# Hilton chapter 4

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

# Answers to Review Questions

4-1 In a job-order costing system, costs are assigned to batches or job orders of production. Job-order costing is used by firms that produce relatively small numbers of dissimilar products. In a process-costing system, costs are averaged over a large number of product units. Process costing is used by firms that produce large numbers of nearly identical products.

4-2 Process costing would be an appropriate product-costing system in the following industries: petroleum, food processing, lumber, chemicals, textiles, and electronics. Each of these industries is involved in the production of very large numbers of highly similar products.

4-3 Process costing could be used in the following nonmanufacturing enterprises: processing of tests in a medical diagnostic laboratory, processing of tax returns by the Internal Revenue Service, and processing of loan applications in a bank.

4-4 Product-costing systems are used for the following purposes:

(a) In financial accounting: Product costs are needed to value inventory on the balance sheet and to compute the cost-of-goods-sold expense on the income statement.

(b) In managerial accounting: Product costs are needed for planning, for cost control, and to provide managers with data for decision making.

(c) In reporting to interested organizations: Product cost information is used to report on relationships between firms and various outside organizations. For example, hospitals keep track of the costs of medical procedures that are reimbursed by insurance companies or by the federal government under the Medicare program.

4-5 An equivalent unit is a measure of the amount of productive effort applied in the production process. In process costing, costs are assigned to equivalent units rather than to physical units.

4-6 The following four steps are used in process costing:

(a) Analysis of physical flow of units: All of the units in the beginning and ending inventories, those started during the period, and those transferred out to finished goods are accounted for.

(b) Calculation of equivalent units: The equivalent units of activity are computed for direct material and for conversion.

(c) Computation of unit costs: The costs per equivalent unit for direct material and conversion are computed.

(d) Analysis of total costs: The cost of the goods completed and transferred out and the cost of the ending work-in-process inventory are determined.

4-7 (a) Journal entry to enter direct-material costs into Work-in-Process Inventory account:

|  |  |  |
| --- | --- | --- |
| Work-in-Process Inventory: Department A | XXX |  |
| Raw-Material Inventory |  | XXX |

(b) Journal entry to record transfer of goods from the first to the second department in the production sequence:

|  |  |  |
| --- | --- | --- |
| Work-in-Process Inventory: Department B | XXX |  |
| Work-in-Process Inventory: Department A |  | XXX |

4-8 Transferred-in costs are the costs assigned to partially completed products that have been completed in one production department and transferred from that production department into the next department.

4-9 The $182,000 of transferred-in costs were incurred prior to January 1 and in the mixing department. The costs must have been incurred prior to January 1, because they are included in the cost of the beginning work-in-process inventory on that date. Moreover, these costs must have been incurred in the mixing department, because they have been transferred into the cooking department.

4-10 The name ''weighted-average method'' comes from the fact that the cost per equivalent unit computed under this method is a weighted average of costs incurred during the current period and costs incurred during prior periods.

4-11 The difference between normal and actual costing lies in the calculation of the manufacturing-overhead cost of the current period. Under actual costing, the manufacturing-overhead cost of the current period is the actual overhead cost incurred during the period. Under normal costing, the current-period manufacturing overhead is computed as the product of the predetermined overhead rate and the actual level of the cost driver used to apply manufacturing overhead.

4-12 If manufacturing overhead were applied according to some activity base (or cost driver) other than direct labor, then direct-labor costs and manufacturing-overhead costs would be accounted for separately instead of being combined into one account called "conversion costs." Thus, instead of two columns for direct-material and conversion costs, there would be three columns: direct material, direct labor, and manufacturing overhead.

4-13 Operation costing is a hybrid product-costing system that is used when conversion activities are very similar across product lines, but the direct materials differ significantly. This is often the case in batch manufacturing operations. Conversion costs are accumulated by department, and process-costing methods are used to assign these costs to products. In contrast, direct-material costs are accumulated by job order or by batch, and job-order costing is used to assign direct-material costs to products.

4-14 The departmental production report is the key document in a process-costing system rather than the job-cost sheet used in job-order costing. The departmental production report shows the analysis of the physical flow of units, the calculation of equivalent units, the computation of the cost per equivalent unit, and the analysis of the total costs incurred in the production department. The report shows the cost of the ending work-in-process inventory as well as the cost of the goods completed and transferred out of the department.

# SOLUTIONS to ASSIGNED EXERCISES

## Exercise 4-21 (15 minutes)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Calculation of Cost per Equivalent Unit: MONTANA Lumber Company | | | | | |
| Weighted-Average Method | | | | | |
|  | Direct Material | | Conversion | | Total |
| Work in process, June 1 | $ 74,900 | $167,000 | | $  241,900 | |
| Costs incurred during June | 380,700 | 625,000 | | 1,005,700 | |
| Total costs to account for | $455,600 | $792,000 | | $1,247,600 | |
| Equivalent units | 6,700 | 1,600 | |  | |
| Costs per equivalent unit | $68\* | $495† | | $563 | |

\*$68 = $455,600 ÷ 6,700

†$495 = $792,000 ÷ 1,600

## Exercise 4-23

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| RALEIGH Textiles Company | | | | | | | |
| Weighted-Average Method | | | | | | | |
|  | | Direct Material | | | Conversion | | Total |
| Work in process, November 1 | | $ 85,750 | $ 16,900 | | | $ 102,650 | |
| Costs incurred during November | | 158,000 | 267,300 | | | 425,300 | |
| Total costs to account for | | $243,750 | $284,200 | | | $527,950 | |
| Equivalent units | | 62,500 | 49,000 | | |  | |
| Costs per equivalent unit | | $3.90 | $5.80 | | | $9.70 | |
|  |  |  | | |  | |  |
| 1. | Cost of goods completed and  transferred out during November: |  | | |  | |  |
|  |  | | | 47,000$9.70 | | | $455,900 |
|  |  |  | | |  | |  |
| 2. | Cost remaining in November 30  work in process: |  | | |  | |  |
|  |  |  | | |  | |  |
|  | Direct material (15,500\*$3.90) |  | | | $60,450 | |  |
|  | Conversion (2,000\*$5.80) |  | | | 11,600 | |  |
|  | Total |  | | |  | | 72,050 |
|  | Total costs accounted for |  | | |  | | $527,950 |

\*Equivalent units in November 30 work in process:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Direct Material | Conversion | |
| Total equivalent units (weighted average) | 62,500 | | 49,000 |
| Units completed and transferred out | (47,000) | | (47,000) |
| Equivalent units in ending work in process | 15,500 | | 2,000 |

# SOLUTIONS to ASSIGNED PROBLEMS

## Problem 4-26

1. Physical flow of units:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | | | | | | | | Physical  Units | | |
| Work in process, April 1 | | | | | | | | | | 10,000 | | |
| Units started during April | | | | | | | | | | 100,000 | | |
| Total units to account for | | | | | | | | | | 110,000 | | |
| Units completed and transferred out during April | | | | | | | | | | 80,000 | | |
| Work in process, April 30 | | | | | | | | | | 30,000 | | |
|  | Total units accounted for | | | | | | | | | 110,000 | | |
| 2. | Equivalent units: | |  | |  | |  | |  | | |
|  |  | | Physical Units | | Percentage of Completion with Respect to Conversion | | Equivalent Units | | | | |
| Direct Material | | Conversion | | |
|  | Work in process, April 1 | | 10,000 | | 20% | |  | |  | | |
|  | Units started during April | | 100,000 | |  | |  | |  | | |
|  | Total units to account for | | 110,000 | |  | |  | |  | | |
|  | Units completed and  transferred out during April | | 80,000 | | 100% | | 80,000 | | 80,000 | | |
|  | Work in process, April 30 | | 30,000 | | 33 1/3% | | 30,000 | | 10,000 | | |
|  | Total units accounted for | | 110,000 | |  | | \_\_\_\_\_\_ | | \_\_\_\_\_ | | |
|  | Total equivalent units | |  | |  | | 110,000 | | 90,000 | | |
| 3. | | Cost per equivalent unit: | |  | |  | | | |  |
|  | |  | | Direct Material | | Conversion | | | | Total |
|  | | Work in process, April 1 | | $ 22,000 | | $  4,500 | | $ 26,500 | | |
|  | | Costs incurred during April | | 198,000 | | 158,400 | | 356,400 | | |
|  | | Total costs to account for | | $220,000 | | $162,900 | | $382,900 | | |
|  | | Equivalent units | | 110,000 | | 90,000 | |  | | |
|  | | Costs per equivalent unit | | $2.00\* | | $1.81† | | $3.81 | | |

\*$2.00 = $220,000 ÷ 110,000

†$1.81 = $162,900 ÷ 90,000

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 4. | Cost of goods completed and transferred out during April: | |  |  |
|  |  |  |  |  |
|  |  | 80,000$3.81 |  | $304,800 |
|  |  | |  |  |
|  | Cost remaining in April 30 work-in-process inventory: | |  |  |
|  |  |  |  |  |
|  | Direct material: |  |  |  |
|  |  |  |  |  |
|  |  | 30,000$2.00 |  | $60,000 |
|  |  |  |  |  |
|  | Conversion: |  |  |  |
|  |  |  |  |  |
|  |  | 10,000$1.81 |  | 18,100 |
|  |  | |  |  |
|  | Total cost of April 30 work-in-process | |  | $78,100 |
|  |  |  |  |  |
|  | Check: Cost of goods completed and transferred out | |  | $304,800 |
|  | Cost of April 30 work-in-process inventory | |  | 78,100 |
|  | Total costs accounted for | |  | $382,900 |