CHAPTER 2

ASSIGNMENT CLASSIFICATION TABLE

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Study Objectives** |  | **Self-Study**  **Questions** |  | **Brief**  **Exercises** |  | **Do It!**  **Review** |  | **Exercises** |  | **Problems** |
| 1. Define the three classes of manufacturing costs and differentiate between product and period costs. |  | 5, 6, 7, 8 |  | 1, 2, 3, 9, 11 |  | 14 |  | 18, 19, 20, 21, 22, 29, 35 |  | 40A, 41A, 45A, 48A, 49B, 50B, 53B, |
|  |  |  |  |  |  |  |  |  |  |  |
| 2. Explain variable, fixed, and mixed costs and the relevant range. |  | 1, 2 |  | 4, 5 |  | 15 |  | 23, 24, 26, 28 |  | 47A, 55B |
|  |  |  |  |  |  |  |  |  |  |  |
| 3. Apply the high-low method to determine the components of mixed costs. |  | 3, 4 |  | 4, 6, 7, 8 |  | 16 |  | 25, 27 |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| 4. Demonstrate how to calculate cost of goods manufactured and prepare financial statements for a manufacturer. |  | 9, 10 |  | 10, 12, 13 |  | 17 |  | 30, 31, 32, 33, 34, 35, 36, 37, 38, 39 |  | 42A, 43A, 44A, 45A, 46A, 48A, 51B, 52B, 53B, 54B, 56B, 57B, 58B |

ASSIGNMENT CHARACTERISTICS TABLE

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Problem**  **Number** |  | **Description** |  | **Difficulty**  **Level** |  | **Time Allotted (min.)** |
| 40A |  | Classify manufacturing costs into different categories and calculate the unit cost. |  | Simple |  | 20–30 |
| 41A |  | Classify manufacturing costs into different categories and calculate the unit cost. |  | Simple |  | 20–30 |
| 42A |  | Indicate the missing amount of different cost items, and prepare a condensed cost of goods manufactured schedule, an income statement, and a partial balance sheet. |  | Moderate |  | 30–40 |
| 43A |  | Prepare a cost of goods manufactured schedule, a partial income statement, and a partial balance sheet. |  | Moderate |  | 30–40 |
| 44A |  | Prepare a cost of goods manufactured schedule and a correct income statement. |  | Moderate |  | 30–40 |
| 45A |  | Calculate cost of goods manufactured, and cost of goods sold. |  | Moderate |  | 20–30 |
| 46A |  | Calculate raw materials purchased, cost of goods manufactured, and cost of goods sold. |  | Moderate |  | 20–30 |
| 47A |  | Determine missing amounts in the cost of goods manufactured and sold schedule and compare fixed and variable costs. |  | Challenging |  | 30–40 |
| 48A |  | Determine missing amounts and calculate selected costs for schedules of cost of goods manufactured and sold. |  | Challenging |  | 30–40 |
| 49B |  | Classify manufacturing costs into different categories and calculate the unit cost. |  | Simple |  | 20–30 |
| 50B |  | Classify manufacturing costs into different categories and calculate the unit cost. |  | Simple |  | 20–30 |
| 51B |  | Indicate the missing amount of different cost items, and prepare a condensed cost of goods manufactured schedule, an income statement, and a partial balance sheet. |  | Moderate |  | 30–40 |
| 52B |  | Prepare a cost of goods manufactured schedule, a partial income statement, and a partial balance sheet. |  | Moderate |  | 30–40 |

ASSIGNMENT CHARACTERISTICS TABLE (Continued)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Problem**  **Number** |  | **Description** |  | **Difficulty**  **Level** |  | **Time Allotted (min.)** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 53B |  | Calculate prime cost, conversion cost and cost of goods manufactured. |  | Moderate |  | 20–30 |
| 54B |  | Prepare income statement schedules for cost of goods sold and cost of goods manufactured. |  | Moderate |  | 30–40 |
| 55B |  | Determine missing amounts in the cost of goods manufactured and sold schedule and compare fixed and variable costs. |  | Challenging |  | 20–30 |
| 56B |  | Prepare a cost of goods manufactured schedule and a correct income statement. |  | Moderate |  | 30–40 |
| 57B |  | Calculate selected costs for the income statement, and schedules of cost of goods manufactured and sold. |  | Moderate |  | 20–30 |
| 58B |  | Determine missing amounts, prepare cost of goods manufactured and calculate inventory values. |  | Challenging |  | 40–50 |
|  |  |  |  |  |  |  |

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**Correlation Chart between Bloom’s Taxonomy, Study Objectives and End-of-Chapter Exercises and Problems**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Study Objective** | **Knowledge** | **Comprehension** | **Application** | **Analysis** | **Synthesis** | **Evaluation** |
| **1. Define the three classes of manufacturing costs and differentiate between product and period costs.** | **D14** | **BE1,**  **BE2, BE3, BE9, BE11,E18, E19, E20, E21, E22** | **E29, E35, P53B** | **P40A, P41A, P45A, P48A, P49B, P50B** |  |  |
|  |  |  |
|  |  |  |
| **2. Explain variable, fixed, and mixed costs and the relevant range.**  **.** |  | **BE4, D15, E23,**  **E26** | **BE5, E28** | **E24** | **P47A, P55B** |  |
|  |  |  |
|  |  |  |
| **3. Apply the high-low method to determine the components of mixed costs.** |  | **BE4** | **BE6, D16, E25, E27** | **BE7, BE8** |  |  |
|  |  |  |
|  |  |  |
| **4. Demonstrate how to calculate cost of goods manufactured and prepare financial statements for a manufacturer.** | **E37** | **BE10** | **BE12, BE13, D17, E30, E31, E34, E35, E36, E38, E39, P43A, P52B, P53B, P56B** | **P45A, P46A, P48A, P54B, P57B** | **E32, E33, P42A, P44A, P51B, P58B** |  |
|  |  |
|  |  |
|  |  |

BLOOM’S TAXONOMY TABLE

SOLUTIONS TO BRIEF EXERCISES

BRIEF EXERCISE 2-1

(a) DM Frames and tires used in manufacturing bicycles.

(b) DL Wages paid to production workers.

(c) MO Insurance on factory equipment and machinery.

(d) MO Depreciation on factory equipment.

BRIEF EXERCISE 2-2

(a) Direct materials.

(b) Direct materials.

(c) Direct labour.

(d) Manufacturing overhead.

(e) Manufacturing overhead (Indirect materials).

(f) Direct materials.

(g) Direct materials.

(h) Manufacturing overhead (Indirect labour).

BRIEF EXERCISE 2-3

(a) Product. (d) Product.

(b) Period. (e) Period.

(c) Period. (f) Product.

BRIEF EXERCISE 2-4

Indirect labour is a variable cost because it increases in total directly and proportionately with the change in the activity level: $10,000 ÷ 2,000 units = $5.00 and $20,000 ÷ 4,000 units = $5.00.

Supervisory salaries are a fixed cost because they remain the same in total regard­less of changes in the activity level: $5,000 at both levels.

Maintenance is a mixed cost because it increases in total but not proportionately with changes in the activity level: $4,000 ÷ 2,000 units = $2.00 and $7,000 ÷ 4,000 units = $1.75.

BRIEF EXERCISE 2-5

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | VARIABLE COST  Relevant Range | | | | | | | | | | | | | | | |  | |  | |  | | FIXED COST  Relevant Range | | | | | | | | | | | | | | |  | |
| $10,000 | |  | | |  |  | |  |  | |  |  | |  |  | |  |  | |  | | $10,000 | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
|  | | |  |  | |  |  | |  |  | |  |  | |  |  | |  | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
| 8,000 | |  | | |  |  | |  |  | |  |  | |  |  | |  |  | |  | | 8,000 | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
|  | | |  |  | |  |  | |  |  | |  |  | |  |  | |  | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
| 6,000 | |  | | |  |  | |  |  | |  |  | |  |  | |  |  | |  | | 6,000 | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
|  | | |  |  | |  |  | |  |  | |  |  | |  |  | |  | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
| 4,000 | |  | | |  |  | |  |  | |  |  | |  |  | |  |  | |  | | 4,000 | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
|  | | |  |  | |  |  | | | | | |  | |  |  | |  | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
| 2,000 | |  | | |  |  | |  |  | |  |  | |  | | 2,000 | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
|  | | |  |  | |  |  | |  |  | |  |  | |  |  | |  | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
|  | |  | | |  |  | |  |  | |  |  | |  |  | |  |  | |  | |  | |  | |  |  | |  |  | |  |  | |  |  | |  |  | |
|  | 0 | | 20 | | | | 40 | | | 60 | | | 80 | | | 100 | | |  | |  | | 0 | | 20 | | | 40 | | | 60 | | | 80 | | | 100 | | |
|  | |  | |  | | | | | | | | | | | | | | | |  | |  | |  | |  | | | | | | | | | | | | | | |
|  | | Activity Level | | | | | | | | | | | | | | | |  | | | |  | | Activity Level | | | | | | | | | | | | | | |  | |

BRIEF EXERCISE 2-6

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | $60,000 | |  | |  |  |  |  |  |  |  |  |  |  | |
| COST |  |  | |  |  |  |  |  |  |  |  |  |  | Total Cost Line |
|  | 45,000 | |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  | 30,000 | |  |  |  |  |  |  |  |  |  |  |  | Variable Cost Element |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  | 15,000 | |  |  |  |  |  |  |  |  |  |  |  | Fixed Cost Element |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | |  | |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  | 0 | | | 500 | | 1,000 | | 1,500 | | 2,000 | | 2,500 | |  |
|  |  |  | |  | |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  | | Direct Labour Hours | | | | | | | | | | |  |  |

BRIEF EXERCISE 2-7

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| High |  | Low |  | Difference |
|  |  |  |  |  |
| $16,490 | – | $12,330 | = | $4,160 |
| 8,200 | – | 5,000 | = | 3,200 |

$4,160 ÷ 3,200 = $1.30—Variable cost per kilometer.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | High |  | Low |
|  |  |  |  |  |
| Total cost  Less: Variable costs  8,200 × $1.30  5,000 × $1.30  Total fixed costs |  | $16,490   10,660    $5,830 |  | $12,330    6,500  $5,830 |

The mixed cost is $5,830 plus $1.30 per kilometer.

BRIEF EXERCISE 2-8

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| High |  | Low |  | Difference |
|  |  |  |  |  |
| $65,000 | – | $32,000 | = | $33,000 |
| 40,000 | – | 18,000 | = | 22,000 |

$33,000 ÷ 22,000 = $1.50 per unit.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Activity Level | | |
|  |  | High |  | Low |
|  |  |  |  |  |
| Total cost  Less: Variable costs  40,000 × $1.50  18,000 × $1.50  Total fixed costs |  | $65,000   60,000  000,000  $ 5,000 |  | $32,000   27,000  $ 5,000 |

The mixed cost is $5,000 plus $1.50 per unit produced.

BRIEF EXERCISE 2-9

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

BRIEF EXERCISE 2-10

DIEKER COMPANY

Balance Sheet

December 31, 2016

Current assets

Cash $ 62,000

Accounts receivable  200,000

Inventories

Finished goods $71,000

Work in process  87,000

Raw materials  73,000  231,000

Prepaid expenses 38,000

Total current assets $531,000

BRIEF EXERCISE 2-11

(a) Direct labour costs = prime costs + conversion costs

– total manufacturing costs

Direct labour = $195,000 + $140,000 – $270,000 = $65,000

Direct material costs = prime costs – direct labour costs

Direct material costs = $195,000 – $65,000 = $130,000

Manufacturing overhead costs = conversion costs – direct labour

costs

Manufacturing overhead costs = $140,000 – $65,000 = $75,000

(b) Total costs of production = direct material + direct labour + overhead

= $130,000 + $65,000 + $75,000 = $270,000

(c) Total period costs = $200,000

BRIEF EXERCISE 2-12

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Direct  Materials Used |  | Direct  Labour Used |  | Factory  Overhead |  | Total  Manufacturing  Costs |
|  |  |  |  |  |  |  |  |
| (1)  (2)  (3) | $81,000(2) |  | $144,000(3) |  |  |  | $136,000(1) |

1. $25,000 + $61,000 + $50,000
2. $296,000 – $140,000 – $75,000
3. $310,000 – $111,000 – $55,000

BRIEF EXERCISE 2-13

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Total  Manufacturing  Costs |  | Work in  Process  (1/1) |  | Work in  Process  (12/31) |  | Cost of Goods  Manufactured |
|  |  |  |  |  |  |  |  |
| (1)  (2)  (3) | $136,000 |  | $123,000(2) |  | $58,000(3) |  | $174,000(1) |

(1) $120,000 + $136,000 – $82,000 = $174,000

(2) $321,000 – $296,000 + $98,000 = $123,000

(3) $310,000 + $463,000 - $715,000 = $58,000

SOLUTIONS TO *DO IT!* REVIEW EXERCISES

*DO IT!* 2-14

Period costs:

Advertising

Salaries of sales representatives

Product costs:

**Blank CDs (DM)**

**Depreciation of CD image burner (MO)**

**Salary of factory manager (MO)**

**Factory supplies used (MO)**

**Paper inserts for CD cases (DM)**

**CD plastic cases (DM)**

**Salaries of factory maintenance employees (MO)**

**Salaries of employees who burn music onto CDs (DL)**

***DO IT!* 2-15**

Variable costs: Indirect labour, direct labour, and direct materials.

**Fixed costs: Property taxes and depreciation.**

**Mixed costs: Utilities and maintenance.**

***DO IT!* 2-16**

(a) Variable cost: ($18,750 – $16,200) ÷ (10,500 – 8,800) = $1.50 per unit

Fixed cost: $18,750 – ($1.50 × 10,500 units) = $3,000 or $16,200 – ($1.50 × 8,800 units) = $3,000

(b) Total estimated cost to produce 8,500 units:

= $3,000 + ($1.50 × 8,500) = $15,750

*DO IT!* 2-17

**ROLEN MANUFACTURING COMPANY**

**Cost of Goods Manufactured Schedule**

**For the Month Ended April 30**

**Work in process, April 1 $ 5,000**

**Direct materials**

**Raw materials, April 1 $ 10,000**

**Raw materials purchases     98,000**

**Total raw materials available for use 108,000**

**Less: Raw materials, April 30     14,000**

**Direct materials used $ 94,000**

**Direct labour 60,000**

**Manufacturing overhead   180,000**

**Total manufacturing costs   334,000**

**Total cost of work in process $339,000**

**Less: Work in process, April 30      3,500**

**Cost of goods manufactured $335,500**

SOLUTIONS TO EXERCISES

EXERCISE 2-18

 1. (b) Direct labour.\*

 2. (c) Manufacturing overhead.

 3. (c) Manufacturing overhead.

 4. (c) Manufacturing overhead.

 5. (a) Direct materials.

 6. (b) Direct labour.

 7. (c) Manufacturing overhead.

 8. (c) Manufacturing overhead (Indirect materials).

 9. (c) Manufacturing overhead (Indirect labour).

10. (a) Direct materials.

\*or sometimes (c), depending on the circumstances

EXERCISE 2-19

|  |  |  |  |
| --- | --- | --- | --- |
| (a) | Materials used in product DM |  | Advertising expense Period |
|  | Depreciation on plant MOH |  | Property taxes on plant MOH |
|  | Property taxes on store Period |  | Delivery expense Period |
|  | Labour costs of assembly-  line workers DL |  | Sales commissions Period |
|  |  | Salaries paid to sales clerks Period |
|  | Factory supplies used MOH |  |  |

(b) Product costs are recorded as a part of the cost of inventory, because they are an integral part of the cost of producing the product. Product costs are not expensed until the goods are sold and are reflected in the cost of goods sold account. Period costs are recognized as an expense when incurred.

EXERCISE 2-20

(a) Factory utilities $ 15,500

Depreciation on factory equipment   12,650

Indirect factory labour   48,900

Indirect materials   80,800

Factory manager’s salary    8,000

Property taxes on factory building    2,500

Factory repairs    2,000

Manufacturing overhead $170,350

(b) Direct materials $137,600

Direct labour   69,100

Manufacturing overhead  170,350

Product costs $377,050

(c) Depreciation on delivery trucks $ 3,800

Sales salaries  46,400

Repairs to office equipment    1,300

Advertising   15,000

Office supplies used   2,640

Period costs $69,140

EXERCISE 2-21

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1.  2. | (c)  (c) |  | 3.  4. | (a)  (c) |  | 5.  6. | (b)\*  (d) |  | 7.  8. | (a)  (b) |  | 9.  10. | (c)  (c) |

\*or sometimes (c), depending on the circumstances.

EXERCISE 2-22

 1. (b)

 2. (c)

 3. (a)

 4. (c)

 5. (c)

 6. (c)

 7. (c)

 8. (c)

 9. (c)

10. (c)

EXERCISE 2-23

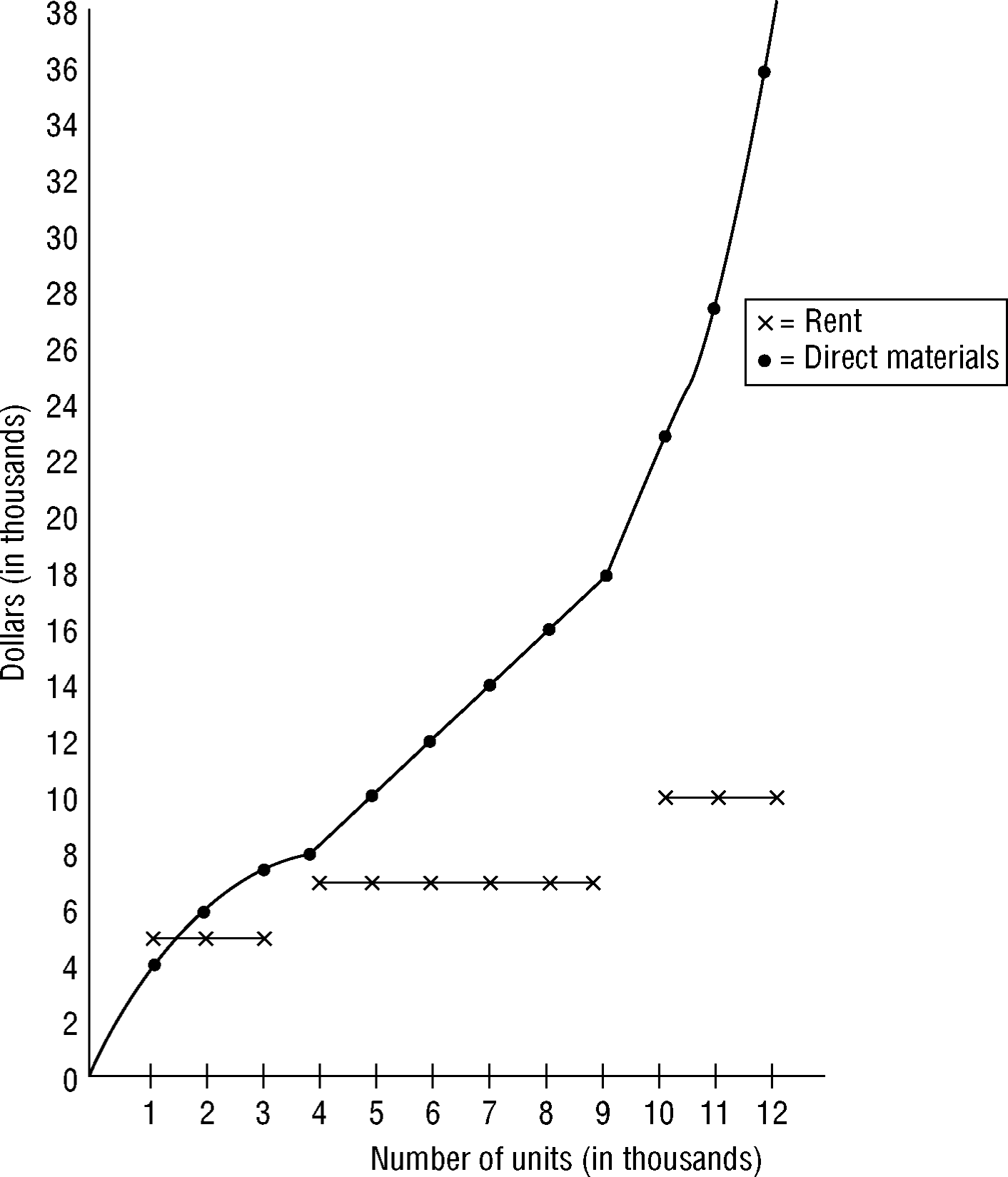
|  |  |  |  |
| --- | --- | --- | --- |
| (a) | Variable Costs  Fixed Costs  Mixed Costs |  | Vary in total directly and proportionately with changes in the activity level but remain constant on a per-unit basis.  Remain constant in total regardless of changes in the activity level but vary on a per-unit basis.  Contain both a variable and fixed cost element. They change in total but not proportionately with changes in the activity level and vary both in total and on a per-unit basis. |

(b) Using these criteria as a guideline, the classification is as follows:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Direct materials  Direct labour  Utilities |  | Variable  Variable  Mixed |  | Rent  Maintenance  Supervisory salaries |  | Fixed  Mixed  Fixed |

EXERCISE 2-24

(a)



(b) The relevant range is 4,000 – 9,000 units of output since a straight-line relationship exists for both direct materials and rent within this range.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| (c) | Variable cost per unit within the relevant range:  (4,000 – 9,000 units) | | | | |
|  |  | = | Cost  Units |  |  |
|  |  | = | $10,000\*  5,000\* | = | $2 per unit |

\*Any costs and units within the relevant range could have been used to calculate the same unit cost of $2.

(d) Fixed cost within the relevant range (4,000 to 9,000 units) = $7,000.

EXERCISE 2-25

(a) Maintenance Costs:

($4,900 – $2,500) ÷ (700 – 300) = $2,400 ÷ 400 =

$6.00 variable cost per machine hour

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | 700  Machine Hours |  | 300  Machine Hours |
|  |  |  |  |  |  |
|  | Total costs  Less: Variable costs   700 × $6.00   300 × $6.00  Total fixed costs |  | $4,900  4,200    $ 700 |  | $2,500  1,800  $ 700 |

Thus, maintenance costs are $700 per month plus $6.00 per machine hour.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (b) |  |  | $5,000 | |  |  | | | |  | | | |  | | | |  | |  | | | | |  | |  | | | |  | | | |
| COSTS |  |  |  | | | | Total Cost Line | | | | | | | | | | | | | | |  | |  |  | | | $4,900 | | | |
|  |  | $4,000 | |  | |  |  | |  | | |  | | | |  | | | | | | |  |  | |  |  | | |  | | | |
|  |  |  | |  |  | |  | | |  | | | |  | | | | | | |  |  | |  |  | | |  | | | |
|  |  | $3,000 | |  | |  |  | |  | | |  | | | |  | | | | | | |  |  | |  |  | | | Variable Cost Element | | | |
|  |  |  | |  |  | |  | | |  | | | |  | | | | | | |  |  | |  |  | | |
|  |  | $2,000 | |  | |  |  | |  | | |  | | | |  | | | | | | |  |  | |  |  | | |  | | | |
|  |  |  | |  |  | |  | | |  | | | |  | | | | | | |  |  | |  |  | | |  | | | |
|  |  | $1,000 | |  | |  |  | |  | | |  | | | |  | | | | | | |  |  | |  |  | | | Fixed Cost Element | | | |
|  |  |  | |  |  | |  | | |  | | | |  | | | | | | |  |  | |  |  | | |
|  |  | |  | |  | | |  | | | |  | | | | | | |  |  | |  |  | | |
|  |  |  | |  |  | | |  |  |  |  | | |  | | | |  | | |  | |  |  | |  |  | | |
|  |  |  |  | 0 | | 100 | | | | 200 | | 300 | | | | 400 | | | | | 500 | | | 600 | | | 700 | | | | |  | | | |
|  |  |  |  | |  |  | | | | |  |  | | | | | |  | | | | |  |  | |  | | | |  | | | |
|  |  |  |  | | Machine Hours | | | | | | | | | | | | | | | | | | | | | | | |  | | | |

EXERCISE 2-26

|  |  |  |
| --- | --- | --- |
| 1. | Wood used in the production of furniture. | Variable. |
| 2. | Fuel used in delivery trucks. | Variable. |
| 3. | Straight-line depreciation on factory building. | Fixed. |
| 4. | Screws used in the production of furniture. | Variable. |
| 5. | Sales staff salaries. | Fixed. |
| 6. | Sales commissions. | Variable. |
| 7. | Property taxes. | Fixed. |
| 8. | Insurance on buildings. | Fixed. |
| 9. | Hourly wages of furniture craftspeople. | Variable. |
| 10. | Salaries of factory supervisors. | Fixed. |
| 11. | Utilities expense. | Mixed. |
| 12. | Telephone bill. | Mixed. |

EXERCISE 2-27

(a) Maintenance Costs:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **$5,000** | **-** | **$2,750** | **=** | **$2,250** |
| **8,000** | **-** | **3,500** | **4,500** |

= $0.50 variable cost per machine hour

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | Activity Level | | |
|  |  |  | High |  | Low |
|  |  |  |  |  |  |
|  | Total cost  Less: Variable costs  8,000 × $.50  3,500 × $.50  Total fixed costs |  | $5,000   4,000  00,000  $1,000 |  | $2,750   1,750  $1,000 |

Thus, maintenance costs are $1,000 per month plus $0.50 per  
machine hour.

EXERCISE 2-27 (Continued)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (b) |  |  | $5,000 | |  | |  |  |  |  |  |  |  |  |  |
| COSTS |  |  | |  | Total Cost Line | | | |  |  |  |  |
|  |  | $4,000 | |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | $3,000 | |  |  |  |  |  |  |  |  |  | Variable Cost Element |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  | $2,000 | |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  | Fixed Cost Element  **$1,000** |
|  |  |  |  |  |  |  |  |  |
|  |  |  | |  |  |  |  |  |  |  |  |  |
|  |  |  | |  | |  |  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  | 0 | | | 2,000 | | 4,000 | | 6,000 | | 8,000 | |  |
|  |  |  |  | |  | |  |  |  |  |  |  |  |  |  |
|  |  |  |  | | Machine Hours | | | | | | | | |  |  |

EXERCISE 2-28

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (a) | Cost | Fixed | Variable | Mixed |
|  | Direct materials |  | X |  |
|  | Direct labour |  | X |  |
|  | Utilities |  |  | X |
|  | Property taxes | X |  |  |
|  | Indirect labour |  | X |  |
|  | Supervisory salaries | X |  |  |
|  | Maintenance |  |  | X |
|  | Depreciation | X |  |  |

EXERCISE 2-28 (Continued)

(b) Variable costs to produce 3,000 units = $7,500 + $15,000 + $4,500

= $27,000

Variable cost per unit = $27,000 ÷ 3,000 units

= $9 per unit

Variable cost portion of mixed cost = Total cost – Fixed portion

Utilities:

Variable cost to produce 3,000 units = $1,800 – $300

= $1,500

Variable cost per unit = $1,500 ÷ 3,000 units

= $0.50 per unit

Maintenance:

Variable cost to produce 3,000 units = $1,100 – $200

= $900

Variable cost per unit = $900 ÷ 3,000 units

= $0.30 per unit

Total variable cost per unit = $9.00 + $0.50 + $0.30

= $9.80

Fixed cost element = $1,000 + $1,800 + $2,400 +

$300 + $200

= $5,700

Cost to produce 5,000 units = ($9.80 × 5,000) + $5,700

= $49,000 + $5,700

= $54,700

EXERCISE 2-29

|  |  |
| --- | --- |
| (a) Delivery service (product) costs: |  |
| Indirect materials | $ 8,400 |
| Depreciation on delivery equipment | 11,200 |
| Dispatcher’s salary | 7,000 |
| Gas and oil for delivery trucks | 2,200 |
| Drivers’ salaries | 15,000 |
| Delivery equipment repairs | 300 |
| Total | $44,100 |
| (b) Period costs: |  |
| Property taxes on office building | $ 2,870 |
| CEO’s salary | 22,000 |
| Advertising | 1,600 |
| Office supplies | 650 |
| Office utilities | 990 |
| Repairs on office equipment | 680 |
| Total | $28,790 |

EXERCISE 2-30

(a) Work-in-process, 1/1 $ 10,000

Manufacturing costs:

Direct materials used $120,000

Direct labour 110,000

Manufacturing overhead

Depreciation on plant $60,000

Factory supplies used 25,000

Property taxes on plant 19,000 104,000 334,000

Total cost of work-in-process 344,000

Less: ending work-in-process 14,000

Cost of goods manufactured $330,000

(b) Finished goods, 1/1 $ 60,000

Cost of goods manufactured 330,000

Cost of goods available for sale 390,000

Finished goods, 12/31 50,600

Cost of goods sold $339,400

EXERCISE 2-31

CEPEDA MANUFACTURING COMPANY

Cost of Goods Manufactured Schedule

For the Year Ended December 31

Work in process inventory, (1/1) $210,000

Direct materials

Raw materials inventory, (1/1) (2) $42,500

Raw materials purchases 165,000

Total raw materials available for use (1)   207,500

Less: Raw materials inventory, (12/31)  17,500

Direct materials used  190,000

Direct labour (5)  111,000

Manufacturing overhead

Indirect labour $15,000

Factory depreciation  36,000

Factory utilities  68,000

Total manufacturing overhead 119,000

Total manufacturing costs (4)  420,000

Total cost of work in process (3)   630,000

Less: Work in process inventory, (12/31)   80,000

Cost of goods manufactured $550,000

Calculations:

(1) Total raw materials available for use:

Direct materials used $190,000

Add: Raw materials inventory (12/31)   17,500

Total raw materials available for use $207,500

(2) Raw materials inventory (1/1):

Raw materials available for use (from (1)) $207,500

Less: Raw materials purchases 165,000

Raw materials inventory (1/1) $ 42,500

(3) Total cost of work in process:

Cost of goods manufactured $550,000

Add: Work in process (12/31)   80,000

Total cost of work in process $630,000

EXERCISE 2-31 (Continued)

(4) Total manufacturing costs:

Total cost of work in process $630,000

Less: Work in process (1/1) 210,000

Total manufacturing costs $420,000

(5) Direct labour:

Total manufacturing costs $420,000

Less: Total overhead 119,000

Direct materials used 190,000

Direct labour $ 111,000

EXERCISE 2-32

(a) + $57,400 + $46,500 = $175,650 $252,100 – $11,000 = (f)

(a) = $71,750 (f) = $241,100

$175,650 + (b) = $221,500 $273,700 – $130,000 – $102,000 =

(b) = $45,850 (g) = $41,700

$221,500 – (c) = $180,725 $273,700 + (h) = $335,000

(c) = $40,775 (h) = $61,300

$68,400 + $86,500 + $81,600 = (d) $335,000 – $90,000 = (i)

(d) = $236,500 (i) = $245,000

$236,500 + $15,600 = (e)

(e) = $252,100

Additional explanation to EXERCISE 2-32 solution:

Case A

(a) Total manufacturing costs $175,650

Less: Manufacturing overhead   46,500

Direct labour   57,400

Direct materials used $ 71,750

EXERCISE 2-32 (Continued)

(b) Total cost of work in process $221,500

Less: Total manufacturing costs 175,650

Work in process (1/1) $ 45,850

(c) Total cost of work in process $221,500

Less: Cost of goods manufactured 180,725

Work in process (12/31) $ 40,775

Case B

(d) Direct materials used $ 68,400

Direct labour   86,500

Manufacturing overhead   81,600

Total manufacturing costs $236,500

(e) Total manufacturing costs $236,500

Work in process (1/1)   15,600

Total cost of work in process $252,100

(f) Total cost of work in process $252,100   11,000

Cost of goods manufactured $241,100

Case C

(g) Total manufacturing costs $273,700

Less: Manufacturing overhead 102,000

Direct materials used 130,000

Direct labour $ 41,700

(h) Total cost of work in process $335,000

Less: Total manufacturing costs 273,700

Work in process (1/1) $ 61,300

(i) Total cost of work in process $335,000   90,000

Cost of goods manufactured $245,000

EXERCISE 2-33

(a) (a) $127,000 + $140,000 + $89,000 = $356,000

(b) $356,000 + $33,000 – $360,000 = $29,000

(c) $430,000 – ($200,000 + $123,000) = $107,000

(d) $40,000 + $470,000 – $430,000 = $80,000

(e) $257,000 – ($80,000 + $100,000) = $77,000

(f) $257,000 + $60,000 – $80,000 = $237,000

(g) $308,000 – ($67,000 + $75,000) = $166,000

(h) $308,000 + $45,000 – $270,000 = $83,000

(b) IKERD COMPANY

Cost of Goods Manufactured Schedule

For the Year Ended December 31, 2016

Work in process, January 1 $ 33,000

Direct materials $127,000

Direct labour  140,000

Manufacturing overhead   89,000

Total manufacturing costs 356,000

Total cost of work in process  389,000

Less: Work in process inventory,

  December 31 29,000

Cost of goods manufactured $360,000

EXERCISE 2-34

(a) AIKMAN CORPORATION

Cost of Goods Manufactured Schedule

For the Month Ended June 30, 2016

Work in process, June 1 $ 3,000

Direct materials used $25,000

Direct labour  30,000

Manufacturing overhead

Indirect factory labour $4,500

Factory manager’s salary  3,000

Indirect materials  2,200

Depreciation, factory equipment  1,400

Maintenance, factory equipment  1,800

Factory utilities    400

Total manufacturing overhead 13,300

Total manufacturing costs 68,300

Total cost of work in process  71,300

Less: Work in process, June 30   2,800

Cost of goods manufactured $68,500

(b) AIKMAN CORPORATION

Income Statement (Partial)

For the Month Ended June 30, 2016

Net sales $87,100

Cost of goods sold

Finished goods inventory, June 1 $ 5,000

Cost of goods manufactured [from (a)]  68,500

Cost of goods available for sale  73,500

Finished goods inventory, June 30   9,500

Cost of goods sold  64,000

Gross profit $23,100

EXERCISE 2-35

(a)

DANNER, LETOURNEAU, AND MAJEWSKI  
Schedule of Cost of Contract Services Provided  
For the Month Ended August 31, 2016

|  |  |  |
| --- | --- | --- |
|  |  |  |
| Supplies used (direct materials) |  | $ 2,500 |
| Salaries of professionals (direct labour) |  | 15,600 |
| Service overhead: |  |  |
| Utilities for contract operations | $1,900 |  |
| Contract equipment depreciation | 900 |  |
| Insurance on contract operations | 800 |  |
| Janitorial services for professional offices | 300 | 3,900 |
| Cost of contract services provided |  | $22,000 |

(b) The costs not included in the cost of contract services provided would all be classified as period costs. They would be reported on the income statement under administrative expenses.

EXERCISE 2-36

(a) Work-in-process, 1/1 $ 13,500

Direct materials used

Raw materials inventory, 1/1 $ 21,000

Materials purchased 150,000

Materials available for use 171,000

Less: Materials inventory, 12/31 30,000 $141,000

Direct labour 220,000

Manufacturing overhead 180,000

Total manufacturing costs 541,000

Total cost of work-in-process 554,500

Less: Work-in-process, 12/31 17,200

Cost of goods manufactured $537,300

EXERCISE 2-36 (Continued)

SASSAFRAS COMPANY  
Income Statement (Partial)  
For the Year Ended December 31, 2016

(b) Sales revenue $910,000

Cost of goods sold

Finished goods, 1/1 $ 27,000

Cost of goods manufactured (from (a)) 537,300

Cost of goods available for sale 564,300

Less: Finished goods, 12/31 21,000

Cost of goods sold 543,300

Gross profit $366,700

SASSAFRAS COMPANY  
(Partial) Balance Sheet  
December 31, 2016

(c) Current assets

Inventories

Finished goods $21,000

Work in process 17,200

Raw materials 30,000 $68,200

(d) In a merchandising company’s income statement, the only difference would be in the computation of cost of goods sold. The beginning and ending finished goods inventory would be replaced by beginning and ending merchandise inven­tory and the cost of goods manufactured total would be replaced by purchases. In a merchandising company’s balance sheet, there would be one inventory account (merchandise inventory) instead of three.

EXERCISE 2-37

1. (a)  9. (a)

2. (a) 1 10. (a), (b)

3. (a), (c) 11. (b)

4. (b) 1 12. (b)

5. (a) 13. (a)

6. (a) 14. (a)

7. (a) 15. (a)

8. (b), (c) 16. (a)

**1Only ending inventory is reflected in the balance sheet. Opening inventory would be reflected as the closing inventory of the previous year in a comparative balance sheet.**

EXERCISE 2-38

(a) KANANASKIS MANUFACTURING

Cost of Goods Manufactured Schedule

For the Month Ended June 30, 2016

Work in process inventory, June 1 $  5,000

Direct materials used

Raw materials inventory, June 1 $ 10,000

Raw materials purchases  64,000

Total raw materials available for use  74,000

Less: Raw materials inventory, June 30  13,100 $60,900 Direct labour   57,000 Manufacturing overhead

Indirect labour $7,500

Factory insurance  4,000

Machinery depreciation  5,000

Factory utilities  3,100

Machinery repairs  1,800

Miscellaneous factory costs  1,500 22,900

Total manufacturing costs  140,800

Total cost of work in process  145,800

Less: Work in process inventory, June 30   13,000

Cost of goods manufactured $132,800

EXERCISE 2-38 (Continued)

(b) KANANASKIS MANUFACTURING

(Partial) Balance Sheet

As at June 30, 2016

Current assets

Inventories

Finished goods $ 6,000

Work in process   13,000

Raw materials  13,100 $32,100

EXERCISE 2-39

(a) Raw Materials account:

5,000 units purchased; 4,650 units used = 350 units remaining

350 units x $8 each = $2,800

Work in Process account Sept 30th:

4,600 units were used in manufacturing; 90% in completed autos

(4,600 × 10%) × $8 = $3,680

Finished Goods account:

4,600 x 90% completed; 75% of completed autos sold

(4,600 × 90% × 25%) × $8 = $8,280

Cost of Goods Sold account:

4,600 x 90% completed; 75% of completed autos sold

(4,600 × 90% × 75%) × $8 = $24,840

Selling Expenses account: 50 × $8 = $400

EXERCISE 2-39 (Continued)

Proof of cost of head lamps allocated (5,000 × $8 = $40,000)

Raw materials $ 2,800

Work in process 3,680

Finished goods 8,280

Cost of goods sold 24,840

Selling expenses 400

Total $40,000

(b) To: Chief Accountant

From: Student

Subject: Statement Presentation of Accounts

Two accounts will appear in the income statement. Cost of Goods Sold will be deducted from net sales in determining gross profit. Selling ex­penses will be shown under operating expenses and will be deducted from gross profit in determining net income. Sometimes, the calculation for Cost of Good Sold is shown on the income statement. In these cases, the balance in Finished Goods inventory would also be shown on the income statement.

The other accounts associated with the head lamps are inventory ac­counts which contain end-of-period balances. Thus, they will be reported under inventories in the current assets section of the balance sheet in the following order: finished goods, work in process, and raw materials.

**SOLUTIONS TO PROBLEMS: SET A**

|  |
| --- |
| PROBLEM 2-40A |

(a)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Product Costs | | | | |  |  |
|  |  |  |  |  |  |  |  |  |
| Cost Item |  | Direct  Materials |  | Direct  Labour |  | Manufact.  Overhead |  | Period  Costs |
|  |  |  |  |  |  |  |  |  |
| Maintenance on factory building  Factory manager’s salary  Advertising for helmets  Sales commissions  Depreciation on factory building  Rent on factory equipment  Insurance on factory building  Raw materials  Utility costs for factory  Supplies for general office  Wages for assembly line workers  Depreciation on office equipment  Miscellaneous materials |  | $20,000 |  | $55,000 |  | $ 1,300  4,000     700  6,000      3,000  800    2,000 |  | $ 8,000  5,000      200    500 |
|  |  | $20,000 |  | $55,000 |  | $17,800 |  | $13,700 |

(b) Total production costs

Direct materials $20,000

Direct labour   55,000

Manufacturing overhead  17,800

Total production cost $92,800

Production cost per helmet = $92,800/1,000 = $92.80

|  |
| --- |
| PROBLEM 2-41A |

(a)

|  |  |
| --- | --- |
|  |  |
|  |  | |  |  |  |  |
| Cost Item | Direct  Materials | | Direct  Labour | MOH |  | Period  Costs |
|  |  | |  |  |  |  |
| Raw materials (1)  Wages for workers (2)  Rent on equipment  Indirect materials (3)  Factory supervisor’s salary  Janitorial costs  Advertising  Depreciation–factory building (4)  Property taxes–factory building (5) | $60,000  000,000  $60,000 | | $65,000  000,000  $65,000 | $ 1,500    7,500    3,500    1,400      800       600  $15,300 |  | $6,000  00,000  $6,000 |

(1) $24 × 2,500 = $60,000.

(2) $13 × 2 hrs × 2,500 = $65,000.

(3) $3 × 2,500 = $7,500.

(4) $9,600/12 = $800.

(5) $7,200/12 = $600.

(b) Total production costs

Direct materials $ 60,000

Direct labour   65,000

Manufacturing overhead   15,300

Total production cost $140,300

Production cost per driver = $140,300 ÷ 2,500 = $56.12

|  |
| --- |
| PROBLEM 2-42A |

(a) Case 1

Total manufacturing costs = (a)

(a) = $6,300 + $3,000 + $6,000 = $15,300

Ending work in process inventory = (b)

$15,300 + $1,000 – (b) = $14,600

(b) = $15,300 + $1,000 – $14,600 = $1,700

Beginning finished goods inventory = (c)

$14,600 + (c) = $18,300

(c) = $18,300 – $14,600 = $3,700

Cost of goods sold = (d)

(d) = $18,300 – $1,500 = $16,800

Gross profit = (e)

(e) = ($22,500 – $1,500) – $16,800 = $4,200

Net income = (f)

(f) = $4,200 – $2,700 = $1,500

Case 2

Direct materials used = (g)

(g) + $8,000 + $4,000 = $18,000

(g) = $18,000 – $8,000 – $4,000 = $6,000

Beginning work in process inventory = (h)

$18,000 total manufacturing costs + (h) beginning work in process

– $3,000 ending work in process = $22,000

(h) = $22,000 + $3,000 – $18,000 = $7,000

Cost of goods sold = (k)

(k) = $3,300 beginning inventory + $22,000 Cost of goods

manufactured – $2,500 ending inventory = $22,800

(Note: Item (i) can only be solved after item (k) is solved.)

PROBLEM 2-42A (Continued)

Sales = (i)

((i) – $1,400) – (k) = $6,000

((i) – $1,400) – $22,800 = $6,000

(i) = $1,400 + $22,800 + $6,000 = $30,200

Goods available for sale = (j)

(j) = $22,000 + $3,300 = $25,300

Operating expenses = (l)

$6,000 – (l) = $2,200

(l) = $3,800

(b) CASE 1

Cost of Goods Manufactured Schedule

Work in process, beginning $ 1,000

Direct materials $6,300

Direct labour  3,000

Manufacturing overhead 6,000

Total manufacturing costs  15,300

Total cost of work in process  16,300

Less: Work in process, ending   1,700

Cost of goods manufactured $14,600

(c) CASE 1

Income Statement

Sales $22,500

Less: Sales discounts 1,500

Net sales $21,000

Cost of goods sold

Finished goods inventory, beginning   3,700

Cost of goods manufactured 14,6­­­00

Cost of goods available for sale  18,300

Less: Finished goods inventory, ending 1,500  16,800

Gross profit   4,200

Operating expenses   2,700

Net income $ 1,500

PROBLEM 2-42A (Continued)

CASE 1

(Partial) Balance Sheet

Current assets

Cash $ 3,000

Receivables (net)  10,000

Inventories

Finished goods $1,500

Work in process  1,700

Raw materials 700   3,900

Prepaid expenses 200

Total current assets $17,100

|  |
| --- |
| PROBLEM 2-43A |

(a) STELLAR MANUFACTURING COMPANY

Cost of Goods Manufactured Schedule

For the Year Ended December 31, 2016

Work in process, (1/1) $ 9,500

Direct materials

Raw materials inventory, (1/1) $ 47,000

Raw materials purchases   62,500

Total raw materials available

  for use  109,500

Less: Raw materials inventory,

  (12/31)   44,800

Direct materials used $ 64,700

Direct labour  145,100

Manufacturing overhead

Indirect labour   18,100

Factory insurance    7,400

Factory machinery depreciation   7,700

Factory utilities   12,900

Plant manager’s salary   40,000

Factory property taxes    6,900

Factory repairs     800

Total manufacturing overhead   93,800

Total manufacturing costs  303,600

Total cost of work in process  313,100

Less: Work in process, (12/31)    7,500

Cost of goods manufactured $305,600

PROBLEM 2-43A (Continued)

(b) STELLAR MANUFACTURING COMPANY

(Partial) Income Statement

For the Year Ended December 31, 2016

Sales revenues

Sales $465,000

Less: Sales discounts    2,500

Net sales $462,500

Cost of goods sold

Finished goods inventory, (1/1)   85,000

Cost of goods manufactured  305,600

Cost of goods available for sale  390,600

Less: Finished goods inventory, (12/31)   77,800

Cost of goods sold  312,800

Gross profit $149,700

(c) STELLAR MANUFACTURING COMPANY

(Partial) Balance Sheet

As at December 31, 2016

Assets

Current assets

Cash $ 28,000

Accounts receivable   27,000

Inventories:

Finished goods $77,800

Work in process  7,500

Raw materials  44,800  130,100

Total current assets $185,100

|  |
| --- |
| PROBLEM 2-44A |

(a) TOMBERT COMPANY

Cost of Goods Manufactured Schedule

For the Month Ended October 31, 2016

Work in process, October 1 $ 16,000

Direct materials

Raw materials inventory,

  October 1 $ 18,000

Raw materials

  purchases 264,000

Total raw materials available

  for use 282,000

Less: Raw materials inventory,

  October 31 29,000

Direct materials used $253,000

Direct labour  190,000

Manufacturing overhead

Rent on factory facilities  60,000

Depreciation factory

  equipment  31,000

Indirect labour  28,000

Factory utilities\*   9,000

Factory insurance\*\* 4,800

Total manufacturing overhead  132,800

Total manufacturing costs  575,800

Total cost of work in process  591,800

Less: Work in process, October 31   14,000

Cost of goods manufactured $577,800

\*\*$12,000 × 75% = $9,000

\*\*$8,000 × 60% = $4,800

PROBLEM 2-44A (Continued)

(b) TOMBERT COMPANY

Income Statement

For the Month Ended October 31, 2016

Sales (net) $780,000

Cost of goods sold

Finished goods inventory, October 1 $ 30,000

Cost of goods manufactured  577,800

Cost of goods available for sale  607,800

Less: Finished goods inventory,

  October 31   45,000

Cost of goods sold  562,800

Gross profit  217,200

Operating expenses

Advertising expense   90,000

Selling and administrative salaries   75,000

Amortization expense—sales

  equipment   45,000

Utilities expense\*    3,000

Insurance expense\*\*    3,200

Total operating expenses  216,200

Net income $  1,000

\*\*$12,000 × 25%

\*\*$8,000 × 40%

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| PROBLEM 2-45A |

(a) Raw materials inventory, beginning $ 9,600

Raw material purchased(1)   28,800

Raw materials available for use  38,400

Less: Raw materials inventory, ending 10,400

Raw materials used in production $28,000

1 28,000 + $10,400 = $38,400

$38,400 – $9,600 = $28,800

(b) Work in process inventory, beginning $ 14,600

Manufacturing costs added 160,000

Total work in process during the month  174,600

Less: Work in process inventory, ending 13,000

Cost of goods manufactured (2)  $161,600

2$14,600 + $160,000 – $13,000 = $161,600

(c) Finished goods inventory, beginning $  9,600

Cost of goods manufactured 161,600

Cost of goods available for sale  171,200

Less: finished goods inventory, ending 9,200

Cost of goods sold3 $162,000

3$9,600 + $161,600 – $9,200 = $162,000

|  |
| --- |
| PROBLEM 2-46A |

(a) Cost of goods sold = manufacturing cost per unit ×

number of units sold

Cost of goods sold = ($3,000,000 ÷ 300,000) × 298,500

= $2,985,000

(b) Gross Profit = Sales – Cost of goods sold

= ($18 × 298,500) – $2,985,000

= $2,388,000

**(c) Cost of finished goods = number of units in inventory ×**

**per unit product cost**

**Cost of finished goods = (300,000 – 298,500) × $10.001**

**= $15,000**

**1$3,000,000** **÷ 300,000 = $10.00 per unit**

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| PROBLEM 2-47A |

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| --- | --- | --- |
| **(1)(a)** | Raw materials inventory, beginning | $18,000 |
|  | Plus: Raw material purchased | 100,000 |
|  | Raw materials available for use | 118,000 |
|  | Less: Raw materials inventory, ending | 18,000 |
|  | Raw materials used in production | 100,000 |
|  | Less: Indirect material | 10,000 |
|  | Direct material used | $ 90,000 |

|  |  |  |
| --- | --- | --- |
| (b) | Manufacturing costs for the month | $285,000 |
|  | Less: Direct material used | 90,000 |
|  | Less: Manufacturing overhead | 115,000 |
|  | Direct labour | $80,000 |

|  |  |  |
| --- | --- | --- |
| (c) | Work in process, beginning | $ 8,000 |
|  | Plus: Manufacturing costs for the month | 285,000 |
|  | Total cost of work in process | 297,000 |
|  | Less: Work in process, ending | 20,000 |
|  | Cost of goods manufactured\* | $277,000 |

\*this is the value of product transferred to finished goods

|  |  |  |
| --- | --- | --- |
| (d) | Cost of goods sold + 40% mark-up = Sales  Sales = 140% × Cost of goods sold  Cost of goods sold = $420,000 ÷ 1.40 = $300,000 |  |
|  |  |  |
| (e) | Cost of goods sold (from (d)) | $300,000 |
|  | Plus: Finished goods inventory, ending | 20,000 |
|  | Goods available for sale | 320,000 |
|  | Less: Cost of goods manufactured | 277,000 |
|  | Finished goods inventory, beginning | $ 43,000 |

(2) Variable costs vary in total directly and proportionately with changes in the activity level but remain constant on a per-unit basis. Fixed costs remain constant in total regardless of changes in the activity level but vary on a per-unit basis.

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| PROBLEM 2-48A |

|  |  |  |
| --- | --- | --- |
| (a) | Raw materials used in production | $180,000 |
|  | Plus: Raw materials inventory, ending | 55,000 |
|  | Raw materials available for use | 235,000 |
|  | Less: Raw materials inventory, beginning | 25,000 |
|  | Raw material purchased | $210,000 |

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| --- | --- | --- |
| (b) | Cost incurred for the month (10,000 hrs × $15) | $150,000 |
|  | Plus: Beginning of the month accrual | 10,000 |
|  |  | 160,000 |
|  | Less: End of the month accrual | 20,000 |
|  | Cash disbursements for labour | $140,000 |

|  |  |  |
| --- | --- | --- |
| (c) | Work in process inventory, beginning | $ 15,000 |
|  | Plus: Materials used in production | 180,000 |
|  | Labour costs (10,000 hrs × $15) | 150,000 |
|  | Manufacturing overhead | 100,000 |
|  |  | 445,000 |
|  | Less: Work in process inventory, ending | 4,500 |
|  | Cost of goods transferred to finished goods | $440,500 |

|  |  |  |
| --- | --- | --- |
| (d) | Cost of goods sold | $400,000 |
|  | Plus: Finished goods inventory, ending | 50,000 |
|  | Goods available for sale | 450,000 |
|  | Less: Transferred from work in process (c) | 440,500 |
|  | Finished goods inventory, beginning | $ 9,500 |

**SOLUTIONS TO PROBLEMS: SET B**

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| PROBLEM 2-49B |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (a) and (b) |  | Product Costs | | | | |  |  |
|  |  |  |  |  |  |  |  |  |
| Cost Item |  | Direct  Materials |  | Direct  Labour |  | Manufact.  Overhead |  | Period  Costs |
|  |  |  |  |  |  |  |  |  |
| Maintenance costs on factory building  Factory manager’s salary  Advertising for helmets  Sales commissions  Depreciation on factory building  Rent on factory equipment  Insurance on factory building  Raw materials  Utility costs for factory  Supplies for general office  Wages for assembly-line workers  Depreciation on office equipment  Miscellaneous materials |  | $20,000  000,000  $20,000 |  | $54,000  000,000  $54,000 |  | $ 1,500    4,000      700    6,000    3,000      800    2,000  $18,000 |  | 8,000    5,000      200      500  000,000  $13,700 |

(c) Total production costs

Direct materials $20,000

Direct labour  54,000

Manufacturing overhead  18,000

Total production cost $92,000

Production cost per motorcycle helmet = $92,000 ÷ 1,000 = $92.00

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| PROBLEM 2-50B |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (a) |  | Product Costs | | | | |  |  |
|  |  |  |  |  |  |  |  |  |
| Cost Item |  | Direct  Materials |  | Direct  Labour |  | MOH |  | Period  Costs |
|  |  |  |  |  |  |  |  |  |
| Raw materials (1)  Wages for workers (2)  Rent on equipment  Indirect materials (3)  Factory supervisor’s salary  Janitorial costs  Advertising  Depreciation – factory (4)  Property taxes – factory (5) |  | $57,500  000,000  $57,500 |  | $65,000  000,000  $65,000 |  | $ 1,300    7,500    3,500    1,400      700      600  $15,000 |  | $6,000  00,000  $6,000 |

|  |
| --- |
| (1) $23 × 2,500 = $57,500.  (2) $13 × 2 hours × 2,500 = $65,000.  (3) $3 × 2,500 = $7,500.  (4) $8,400 ÷ 12 = $700.  (5) $7,200 ÷ 12 = $600. |
|  |
| (b) Total production costs  Direct materials $ 57,500  Direct labour   65,000  Manufacturing overhead   15,000  Total production cost $137,500  Production cost per racket = $137,500 ÷ 2,500 = $55.00. |

|  |
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| PROBLEM 2-51B |

(a) Case 1

Total manufacturing costs = (a)

(a) = $6,300 + $3,000 + $6,000 = $15,300

Ending work in process inventory = (b)

$15,300 + $1,000 – (b) = $15,800

(b) = $15,300 + $1,000 – $15,800 = $500

Beginning finished goods inventory = (c)

(c) + $15,800 = $18,300

(c) = $18,300 – $15,800 = $2,500

Cost of goods sold = (d)

(d) = $18,300 – $1,200 = $17,100

Gross profit = (e)

(e) = ($22,500 – $1,500) – $17,100 = $3,900

Net Income = (f)

(f) = $3,900 – $2,700 = $1,200

Case 2

Direct materials used = (g)

(g) + $4,000 + $5,000 = $16,000

(g) = $16,000 – $4,000 – $5,000 = $7,000

Beginning work in process inventory = (h)

$16,000 + (h) – $2,000 = $20,000

(h) = $20,000 + $2,000 – $16,000 = $6,000

Goods available for sale = (j)

(j) = $20,000 + $5,000 = $25,000

Cost of goods sold = (k)

(k) = $25,000 – $2,500 = $22,500

PROBLEM 2-51B (Continued)

(Note: Item (i) can only be solved after items (j) and (k) are solved.)

Sales = (i)

((i) – $1,200) – (k) = $6,000

((i) – $1,200) – $22,500 = $6,000

(i) = $1,200 + $22,500 + $6,000 = $29,700

Operating expenses = (l)

$6,000 – (l) = $2,200

(l) = $3,800

(b) CASE 1

Cost of Goods Manufactured Schedule

Work in process, beginning $ 1,000

Direct materials $6,300

Direct labour  3,000

Manufacturing overhead 6,000

Total manufacturing costs  15,300

Total cost of work in process  16,300

Less: Work in process, ending   500

Cost of goods manufactured $15,800

(c) CASE 1

Income Statement

Sales $22,500

Less: Sales discounts   1,500

Net sales $21,000

Cost of goods sold

Finished goods inventory, beginning $ 2,500

Cost of goods manufactured  15,800

Cost of goods available for sale  18,300

Finished goods inventory, ending   1,200

Cost of goods sold  17,100

Gross profit   3,900

Operating expenses   2,700

Net income $ 1,200

PROBLEM 2-51B (Continued)

CASE 1

(Partial) Balance Sheet

Current assets

Cash $ 3,000

Receivables (net)  10,000

Inventories

Finished goods $1,200

Work in process  500

Raw materials 700   $2,400 Prepaid Expenses 200

Total current assets $15,600

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| --- |
| PROBLEM 2-52B |

(a) RUIZ MANUFACTURING COMPANY

Cost of Goods Manufactured Schedule

For the Year Ended December 31, 2016

Work in process inventory (1/1) $  9,500

Direct materials

Raw materials inventory (1/1)   $ 47,000

Raw materials purchases   62,500

Raw materials available for use 109,500

Less: Raw materials inventory

(12/31)   44,200

Direct materials used $ 65,300

Direct labour  145,100

Manufacturing overhead

Plant manager’s salary   40,000

Indirect labour   18,100

Factory utilities   12,900

Factory machinery

  depreciation    7,700

Factory insurance    7,400

Factory property taxes    6,100

Factory repairs      800

Total manufacturing overhead   93,000

Total manufacturing costs  303,400

Total cost of work in process  312,900

Less: Work in process, (12/31)    8,000

Cost of goods manufactured $304,900

PROBLEM 2-52B (Continued)

(b) RUIZ MANUFACTURING COMPANY

(Partial) Income Statement

For the Year Ended December 31, 2016

Sales revenues

Sales $465,000

Less: Sales discounts    2,500

Net sales $462,500

Cost of goods sold

Finished goods inventory, (1/1)  85,000

Cost of goods manufactured (see

  schedule)  304,900

Cost of goods available for sale 389,900

Finished goods inventory, (12/31)   67,800

Cost of goods sold  322,100

Gross profit $140,400

(c) RUIZ MANUFACTURING COMPANY

(Partial) Balance Sheet

As at December 31, 2016

Assets

Current assets

Cash $ 28,000

Accounts receivable   27,000

Inventories

Finished goods $67,800

Work in process   8,000

Raw materials 44,200  120,000

Total current assets $175,000

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| PROBLEM 2-53B |

(a) Prime costs = direct materials + direct labour

Prime costs = $200,000 + $160,000 = $360,000

(b) Conversion costs = direct labour + manufacturing overhead

Conversion costs = $160,000 + $128,000\* = $288,000

\*Manufacturing overhead = ($160,000/$10) × $8

(c)

|  |  |
| --- | --- |
| Cost of goods manufactured = |  |
| Beginning work in process inventory | $ 80,000 |
| + total manufacturing costs1 | 488,000 |
|  | 568,000 |
| – Ending work in process inventory | 50,000 |
|  | $518,000 |

1$200,000 + $160,000 + $128,000

|  |
| --- |
| PROBLEM 2-54B |

(a) Let GP = Gross profit

GP – non-manufacturing costs = net income

GP = $50,000 + $170,000 = $220,000

(b) Let COGS = Cost of goods sold

Sales – COGS = gross profit

COGS = $560,000 – $220,000 = $340,000

(c) Let EFI = Ending finished goods inventory

EFI = Beginning finished goods inventory +

cost of goods manufactured – COGS

EFI = $270,000 + $260,000 – $340,000 = $190,000

(d) Let TMC = total manufacturing costs

Let BWI = Beginning work in process inventory

Let EWI = Ending work in process inventory

Let COGM = Cost of goods manufactured

BWI + TMC – EWI = COGM

$110,000 + TMC – $0 = $260,000

TMC = $150,000

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| PROBLEM 2-55B |

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| --- | --- | --- |
| **(1)(a)** | Raw materials inventory, beginning | $28,000 |
|  | Plus: Raw material purchased | 150,000 |
|  | Raw materials available for use | 178,000 |
|  | Less: Direct material used | 125,000 |
|  |  | 53,000 |
|  | Less: Indirect material transferred out | 20,000 |
|  | Raw materials inventory, ending | $ 33,000 |

|  |  |  |
| --- | --- | --- |
| (b) | Manufacturing costs for the month | $498,000 |
|  | Less: Direct material used | 125,000 |
|  | Less: Manufacturing overhead | 145,000 |
|  | Direct labour | $228,000 |

|  |  |  |
| --- | --- | --- |
| (c) | Work in process, beginning | $ 38,000 |
|  | Plus: Manufacturing costs for the month | 498,000 |
|  | Total cost of work in process | 536,000 |
|  | Less: Work in process, ending | 30,000 |
|  | Cost of goods manufactured\* | $506,000 |

\*This is the value of product transferred to finished goods

|  |  |  |
| --- | --- | --- |
| (d) | Cost of goods sold + 30% mark-up = Sales  Sales = 130% × CGS  CGS = $780,000 ÷ 1.30 = $600,000 |  |
|  |  |  |
| (e) | Cost of goods sold (from (d)) | $600,000 |
|  | Plus: Finished goods inventory, ending | 25,000 |
|  | Goods available for sale | 625,000 |
|  | Less: Cost of goods manufactured | 506,000 |
|  | Finished goods inventory, beginning | $119,000 |

(2) Variable costs vary in total directly and proportionately with changes in the activity level but remain constant on a per-unit basis. Fixed costs remain constant in total regardless of changes in the activity level but vary on a per-unit basis.

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| PROBLEM 2-56B |

(a) AGLER COMPANY

Cost of Goods Manufactured Schedule

For the Month Ended August 31, 2016

Work in process, August 1 $ 25,000

Direct materials

Raw materials inventory,

  August 1 $ 19,500

Raw materials purchases  200,000

Total raw materials

  available for use  219,500

Less: Raw materials inventory,

  August 31   30,000

Direct materials used $189,500

Direct labour  160,000

Manufacturing overhead

Rent on factory facilities $ 60,000

Depreciation on factory

  equipment   35,000

Indirect labour   20,000

Factory utilities\*    5,000

Factory insurance\*\*    3,500

Total manufacturing overhead  123,500

Total manufacturing costs  473,000

Total cost of work in process  498,000

Less: Work in process,

  August 31   21,000

Cost of goods manufactured $477,000

\*$10,000 × 50%

\*\*$5,000 × 70%

PROBLEM 2-56B (Continued)

(b) AGLER COMPANY

Income Statement

For the Month Ended August 31, 2016

Sales (net) $675,000

Cost of goods sold

Finished goods inventory, August 1 $ 40,000

Cost of goods manufactured  477,000

Cost of goods available for sale  517,000

Less: Finished goods inventory,

  August 31   59,000

Cost of goods sold  458,000

Gross profit  217,000

Operating expenses

Advertising expense   75,000

Selling and administrative salaries   70,000

Depreciation on sales equipment   50,000

Utilities expense\*    5,000

Insurance expense\*\*    1,500

Total operating expenses  201,500

Net income $ 15,500

\*$10,000 × 50%

\*\*$5,000 × 30%

|  |
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| PROBLEM 2-57B |

(a) Cost of goods sold = $390 – $70 = $320 million

(b) Total factory overhead cost =

$320 – $80 – $180 = $60 million

(c) Selling and administrative expenses =

$70 – $22 = $48 million

(d) Total product costs = DM + DL + MOH =

$80 + $180 + $60 = $320 million

(e) Total period costs = $48 million

(f) Prime cost = DM + DL = $80 + $180 = $260 million

(g) Conversion cost = DL + MOH = $180 + $60 = $240 million

(h) Cost of goods manufactured = $0 + $320 – $0 = $320 million

|  |
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| PROBLEM 2-58B |

Abbreviations used:

Let CON = Conversion cost

Let FOH = Factory overhead costs

Let PRI = Prime cost

Let TMC = Total manufacturing costs

BDMI is Beginning Direct Material Inventory

EDMI is Ending Direct Materials Inventory

1. Calculations:

Gross profit = $900,000 × 20% = $180,000

Cost of goods sold = $900,000 – $180,000 = $720,000

CON = $360,000 + (40% × CON)

(0.6 × CON) = $360,000

CON = $600,000

FOH = $600,000 – $360,000 = $240,000

PRI = 70% × TMC

DM + DL = 0.70(DM + DL + FOH)

1.0DM – 0.70DM = 0.70(DL + FOH) – DL

0.30DM = 0.70($360,000 + 240,000) – $360,000

DM = $200,000

Total manufacturing costs = $200,000 + $360,000 + $240,000 = $800,000

Ending WIP = 10% × TMC = 0.10 × $800,000 = $80,000

COGM = BWIP + TCM – EWIP = $68,000 + $800,000 – $80,000 = $788,000

BFI + COGM – EFI = COGS

EFI = $30,000 + $788,000 – $720,000 = $98,000 (1)

EDMI = BDMI + DM Purchases – DM Used

EDMI = $32,000 + $320,000 – $200,000 = $152,000

PROBLEM 2-58B (Continued)

MEDIUM-SIZED COMPANY

Cost of Goods Manufactured Schedule

For the month ended January 31, 2016

Work in process, beginning $ 68,000

Direct materials

Direct materials inventory,

  January 1 $ 32,000

Direct materials purchases 320,000

Total direct materials

  available for use  352,000

Less: Direct materials inventory,

  January 31(2) 152,000

Direct materials used $200,000

Direct labour  360,000

Manufacturing overhead 240,000

Total manufacturing costs 800,000

Total cost of work in process  868,000

Less: Work in process, ending (3)   80,000

Cost of goods manufactured $788,000

(b) Inventories destroyed:

|  |  |
| --- | --- |
| Finished goods | $98,0001 |
| Work in process | 80,0003 |
| Direct materials | 152,0002 |
| Total | $330,000 |

**SOLUTIONS TO CASES**

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| --- |
| CASE 2-59 |

Calculations to complete the data for operations in 2016:

|  |  |  |
| --- | --- | --- |
|  | Raw materials1 inventory, beginning | $13,000 |
|  | Raw material purchased | 13,000 |
|  | Raw materials available for use | 26,000 |
|  | Direct materials used | 20,000 |
|  | Raw materials inventory, ending | $ 6,000 |

1Assume all raw materials are used as direct materials

|  |  |  |
| --- | --- | --- |
|  | Direct materials | $20,000 |
|  | Direct labour | 25,000 |
|  | Factory overhead | 8,000 |
|  | Manufacturing costs added during the year | $53,000 |

|  |  |  |
| --- | --- | --- |
|  | Work in process inventory, beginning | $ 8,000 |
|  | Manufacturing costs (see above) | 53,000 |
|  | Total work in process during the year | 61,000 |
|  | Less: Work in process inventory, ending | 7,000 |
|  | Cost of goods manufactured | $54,000 |

|  |  |  |
| --- | --- | --- |
|  | Finished goods inventory, beginning | $ 6,000 |
|  | Plus: Cost of goods manufactured (see above) | 54,000 |
|  | Cost of goods available for sale | 60,000 |
|  | Less: Cost of goods sold | 55,000 |
|  | Finished goods inventory, ending | $ 5,000 |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Sales ($9,000 + $55,000) | $64,000 |  |
|  | Less: Cost of goods sold (given) | 55,000 |  |
|  | Gross profit (given) | 9,000 |  |
|  | Less: Operating expenses ($9,000 – ($4,000)) | 13,000 |  |
|  | Operating income (loss) | $ (4,000) |  |

CASE 2-59 (Continued)

BYDO INC

Cost of Goods Manufactured Schedule

For the Year Ended December 31, 2016

|  |  |  |  |
| --- | --- | --- | --- |
| Work in process, beginning |  |  | $8,000 |
| Direct materials: |  |  |  |
| Raw materials inventory, beginning | $13,000 |  |  |
| Plus: Raw materials purchases | 13,000 |  |  |
| Total raw materials available for use | 26,000 |  |  |
| Less: Raw materials inventory, ending | 6,000 |  |  |
| Direct materials used |  | $20,000 |  |
| Direct labour |  | 25,000 |  |
| Manufacturing overhead |  | 8,000 |  |
| Total manufacturing costs |  |  | 53,000 |
| Total cost of work in process |  |  | 61,000 |
| Less: Work in process, ending |  |  | 7,000 |
| Cost of goods manufactured |  |  | $54,000 |

BYDO INC

Schedule of Cost of Goods Sold

For the Year Ended December 31, 2016

|  |  |  |
| --- | --- | --- |
| Finished goods inventory, beginning |  | $ 6,000 |
| Plus: Cost of goods manufactured |  | 54,000 |
| Cost of goods available for sale |  | 60,000 |
| Less: Finished goods inventory, ending |  | 5,000 |
| Cost of goods sold |  | $55,000 |

BYDO INC

Income Statement

For the Year Ended December 31, 2016

|  |  |  |
| --- | --- | --- |
| Sales |  | $64,000 |
| Less: Cost of goods sold |  | 55,000 |
| CASE 2-59 (Continued)  Gross profit |  | 9,000 |
| Less: Operating expenses |  | 13,000 |
| Operating income (loss) |  | $(4,000) |

|  |
| --- |
| CASE 2-60 |

(a) Direct materials inventory, beginning $ 6,000

Plus: Direct materials purchased   18,000

Direct materials available for use  24,000

Less: Direct materials inventory, ending 10,000

**Direct materials used in production**  **$14,000**

(b) Finished goods inventory, beginning $12,000

Plus: Cost of goods manufactured   26,5003

Cost of goods available for sale   38,5002

Less: Finished goods inventory, ending    2,500

Cost of goods sold $ 36,0001

**1COGS = Sales of $60,000 × (100% – 40% Gross profit) = $36,000**

**2 $36,000 + $2,500 = $38,500**

**3 $38,500 – $12,000 = $26,500 which is cost of goods transferred out**

**Note: What we are looking for here is the "cost of goods manufactured" (which is footnote 3). In order to calculate this, we need to calculate "cost of goods available for sale" (which is footnote 2). In order to calculate this, we need to know "cost of goods sold," which we can calculate from the information provided (footnote 1).**

(c) Finished goods inventory, beginning $12,000

Cost of goods manufactured   28,0004

Cost of goods available for sale   $40,000

Work in process inventory, beginning $2,000

Plus: Direct materials used 20,000

Plus: Conversion costs   22,000

Total cost of work in process 44,000

Less: Work in process inventory, ending   16,0006

Cost of goods manufactured   $28,0005

**4** **$40,000 – $12,000 = $28,000**

**5** **Cost of goods manufactured = $28,000 from point (4)**

**6** **($2,000 + $20,000 + $22,000) – $28,000 = $16,000**

|  |
| --- |
| CASE 2-61 |

(a)

Sayers Manufacturing

Cost of Goods Manufactured Schedule

For the Month ended January 31, 2016

|  |  |  |
| --- | --- | --- |
| Work in process, beginning |  | $ 110,000 |
| Direct materials: |  |  |
| Direct materials inventory, beginning | $ 80,000 |  |
| Plus: Direct materials purchases | 900,000 |  |
| Total direct materials available for use | 980,000 |  |
| Less: Direct materials inventory, ending | 90,000 |  |
| Direct materials used | 890,000 |  |
| Direct labour | 710,000 |  |
| Manufacturing overhead1 | 386,600 |  |
| Total manufacturing costs |  | 1,986,600 |
| Total cost of work in process |  | 2,096,600 |
| Less: Work in process, ending |  | 74,600 |
| Cost of goods manufactured |  | $2,022,000 |

1 $75,000 + $50,000 + $125,000 + $92,500 + $2,800 + $10,000 + $31,300

(b)

Sayers Manufacturing

Schedule of Cost of Goods Sold

For the Month Ended January 31, 2016

|  |  |  |
| --- | --- | --- |
| Finished goods inventory, beginning |  | $ 95,000 |
| Plus: Cost of goods manufactured |  | 2,022,000 |
| Cost of goods available for sale |  | 2,117,000 |
| Less: Finished goods inventory, ending |  | 108,000 |
| Cost of goods sold |  | $2,009,000 |

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| CASE 2-62 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **(a)** | **Direct costs of production** | **$220.00** |  |
|  |  | **Indirect costs of production** | **180.00** |  |
|  |  | **Total costs of production** | **$400.00** |  |
|  |  |  |  |  |
|  | **(b)** | **Direct materials, beginning** | **$ 50.00** |  |
|  |  | **Plus: Direct material purchased** | **140.00** |  |
|  |  | **Total material available for use** | **190.00** |  |
|  |  | **Less: Direct materials, ending** | **80.00** |  |
|  |  | **Direct materials used** | **$110.00** |  |
|  |  |  |  |  |
|  | **(c)** | **Direct costs of production** | **$220.00** |  |
|  |  | **Less: Direct materials used** | **110.00** |  |
|  |  | **Direct labour** | **$110.00** |  |
|  |  |  |  |  |
|  | **(d)** | **Total variable costs of production1** | **$280.00** |  |
|  |  | **Less: direct costs of production** | **220.00** |  |
|  |  | **Variable overhead costs** | **$ 60.00** |  |
|  |  | **1Includes DM, DL, VOH** |  |  |
|  | **(e)** | **Total indirect costs of production2** | **$180.00** |  |
|  |  | **Less: variable overhead costs** | **60.00** |  |
|  |  | **Fixed manufacturing overhead** | **$120.00** |  |
|  |  | **2Indirect costs are overhead costs – both variable and fixed** | | |
|  | **(f)** | **Work in process, beginning** |  | **$140.00** |
|  |  | **Plus: Manufacturing costs** |  |  |
|  |  | **Direct material** | **$110.00** |  |
|  |  | **Direct labour** | **110.00** |  |
|  |  | **Variable manufacturing overhead** | **60.00** |  |
|  |  | **Fixed manufacturing overhead** | **120.00** | **400.00** |
|  |  | **Total work in process cost** |  | **540.00** |
|  |  | **Less: Work in process, ending** |  | **180.00** |
|  |  | **Cost of goods manufactured** |  | **$360.00** |

CASE 2-62 (Continued)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **(g)** | **Finished goods inventory, beginning** | **$240.00** |
|  |  | **Plus: Cost of goods manufactured** | **360.00** |
|  |  | **Cost of goods available for sale** | **600.00** |
|  |  | **Less: Finished goods inventory, ending** | **250.00** |
|  |  | **Cost of goods sold** | **$350.00** |
|  |  |  |  |
|  | **(h)** | **Direct Labour** | **$110.00** |
|  |  | **Variable manufacturing overhead** | **60.00** |
|  |  | **Fixed manufacturing overhead** | **120.00** |
|  |  | **Total conversion costs** | **$290.00** |
|  |  |  |  |
|  | **(i)** | **Direct materials** | **$110.00** |
|  |  | **Direct labour** | **110.00** |
|  |  | **Total prime costs** | **$220.00** |
|  |  |  |  |
|  | **(j)** | **Period costs =** |  |
|  |  | **Selling and administrative costs** | **$210.00** |
|  |  |  |  |

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| CASE 2-63 |

|  |  |  |
| --- | --- | --- |
|  | Raw materials inventory, beginning | $ 19,000 |
|  | Plus: Raw material purchased | 345,000 |
|  | Raw materials available for use | 364,000 |
|  | Less: Raw materials used in production | 350,000 |
|  | Raw materials inventory, ending | $ 14,000 |

|  |  |  |
| --- | --- | --- |
|  | Direct materials | $350,000 |
|  | Direct labour | 240,000 |
|  | Factory overhead ($240,000 × 60%) | 144,000 |
|  | Manufacturing costs added during the year | $734,000 |

|  |  |  |
| --- | --- | --- |
|  | Cost of goods available for sale | $770,000 |
|  | Less: finished goods inventory, beginning | 38,000 |
|  | Cost of goods manufactured | $732,000 |

|  |  |  |
| --- | --- | --- |
|  | Work in process inventory, beginning | $ 25,000 |
|  | Manufacturing costs | 734,000 |
|  | Total work in process during the year | 759,000 |
|  | Less: Cost of goods manufactured | 732,000 |
|  | Work in process inventory, ending | $ 27,000 |

|  |  |  |
| --- | --- | --- |
|  | Sales …………………… | $1,260,000 |
|  | Less: Gross profit ($1,260,000 × 40%) | 504,000 |
|  | Cost of goods sold | $ 756,000 |

|  |  |  |
| --- | --- | --- |
|  | Cost of goods available for sale | $770,000 |
|  | Less: cost of goods sold | 756,000 |
|  | Finished goods inventory, ending | $ 14,000 |

|  |
| --- |
| CASE 2-64 |

(a) The stakeholders in this situation are:

* The users of Robbin Industries’ financial statements.
* Wayne Terrago, controller.
* The vice-president of finance.
* The president of Robbin Industries.

(b) The ethical issues in this situation pertain to the adherence to sound and acceptable accounting principles. Intentional violation of current standards in order to satisfy a practical short-term personal or company need thereby creating misleading financial statements would be unethical. However, selecting one acceptable method of accounting and reporting among various acceptable methods is not necessarily unethical.

(c) Ethically, the management of Robbin Industries should be trying to report the financial condition and results of operations as fairly as possible; that is, in accordance with current accounting standards. Wayne should inform management what is acceptable accounting and what is not. The basic concept to be supported in this advertising cost transaction is matching costs and revenues. Normally, advertising costs are expensed in the period in which they are incurred because it is very difficult to associate them with specific revenues. Further, as advertising costs are not incurred to manufacture the product they should not be classified as product costs.

# CASE 2-65: “All About You” Activity

**There is no one specific correct response. Students should consider the wider implications of the situation, making assumptions as needed.**

1. **By eliminating one of the production shifts, the cost of labour could be reduced. However, the shortfall of 1,000 units (11,000 – 10,000) would have to be produced using overtime labour (assuming this is practical). This could result in a higher labour cost per unit than at the 20,000-production level.**

**Also, it is possible that material costs will increase if the company is no longer able to get volume discounts from its suppliers.**

1. **Fixed costs could be reduced by:** 
   * **A partial closure of plant or consolidating activities to one location in plant**
   * **Subletting a portion of the plant**
   * **Closing plant completely and outsourcing production of the 11,000 units**
2. **Other options for the company, to increase profits are to**
   * **consider utilizing the excess production capacity created by the bankruptcy to produce another product**
   * **diversify their customer base**
   * **reduce discretionary expenditures**
   * **negotiate improved prices from suppliers**
   * **research assistance packages from provincial or federal governments**

SOLUTION TO DECISION-MAKING AT CURRENT DESIGNS

**DM2-1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Payee | Purpose | Product Costs | | | Period Costs |
| Direct Materials | Direct Labour | Manufacturing Overhead |
| Winona Agency | Property insurance for the manufacturing plant |  |  | X |  |
| Bill Johnson (sales manager) | Payroll–payment to sales manager |  |  |  | X |
| Xcel Energy | Electricity for manufacturing plant |  |  | X |  |
| Winona Printing | Price lists for salespeople |  |  |  | X |
| Jim Kaiser (sales representative) | Sales commissions |  |  |  | X |
| Dave Thill (plant manager) | Payroll–payment to plant manager |  |  | X |  |
| Dana Schultz (kayak assembler) | Payroll–payment to kayak assembler |  | X |  |  |
| Composite One | Bagging film used when kayaks are assembled; it is discarded after use. |  |  | X |  |
| Fastenal | Shop supplies–brooms, paper towels, etc. |  |  | X |  |
| Ravago | Polyethylene powder which is the main ingredient for the rotational moulded kayaks | X |  |  |  |
| Winona County | Property taxes on manufacturing plant |  |  | X |  |
| North American Composites | Kevlar® fabric for composite kayaks | X |  |  |  |
| Waste Management | Garbage disposal for the company office building |  |  |  | X |
| None | Journal entry to record depreciation of manufacturing equipment |  |  | X |  |

SOLUTION TO WATERWAYS CONTINUING PROBLEM WCP-2

(a) Direct labour:

($176,000 – $148,000) ÷ ($32,000 – $24,000) = 350%

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Activity Level | | |
|  |  | High |  | Low |
|  |  |  |  |  |
| Total cost  Less: Variable costs  32,000 × 350%  24,000 × 350%  Total fixed costs |  | $176,000   112,000  000,00 0  $ 64,000 |  | $148,000   84,000  $ 64,000 |

The cost formula is: $64,000 + 3.50X.

Hours of Operation:

($170,000 – $145,000) ÷ (700 – 500) = $125 per hour

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Activity Level | | |
|  |  | High |  | Low |
|  |  |  |  |  |
| Total cost  Less: Variable costs  700 × $125  500 × $125  Total fixed costs |  | $170,000   87,500  000,00 0  $ 82,500 |  | $145,000   62,500  $ 82,500 |

The cost formula is: $82,500 + $125X.

WCP-2 (Continued)

(b) First determine the direct labour cost for the month:

$70,000 x (100% - 60%) = $28,000.

Then, if we substitute the actual values of the activity bases from the current month we would get the following estimates:

Labour dollars: $64,000 + (3.5 × $28,000) = $162,000

Hours of operation: $82,500 + ($125 × 600) = $157,500

Actual manufacturing overhead for the month has to be calculated as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Total manufacturing costs (given)** | |  | **$315,000** |
| **Less:** | **Direct material (1)** | **$132,000** |  |
|  | **Direct labour (2)** | **28,000** | **160,000** |
| **Manufacturing overhead** | |  | **$155,000** |
|  |  |  |  |
| **(1) Direct Material** | |  |  |
| **Raw materials inventory, beg** | |  | **$35,000** |
| **Plus: raw material purchases** | |  | **191,000** |
| **Raw materials available for use** | |  | **226,000** |
| **Less: Raw materials inventory, end** | |  | **50,000** |
| **Raw materials used in production** | |  | **176,000** |
| **Less: indirect materials (25%)** | |  | **44,000** |
| **Direct materials used in production** | |  | **$132,000** |
|  |  |  |  |
| **(2) Total salaries and wages** | |  | **$70,000** |
| **Less: Indirect wages (60%)** | |  | **42,000** |
| **Direct labour used in production** | |  | **$28,000** |

As the actual manufacturing overhead was $155,000 for the month, hours of operation would be the better choice as an activity base for predicting manufacturing overhead.

WCP-2 (Continued)

**(c)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Waterways Corporation** | | | | | | | | | | | | |
| **Schedule of Cost of Goods Manufactured** | | | | | | | | | | | | |
|  |  |  | |  | |  | | | | |  |  |
| **Work in process, beginning** | |  | |  |  | | |  | **$52,000** | | | | |
| **Direct materials:** | |  | |  |  | | |  |  | | | | |
|  | **Raw materials inventory, beginning** | **$35,000** | |  | |  | | | | |  |  |
|  | **Raw material purchases** | **191,000** |  |  | | |
|  | **Total raw materials available for use** | **226,000** | |  |  | | |  |  | | | | |
|  | **Less: Raw materials inventory, ending** | **50,000** | |  |  | | |  |  | | | | |
|  | **Raw materials used in production** | **176,000** |  |  | | | | | |
|  | **Less: indirect materials** | **44,000** | |  |  | | |  |  | | | | |
| **Direct materials** | |  | |  | **$132,000** | | |  |  | | | | |
| **Direct labour** | |  | |  | **28,000** | | |  |  | | | | |
| **Manufacturing overhead** | |  | |  | **155,000** | | |  |  | | | | |
| **Total manufacturing costs** | |  | |  |  | | |  | **315,000** | | | | |
| **Total cost of work in process** | |  | |  |  | | |  | **367,000** | | | | |
| **Less: Work in process, ending (3)** | |  | |  |  | | |  | **42,000** | | | | |
| **Cost of goods manufactured** | |  | |  |  | | |  | **$325,000** | | | | |

**(3) Work in process, ending**

|  |  |  |
| --- | --- | --- |
| **Work in process beginning** |  | **$52,000** |
| **Plus: total manufacturing costs** |  | **315,000** |
| **Total cost of work in process** |  | **367,000** |
| **Less: cost of goods manufactured** |  | **325,000** |
| **Work in process ending** |  | **$42,000** |

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