thinking Analytically**(LO3CC5, 7; LO5CC9, 10; LO6CC11, 12) (30 minutes)

Schedule of Cost of Goods Manufactured

**Notes:**

Computing Total Manufacturing Costs

Cost of goods manufactured (given) = $53,540,000

+ Ending inventory = $ 40,000

- Beginning inventory = $ 48,000

= Total manufacturing costs = $53,532,000

Computing Manufacturing Overhead cost

We are told that applied overhead = two-third of conversion costs. Therefore the remaining third must be direct labour cost. OH = DL + OC This means overhead cost is twice that of direct labour

Therefore, overhead cost = $12,375,000 × 2 = $24,750,000

**Thinking Analytically** (continued)

Computing Cost of Direct Materials Used

Total manufacturing costs = $53,532,000

- Direct labour = $12,375,000

- Manufacturing overhead = $24,750,000

= Direct materials used = $16,407,000

Computing Cost of Direct Materials Purchased

Direct materials used = $16,407,000

+ Ending inventory = $ 20,000

- Beginning inventory = $ 24,000

= Direct materials purchased = $16,403,000

**Thinking Analytically** (continued)



**Notes:**

Computing Net Income

Net income = 10% of sales revenues

= 0.10 × $76,500,000

= $7,650,000

Computing SG & A Expenses

Gross margin = $22,950,000

* Net income = $ 7,650,000

= SG & Expenses = $15,300,000

**Communicating in Practice** (LO4 CC7, 8; LO5 CC9, 10; LO6 CC11, 12) (90 minutes)

1. Memorandum to president:

Date: Current date

To: Brittany Patel, President

From: Student

Subject: Income Statement

I reviewed the income statement for Sun Power Communications, Inc. and noted that no distinction has been made between period expenses and product costs. Period expenses should be included on the income statement when incurred. However, product costs (that is, direct materials, direct labour, and manufacturing overhead) should be assigned to inventory (that is, capitalized or recorded as inventory on the balance sheet) when incurred and flow through to the income statement as cost of goods sold only when finished products are sold.

All of the direct materials purchased and the direct labour and manufacturing overhead costs incurred during the period are included on the income statement that I reviewed for the quarter ended March 31. This treatment would be appropriate only if the inventory level does not change during the period (that is, the ending inventory is the same as the beginning inventory which is not the case in this question). As such, this income statement does not reflect the results of the company’s operations and should be revised.

**Communicating in Practice** (continued)

2.

|  |  |  |
| --- | --- | --- |
| SUN POWER COMMUNICATIONS, INC.  Schedule of Cost of Goods Manufactured  For the Quarter Ended March 31 | | |
| Direct materials: |  |  |
| Raw materials inventory, beginning | $  –0– |  |
| Add: Purchases of raw materials | 460,000 |  |
| Raw materials available for use | 460,000 |  |
| Deduct: Raw materials inventory, ending | 10,000 |  |
| Raw materials used in production |  | $450,000 |
| Direct labour |  | 90,000 |
| Manufacturing overhead: |  |  |
| Maintenance, production | 73,000 |  |
| Indirect labour | 120,000 |  |
| Cleaning supplies, production | 7,000 |  |
| Rental cost, facilities (80% × $95,000) | 76,000 |  |
| Insurance, production | 18,000 |  |
| Utilities (90% × $100,000) | 90,000 |  |
| Depreciation, production equipment | 140,000 |  |
| Total overhead costs |  | 524,000 |
| Total manufacturing costs |  | 1,064,000 |
| Add: Work in process inventory, beginning |  | –0– |
|  |  | 1,064,000 |
| Deduct: Work in process inventory, ending |  | 50,000 |
| Cost of goods manufactured |  | $1,014,000 |

**Communicating in Practice**(continued)

3. Before an income statement can be prepared, the cost of the 8,000 phones in the ending finished goods inventory must be determined. Altogether, the company produced 40,000 phones during the quarter; thus, the production cost per phone would be:



Since 8,000 phones (40,000 – 32,000 = 8,000) were in the finished goods inventory at the end of the quarter, the total cost of this inventory would be:

8,000 phones × $25.35 per phone = $202,800.

With this figure and other data from the case, the company’s income statement for the quarter can be prepared as follows:

|  |  |  |
| --- | --- | --- |
| SUN POWER COMMUNUCATIONS, INC. Income Statement For the Quarter Ended March 31 | | |
| Sales (32,000 phones) |  | $1,280,000 |
| Less cost of goods sold: |  |  |
| Finished goods inventory, beginning | $  –0– |  |
| Add: Cost of goods manufactured | 1,014,000 |  |
| Goods available for sale | 1,014,000 |  |
| Deduct: Finished goods inventory, ending | 202,800 | 811,200 |
| Gross margin |  | 468,800 |
| Less operating expenses: |  |  |
| Selling and administrative salaries | 150,000 |  |
| Advertising | 90,000 |  |
| Rental cost, facilities (20% × $95,000) | 19,000 |  |
| Depreciation, office equipment | 47,000 |  |
| Utilities (10% × $100,000) | 10,000 |  |
| Travel, salespersons | 40,000 | 356,000 |
| Net income |  | $ 112,800 |

**Communicating in Practice**(continued)

4. Memorandum to president:

Date: Current date

To: Brittany Patel, President

From: Student

Subject: Insurance Claim

On April 3, 8,000 unsold phones were destroyed by fire. The insurance policy indicates that the company will be reimbursed for the cost of any finished phones destroyed or stolen. The key question is how “cost” is defined in the insurance contract. Typically, insurance contracts limit reimbursement for losses to those costs that would normally be considered product costs—in other words, the direct materials, direct labour, and manufacturing overhead costs that were incurred to manufacture the units that were insured.

The 8,000 unsold phones were in the company’s ending finished goods inventory on March 31. As you know, the income statement for the quarter ended March 31 was recently revised. That income statement shows an ending finished goods inventory of $202,800. Accordingly, assuming cost is defined as set forth above the insurance company owes Sun Power Communications, Inc. $202,800 for the 8,000 phones that were destroyed.

This amount is considerably less than the $286,000 that was computed by the company’s accountant. The $286,000 figure is overstated for two reasons. First, it includes period costs (that is, selling and administrative expenses) as well as product costs. Period costs may not be included in inventory. Second, it includes some costs incurred during the period that were in the raw materials and work in process inventories on March 31. Those inventories were not destroyed and, as such, may not be part of the loss claimed.

**Ethics Challenge** (LO4 CC7) (45 minutes)

1. A cost that is classified as a period cost will be recognized on the income statement as an expense in the current period. A cost that is classified as a product cost will be recognized on the income statement as an expense (i.e., cost of goods sold) only when the associated units of product are sold. If some units are unsold at the end of the period, the costs of those unsold units are treated as assets. Therefore, by reclassifying period costs as product costs, the company is able to carry forward in inventories some costs that would have been treated as current expenses.

2. The discussion below is divided into two parts—Gallant’s actions to postpone expenditures and the actions to reclassify period costs as product costs.

The decision to postpone expenditures is highly questionable. It is one thing to postpone expenditures due to a cash bind; it is quite another to postpone expenditures in order to hit a profit target. Postponing these expenditures may have the effect of ultimately increasing future costs and reducing future profits. If orders to the company’s suppliers are changed, it may disrupt the suppliers’ operations. The additional costs may be passed on to Gallant’s company and may create ill-will and a feeling of mistrust. Postponing maintenance on equipment is particularly questionable. The result may be breakdowns, inefficient and/or unsafe operations, and a shortened life for the machinery.

Interestingly, in a survey of 649 managers reported in *Management Accounting*, only 12% stated that it is unethical to defer expenses and thereby manipulate quarterly earnings. The proportion who felt it was unethical increased to 24% when it involved annual earnings. Another 41% said that deferring expenses is a questionable practice when it involved quarterly reports and 35% said this when annual reports were involved. Finally, 47% said that it is completely ethical to manipulate quarterly reports in this way and 41% gave the green light for annual reports. (See William J. Bruns, Jr. and Kenneth A. Merchant, “The Dangerous Morality of Managing Earnings,” *Management Accounting*, August 1990, pp. 22-25)

Gallant’s decision to reclassify period costs is not ethical—assuming that there is no intention of disclosing in the financial reports this reclassification. Such a reclassification would be a violation of the principle of consistency in financial reporting and is a clear attempt to mislead readers of the financial reports. Although some may argue that the overall effect of Gallant’s action will be a “wash”—that is, profits gained in this period will simply be taken from the next period—the trend of earnings will be affected. Hopefully, the auditors would discover any such attempt to manipulate annual earnings and would refuse to issue an unqualified opinion due to the lack of consistency.

**Teamwork in Action**(LO1 CC1)

1. A fixed cost is normally defined as a cost that remains constant, in total, for changes in activity within the relevant range. A variable cost is normally defined as a cost that varies, in total, in direct proportion to changes in the level of activity within the relevant range.

2. a) Fixed costs for a steel company consist of items such as factory rent or depreciation, insurance, and periodic equipment depreciation. Variable costs include items such as the cost of raw materials and certain supplies. Labour may or may not be a variable cost. The relevant measure of production is the volume of steel produced. As production of steel increases within the relevant range, total fixed costs and unit variable costs remain constant, while total variable costs increase and unit fixed costs decrease.

b) Fixedcosts for a hospital include items such as property taxes, supervisory salaries, and insurance. Variable costs include supplies, drugs, and perhaps some nursing and other labour. A relevant measure of production might be the number of patients treated. As the number of patients treated increase within the relevant range, total fixed costs and unit variable costs remain constant, while total variable costs increase and unit fixed costs decrease.

c) Fixed costs for a university include property taxes, salaries, and advertising. Variable costs depend on the measure of activity. If the measure of activity is students enrolled, the variable costs are limited to the costs of handouts and other supplies (such as in science laboratories). As the number of students enrolled increases within the relevant range, total fixed costs and unit variable costs remain constant, while total variable costs increase and unit fixed costs decrease.

d) Fixed costs for an auto manufacturer would include items such as factory rent or depreciation, insurance, supervisory salaries, and periodic equipment depreciation. Variable costs include raw materials and perhaps some labour cost. A relevant measure of productive activity would be the number of cars produced. As the number of cars produced increases within the relevant range, total fixed costs and unit variable costs remain constant, while total variable costs increase and unit fixed costs decrease.

3. As the volume of steel produced increases within the relevant range, total fixed costs remain the same; the fixed cost per unit decreases; total variable costs increase; the variable cost per unit remains the same; total cost increases (due to the increase in total variable cost); and the average unit cost declines (due to the presence of fixed costs).

4.

**Teamwork in Action** (continued)

5.

6. Once capacity has been set, total costs increase with increases in demand due to the presence of variable costs while per unit costs drop due to the presence of fixed costs.