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** |  | **TimeAllotted (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** |  | **TimeAllotted (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 COSTRelevant Range |  |  |  | FIXED COSTRelevant 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 costLess: Variable costs 8,200 × $1.30 5,000 × $1.30Total 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 costLess: Variable costs 40,000 × $1.50 18,000 × $1.50Total fixed costs |  | $65,000 60,000000,000$ 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 |
|  |  |  |  |  |  |
|  | DirectMaterials |  | DirectLabour |  | FactoryOverhead |
|  |  |  |  |  |  |
| (a)(b)(c)(d) | X |  | X |  | XX |

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | DirectMaterials Used |  | DirectLabour Used |  | FactoryOverhead |  | TotalManufacturingCosts |
|  |  |  |  |  |  |  |  |
| (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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | TotalManufacturingCosts |  | Work inProcess(1/1) |  | Work inProcess(12/31) |  | Cost of GoodsManufactured |
|  |  |  |  |  |  |  |  |
| (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 CostsFixed CostsMixed 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 materialsDirect labourUtilities |  | VariableVariableMixed |  | RentMaintenanceSupervisory salaries |  | FixedMixedFixed |

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) |
|  |  | = | CostUnits |  |  |
|  |  | = | $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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  | 700Machine Hours |  | 300Machine Hours |
|  |  |  |  |  |  |
|  | Total costsLess: Variable costs  700 × $6.00  300 × $6.00Total 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 costLess: Variable costs 8,000 × $.50 3,500 × $.50Total fixed costs |  | $5,000 4,00000,000$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 |  | DirectMaterials |  | DirectLabour |  | Manufact.Overhead |  | PeriodCosts |
|  |  |  |  |  |  |  |  |  |
| Maintenance on factory buildingFactory manager’s salaryAdvertising for helmetsSales commissionsDepreciation on factory buildingRent on factory equipmentInsurance on factory buildingRaw materialsUtility costs for factorySupplies for general officeWages for assembly line workersDepreciation on office equipmentMiscellaneous materials |  |  $20,000 |  | $55,000 |  | $ 1,300 4,000   700 6,000    3,000800  2,000 |  | $ 8,0005,000      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 | DirectMaterials | DirectLabour | MOH |  | PeriodCosts |
|  |  |  |  |  |  |
| Raw materials (1)Wages for workers (2)Rent on equipmentIndirect materials (3)Factory supervisor’s salaryJanitorial costsAdvertisingDepreciation–factory building (4)Property taxes–factory building (5) | $60,000000,000$60,000 | $65,000000,000$65,000 | $ 1,500  7,500  3,500  1,400    800     600$15,300 |  | $6,00000,000$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%

|  |
| --- |
| 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**

|  |
| --- |
| PROBLEM 2-47A |

|  |  |  |
| --- | --- | --- |
|  **(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 = SalesSales = 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.

|  |
| --- |
| 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 |

|  |  |  |
| --- | --- | --- |
| (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**

|  |
| --- |
| PROBLEM 2-49B |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (a) and (b) |  | Product Costs |  |  |
|  |  |  |  |  |  |  |  |  |
| Cost Item |  | DirectMaterials |  | DirectLabour |  | Manufact.Overhead |  | PeriodCosts |
|  |  |  |  |  |  |  |  |  |
| Maintenance costs on factory buildingFactory manager’s salaryAdvertising for helmetsSales commissionsDepreciation on factory buildingRent on factory equipmentInsurance on factory buildingRaw materialsUtility costs for factorySupplies for general officeWages for assembly-line workersDepreciation on office equipmentMiscellaneous materials |  | $20,000000,000$20,000 |  | $54,000000,000$54,000 |  | $ 1,500  4,000    700  6,000  3,000    800  2,000$18,000 |  |   8,000  5,000    200    500000,000$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

|  |
| --- |
| PROBLEM 2-50B |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (a) |  | Product Costs |  |  |
|  |  |  |  |  |  |  |  |  |
| Cost Item |  | DirectMaterials |  | DirectLabour |  | MOH |  | PeriodCosts |
|  |  |  |  |  |  |  |  |  |
| Raw materials (1)Wages for workers (2)Rent on equipmentIndirect materials (3)Factory supervisor’s salaryJanitorial costsAdvertisingDepreciation – factory (4)Property taxes – factory (5) |  | $57,500000,000$57,500 |  | $65,000000,000$65,000 |  | $ 1,300  7,500  3,500  1,400    700    600$15,000 |  | $6,00000,000$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.  |

|  |
| --- |
| 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

|  |
| --- |
| 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

|  |
| --- |
| 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

|  |
| --- |
| PROBLEM 2-55B |

|  |  |  |
| --- | --- | --- |
|  **(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 = SalesSales = 130% × CGSCGS = $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.

|  |
| --- |
| 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%

|  |
| --- |
| 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

|  |
| --- |
| 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 |

|  |
| --- |
| 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**  |
|  |  |  |  |

|  |
| --- |
| 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 costLess: Variable costs 32,000 × 350% 24,000 × 350%Total fixed costs |  | $176,000 112,000000,00 0$ 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 costLess: Variable costs 700 × $125 500 × $125Total fixed costs |  | $170,000 87,500000,00 0$ 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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