# Hilton chapter 3

**Answers to Assigned End of Chapter Exercises, Problems, Cases**

# Answers to Review Questions

3-1 (a) Use in financial accounting: In financial accounting, product costs are needed to determine the value of inventory on the balance sheet and to compute the cost-of-goods-sold expense on the income statement.

1. Use in managerial accounting: In managerial accounting, product costs are needed for planning, for cost control, and for decision making.
2. Use in cost management: In order to manage, control, or reduce the costs of manufacturing products or providing services, management needs a clear idea of what those costs are.

(d) Use in reporting to interested organizations: Product cost information is used in reporting on relationships between firms and various outside organizations. For example, public utilities such as electric and gas companies record product costs to justify rate increases that must be approved by state regulatory agencies.

3-2 In a job-order costing system, costs are assigned to batches or job orders of production. Job-order costing systems are used by firms that produce relatively small numbers of dissimilar products. In a process-costing system, production costs are averaged over a large number of product units. Process-costing systems are used by firms that produce large numbers of nearly identical products.

3-3 Concepts of product costing are applied in service industry firms to inform management of the costs of producing services. For example, banks record the costs of producing financial services for the purposes of planning, cost control, and decision making.

3-4 a. Material requisition form: A document upon which the production department supervisor requests the release of raw materials for production.

b. Labor time record: A document upon which employees record the time they spend working on each production job or batch.

c. Job-cost record: A document on which the costs of direct material, direct labor, and manufacturing overhead are recorded for a particular production job or batch. The job-cost sheet is a subsidiary ledger account for the Work-in-Process Inventory account in the general ledger.

3-5 Although manufacturing-overhead costs are not directly traceable to products, manufacturing operations cannot take place without incurring overhead costs. Consequently, overhead costs are applied to products for the purpose of making pricing decisions, in order to ensure that product prices cover all of the costs of production.

3-6 The primary benefit of using a predetermined overhead rate instead of an actual overhead rate is to provide timely information for decision making, planning, and control.

3-7 An advantage of prorating overapplied or underapplied overhead is that it results in the adjustment of all the accounts affected by misestimating the overhead rate. These accounts include the Work-in-Process Inventory account, the Finished-Goods Inventory account, and the Cost of Goods Sold account. The resulting balances in these accounts are more accurate when proration is used than when overapplied or underapplied overhead is closed directly into Cost of Goods Sold. The primary disadvantage of prorating overapplied or underapplied overhead is that it is more complicated and time-consuming than the simpler alternative of closing overapplied or underapplied overhead directly into Cost of Goods Sold.

3-8 An important cost-benefit issue involving accuracy versus timeliness in accounting for overhead involves the use of a predetermined overhead rate or an actual overhead rate. Since an actual overhead rate is computed after costs have been incurred and activity has been recorded, it is more accurate than a predetermined rate. However, a predetermined overhead rate is more timely than an actual rate, since the predetermined rate is computed earlier and in time to be used for making decisions, planning, and controlling operations.

3-9 The difference between actual and normal costing systems involves the procedure for applying manufacturing overhead to Work-in-Process Inventory. Under actual costing, applied overhead is the product of the actual overhead rate (computed at the end of the period) and the actual amount of the cost driver used. Under normal costing, applied overhead is the product of the predetermined overhead rate (computed at the beginning of the period) and the actual amount of the cost driver used.

3-10 When a single volume-based cost driver is used to apply manufacturing overhead, the managerial accountant's primary objective is to select a cost driver that varies in a pattern similar to the pattern in which manufacturing overhead varies. Moreover, if a single cost driver is used, it should be some productive input that is common to all of the firm's products.

3-11 The benefit of using multiple overhead rates is that the resulting product-costing information is more accurate and more useful for decision making than is the information that results from using a single overhead rate. However, the use of multiple cost drivers and overhead rates is more complicated and more costly.

3-12 The development of departmental overhead rates involves a two-stage process. In stage one, overhead costs are assigned to the firm's production departments. First, overhead costs are distributed to all departments, including both service and production departments. Second, costs are allocated from the service departments to the production departments. At the end of stage one, all overhead costs have been assigned to the production departments.

In stage two, the costs that have been accumulated in the production departments are applied to the production jobs that pass through the departments.

3-13 a. Overhead cost distribution: Assignment of all manufacturing-overhead costs to department overhead centers.

b. Service department cost allocation: Allocation of service department costs to production departments on the basis of the relative proportion of each service department's output that is used by the various production departments.

c. Overhead application (or overhead absorption): The assignment of all manufacturing overhead costs accumulated in a production department to the jobs that the department has worked on.

These three processes are used in developing departmental overhead rates.

3-14 Job-order costing concepts are used in professional service firms. However, rather than referring to production “jobs,” such organizations use terminology that reflects their operations. For example, hospitals and law firms assign costs to “cases,” and governmental agencies often refer to “programs” or “missions.” It is important in such organizations to accumulate the costs of providing the services associated with a case, project, contract, or program. Such cost information is used for planning, cost control, and pricing, among other purposes.

3-15 A cost driver is a characteristic of an event or activity that results in the incurrence of costs by that event or activity. A volume-based cost driver is one that is closely associated with production activity, such as the number of units produced, direct-labor hours, or machine hours.

3-16 When direct material, direct labor, and manufacturing-overhead costs are incurred, they are applied to Work-in-Process Inventory by debiting the account. When goods are finished, the costs are removed from that account with a credit, and they are transferred to Finished-Goods Inventory by debiting that account. Subsequently, when the goods are sold, Finished-Goods Inventory is credited, and the costs are added to Cost of Goods Sold with a debit.

3-17 Hospitals use job-order costing concepts to accumulate the costs associated with each case treated in the hospital. For example, the costs of treating a heart patient would be assigned to that patient's case. These costs would include the hospital room, food and beverages, medications, and specialized services such as diagnostic testing and X rays.

3-18 Some manufacturing firms are switching from direct-labor hours to machine hours or throughput time as the basis for overhead application as a result of increased automation in their factories. With increased automation comes a reduction in the amount of direct labor used in the production process. In such cases, direct labor may cease to be a cost driver that varies in a pattern similar to the way in which manufacturing-overhead costs are incurred.

3-19 Overapplied or underapplied overhead is caused by errors in estimating the predetermined overhead rate. These errors can occur in the numerator (budgeted manufacturing overhead), or in the denominator (budgeted level of the cost driver).

3-20 Overapplied or underapplied overhead can be closed directly into Cost of Goods Sold, or it can be prorated among Work-in-Process Inventory, Finished-Goods Inventory, and Cost of Goods Sold.

3-21 A large retailer could use EDI to exchange such documents as purchase orders, shipping and receiving notices, and invoices electronically with its suppliers. Electronic data interchange (EDI) is the direct exchange of data via a computer-to-computer interface.

3-22 An engineer could use bar code technology to record how she spends her time. Bar codes would be assigned to her and to each of her activities. Each time she arrived at work, left work, or changed activity at work, the engineer would scan her personal bar code and the bar code of the appropriate action or activity. Examples of activities are designing, redesigning, or testing a product; change orders; visiting the factory floor; constructing a prototype; and being trained.

# SOLUTIONS to ASSIGNED EXERCISES

## Exercise 3-35

**1. Predetermined overhead rate = $993,300 / 77,000 hours = $12.90 per hour**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2. | To compute actual manufacturing overhead: | | | | | |  |  |
|  |  | | | | | |  |  |
|  | Depreciation | | | | | |  | $225,000 |
|  | Property taxes | | | | | |  | 19,000 |
|  | Indirect labor | | | | | |  | 79,000 |
|  | Supervisory salaries | | | | | |  | 210,000 |
|  | Utilities | | | | | |  | 58,000 |
|  | Insurance | | | | | |  | 32,000 |
|  | Rental of space | | | | | |  | 295,000 |
|  | Indirect material: | | | | | |  |  |
|  | Beginning inventory, January 1 | | | | | | $ 46,000 |  |
|  | Add: Purchases | | | | | | 95,000 |  |
|  | Indirect material available for use | | | | | | $141,000 |  |
|  | Deduct: Ending inventory, December 31 | | | | | | 62,000 |  |
|  | Indirect material used | | | | | |  | 79,000 |
|  | Actual manufacturing overhead | | | | | |  | $997,000 |
|  |  |  |  |  |  |  | |  |
|  |  |  | actual |  | applied |  | |  |
|  | Overapplied | = | manufacturing | – | manufacturing |  | |  |
|  | overhead |  | overhead |  | overhead |  | |  |
|  |  |  |  | | | | | |
|  |  | = | $997,000 – ($12.9079,000\*) = $22,100 | | | | | |

\*Actual direct-labor hours.

|  |  |  |  |
| --- | --- | --- | --- |
| 3. | Manufacturing Overhead | 22,100 |  |
|  | Cost of Goods Sold |  | 22,100 |

## Exercise 3-36

Calculation of proration amounts:

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  | Calculation of |
| Account | Amount | Percentage | Percentage |
| Work in Process | $ 29,000 | 20% | 29,000  $145,000 |
| Finished Goods | 50,750 | 35% | 50,750  $145,000 |
| Cost of Goods Sold | 65,250 | 45% | 65,250  $145,000 |
| Total | $145,000 | 100% |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Underapplied |  |  | Amount Added |
| Account | Overhead | x | Percentage | to Account |
| Work in Process | $22,000\* | x | 20% | $4,400 |
| Finished Goods | 22,000 | x | 35% | 7,700 |
| Cost of Goods Sold | 22,000 | x | 45% | 9,900 |

\*Underapplied overhead = actual overhead – applied overhead

$22,000 = $167,000 – $145,000

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | |  |  |
| Journal entry: | | |  |  |
|  | | |  |  |
| Work-in-Process Inventory | | 4,400 |  |
| Finished-Goods Inventory | | 7,700 |  |
| Cost of Goods Sold | | 9,900 |  |
| Manufacturing Overhead |  | 22,000 |

## Exercise 3-37

Budgeted overhead rate = budgeted overhead / budgeted direct professional labor

170% = 510,000 *euros* / 300,000 *euros*

|  |  |  |
| --- | --- | --- |
| Contract to redecorate mayor’s offices: |  | |
|  |  | |
| Direct material | 4,100 *euros* | |
| Direct professional labor | 7,000 *euros* | |
| Overhead (170% × 7,000 *euros*) | 11,900 *euros* | |
| Total contract cost | 23,000 *euros* |

# SOLUTIONS to ASSIGNED PROBLEMS

**PROBLEM 3-47**

NOTE: Actual selling and administrative expense, although given in the exercise, is irrelevant to the solution.

1. Machining Dept. overhead rate = budgeted overhead ÷ budgeted machine hours

= $2,000,000 ÷ 200,000 = $10 per machine hour

Assembly Dept. overhead rate = budgeted overhead ÷ budgeted direct-labor cost

= $1,540,000 ÷ $2,800,000 = 55% of direct-labor cost

2. The ending work-in-process inventory is carried at a cost of $76,765, computed as follows:

|  |  |  |
| --- | --- | --- |
| Machining Department: |  |  |
| Direct material…………………………………… | $12,250 |  |
| Direct labor………………………………………. | 13,950 |  |
| Manufacturing overhead (180 x $10)………… | 1,800 | $ 28,000 |
| Assembly Department: |  |  |
| Direct material…………………………………… | $ 3,350 |  |
| Direct labor………………………………………. | 29,300 |  |
| Manufacturing overhead ($29,300 x 55%)….. | 16,115 | 48,765 |
| Total cost……………………………………………... |  | $ 76,765 |

3. Actual overhead in the Machining Department amounted to $2,130,000, whereas applied overhead totaled $2,125,000 (212,500 hours x $10). Thus, overhead was underapplied by $5,000 during the year.

4. Actual overhead in the Assembly Department amounted to $1,525,000, whereas applied overhead totaled $1,589,500 ($2,890,000 x 55%). Thus, overhead was overapplied by $64,500.

5. The company’s manufacturing overhead was overapplied by $59,500 ($64,500 - $5,000). As a result, excessive overhead flowed from Work-in-Process Inventory, to Finished-Goods Inventory, to Cost of Goods Sold, meaning that the Cost of Goods Sold account must be decreased at year-end.

6. The Work-in-Process account is charged with applied overhead, or $3,714,500 ($2,125,000 + $1,589,500).

**PROBLEM 3-48**

1. Traceable costs total $3,750,000, computed as follows:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Total Cost | Percent  Traceable | Traceable  Cost |
|  |  |  |  |
| Professional staff salaries……… | $3,750,000 | 80% | $3,000,000 |
| Administrative support staff…… | 450,000 | 60 | 270,000 |
| Photocopying…………………….. | 75,000 | 90 | 67,500 |
| Travel………………………………. | 375,000 | 90 | 337,500 |
| Other operating costs…………… | 150,000 | 50 | 75,000 |
| Total……………………………. | $4,800,000 |  | $3,750,000 |

Golden State Enterprises’ overhead (i.e., the nontraceable costs) total $1,050,000 ($4,800,000 - $3,750,000).

1. Predetermined overhead rate = budgeted overhead ÷ traceable costs = $1,050,000 ÷ $3,750,000 = 28% of traceable costs
2. Target profit percentage = target profit ÷ total cost

= $960,000 ÷ $4,800,000 = 20% of cost

1. The total cost of the Davis Manufacturing project is $96,000, and the billing is $115,200, as follows:

|  |  |
| --- | --- |
| Professional staff salaries… ……… | $61,500 |
| Administrative support staff……… | 3,900 |
| Photocopying………………………… | 750 |
| Travel………………………………….. | 6,750 |
| Other operating costs………………. | 2,100 |
| Subtotal…………………………… | $75,000 |
| Overhead ($75,000 x 28%)…………. | 21,000 |
| Total cost…………………………. | $96,000 |
| Markup ($96,000 x 20%)……………. | 19,200 |
| Billing to Davis……………………… | $115,200 |

1. Possible nontraceable costs include utilities, rent, depreciation, advertising, top management salaries, and insurance.

6. Professional staff members are compensated for attending training sessions and firm-wide planning meetings, paid vacations, and completion of general, non-client-related paperwork and reports. These activities benefit multiple clients, the consultant, and/or the overall firm, making traceability to specific clients difficult if not impossible.