# Solutions for Managerial Accounting 5th Edition by Whitecotton

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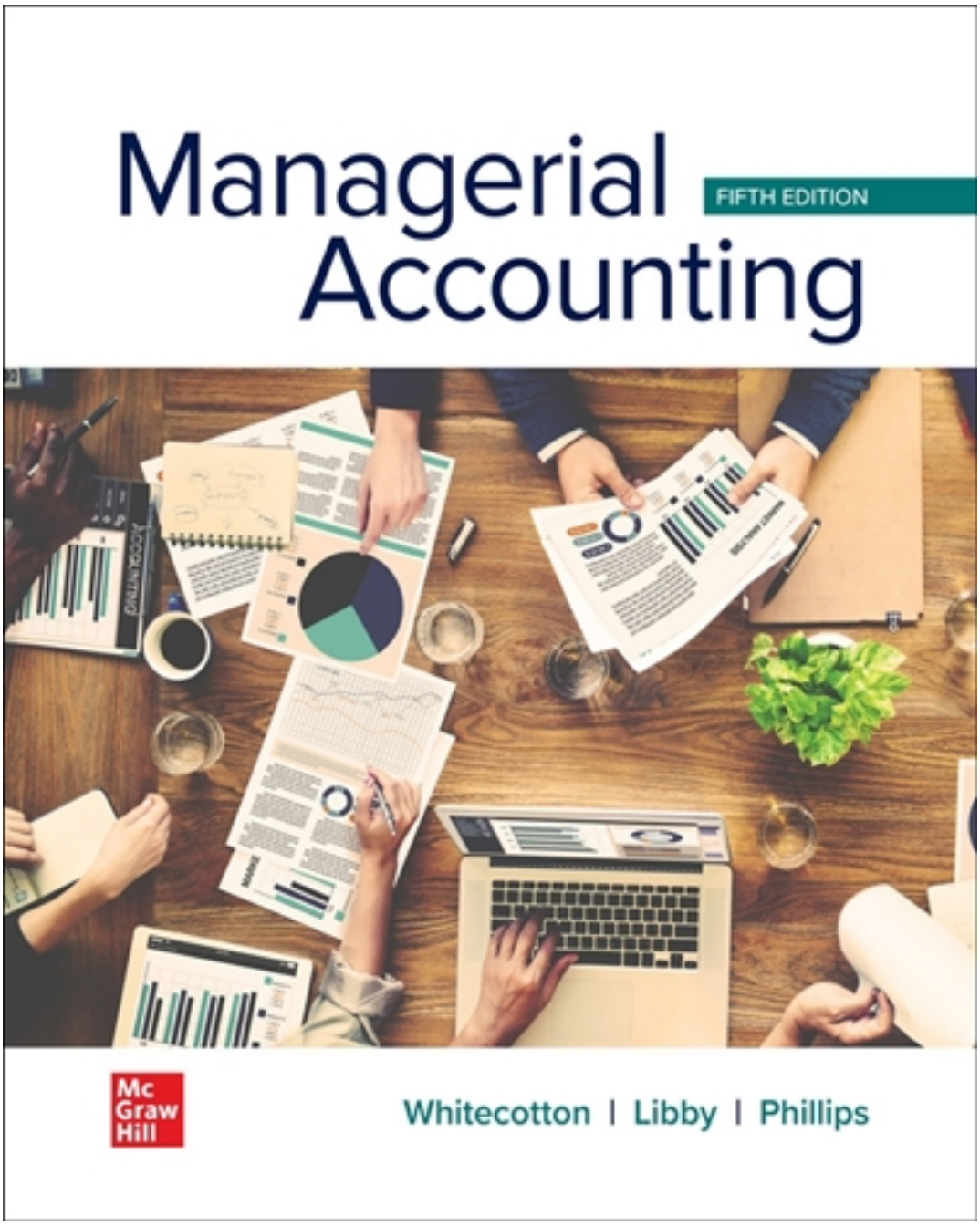


# Solutions

# CHAPTER 2
# JOB ORDER COSTING

## Student Learning Objectives and Related Assignment Materials

| *Student Learning Objectives* | *Mini Exercises* | *Exercises* | *Problems (A & B)* | *Skills Development Cases* |
|---|---|---|---|---|
| 1. Describe the key differences between job order costing and process costing. | 1, 3 | None | None | 1, 2 |
| 2. Describe the source documents used to track direct material and direct labor costs to the job cost sheet. | 2, 3, 13, 15, 22 | 1, 3, 27 | None | 2 |
| 3. Calculate a predetermined overhead rate and use it to apply manufacturing overhead cost to jobs. | 3, 5, 6, 7, 9, 17, 21 | 1, 5, 6, 7, 12, 13, 14, 15, 18, 20, 21, 26 | A1, A3, A5, A6, A7, A8, B1, B3, B5, B6, B7, B8 | 2, 3 |
| 4. Describe how costs flow through the accounting system in job order costing. | 3, 4, 11, 13, 15, 17 | 1, 3, 9, 11, 12, 13, 15, 17, 18, 20, 21, 26 | A1, A3, A5, A6, A8, B1, B3, B5, B6, B8 | 3 |
| 5. Calculate and dispose of overapplied or underapplied manufacturing overhead. | 3, 8, 10, 12, 17 | 7, 18, 20, 21 | A1, A3, A5, A6, A7, A8, B1, B3, B5, B6, B7, B8 | 3 |
| 6. Calculate the cost of goods manufactured and cost of goods sold. | 4, 19, 20, 21, 23, 24 | 6, 9, 10, 15, 18, 21, 22 | A1, A6, A8, B1, B6, B8 | 3 |
| 7. Apply job order costing to a service setting. | None | 12, 14, 26 | None | None |
| 2-S1. Prepare journal entries to record manufacturing and nonmanufacturing costs in a job order cost system. | 14, 16, 18 | 2, 4, 8, 16, 19, 23, 24, 25 | A2, A4, B2, B4 | 3 |

## PowerPoint Slides

| *Student Learning Objectives* | *PowerPoint® Slides* |
|---|---|
| 1. Describe the key differences between job order costing and process costing. | 2–6 |
| 2. Describe the source documents used to track direct material and direct labor costs to the job cost sheet. | 7–9 |
| 3. Calculate a predetermined overhead rate and use it to apply manufacturing overhead cost to jobs. | 10–16 |
| 4. Describe how costs flow through the accounting system in job order costing. | 17–26 |
| 5. Calculate and dispose of overapplied or underapplied manufacturing overhead. | 27–29 |
| 6. Calculate the cost of goods manufactured and cost of goods sold. | 30–33 |
| 7. Apply job order costing to a service setting. | 34–37 |
| S1. Prepare journal entries to record manufacturing and nonmanufacturing costs in a job order cost system. | 38–46 |

## Chapter Summary

**LO 2-1 Describe the key differences between job order costing and process costing. p. 48**

- Job order costing is used in companies that make unique products or provide specialized services.
- Process costing is used in companies that make homogeneous products using a continuous production process.
- Operations costing is a hybrid system that blends elements of job order costing (for unique materials and components) and process costing (for the standardized processes).



**LO 2-2 Describe the source documents used to track direct material and direct labor costs to the job cost sheet. p. 51**

- Direct materials are issued to production using a materials requisition form that shows the costs and quantities of all materials requested and the job they were used for.
- Direct labor costs are recorded using labor time tickets showing the amount of time workers spent on each specific job.
- The direct costs incurred for each job are recorded on separate job cost sheets.

**LO 2-3 Calculate a predetermined overhead rate and use it to apply manufacturing overhead cost to jobs. p. 53**

- Because manufacturing overhead costs cannot be traced directly to individual jobs, we must use an allocation base, or cost driver, to calculate a predetermined overhead rate so that we can apply manufacturing overhead costs to each specific job.
- We call the overhead rate *predetermined* because it is calculated before actual costs are incurred, allowing managers to project the cost of a job before it begins.
- The predetermined overhead rate is calculated by dividing the estimated total manufacturing overhead cost by the estimated value of the cost driver.
- Manufacturing overhead is applied to specific jobs by multiplying the predetermined overhead rate by the actual amount of the cost driver used on the job.

**LO 2-4 Describe how costs flow through the accounting system in job order costing. p. 56**

- Initially, raw materials purchases are recorded in the Raw Materials Inventory account.
- When materials are placed into production, direct materials are recorded in the Work in Process Inventory account; indirect materials are recorded in the Manufacturing Overhead account.
- When labor costs are incurred, direct labor is recorded in the Work in Process Inventory; indirect labor is recorded in the Manufacturing Overhead account.
- Applied manufacturing overhead costs are recorded on the debit (left) side of the Work in Process Inventory account and the credit (right) side of the Manufacturing Overhead account.
- Actual manufacturing overhead costs are recorded on the debit (left) side of the Manufacturing Overhead account.
- When a job is completed, the total cost of goods completed is transferred out of Work in Process Inventory (with a credit) and into Finished Goods Inventory (with a debit).
- When the job is delivered to the customer, the total cost is transferred out of Finished Goods Inventory (with a credit) and into Cost of Goods Sold account (with a debit).
- Nonmanufacturing costs are recorded as selling and administrative expenses and are expensed during the period incurred.

**LO 2-5 Calculate and dispose of overapplied or underapplied manufacturing overhead. p. 61**

- Actual overhead costs are recorded on the debit (left) side of the Manufacturing Overhead account; applied manufacturing overhead costs are recorded on the credit (right) side. Any balance in the Manufacturing Overhead account represents the amount of overapplied or underapplied overhead.
- If the overhead account has a debit (left) balance, actual overhead costs were higher than applied overhead costs; that is, overhead was underapplied.
- If the overhead account has a credit (right) balance, applied overhead costs were higher than actual overhead costs; that is, overhead was overapplied.
- At the end of the year, the balance in the Manufacturing Overhead account is transferred to the Cost of Goods Sold account. Overapplied overhead decreases (credits) the Cost of Goods Sold account; underapplied overhead increases (debits) the Cost of Goods Sold account.

**LO 2-6 Calculate the cost of goods manufactured and cost of goods sold. p. 63**

- The total manufacturing costs that flow out of the Work in Process Inventory and into Finished Goods Inventory are called *cost of goods manufactured*. When the product is sold, the total cost is called *cost of goods sold* and is transferred to the Cost of Goods Sold account.
- Initially, the cost of goods manufactured and the cost of goods sold are based on actual direct materials, actual direct labor, and applied manufacturing overhead costs.
- The Cost of Goods Sold account is updated to reflect actual manufacturing overhead costs through an adjustment for overapplied or underapplied manufacturing overhead.

**LO 2-7 Apply job order costing to a service setting. p. 65**

- Job order costing is often used by professional service firms that provide unique services to clients with different needs. Examples include accounting firms, law firms, architectural firms, and health care providers.

- Just like manufacturing firms, service firms will charge direct costs of labor and materials to specific client accounts. Indirect costs must be assigned to clients using a cost driver, or allocation base, such as billable hours (for an accounting firm) or patient days (for a hospital).
- Although job costing works essentially the same in a service setting as it does in a manufacturing setting, language and terminology differ, as do the types of allocation bases used to assign indirect costs to customers.

**LO 2-S1 Prepare journal entries to record manufacturing and nonmanufacturing costs in a job order cost system. p. 66**

- Journal entries can be used to record the flow of manufacturing costs through the Raw Materials Inventory, Work in Process Inventory, Finished Goods Inventory, and Cost of Goods Sold accounts.
- Actual direct materials and actual direct labor are recorded as debits to the Work in Process Inventory account, with a credit to Raw Materials Inventory or Cash/Wages Payable.
- Applied manufacturing overhead costs are recorded with a debit to the Work in Process Inventory account and a credit to the Manufacturing Overhead account.
- Actual manufacturing overhead costs are recorded with a debit to the Manufacturing Overhead account and a credit to the appropriate balance sheet account.
- The balance in the Manufacturing Overhead account represents overapplied or underapplied overhead. A debit balance means that actual overhead costs were greater than applied, or that overhead was underapplied. A credit balance means that applied overhead was greater than actual, or that overhead was overapplied.
- When jobs are completed, Finished Goods Inventory is debited, with a credit to Work in Process Inventory. When a job is sold, Cost of Goods Sold is debited and Finished Goods Inventory is credited.
- Nonmanufacturing costs, or period costs, are recorded in expense accounts during the period incurred.

| Chapter Outline | Teaching Notes |
|---|---|
| I. Job Order versus Process Costing<br>***LO 2-1 Describe the key differences between job order costing and process costing.*** | **Exhibit 2.1** |
| A. **Job order costing** is used in companies that offer customized or unique products or services. | Examples:<br>Custom-built home |
| 1. Unlike process costing, in which each unit is identical to the next, companies use job order costing when each unit or customer tends to be different from the next. | |
| 2. Job order costing is also common in service industries that serve clients or customers with unique needs. | Service Industries such as accounting and law firms |
| B. **Process costing** is used by companies that make standardized or homogeneous products or services. | Beverage, toilet tissue, petroleum products |
| 1. Because each unit is the same, there is no need to track the cost of each unit individually. | |
| 2. Process costing breaks the production process down into its basic steps, or processes, and then averages the total cost of the process over the number of units produced. | |
| C. The key difference between job order costing and process costing is whether the company's products or services are heterogeneous (different) or homogeneous (similar). | **Handout 2-1** |
| 1. Job order costing characteristics include: | |
| a. Unique products and services, such as a construction project. | |
| b. Customized to the needs of the customer or client. | |
| c. Costs accumulated by job, project, or customer. | |
| d. Job cost sheet for each unique unit, customer, or job. | |
| 2. Process costing characteristics include: | |
| a. Homogeneous products and services, such as bottles of water or wine. | |
| b. Mass-production of products in series of standardized processes. | *Urge students to complete the **Self-Study Practice** for LO 2-1.* |
| c. Costs accumulated by process. | |
| d. Production report for each major production process. | |
| 3. Some companies use a hybrid system, **operations costing**, that includes both types. | |
| a. Products and services that have some common and some unique characteristics, such as automobile. | |
| b. Mass-production to make each car, but customized to various models and trim lines. | |
| II. Assign Manufacturing Costs to Jobs | **Exhibit 2.2** |

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| ***LO 2-2 Describe the source documents used to track direct material and direct labor costs to the job cost sheet.*** | Examples: to build a home<br>Concrete, lumber, fixtures<br><br>Installing the plumbing<br><br>Cost of site supervision, depreciation on equipment<br>**Handout 2-2** |
| A. Manufacturing Costs are divided into three different categories:<br>1. **Direct materials** are the major materials input that can be directly and conveniently traced to each job.<br>2. **Direct labor** is the "hands-on" labor that can be directly and conveniently traced to a specific job.<br>3. **Manufacturing overhead** includes all indirect manufacturing costs, or those that cannot be directly or conveniently traced to a specific project or job. | |
| B. In a job order cost system, all of the manufacturing costs are recorded on a document called a **job cost sheet,** which provides a detailed record of the costs incurred to complete a specific job, including direct materials, direct labor, and applied manufacturing overhead. | |
| C. All that is needed to keep track of the direct costs of specific jobs is a set of records called **source documents**.<br>1. Before materials can be used on a job, a **materials requisition form** – a form that lists the quantity and cost of materials used on a specific job – must be filled out.<br>a. This form is used to control the physical flow of materials out of inventory and into production.<br>b. It provides the information needed to record direct materials on the job cost sheet.<br>2. A **labor time ticket** is a source document that shows how employees spend their time each week. | |
| ***LO 2-3 Calculate a predetermined overhead rate and use it to apply manufacturing overhead cost to jobs.*** | **Handout 2-3** |
| D. Unlike direct materials and direct labor, which can be traced to individual jobs using source documents, manufacturing overhead cannot be directly traced to specific jobs.<br>1. Manufacturing overhead must be assigned or applied to jobs using a predetermined overhead rate and an allocation base.<br>2. Ideally, the allocation base should be a cost driver, or a measure that causes or influences the amount of manufacturing overhead cost incurred. | Example:<br>The number of students is the cost driver for the cost of class handouts. |
| E. Before we assign manufacturing overhead cost to jobs, we must first calculate a predetermined overhead rate using our chosen allocation base.<br>1. The **predetermined overhead rate** is calculated as follows: *Predetermined overhead rate = Estimated total manufacturing overhead cost ÷ Estimated total cost driver* | *Ensure that students understand why it is necessary to estimate and assign the manufacturing overhead.*<br><br>*Emphasize that the predetermined overhead rate calculation uses* |

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| 2. The overhead rate is calculated for an entire year to avoid fluctuations in costs and activity due to seasonality and demand peaks.<br>3. The rate is predetermined because it is calculated in advance based on estimated rather than actual values.<br>F. Once the predetermined overhead rate has been established, accountants use it to determine how much overhead should be added to each job.<br>1. The **applied manufacturing overhead** is calculated by multiplying the predetermined overhead rate by the *actual value* of the cost driver used on the job, as follows: *Predetermined overhead rate × Actual cost driver =Applied manufacturing overhead*<br>2. Because the predetermined overhead is based on estimated data, applied manufacturing overhead is unlikely to be exactly the same as the actual manufacturing overhead cost incurred.<br>3. Therefore, we need to learn how to record actual manufacturing overhead and account for the difference between actual manufacturing overhead and applied manufacturing overhead later in this chapter. | *estimated amounts rather than actual amounts in the ratio.*<br><br>*Urge students to complete the **Self-Study Practice** for LO 2-3.* |
| III. Recording the Flow of Costs in Job Order Costing<br>***LO 2-4 Describe how costs flow through the accounting system in job order costing.***<br>A. The three inventory accounts that are used to record manufacturing costs follow:<br>1. **Raw Materials Inventory** represents the cost of materials purchased from suppliers but not yet used in production. This account includes the **direct materials** and the **indirect materials.**<br>2. **Work in Process Inventory** represents the total cost of jobs that are still in process.<br>a. Any cost that is added to the Work in Process Inventory account must be also recorded on the individual job cost sheet.<br>b. The total cost of all jobs in process should be equal to the balance in the Work in Process Inventory.<br>3. **Finished Goods Inventory** represents the cost of jobs that have been completed but not yet sold. The cost of a job completed remains in the Finished Goods Inventory account until it is sold.<br>B. Only actual direct materials and actual direct labor costs are recorded directly in the Work in Process Inventory account. All | **Exhibit 2.3** |

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| indirect or manufacturing overhead costs flow through the Manufacturing Overhead account.<br>C. The Manufacturing Overhead account is a temporary or holding account used to record actual and applied manufacturing overhead costs.<br>1. Actual manufacturing overhead costs are accumulated on the debit (left-hand) side of the Manufacturing Overhead account.<br>2. The credit (right-hand) side of the manufacturing overhead account shows the amount of manufacturing overhead that is applied to specific jobs by multiplying the predetermined overhead rate by the actual value of the cost driver.<br>D. As jobs are produced, the Work in Process inventory account and the job cost sheets accumulate the direct materials, direct labor, and applied manufacturing overhead for each job.<br>E. When a job is completed, its total manufacturing cost is transferred out of Work in Process Inventory and into the Finished Goods Inventory account. This amount is referred to as Cost of Goods Manufactured.<br>F. Once a job has been sold, its total cost is transferred out of Finished Goods Inventory account and into the **Cost of Goods Sold** account.<br>G. We use T-accounts to show how manufacturing costs flow through the various inventory accounts in a job order costing system before eventually being recognized as Cost of Goods Sold.<br>1. **Direct and Indirect Materials** – the cost of purchased raw materials is initially recorded in Raw Materials Inventory. Then, the cost of issued raw materials for production will be transferred (debited) to Work in Process Inventory (for direct materials) or Manufacturing Overhead (for indirect materials).<br>2. **Direct and Indirect Labor** – if the labor can be traced to a specific job, then the cost is added to the job cost sheet and the Work in Process Inventory account (for direct labor). If the labor cannot be traced to a specific job, then the cost is considered indirect cost and is debited to the Manufacturing Overhead account.<br>3. **Applied Manufacturing Overhead** – manufacturing overhead is applied (debited) to Work in Process Inventory based on the predetermined overhead rate.<br>4. **Actual Manufacturing Overhead** – Actual manufacturing overhead costs include the indirect manufacturing costs that cannot be traced to specific jobs. They are debited to the | **Handout 2-4**<br>**Exhibit 2.4**<br>**Exhibit 2.5**<br>**Exhibit 2.6**<br>**Exhibit 2.7**<br>**Exhibit 2.8** |

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| Manufacturing Overhead account and credited to a balance sheet account such as cash or payables.<br>5. **Transferring Costs to Finished Goods Inventory and Cost of Goods Sold** – the manufacturing cost on the job sheet of the completed job (i.e., cost of goods manufactured) will be transferred from Work in Process Inventory to Finished Goods Inventory. As the finished goods are sold, the cost of goods sold will be transferred from Finished Goods inventory to Cost of Goods Sold.<br>6. **Nonmanufacturing costs** are expensed during the period in which they are incurred. | **Exhibit 2.9**<br>**Exhibit 2.10**<br>*Use T-account of Manufacturing Overhead to explain the concept.* |
| IV. Overapplied or Underapplied Manufacturing Overhead<br>***LO 2-5 Calculate and dispose of overapplied or underapplied manufacturing overhead.***<br>A. Calculating overapplied and underapplied manufacturing overhead<br>1. The difference between actual and applied manufacturing overhead is called overapplied or underapplied overhead.<br>2. **Overhead cost is overapplied** if the amount applied (credit side) is greater than the actual overhead (debit side).<br>3. **Overhead cost is underapplied** if the amount applied (credit side) is less than the actual overhead (debit side).<br>B. Disposing of overapplied or underapplied manufacturing overhead<br>1. The most common method for disposing of the balance in manufacturing overhead is to make an adjustment to Cost of Goods Sold.<br>2. To remove **overapplied overhead,** debit the Manufacturing Overhead account and credit (decrease) Cost of Goods Sold.<br>3. To remove **underapplied overhead** credit Manufacturing Overhead and debit (increase) Cost of Goods Sold.<br>***LO 2-6 Calculate the cost of goods manufactured and cost of goods sold.***<br>C. Preparing the **cost of goods manufactured report** – the total cost that is transferred out of Work in Process Inventory and into Finished Goods Inventory is called **cost of goods manufactured** or cost of goods completed.<br>1. Calculation of cost of goods manufactured is as follows:<br>Beginning raw materials inventory<br>+ Raw materials purchased<br>− Indirect raw materials<br>− Ending raw materials inventory<br>= **Direct materials used in production** | *Urge students to complete the **Self-Study Practice** for LO 2-5.*<br>**Handout 2-3**<br>**Exhibit 2.11**<br>**Handout 2-5** |

| | |
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| + **Direct labor**<br>+ **Manufacturing overhead applied**<br>= Total current manufacturing costs<br>+ Beginning work in process inventory<br>− Ending work in process inventory<br>= **Cost of goods manufactured**<br>2. Calculation of cost of goods sold is as follows:<br>Beginning finished goods inventory<br>+ Cost of goods manufactured<br>− Ending finished goods inventory<br>= Unadjusted cost of goods sold<br>+/− Underapplied manufacturing overhead / Overapplied manufacturing overhead<br>= Adjusted cost of goods sold<br><br>***LO 2-7 Apply job order costing to a service setting.***<br>D. Many professional service firms use job order costing to track the time and resources used to service specific clients or accounts.<br>1. Direct costs such as hours spent on a client's account and supplies or other expenses incurred directly for the client are assigned to the client's account by the accounting system.<br>**2.** Indirect costs are treated much like manufacturing overhead, i.e., they are accumulated and assigned to clients based on an allocation base.<br>***LO 2-S1 Prepare journal entries to record manufacturing and nonmanufacturing costs in a job order cost system.***<br>1. Recording the purchase and issue of materials.<br>a. The journal entry to record the purchase of raw materials follows:<br>*Dr. Raw Materials Inventory XXXX*<br>*Cr. Accounts Payable XXXX*<br>b. The journal entry to record the issuance of direct and indirect materials follows:<br>*Dr. Work in Process Inventory XXXX*<br>*Dr. Manufacturing Overhead XXXX*<br>*Cr. Raw Materials Inventory XXXX*<br>2. Recording labor cost.<br>The journal entry to record the direct and indirect labor follows:<br>*Dr. Work in Process Inventory XXXX*<br>*Dr. Manufacturing Overhead XXXX*<br>*Cr. Wages Payable XXXX*<br>3. Recording applied manufacturing overhead. | *Encourage students to study the terms in this chapter and complete the Demonstration Case at the end of the chapter.* |

The journal entry to record the applied manufacturing overhead follows:

*Dr. Work in Process Inventory* *XXXX*
*Cr. Manufacturing Overhead* *XXXX*

4. Transferring costs to Finished Goods Inventory and Cost of Goods Sold.
   a. The journal entry to record transferring costs to Finished Goods Inventory follows:
   *Dr. Finished Goods Inventory* *XXXX*
   *Cr. Work in Process Inventory* *XXXX*
   b. The journal entry to record transfer from Finished Goods Inventory to Cost of Goods Sold follows:
   *Dr. Cost of Goods Sold* *XXXX*
   *Cr. Finished Goods Inventory* *XXXX*
   c. A journal entry is also made to record sales revenue as follows:
   *Dr. Cash or Accounts Receivable* *XXXX*
   *Cr. Sales Revenue* *XXXX*
5. Recording actual manufacturing overhead.
   The combined journal entry to record all actual manufacturing overhead, such as wages, taxes, insurance, depreciation, is as follows:
   
   *Dr. Manufacturing Overhead* *XXXX*
   *Cr. Cash* *XXXX*
   *Cr. Wages Payable* *XXXX*
   *Cr. Taxes Payable* *XXXX*
   *Cr. Prepaid Insurance* *XXXX*
   *Cr. Accumulated Depreciation* *XXXX*
6. Recording nonmanufacturing costs.
   Example: The journal entries to record nonmanufacturing costs are as follows:
   *Dr. Commission Expense* *XXXX*
   *Cr. Cash or Commission Payable* *XXXX*
   *Dr. Advertising Expense* *XXXX*
   *Cr. Cash, Prepaid Advertising, or Payable* *XXXX*
   *Dr. Depreciation Expense* *XXXX*
   *Cr. Accumulated Depreciation* *XXXX*
   *Dr. Salaries and administrative Expense* *XXXX*
   *Cr. Cash, Prepaids, or Payables* *XXXX*
7. Recording underapplied manufacturing overhead.
   Example: The journal entry to record underapplied manufacturing overhead is as follows:
   *Dr. Cost of Goods Sold* *XXXX*
   *Cr. Manufacturing Overhead* *XXXX*

| | |
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| *If manufacturing overhead had been overapplied (with a credit balance), the entry would have debited Manufacturing Overhead and credited (decreased) Cost of Goods Sold.* | |

## Supplemental Enrichment Activities

Note: These activities would be suitable for individual or group activities in class.

- **Handout 2-1** (LO 2-1) is designed to ensure that students understand the linkage between products and different costing systems.

- **Handout 2-2** (LO 2-2) is designed to ensure that students understand how to assign different costs to different manufacturing cost categories. The knowledge they learn here is important for understanding the concepts of cost flows (LO 2-4).

- **Handout 2-3** (LOs 2-3 and 2-5) is designed to ensure that students know how to calculate a predetermined overhead rate and use this information to figure out the applied manufacturing overhead. Also, students are asked to calculate underapplied or overapplied manufacturing overhead.

- **Handout 2-4** (LO 2-4) is designed to ensure that students understand the cost flows.



- **Handout 2-5** (LO 2-6) is designed to ensure that students are able to calculate the cost of goods manufactured and the cost of goods sold using the provided information.

**Handout 2-1** (LO 2-1)

Enter the letter (X) next to the descriptions of products, jobs or services under the column for using either job order costing or process costing in production.

| Descriptions | Job Order Costing | Process Costing |
|---|---|---|
| A. Customized home | | |
| B. Auto repair | | |
| C. Accounting firm | | |
| D. Beverage | | |
| E. Small Appliance | | |
| F. Lawn service | | |
| G. Hollywood movie | | |
| H. Gasoline | | |
| I. Attorney service | | |
| J. Computer mouse | | |
| K. Submarine built for U.S. Department of Defense | | |
| L. Light bulb | | |

**Solution:**

| Descriptions | Job Order Costing | Process Costing |
|---|---|---|
| A. Customized home | X | |
| B. Auto repair | X | |
| C. Accounting firm | X | |
| D. Beverage | | X |
| E. Small Appliance | | X |
| F. Lawn service | X | |
| G. Hollywood movie | X | |
| H. Gasoline | | X |
| I. Attorney service | X | |
| J. Computer mouse | | X |
| K. Submarine built for U.S. Department of Defense | X | |
| L. Light bulb | | X |

## **Handout 2-2** (LO 2-2)

A. Direct Materials
B. Direct Labor
C. Manufacturing Overhead
D. Nonmanufacturing Cost

Classify the following costs into one of the above four categories:

1. _____ Salaries of site supervisors
2. _____ Fixture used in building home
3. _____ Depreciation of equipment used in production
4. _____ Depreciation of headquarters building
5. _____ Glue used in assembling wooden tables
6. _____ Utilities cost of the factory
7. _____ Compensation of the CEO
8. _____ Wages of workers framing the home
9. _____ Utilities cost of the administration building
10. _____ Hard disks used for building laptop computers

**Solution:**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | C | 2. | A | 3. | C | 4. | D | 5. | C |
| 6. | C | 7. | D | 8. | B | 9. | D | 10. | A |

## **Handout 2-3** (LOs 2-3 and 2-5)

Leo, Inc. expects to assemble 20,000 units of laptop computers this coming month. The amount of manufacturing overhead incurred this coming month is estimated to be $1,100,000. The number of direct labor hours is estimated to be 4,000 hours. Leo, Inc. is currently using direct labor hours as the single allocation base to apply manufacturing overhead to the jobs. Leo, Inc. receives a job order which requires labor work of 200 hours. Answer the following questions.

1. Calculate the predetermined overhead rate used to apply manufacturing overhead.

2. Based on your answer in (1), calculate how much of manufactured overhead should be applied to this specific order.



3. The amount of *actual* manufacturing overhead incurred equals $1,200,000 at the end of this month. The amount of *applied* manufacturing overhead during this month is $1,050,000. Calculate the overapplied or underapplied manufacturing overhead.

4. Indicate how to dispose of the overapplied or underapplied manufacturing overhead.

**Solution:**

1. Predetermined overhead rate = Estimated manufacturing overhead ÷ Estimated allocation base = $1,100,000 ÷ 4,000 direct labor hours = $275 per direct labor hours (DLH).

2. Applied manufacturing overhead = Predetermined overhead rate × actual value of allocation base = $275 per DLH × 200 DLHs = $55,000

3. Since the applied manufacturing overhead is less than (or under) the actual manufacturing overhead, the difference of $150,000 ($1,200,000 − $1,050,000) represents the underapplied manufacturing overhead.

4. Since we have underapplied overhead, we need to apply (or add) more overhead to the cost of the units manufactured to fix the problem. Underapplied overhead is represented by a debit ending balance in Manufacturing Overhead because the applied manufacturing overhead (credit side) is less than the actual manufacturing overhead (debit side). In order to dispose of the underapplied manufacturing overhead, we will increase (debit) Cost of Goods Sold and decrease (credit) Manufacturing Overhead. Manufacturing Overhead will have a zero balance after we dispose of the underapplied manufacturing overhead.

## **Handout 2-4** (LO 2-4)

Answer as True or False. If the answer is False, change the statement to make it True.

1. ____ If raw materials used can be traced conveniently to a specific job, its cost should be assigned to Work in Process Inventory and removed from Raw Materials Inventory.

2. _____ When labor costs are incurred, direct labor is added (debited) to Manufacturing Overhead.

3. ____ The left side of Manufacturing Overhead represents the actual manufacturing overhead costs incurred.

4. ____ Work in Process Inventory accumulates the direct materials, direct labor, and the *applied* manufacturing overhead cost for each job.

5. ____ Manufacturing Overhead is credited as manufacturing overhead is applied to Work in Process Inventory.

6. ____ Once a job has been sold, its total cost is transferred out of Finished Goods Inventory to Cost of Goods Sold.

7. ____ Actual manufacturing overhead costs include all of the indirect manufacturing costs incurred but that cannot be traced to the specific jobs.

8. ____ If a job is completed, its total manufacturing cost is transferred out of Finished Goods Inventory and assigned to Work in Process Inventory.

9. ____ Raw Materials Inventory, Work in Process Inventory, and Finished Goods accounts are available on the income statement.

10. ____ Cost of goods manufactured represents the cost of goods completed during the accounting period.

**Solution:**

1. __**T**__ If raw materials used can be traced conveniently to a specific job, its cost should be assigned to Work in Process Inventory and removed from Raw Materials Inventory.

2. __**F**__ When labor costs are incurred, direct labor is added (debited) to Manufacturing Overhead.
   Correct Statement:
   *Direct labor is added (debited) to Work in Process account.*

3. __**T**__ The left side of Manufacturing Overhead represents the actual manufacturing overhead costs incurred.

4. __**T**__ Work in Process Inventory accumulates the direct materials, direct labor, and the *applied* manufacturing overhead cost for each job.

5. __**T**__ Manufacturing Overhead is credited as manufacturing overhead is applied to Work in Process Inventory.

6. __**T**__ Once a job has been sold, its total cost is transferred out of Finished Goods Inventory to Cost of Goods Sold.

7. __**T**__ Actual manufacturing overhead costs include all of the indirect manufacturing costs incurred but that cannot be traced to the specific jobs.



8. __**F**__ If a job is completed, its total manufacturing cost is transferred out of Finished Goods Inventory and assigned to Work in Process Inventory.
   Correct Statement:
   *If a job is completed, its total manufacturing cost is transferred out of Work in Process Inventory and assigned to Finished Goods Inventory.*

9. __**F**__ Raw Materials Inventory, Work in Process Inventory, and Finished Goods accounts are available on the income statement.
   Correct Statement:
   *Raw Materials Inventory, Work in Process Inventory, and Finished Goods accounts are available on the balance sheet.*

10. __**T**__ Cost of goods manufactured represents the cost of goods completed during the accounting period.

**Handout 2-5** (LO 2-6)

The accounting information of Leo, Inc. in May is as follows.

| | |
|---|---|
| Beginning Raw Materials | $1,000 |
| Ending Raw Materials | 1,500 |
| Purchase of Raw Materials | 2,000 |
| | |
| Beginning Work in Process | 3,000 |
| Ending Work in Process | 2,000 |
| | |
| Beginning Finished Goods | 3,000 |
| Ending Finished Goods | 2,000 |
| | |
| Direct Labor | 2,000 |
| Manufacturing overhead applied | 1,500 |

Answer the following questions:

1. Calculate the cost of raw materials used in production during May.

2. Calculate total current manufacturing costs for the month of May assuming that all raw materials used are direct materials.



3. Calculate cost of goods manufactured for the month of May.

4. Calculate the unadjusted cost of goods sold for the month of May.

5. If actual manufacturing overhead incurred equals $2,000, indicate the amount of underapplied or overapplied overhead at the end of May.

6. Calculate the adjusted cost of goods sold after you remove the underapplied or overapplied overhead.

**Solution:**

1. 

| | |
|---|---|
| Beginning Raw Materials | $1,000 |
| + Purchase of Raw Materials | 2,000 |
| − Ending Raw Materials | 1,500 |
| = Raw Materials used | 1,500 |
| − Indirect Materials | 0 |
| = Direct Materials | 1,500 |

2. Total current manufacturing cost = direct materials used + direct labor + applied manufacturing overhead = $1,500 + $2,000 + $1,500 = $5,000.

3. 

| | |
|---|---|
| Beginning Work in Process | $3,000 |
| + Total current manufacturing costs | 5,000 |
| − Ending Work in Process | 2,000 |
| = Cost of Goods Manufactured | 6,000 |

4. 

| | |
|---|---|
| Beginning Finished Goods | 3,000 |
| + Cost of Goods Manufactured | 6,000 |
| − Ending Finished Goods | 2,000 |
| = Unadjusted Cost of Goods Sold | 7,000 |



5. Underapplied manufacturing overhead = Actual manufacturing overhead − Applied manufacturing overhead = $2,000 − $1,500 = $500.

6. Adjusted cost of goods sold = unadjusted cost of goods sold + Underapplied manufacturing overhead = $7,000 − $500 = $7,500.

# Chapter 2
# Job Order Costing

## ANSWERS TO QUESTIONS

1. The difference between job order costing and process costing relates to the type of product or service the company provides, and whether that product or service is homogeneous or unique. Job order costing is used by companies that offer customized or unique products or services, where each unit or service tends to be very different than the next. Process costing is used in companies that offer standardized or homogeneous products or services, where each unit or service is very similar to the next.

2. Job order costing is used in companies that offer customized products or services. Examples include any product that is specially built for a specific customer (e.g., custom home, custom built boat, custom made furniture), unique services provided to customers (e.g., an auto repair shop, a catering business), or industries that serve clients with unique needs (e.g., accounting firm, law firm, architecture firm).

3. Process costing is used in companies that offer standardized or homogeneous products or services. Examples include canned and bottled goods, petroleum products, perfume, toilet paper, dishwashing detergent, and many other common household products.

4. Examples of service companies that offer homogenized services include Jiffy Lube oil and filter change, a children's haircut salon, a nail salon, a tax return service (e.g., H&R Block), an attorney who provides standardized legal services (such as will preparation or traffic cases). In these examples, the basic service the company is performing tends to be fairly similar from one customer to the next. As a result, the company could use process costing to account for the cost of providing the standardized service. As described in the next question, they could then use elements of job order costing to keep track of any "additional" services that are added to the basic service.

5. Examples of itemized bills could include any bill or receipt received from a merchant, restaurant, etc.

6. Many companies use a modified (or hybrid) costing system that has elements of both job order and process costing. An example is a computer company that uses process costing to determine the "base cost" of building a computer, plus job order costing to keep track of all ~~of~~ the upgrades that are used to customize it for a particular customer. Auto manufacturers use process costing to account for standardized manufacturing processes (e.g., installing the engine, painting the car, installing tires), then use job order costing to account for the unique components and features that are added to a particular model.

7. The three categories of manufacturing costs are direct material, direct labor, and manufacturing overhead. Direct materials are the major material inputs that can be directly and conveniently traced to specific jobs. For an auto repair shop, this would include the major parts that are needed for the repair. Direct labor is the "hands-on" labor, such as the mechanic who does the actual work in an auto repair shop. Manufacturing overhead would include all the other costs of making a product (or providing a service such as an auto repair) other than direct material and direct labor. For an auto repair shop, this would include the cost of rent and utilities for the repair shop, supervision, depreciation on machines and tools, and incidental supplies such as lubricants, grease, rags, etc.

8. The job order cost sheet is used to keep track of all the costs incurred on a specific job. It should list all the direct material, direct labor, and manufacturing overhead costs that have been incurred on the job, along with cross-references to the materials requisition form and labor time tickets that relate to the specific job.



9. In job order costing, any entry to the Work in Process Inventory account should have a corresponding entry to update the individual job cost record, called the job cost sheet. The job cost sheet serves as a subsidiary ledger to the Work in Process Inventory account. If you add up the job cost sheets for all jobs that are currently in process, the total should equal the overall balance in the Work in Process Inventory account.

10. A materials requisition form is the source document that must be completed when materials are withdrawn from the warehouse (inventory) to be used in production. The materials requisition form should show the quantity and cost of materials that are withdrawn from inventory, along with an indication of which job(s) the materials will be used for. This allows the accountant to assign the direct materials cost to the appropriate job cost sheet.

11. Direct materials are those that can be traced to specific jobs. These costs are added to Work in Process Inventory, with a corresponding entry on the individual job cost sheet. Indirect materials, by definition, are those that cannot be traced to a specific job, or it is simply not worth the effort to do so. Indirect costs are recorded in the Manufacturing Overhead account. These costs get "applied" to Work in Process using a predetermined overhead rate and some secondary allocation measure such as direct labor hours.

12. Labor time tickets are used to trace the cost of direct labor to specific jobs and account for indirect labor costs. The labor time ticket should include the number of hours that the employee worked on specific jobs during the week, along with the hourly wage rate paid to that employee. This information is used to assign the direct labor cost to specific jobs by updating the job cost sheets.

13. Although the overhead rate might be more accurate if it were based on actual rather than estimated values, companies usually won't know the actual values until it is too late to be used for managerial decision making. Using a predetermined overhead rate based on estimated values allows us to set the overhead rate in advance, so that we can use it to apply the indirect cost to jobs throughout the accounting period. We then "settle up" at the end of the accounting period by adjusting for any difference between actual and applied manufacturing overhead.

14. Direct material and direct labor costs can be traced directly to jobs and therefore are assigned directly to the Work in Process Inventory account and the individual job cost sheet. Manufacturing overhead costs cannot be directly traced to jobs. These indirect costs are accumulated in a temporary holding account and applied to Work in Process using a predetermined overhead rate based on some observable allocation base such as direct labor hours.

15. Depreciation on office equipment is a nonmanufacturing cost, which must be expensed during the period incurred (period expense). Depreciation on manufacturing equipment is a manufacturing related cost, which according to GAAP must be treated as a cost of the product being made (product cost). Manufacturing costs are counted as inventory (raw materials, work in process, or finished goods) until the product is sold. Because depreciation on manufacturing equipment is an indirect cost (not directly traceable to a specific job), it is counted as part of manufacturing overhead and included as part of the cost of the product.

16. A predetermined overhead rate is calculated by estimating the year's total manufacturing overhead cost and dividing it by the estimated value of the allocation base (cost driver). Ideally, the company should select an allocation base that has a cause and effect relationship with the incurrence of cost. Common allocation bases are direct labor hours, direct labor dollars, and machine hours.

17. To determine the amount of overhead to apply to Work in Process, you multiply the predetermined overhead rate by the actual value of the allocation base. Applied manufacturing overhead is a function of both actual and estimated data. The predetermined overhead rate is based on estimated values, but this rate is multiplied by the actual value of the allocation base.

18. The manufacturing overhead cost that is applied to Work in Process will not necessarily be equal to the actual manufacturing overhead cost incurred. The applied amount is based on a predetermined overhead rate that must be estimated in advance. This rate is then multiplied by the actual value of a secondary allocation base, which may not perfectly capture the actual incurrence of cost.

19. Manufacturing overhead is overapplied when the actual manufacturing overhead cost is LESS than the amount that was applied to Work in Process using the predetermined overhead rate. If manufacturing overhead is overapplied, the Manufacturing Overhead account will show a credit balance because the amount applied (credit) is more than the actual overhead costs incurred (debit).

20. Manufacturing overhead is underapplied when the actual manufacturing overhead cost is GREATER than the amount that was applied to Work in Process using the predetermined overhead rate. If manufacturing overhead is underapplied, the Manufacturing Overhead account will show a debit balance, because actual overhead costs (debit) were more than the amount applied (credit).

21. The most common method for eliminating the balance in the manufacturing overhead account at year end is to transfer the account balance directly to Cost of Goods Sold. If manufacturing overhead is underapplied (debit balance), we will need to increase Cost of Goods Sold (with a debit) and credit Manufacturing Overhead. If manufacturing overhead is overapplied (credit balance), we will need to decrease (credit) Cost of Goods Sold and debit Manufacturing Overhead.

## Author's Recommended Solution Time
## (Time in minutes)

| *Mini-exercises* | | *Exercises* | | *Problems* | | *Cases and Projects** | |
|---|---|---|---|---|---|---|---|
| | *Time* | | *Time* | | *Time* | *No.* | *Time* |
| 1 | 2 | 1 | 5 | PA-1 | 12 | 1 | 20 |
| 2 | 3 | 2 | 6 | PA-2 | 12 | 2 | 30 |
| 3 | 3 | 3 | 5 | PA-3 | 12 | 3 | 60 |
| 4 | 3 | 4 | 5 | PA-4 | 12 | | |
| 5 | 3 | 5 | 6 | PA-5 | 12 | | |
| 6 | 2 | 6 | 5 | PA-6 | 12 | | |
| 7 | 4 | 7 | 6 | PA-7 | 15 | | |
| 8 | 3 | 8 | 5 | PA-8 | 15 | | |
| 9 | 2 | 9 | 5 | PB-1 | 12 | | |
| 10 | 4 | 10 | 6 | PB-2 | 12 | | |
| 11 | 3 | 11 | 6 | PB-3 | 12 | | |
| 12 | 4 | 12 | 5 | PB-4 | 12 | | |
| 13 | 4 | 13 | 6 | PB-5 | 12 | | |
| 14 | 3 | 14 | 5 | PB-6 | 12 | | |
| 15 | 4 | 15 | 6 | PB-7 | 15 | | |
| 16 | 4 | 16 | 5 | PB-8 | 15 | | |
| 17 | 4 | 17 | 6 | | | | |
| 18 | 4 | 18 | 5 | | | | |
| 19 | 4 | 19 | 6 | | | | |
| 20 | 4 | 20 | 6 | | | | |
| 21 | 4 | 21 | 6 | | | | |
| 22 | 3 | 22 | 6 | | | | |
| 23 | 4 | 23 | 6 | | | | |
| 24 | 4 | 24 | 5 | | | | |
| | | 25 | 6 | | | | |
| | | 26 | 5 | | | | |
| | | 27 | 5 | | | | |





* Due to the nature of cases, it is very difficult to estimate the amount of time students will need to complete them. As with any open-ended project, it is possible for students to devote a large amount of time to these assignments. While students often benefit from the extra effort, we find that some become frustrated by the perceived difficulty of the task. You can reduce student frustration and anxiety by making your expectations clear, and by offering suggestions (about how to research topics or what companies to select).

## ANSWERS TO MINI-EXERCISES

### M2–1

P 1. Golf ball manufacturer.
J 2. Landscaping business.
P 3. Tile manufacturer.
J 4. Auto repair shop.
P 5. Pet food manufacturer.
P 6. Light bulb manufacturer.
P 7. Water bottling company.
J 8. Appliance repair business.
P 9. DVD manufacturer.
J 10. Music video production company.

### M2-2

LTT 1. Employee name.
MRF, JCS 2. Quantity of direct material used.
MRF, JCS 3. Total dollar value of direct materials.
JCS 4. Applied manufacturing overhead.
LTT 5. Hours worked by an employee.
LTT 6. Hours a specific employee worked on a particular job.
JCS 7. Job start date.
LTT 8. Time an employee clocked in or out.
LTT 9. Different jobs that a specific employee worked on.



### M2–3

L 1. Allocation Base
B 2. Labor Time Ticket
G 3. Indirect Costs
A 4. Job Cost Sheet
D 5. Job Order Costing
I 6. Materials Requisition Form
N 7. Overapplied Overhead
H 8. Underapplied Overhead
K 9. Predetermined Overhead Rate
C 10. Process Costing

**M2–4**

| | |
|---|---|
| D | 1. Actual Manufacturing Overhead |
| F | 2. Applied Manufacturing Overhead |
| B | 3. Cost of Goods Manufactured |
| H | 4. Cost of Goods Sold |
| E | 5. Direct Materials |
| I | 6. Finished Goods |
| A | 7. Indirect Materials |
| C | 8. Raw Materials Inventory |
| G | 9. Work in Process Inventory |

**M2–5**

a. Conversion cost = Total manufacturing cost − Direct materials
Conversion cost = $900 − $300 = $600

b. Direct labor = Conversion cost − Manufacturing overhead
Direct labor = $600 − 200% Direct labor
300% Direct labor = $600
Direct labor = $600 / 3 = $200

c. Manufacturing overhead = 200% of Direct labor
Manufacturing overhead = 200% of $200
Manufacturing overhead = $400

d. Prime cost = Direct Material + Direct Labor
Prime cost = $300 + $200 = $500

**M2–6**

Req. 1
Predetermined overhead rate = $900,000 / $600,000 = 150% of Direct labor cost

Req. 2
This rate means that manufacturing overhead will be applied at a rate equal to 150% of direct labor cost. For every $1.00 of direct labor cost, we will apply $1.50 in manufacturing overhead.

Req. 3
The predetermined overhead rate is based on estimated values because it is set in advance of the accounting period. Often managers won't know the actual manufacturing overhead cost until after the month, quarter, or year has ended. They cannot wait that long to be able to estimate their total manufacturing costs, so they use a predetermined overhead rate that is based on estimates made in advance of the accounting period.

**M2–7**

Req. 1
Predetermined Overhead Rate = $900,000 / $600,000 = 150% of Direct Labor Cost
Applied Manufacturing Overhead = Actual Direct Labor Cost × 150%
Applied Manufacturing Overhead = $550,000 × 150% = $825,000



Req. 2
Applied manufacturing overhead is based on **both** estimated and actual data. The predetermined overhead rate is based strictly on estimated values. However, to apply manufacturing overhead to specific jobs, we multiply the predetermined (estimated) overhead rate by actual direct labor cost.

**M2–8**

Req. 1
Predetermined Overhead Rate = $900,000 / $600,000 = 150% of Direct Labor Cost
Applied Manufacturing Overhead = Actual Direct Labor Cost × 150%
Applied Manufacturing Overhead = $550,000 × 150% = $825,000

| Manufacturing Overhead | |
|---|---|
| Actual 850,000 | 825,000 Applied |
| Balance 25,000 Underapplied | |

Req. 2
At the end of the accounting period, an adjusting entry is made to transfer the balance in the Manufacturing Overhead account to the Cost of Goods Sold account. In this case, since manufacturing overhead is underapplied, we would need to increase (debit) Cost of Goods Sold by $25,000, while eliminating the $25,000 balance in the manufacturing overhead account with a credit, as shown in the following T-accounts:

| Manufacturing Overhead | | | Cost of Goods Sold | |
|---|---|---|---|---|
| Actual 850,000 | 825,000 Applied | | | |
| Balance 25,000 Underapplied | 25,000 Adjust | → | Adjust 25,000 | |

**M2–9**



Req. 1
Predetermined Overhead Rate = $250,000/20,000 direct labor hours = $12.50 per direct labor hour

Req. 2
Applied Manufacturing Overhead = $12.50 × 22,000 direct labor hours = $275,000

**M2–10**

Req. 1

| Manufacturing Overhead | |
|---|---|
| Actual 260,000 | 275,000 Applied |
| | Balance 15,000 Overapplied |

Req. 2
Cost of Goods Sold and Manufacturing Overhead are affected. Since manufacturing overhead is overapplied, we will need to decrease (credit) the Cost of Goods Sold account by $15,000 and eliminate the $15,000 balance in the manufacturing overhead account with a debit.

**M2-11**

| Action | Raw Materials Inventory | Work in Process Inventory | Finished Goods Inventory | Cost of Goods Sold |
|---|---|---|---|---|
| a. Table frames, legs, felt, and pockets are delivered to the inventory storeroom. | Increase | | | |
| b. Factory manager requisitions table frames, legs, felt, and pockets to build 30 pool tables. | Decrease | Increase | | |
| c. Factory workers assemble the pool tables. | | Increase | | |
| d. 18 pool tables are completed and moved to the showroom. | | Decrease | Increase | |
| e. Customers purchase 10 tables. | | | Decrease | Increase |

**M2-12**

| Case | Actual MOH | Applied MOH | Over/Under-applied | Amount |
|---|---|---|---|---|
| A | $100,000 | $105,000 | Overapplied | $5,000 |
| B | 79,000 | 78,000 | Underapplied | 1,000 |
| C | 247,300 | 261,300 | Overapplied | 14,000 |
| D | 141,000 | 135,000 | Underapplied | 6,000 |



**M2-13**

Req. 1
Direct materials added to Work in Process = $25,000 + $35,000 = $60,000

Req. 2
Indirect materials added to Manufacturing Overhead = $30,000

Req. 3

Raw Materials Inventory

| | | |
|---|---|---|
| Beg. Balance | 20,000 | 90,000 Issued to Production |
| Purchases | 90,000 | |
| End. Balance | 20,000 | |

**M2–14**

Req. 1

| | | |
|---|---|---|
| Raw Materials Inventory …… | 90,000 | |
| Accounts Payable or Cash…… | | 90,000 |

Req. 2

| | | |
|---|---|---|
| Work in Process Inventory ($25,000 + $35,000)……..... | 60,000 | |
| Manufacturing Overhead…… | 30,000 | |
| Raw Materials Inventory…… | | 90,000 |

**M2–15**

Req. 1

Direct Labor Added to Work in Process Inventory = $22,500

Indirect Labor Added to Manufacturing Overhead = $4,000 + $8,000 + $2,500 = $14,500

Selling and Administrative Expenses = $9,000

Req. 2

Only **direct** labor costs are recorded directly in the Work in Process Inventory account, because these costs can be traced to specific jobs in process. Any entry to Work in Process Inventory must have a corresponding update to the specific job cost sheet. Other **indirect** manufacturing related labor costs must be treated as manufacturing overhead. Although these costs are not directly traceable to a specific job, they must be counted as part of the cost of the product, which occurs when manufacturing overhead costs are applied to work in process. Selling and administrative expenses are never counted as part of the cost of the product, but rather are expensed immediately as period costs.



**M2-16**

Req. 1

| | | |
|---|---|---|
| Work in Process Inventory…..……..... | 22,500 | |
| Manufacturing Overhead ($4,000 + $8,000 + $2,500)..... | 14,500 | |
| General and Administrative Salary Expense…… | 9,000 | |
| Salary and Wages Payable or Cash…….. | | 46,000 |

Req. 2

Applied manufacturing overhead = Predetermined overhead rate × Actual value of allocation base
Applied manufacturing overhead = $50 × 750 Direct labor hours = $37,500

| | | |
|---|---|---|
| Work in Process Inventory…….. | 37,500 | |
| Manufacturing Overhead…….. | | 37,500 |

**M2–17**

Req. 1

| Manufacturing Overhead | |
|---|---|
| Actual | Applied |
| Indirect materials 30,000 | 750 DL hours |
| Factory supervision 4,000 | x $50 Predetermined OH rate |
| Production engineer 8,000 | 37,500 |
| Factory janitorial work 2,500 | |
| Other factory overhead 7,500 | |
| 52,000 | |
| 14,500 Balance (underapplied) | |

Req. 2

$52,000 − $37,500 = $14,500 underapplied

**M2-18**

Req. 1

| | | |
|---|---|---|
| Cost of Goods Sold…… | 14,500 | |
| Manufacturing Overhead…….. | | 14,500 |



Req. 2

This entry will increase Cost of Goods Sold, which makes sense since manufacturing overhead was UNDERAPPLIED. In other words, we didn't apply enough cost to Work in Process Inventory, to Finished Goods Inventory, or, eventually, to Cost of Goods Sold.

**M2–19**

Total current manufacturing costs + Beginning work in process inventory − Ending work in process inventory = Cost of goods manufactured
Total current manufacturing costs + $30,000 − $25,000 = $180,000
Total current manufacturing costs = $180,000 − $30,000 + $25,000
Total current manufacturing costs = $175,000

**M2–20**

| | |
|---|---|
| Cost of goods manufactured | $320,000 |
| + Beginning finished goods inventory | 45,000 |
| − Ending finished goods inventory | - 35,000 |
| Cost of goods sold | $330,000 |

**M2–21**

Direct materials used + Direct labor + Applied manufacturing overhead = Total current manufacturing costs
Direct materials used + $60,000 + ($60,000 × 200%) = $300,000
Direct materials used = $300,000 − $60,000 – $120,000
Direct materials used = $120,000

**M2–22**

Miscellaneous (overhead) costs for an auto-repair shop would include rent on the garage, supervision, miscellaneous parts and supplies, depreciation on tools and machinery, utilities, etc.

**M2-23**

| Case | Total Current Manufacturing Costs | Beginning Work in Process Inv | Ending Work in Process Inv | Cost of Goods Manufactured |
|---|---|---|---|---|
| A | $7,200 | $2,100 | $1,650 | $7,650 |
| B | 3,960 | 3,015 | 2,385 | 4,590 |
| C | 8,650 | 1,350 | 3,000 | 7,000 |
| D | 4,740 | 750 | 1,365 | 4,125 |



**M2-24**

| Case | Cost of Goods Manufactured | Beginning Finished Goods Inv | Ending Finished Goods Inv | Cost of Goods Sold |
|---|---|---|---|---|
| A | $5,270 | $760 | $850 | $5,180 |
| B | 6,750 | 475 | 325 | 6,900 |
| C | 4,520 | 750 | 895 | 4,375 |
| D | 1,900 | 250 | 400 | 1,750 |

## ANSWERS TO EXERCISES

### E2–1

Req. 1

| | (Job #33) | (Job #34) | (Job #35) | Total |
|---|---|---|---|---|
| Balance on 3/1 | $7,500 | $6,000 | $0 | $13,500 |
| Direct Materials | 3,500 | 6,000 | 4,200 | 13,700 |
| Direct Labor | 6,500 | 7,800 | 3,250 | 17,550 |
| Applied Manufacturing Overhead (150% of Direct labor) | 9,750 | 11,700 | 4,875 | 26,325 |
| Total Manufacturing Cost | $27,250 | $31,500 | $12,325 | $71,075 |

Req. 2

| | | |
|---|---|---|
| Work in Process Inventory (Job #35) | | $12,325 |
| Finished Goods Inventory (Job #34) | $31,500 | |
| Cost of Goods Sold (Job #33) | $27,250 | |

### E2-2

| | | |
|---|---|---|
| Work in Process Inventory…….. | 13,700 | |
| Manufacturing Overhead……. | 1,300 | |
| Raw Materials Inventory……... | | 15,000 |
| | | |
| Work in Process Inventory…….. | 17,550 | |
| Manufacturing Overhead……. | 2,140 | |
| Wages Payable or Cash…….. | | 19,690 |
| | | |
| Work in Process Inventory ($17,550 × 150%)…….. | 26,325 | |
| Manufacturing Overhead…….. | | 26,325 |

**E2–3**

Req. 1

| | |
|---|---|
| Job 271 = (8 hrs + 8 hrs) × $30 per hour = | $ 480 |
| Job 272 = (8 hrs + 4 hrs) × $30 per hour = | 360 |
| Job 273 = 8 hrs × $30 per hour = | 240 |
| Total Direct Labor Assigned to Jobs | $1,080 |

Req. 2

The time that Joyce spends doing maintenance (4 hours × $30 = $120) cannot be traced to specific jobs and will be treated as indirect labor, which is recorded in the Manufacturing Overhead account rather than Work in Process Inventory.

**E2-4**

| | | |
|---|---|---|
| Work in Process Inventory…….. | 1,080 | |
| Manufacturing Overhead……. | 120 | |
| Wages Payable…….. | | 1,200 |

**E2-5**

Req. 1



Must first determine expected number of DL hours.

Estimated DL Cost / DL rate = Estimate DL hours

$300,000 / $15.00 = 20,000 DL hours expected

Predetermined Overhead Rate = Estimated Mfg. Overhead / Estimated DL hours

Estimated Total Manufacturing Overhead:

| | |
|---|---|
| Factory machinery depreciation | $55,000 |
| Factory supervisor salaries | 140,000 |
| Factory supplies | 7,500 |
| Factory property tax | 37,500 |
| Total Estimated MOH | $240,000 |

Predetermined Overhead Rate = $240,000 / 20,000 DL Hours
= $12.00 per DL Hour

*Note that $15 is the direct labor rate, while $12 is the predetermined overhead rate.*

Req. 2

Applied Overhead = Overhead Rate × Actual DL Hours
= $12.00 × 18,500 DL Hours
= $222,000

**E2–6**

| | Case 1 | Case 2 | Case 3 |
|---|---|---|---|
| Direct material used | $12,000 | $15,000 | $15,000 |
| Direct labor | 25,000 | 12,000 | 8,000 |
| Manufacturing overhead applied | 37,500 | 18,000 | 12,000 |
| Total current manufacturing costs | 74,500 | 45,000 | 35,000 |
| Beginning work in process inventory | 10,000 | 8,000 | 9,000 |
| Ending work in process inventory | 12,000 | 7,000 | 12,000 |
| Cost of goods manufactured | 72,500 | 46,000 | 32,000 |
| Beginning finished goods inventory | 15,000 | 10,000 | 8,000 |
| Ending finished goods inventory | 12,000 | 8,000 | 6,000 |
| Cost of goods sold | 75,500 | 48,000 | 34,000 |

Detailed calculations provided below:

a. Manufacturing overhead applied = 150% of Direct labor
Manufacturing overhead applied = 150% × $25,000
Manufacturing overhead applied = $37,500

b. Direct materials + Direct labor + Manufacturing overhead applied = Total current manufacturing costs
$12,000 + $25,000 + $37,500 = $74,500



c. Total current manufacturing costs + Beginning work in process inventory – Ending work in process inventory = Cost of goods manufactured
$74,500 + $10,000 − $12,000 = $72,500

d. Cost of goods manufactured + Beginning finished goods inventory – Ending finished goods inventory = Cost of goods sold
$72,500 + $15,000 − $12,000 = $75,500

e. Manufacturing overhead applied = 150% × Direct labor
$18,000 = 150% × Direct labor
Direct labor = $12,000

f. Direct materials + Direct labor + Manufacturing overhead applied = Total current manufacturing costs
Direct materials + $12,000 + $18,000 = $45,000
Direct materials = $15,000

**E2–6 (continued)**

g. Total current manufacturing costs + Beginning work in process inventory − Ending work in process inventory = Cost of goods manufactured
$45,000 + Beginning work in process inventory − $7,000 = $46,000
Beginning work in process inventory = $8,000

h. Cost of goods manufactured + Beginning finished goods inventory − Ending finished goods inventory = Cost of goods sold
$46,000 + $10,000 − Ending finished goods inventory = $48,000
Ending finished goods inventory = $8,000

i. Conversion cost = Total current manufacturing costs − Direct materials
Conversion cost = $35,000 − $15,000
Conversion cost = $20,000

Conversion cost = Direct labor + Manufacturing overhead applied
Conversion cost = Direct labor + (1.5 × Direct labor)
$20,000 = (1 × Direct labor) + (1.5 × Direct labor)
$20,000 = (2.5 × Direct labor)
Direct labor = $8,000

j. Manufacturing overhead applied = 1.5 × Direct labor
Manufacturing overhead applied = 1.5 × $8,000
Manufacturing overhead applied = $12,000



k. Total current manufacturing costs + Beginning work in process inventory − Ending work in process inventory = Cost of goods manufactured
$35,000 + $9,000 − Ending work in process inventory = $32,000
Ending work in process inventory = $12,000

l. Cost of goods manufactured + Beginning finished goods inventory − Ending finished goods inventory = Cost of goods sold
$32,000 + Beginning finished goods inventory − $6,000 = $34,000
Beginning finished goods inventory = $8,000

**E2–7**

Req. 1
Predetermined overhead rate = $325,000 / 25,000 machine hours = $13 per machine hour

Req. 2
Applied manufacturing overhead = Predetermined overhead rate × Actual value of allocation base
Applied manufacturing overhead = $13 × 26,000 actual machine hours = $338,000

Req.3

| Manufacturing Overhead | |
|---|---|
| Actual 372,000 | 338,000 Applied |
| Balance 34,000 (Underapplied) | |

**E2-8**

Req. 1



| | | |
|---|---|---|
| Manufacturing Overhead …….. | 372,000 | |
| Cash, Payables, etc. ……. | | 372,000 |
| Work in Process Inventory…… | 338,000 | |
| Manufacturing Overhead……. | | 338,000 |

Req. 2

| | | |
|---|---|---|
| Cost of Goods Sold……... | 34,000 | |
| Manufacturing Overhead…….. | | 34,000 |

**E2-9**

1. Direct Material Used = $35,500 +304,200 − 15,000 − 40,250 = $284,450
2. Applied Overhead = $275,300 × .75 = $206,475
3. Total Manufacturing Cost = $284,450 + 275,300 + 206,475 = $766,225
4. Cost of Goods Manufactured = $110,300 + 766,225 − 120,600 = $755,925
5. Cost of Goods Sold = $24,100 + 755,925 − 22,400 = $757,625

**E2-10**

Req. 1

**Davenport Company**
**Cost of Goods Manufactured Report**
**for the Year 2021**

| | |
|---|---|
| Beginning Raw Materials Inventory | $35,500 |
| Plus: Raw Material Purchases | 304,200 |
| Less: Indirect Material Used | (15,000) |
| Less: Ending Raw Materials Inventory | (40,250) |
| Direct Materials Used in Production | $284,450 |
| Direct Labor | 275,300 |
| Applied Manufacturing Overhead | 206,475 |
| Total Current Manufacturing Costs | $766,225 |
| Plus: Beginning Work in Process Inventory | 110,300 |
| Less: Ending Work in Process Inventory | (120,600) |
| Cost of Goods Manufactured | $755,925 |



Req. 2

**Davenport Company**
**Income Statement**
**for the Year 2021**

| | | |
|---|---|---|
| Sales Revenue | | $1,250,000 |
| Less: Cost of Goods Sold | | |
| Beginning Finished Goods Inventory | 24,100 | |
| Plus: Costs of Goods Manufactured | 755,925 | |
| Cost of Goods Available for Sale | 780,025 | |
| Less: Ending Finished Goods Inventory | (22,400) | |
| Cost of Goods Sold | | (757,625) |
| Gross Profit | | 492,375 |
| Less: Operating (Period) Expenses | | (210,000) |
| Net Income from Operations | | $282,375 |

**E2-11**

| | Cost of Jobs in Process, 4/1/2021 | Direct Materials Used | Direct Labor Cost | Overhead Applied | Total |
|---|---|---|---|---|---|
| **Job A** | $ 12,000 | 2,000 | 10,000 | **$7,500** | **$ 31,500** |
| **Job B** | $ 1,000 | 8,000 | 8,000 | **$6,000** | **$ 23,000** |
| **Job C** | $ - | 9,000 | 3,000 | **$2,250** | **$ 14,250** |

| | | |
|---|---|---|
| **Predetermined Overhead Rate** | **$15** | **per Direct Labor Hour** |
| **Direct Labor Rate** | **$20** | **per hour** |

Determine the balance in each of following at the end of April

| | | |
|---|---|---|
| Work in Process | **$ 14,250** | Job C |
| Finished Goods | **$ 23,000** | Job B |
| Cost of Goods Sold | **$ 31,500** | Job A |

**E2-12**

| | Judy | Tom | Elizabeth |
|---|---|---|---|
| Food and nutritional supplements | $ 500 | $ 1,000 | $ 300 |
| Nutritional counseling ($15 per hour) | 150 | 300 | 180 |
| Personal fitness training ($20 per hour) | 400 | 600 | 800 |
| Indirect operating costs | **825** | **1,350** | **1,470** |
| Total cost to serve | **$ 1,875** | **$ 3,250** | **$ 2,750** |

| | Estimated | Actual |
|---|---|---|
| Indirect operating costs | $ 300,000 | $ 290,000 |
| Consultants costs | $ 200,000 | $ 215,000 |

| | |
|---|---|
| Nutritional counseling cost per hour | $ 15 |
| Personal fitness cost per hour | $ 20 |

| | |
|---|---|
| Upfront fee | $ 400 |
| Supplements markup | 30% |
| Nutritional counseling rate | $ 40 |
| Personal fitness training rate | $ 40 |



Req. 1 Predetermined Overhead Rate **150%** of consultants cost (nutrition and fitness)

| Req. 2 Total Cost of serving each client | Judy | Tom | Elizabeth |
|---|---|---|---|
| | **$ 1,875** | **$ 3,250** | **$ 2,750** |

| Req. 3 Profitability of each client | Judy | Tom | Elizabeth |
|---|---|---|---|
| Revenue: Upfront fee | $ 400 | $ 400 | $ 400 |
| Revenue: Nutritional supplements | 650 | 1,300 | 390 |
| Revenue: Nutritional counseling | 400 | 800 | 480 |
| Revenue: Personal fitness training | 800 | 1,200 | 1,600 |
| Total Revenue | $ 2,250 | $ 3,700 | $ 2,870 |
| Less Total Costs | 1,875 | 3,250 | 2,750 |
| Operating Profit | **$ 375** | **$ 450** | **$ 120** |

**E2-13**

Req. 1
Predetermined Overhead Rate = Estimated Overhead / Estimated Direct Labor
= $90,000 / $120,000
= $0.75 per DL Dollar

Req. 2

| Work in Process | |
|---|---|
| Beginning Balance 41,000 | 58,000 |
| Direct Materials 75,000 | 65,000 |
| Direct Labor 120,000 | 74,500 |
| Overhead 90,000 | 67,500 |
| Ending Balance 61,000 | |

Req. 3

Job 248 (as of August 31):

| | |
|---|---|
| Direct Material | ? |
| Direct Labor | 24,000 |
| Applied Manufacturing Overhead (75% × 24,000) | ? |
| Total Manufacturing Cost | 61,000 |



Applied Manufacturing Overhead = $24,000 × 75% = $18,000
Direct Materials = $61,000 − $24,000 – $18,000 = $19,000

**E2-14**

Req. 1

Predetermined Overhead Rate: $346,500 / ($150,000 + 81,000) = 150% of Salary Cost

Req. 2

| | Debbie | Tara |
|---|---|---|
| Annual Salary | $150,000 | $81,000 |
| Overhead (150% of Salary) | 225,000 | 121,500 |
| Total Cost | $375,000 | 202,500 |
| | | |
| Billable Hours | 2,000 | 1,800 |
| Hourly Cost | $187.50 | $112.50 |
| Mark-up (20%) | 37.50 | 22.50 |
| Billing Rate | $225.00 | $135.00 |

**E2–15**

Req. 1
Applied manufacturing overhead = Predetermined overhead rate × Actual value of allocation base
Applied manufacturing overhead = $15 × 158 Direct labor hours = $2,370

Req. 2

| | |
|---|---|
| Direct materials | $ 7,500 |
| Direct labor | 3,200 |
| Applied manufacturing overhead | 2,370 |
| Total manufacturing cost | $13,070 |

Req. 3
Revenue = 130% of total manufacturing cost
Revenue = 1.30 × $13,070 = $16,991

Req. 4
Gross profit = Sales revenue – Cost of goods sold
Gross profit = $16,991 − $13,070 = $3,921

**E2-16**

| | | |
|---|---|---|
| Cost of Goods Sold | 13,070 | |
| Finished Goods Inventory | | 13,070 |
| Cash | 16,991 | |
| Sales Revenue | | 16,991 |

**E2–17**

| Description | Transaction |
|---|---|
| Applied Manufacturing Overhead | (e) |
| Recorded Direct Labor | (d) |
| Recorded the Cost of Jobs Completed | (f) |
| Purchased Raw Materials | (a) |
| Recorded Actual Manufacturing Overhead | (c) |
| Recorded the Cost of Jobs Sold | (g) |
| Issued Raw Materials to Production | (b) |

**E2–18**

Req. 1
Predetermined overhead rate = $300,000 / 20,000 DLH = $15 per DLH

Req. 2
Applied manufacturing overhead = Predetermined overhead rate × Actual value of allocation base
Applied manufacturing overhead = $15 × 1,500 actual direct labor hours = $22,500

Req. 3

| | |
|---|---|
| Indirect labor | $ 4,500 |
| Indirect materials | 2,500 |
| Factory rent | 4,200 |
| Factory supervision | 4,700 |
| Factory depreciation | 5,600 |
| Factory janitorial work | 1,200 |
| Factory insurance | 2,600 |
| Actual manufacturing overhead costs | $25,300 |

Req. 4

| Manufacturing Overhead | |
|---|---|
| Actual 25,300 | 22,500 Applied |
| Balance 2,800 (Underapplied) | |

**E2-19**

Req. 1
Applied manufacturing overhead = Predetermined overhead rate × Actual value of allocation base
Applied manufacturing overhead = $15 × 1,500 actual direct labor hours = $22,500

| | | |
|---|---|---|
| Work in Process Inventory…….. | 22,500 | |
| Manufacturing Overhead…….. | | 22,500 |

Req. 2

| | | |
|---|---|---|
| Manufacturing Overhead…….. | 25,300 | |
| Cash, Payables, etc. ……. | | 25,300 |

Req. 3

| | | |
|---|---|---|
| Cost of Goods Sold ……... | 2,800 | |
| Manufacturing Overhead…….. | | 2,800 |

This entry will increase Cost of Goods Sold. This is appropriate since manufacturing overhead costs were underapplied (i.e., we did not apply enough cost to Work in Process, Finished Goods, and ultimately Cost of Goods Sold).

**E2–20**

Req. 1

| Raw Materials Inventory | |
|---|---|
| 1/1 32,000 | b. 36,200 |
| a. 20,000 | |
| Bal. 15,800 | |

| Work in Process Inventory | |
|---|---|
| 1/1 15,500 | f. 32,150 |
| b. 33,000 | |
| c. 12,900 | |
| d. 15,000 | |
| Bal. 44,250 | |

| Finished Goods | |
|---|---|
| 1/1 20,000 | g. 20,000 |
| f. 32,150 | |
| Bal. 32,150 | |

| Cost of Goods Sold | |
|---|---|
| g. 20,000 | |
| Bal. 20,000 | |

| Manufacturing Overhead | |
|---|---|
| b. 3,200 | d. 15,000 |
| c. 5,000 | |
| e. 8,600 | |
| Bal. 1,800 | |

| Sales Revenue | |
|---|---|
| | g. 31,000 |
| | Bal. 31,000 |

| Miscellaneous Accounts (Cash, Payables, etc.) | |
|---|---|
| g. 31,000 | a. 20,000 |
| | c. 17,900 |
| | e. 8,600 |

Supporting Calculations:

b. $12,000 + $21,000 = $33,000
c. $2,150 + $10,750 = $12,900
d. 600 hours × $25 = $15,000

Req. 2

Raw Materials Inventory = $15,800
Work in Process Inventory = $44,250
Finished Goods Inventory = $32,150
Cost of Goods Sold = $20,000 (unadjusted)
Manufacturing Overhead = $1,800 (underapplied)



Req. 3

| Job Number | Beginning Balance | Direct Materials | Direct Labor | OH Applied @ $25 per DL Hour | Total Cost of Job |
|---|---|---|---|---|---|
| 201 | 15,500 | 12,000 | 2,150 | 2,500 | 32,150 |
| 202 | 0 | 21,000 | 10,750 | 12,500 | 44,250 |

Job 200 is in Cost of Goods Sold. Job 201 is in Finished Goods Inventory. Job 202 is in Work in Process Inventory. The balance in each of these accounts matches the individual job cost sheets.

**E2-21**

| | Case 1 | Case 2 | Case 3 | Case 4 |
|---|---|---|---|---|
| Beginning raw materials | $7,000 | $9,000 | $16,000 | $55,000 |
| Raw material purchases | 63,000 | 24,500 | 33,312 | 140,000 |
| Indirect materials issued | 1,400 | 2,000 | 1,200 | 1,000 |
| Ending raw materials | 2,800 | 4,500 | 21,136 | 46,750 |
| Direct materials used | 65,800 | 27,000 | 26,976 | 147,250 |
| Direct labor | 40,600 | 43,500 | 22,480 | 61,625 |
| Manufacturing overhead applied | 72,800 | 80,700 | 24,864 | 270,865 |
| Total current manufacturing costs | 179,200 | 151,200 | 74,320 | 479,740 |
| Beginning work in process | 57,400 | 65,200 | 30,060 | 51,260 |
| Ending work in process | 42,000 | 56,800 | 33,000 | 118,050 |
| Cost of goods manufactured | 194,600 | 159,600 | 71,380 | 412,950 |
| Beginning finished goods | 100,800 | 42,600 | 41,520 | 205,350 |
| Ending finished goods | 112,000 | 60,200 | 22,200 | 198,600 |
| Cost of goods sold | 183,400 | 142,000 | 90,700 | 419,700 |

**E2-22**

Req. 1

**StorSmart Company**
**Cost of Goods Manufactured Report**
**For the Month of March**

| | |
|---|---|
| Beginning Raw Materials Inventory | $33,000 |
| Plus: Raw Material Purchases | 84,000 |
| Less: Indirect Material Used | (10,000) |
| Less: Ending Raw Materials Inventory | (22,000) |
| Direct Materials Used in Production | $85,000 |
| Direct Labor | 55,000 |
| Manufacturing Overhead | 85,000 |
| Total Current Manufacturing Costs | $225,000 |
| Plus: Beginning Work in Process Inventory | 25,000 |
| Total Work in Process | $250,000 |
| Less: Ending Work in Process Inventory | (44,000) |
| Cost of Goods Manufactured | $206,000 |

Req. 2

**StorSmart Company**
**Income Statement**

**For the Month of March**

| | | |
|---|---|---|
| Sales Revenue | | $450,000 |
| Less: Cost of Goods Sold | | |
| Beginning Finished Goods Inventory | $60,000 | |
| Plus: Cost of Goods Manufactured* (see schedule above) | 206,000 | |
| Cost of Goods Available for Sale | 266,000 | |
| Less: Ending Finished Goods Inventory | (58,000) | |
| Cost of Goods Sold | | (208,000) |
| Gross Profit | | $242,000 |
| Less: Operating (Period) Expenses | | (58,000) |
| Net Income from Operations | | $184,000 |

**E2–23**

Req. 1

a.

| | | |
|---|---|---|
| Raw Materials Inventory | 50,500 | |
| Accounts Payable | | 50,500 |

b.

| | | |
|---|---|---|
| Manufacturing Overhead | 8,300 | |
| Work In Process Inventory | 23,700 | |
| Raw Materials Inventory | | 32,000 |

c.

| | | |
|---|---|---|
| Work In Process Inventory | 64,400 | |
| Manufacturing Overhead | 17,000 | |
| Salaries/Wages Payable | | 81,400 |

d.

| | | |
|---|---|---|
| Manufacturing Overhead | 90,000 | |
| Accounts Payable | | 90,000 |

e.

| | | |
|---|---|---|
| Depreciation Expense | 7,000 | |
| AccumulatedDepreciation | | 7,000 |

..

f.

| | | |
|---|---|---|
| Work in Process Inventory | 96,600 | |
| Manufacturing Overhead | | 96,600 |

(Direct labor cost of $64,400 × 1.5)

g.

| | | |
|---|---|---|
| Finished Goods Inventory | 102,000 | |
| Work in Process Inventory | | 102,000 |

h.

| | | |
|---|---|---|
| Cost of Goods Sold | 70,000 | |
| Finished Goods Inventory | | 70,000 |
| | | |
| Accounts Receivable | 87,500 | |
| Sales Revenue | | 87,500 |

**E2–23 (continued)**

Req. 2

| Manufacturing Overhead | |
|---|---|
| Actual 8,300 | 96,600 Applied |
| 17,000 | |
| 90,000 | |
| Balance 18,700 Underapplied | |

Req. 3

| | | |
|---|---|---|
| Cost of Goods Sold | 18,700 | |
| Manufacturing Overhead | | 18,700 |

Req. 4

Adjusted Cost of Goods Sold = $70,000 + 18,700 = $88,700

**E2–24**

| | | |
|---|---|---|
| Work in Process Inventory ($450 + $320 + $280) | 1,050 | |
| Manufacturing Overhead | 200 | |
| Raw Materials Inventory | | 1,250 |

**E2–25**

| | | |
|---|---|---|
| a. | | |
| Raw Materials (Parts and Supplies) Inventory | 16,000 | |
| Accounts Payable | | 16,000 |
| b. | | |
| Repair Jobs in Process | 10,000 | |
| Garage/Shop Overhead Costs | 4,000 | |
| Raw Materials (Part and Supplies) Inventory | | 14,000 |
| c. | | |
| Repair Jobs in Process | 12,000 | |
| Wages Payable | | 12,000 |
| d. | | |
| Repair Jobs in Process (500 hours × $20) | 10,000 | |
| Garage/Shop Overhead Costs | | 10,000 |
| e. | | |
| Garage/Shop Overhead Costs | 14,500 | |
| Prepaid Rent | | 8,000 |
| Accumulated Depreciation | | 2,500 |
| Salaries Payable | | 4,000 |



| | | |
|---|---|---|
| f. | | |
| Cost of Repairs Completed and Sold | 40,000 | |
| Repair Jobs in Process | | 40,000 |
| Accounts Receivable | 52,000 | |
| Service Revenue ($40,000 × 1.3) | | 52,000 |

**E2–26**

Req. 1
Predetermined Overhead Rate = $125,000 / 5,000 DLH = $ 25.00 per DLH

| Req. 2 | Oliverio | McComb |
|---|---|---|
| Direct labor cost (professional) | $ 4,000 | $ 3,000 |
| Travel costs | 500 | 100 |
| Overhead ($25 per hour) | 40 × $25 = 1,000 | 30 × $25 = 750 |
| Total Cost to Serve | $ 5,500 | $ 3,850 |

| Req. 3 | | |
|---|---|---|
| Sales Revenue ($250 per hour) | 40 × $250 = $ 10,000 | 30 × $250 = $ 7,500 |
| Less: Total Cost to Serve | 5,500 | 3,850 |
| Gross Profit | $ 4,500 | $ 3,650 |

**E2–27**

Req. 1

| Sustainability Standards: | Is Panderia meeting its sustainability standard? |
|---|---|
| At least 80% of total raw material costs will be sourced from local suppliers (within a 100 mile radius) to reduce transportation costs and to boost the local economy. | No, this standard is not met since a large percentage of the raw materials costs were sourced from Los Angeles, which is outside of the 100 mile radius.<br><br>Total Raw Material Costs = $20,000 + $16,000 + $20,000 + $10,000 = $66,000<br><br>Raw Materials from Local Suppliers: $20,000 + $20,000 + 10,000 = $50,000<br><br>$50,000 / $66,000 = 75.8% |
| At least 60% of lumber will come from recycled sources rather than virgin wood. | Yes. For this job, 80% of the lumber was from recycled sources. |
| All appliances will be ENERGY STAR® rated to reduce energy consumption by an average of 50%. | Yes, all appliances are energy star rated. |
| All paints, woodwork and carpet materials will emit low or zero volatile organic compounds (VOCs) for improved air quality. | Yes. The cabinets are low VOC. |

**E2–27 (continued)**

Req. 2

Panderia can use this information to ensure that they are purchasing materials in a way that meets their sustainability goals. If any of the standards were NOT met, managers should reconsider where they are sourcing their materials and what types of materials are being purchased. For example, in this case they should consider whether it is possible to buy the appliances from a local supplier rather than one located in Los Angeles. Managers may need to make trade-offs between their cost goals and sustainability goals when that is not possible or when it is cost-prohibitive. But with the sustainability data, managers have the information to make an informed decision.

## ANSWERS TO GROUP A PROBLEMS

### PA2-1

Req. 1 and 2

| Raw Materials Inventory | | Work in Process Inventory | | Finished Goods Inventory | |
|---|---|---|---|---|---|
| Bal. 25,000 | b. 122,000 | Bal. 55,000 | f. 375,000 | Bal. 60,000 | g. 402,000 |
| a. 136,000 | | b. 94,000 | | f. 375,000 | |
| | | c. 131,000 | | | |
| | | e. 176,850 | | | |
| Bal. 39,000 | | Bal. 81,850 | | Bal. 33,000 | |

| Manufacturing Overhead | | Cost of Goods Sold | |
|---|---|---|---|
| b. 28,000 | e. 176,850 | g. 402,000 | |
| c. 24,000 | | | |
| d. 26,000 | | | |
| d. 30,000 | | | |
| d. 24,000 | | | |
| | 44,850 Overapplied | Bal. 402,000 | |

| Sales Revenue | | Nonmanufacturing Expenses | |
|---|---|---|---|
| | h. 500,000 | d. 44,000 | |
| | | d. 15,000 | |
| | Bal. 500,000 | Bal. 59,000 | |

Req. 3

Manufacturing overhead is overapplied by $44,850. If this amount is closed directly to Cost of Goods Sold, it will DECREASE Cost of Goods Sold.

**PA2-1 (continued)**

Req. 4

| Lamonda Corp.<br>Cost of Goods Manufactured Report<br>For the Month of April | |
|---|---|
| Beginning raw materials inventory | $ 25,000 |
| Plus: Raw material purchases | 136,000 |
| Less: Indirect materials | 28,000 |
| Less: Ending raw materials inventory | 39,000 |
| Direct materials used | $ 94,000 |
| Direct labor | 131,000 |
| Manufacturing overhead applied | 176,850 |
| Total current manufacturing costs | $401,850 |
| Plus: Beginning work in process inventory | 55,000 |
| Less: Ending Work in Process Inventory | 81,850 |
| Cost of Goods Manufactured | $375,000 |

Req. 5

| Lamonda Corp.<br>Income Statement<br>For the Month of April | | |
|---|---|---|
| Sales revenue | | $500,000 |
| Cost of goods sold | | |
| Beginning finished goods inventory | $60,000 | |
| Plus: Cost of goods manufactured | 375,000 | |
| Less Ending finished goods inventory | 33,000 | |
| Unadjusted Cost of goods sold | 402,000 | |
| Less: Overapplied manufacturing overhead | 44,850 | |
| Adjusted Cost of Goods Sold | | $357,150 |
| Gross profit | | $142,850 |
| Selling and administrative expenses | | 59,000 |
| Net Income from Operations | | $83,850 |

**PA2-2**

| | | |
|---|---|---|
| a. | | |
| Raw Materials Inventory | 136,000 | |
| Accounts Payable | | 136,000 |
| b. | | |
| Manufacturing Overhead | 28,000 | |
| Work In Process Inventory | 94,000 | |
| Raw Materials Inventory | | 122,000 |
| c. | | |
| Work In Process Inventory | 131,000 | |
| Manufacturing Overhead | 24,000 | |
| Salaries/Wages Payable | | 155,000 |
| d. | | |
| Selling and Administrative Expenses (44,000 + 15,000) | 59,000 | |
| Manufacturing Overhead (26,000 + 30,000 + 24,000) | 80,000 | |
| Miscellaneous Accounts (Payables, Cash, Prepaid Assets, Accumulated Dep.) | | 139,000 |
| e. | | |
| Work in Process Inventory | 176,850 | |
| Manufacturing Overhead | | 176,850 |
| f. | | |
| Finished Goods Inventory | 375,000 | |
| Work in Process Inventory | | 375,000 |
| g. | | |
| Cost of Goods Sold | 402,000 | |
| Finished Goods Inventory | | 402,000 |
| h. | | |
| Accounts Receivable | 500,000 | |
| Sales Revenue | | 500,000 |

| | | |
|---|---|---|
| Entry to close manufacturing overhead to Cost of Goods Sold: | | |
| Manufacturing Overhead | 44,850 | |
| Cost of Goods Sold | | 44,850 |

**PA2–3**

Req. 1
Predetermined overhead rate = $420,000 / 60,000 machine hours = $7.00 per machine hour

Req. 2
Total Applied Manufacturing Overhead = 7,000 hours × $7.00 = $49,000

Req. 3
Ending Work in Process Inventory (Job 103) = $9,600 + $9,600 + (2,000 machine hours × $7.00) = $33,200

Req. 4
Cost of Job 101 = $19,200 + $28,800 + (1,000 machine hours × $7.00) = $55,000

Since this was the only job sold, the gross profit before the adjustment for over or underapplied manufacturing overhead is $60,000 − $55,000 = $5,000.

Req. 5

| Manufacturing Overhead | | | |
|---|---|---|---|
| Actual | 45,000 | 49,000 | Applied |
| | | 4,000 | Balance (Overapplied) |



**PA2-4**

Req. 1
Cost of Job 102 = $14,400 + $11,200 + (4,000 machine hours × $7.00) = $53,600

| | | |
|---|---|---|
| Finished Goods Inventory…… | 53,600 | |
| Work in Process Inventory…….. | | 53,600 |

Req. 2
Cost of Job 101 = $19,200 + $28,800 + (1,000 machine hours × $7.00) = $55,000

| | | |
|---|---|---|
| Cost of Goods Sold……... | 55,000 | |
| Finished Goods Inventory……... | | 55,000 |
| Cash or Accounts Receivable……. | 60,000 | |
| Sales Revenue…….. | | 60,000 |

Req. 3

| | | |
|---|---|---|
| Manufacturing Overhead……. | 4,000 | |
| Cost of Goods Sold …… | | 4,000 |

**PA2–5**

Req. 1

| Raw Materials Inventory | |
|---|---|
| 1/1 20,000 | b. 40,000 |
| a. 26,000 | |
| Bal. 6,000 | |

| Work in Process Inventory | |
|---|---|
| 1/1 15,000 | h. 97,000 |
| b. 32,000 | |
| c. 18,000 | |
| g. 54,000 | |
| Bal. 22,000 | |

| Finished Goods Inventory | |
|---|---|
| 1/1 32,000 | i. 70,000 |
| h. 97,000 | |
| Bal. 59,000 | |

| Cost of Goods Sold | |
|---|---|
| i. 70,000 | |
| Bal. 70,000 | |

| Manufacturing Overhead | |
|---|---|
| b. 8,000 | g. 54,000 |
| c. 5,200 | |
| d. 8,500 | |
| e. 1,600 | |
| f. 7,800 | |
| | Bal. 22,900 Overapplied |

| Selling and Administrative Expenses | |
|---|---|
| c. 46,500 | |
| d. 2,400 | |
| e. 2,400 | |
| Bal. 51,300 | |



| Sales Revenue | |
|---|---|
| | i. 91,000 |
| | Bal. 91,000 |

Req. 2
Unadjusted gross profit = $91,000 − $70,000 = $21,000

Req. 3
Manufacturing overhead is $22,900 overapplied.

Req. 4
Adjusted gross profit = $91,000 − ($70,000 – $22,900) = $43,900

**PA2–6**

| Item | Amount |
|---|---|
| Direct materials used in production | $93,850 |
| Direct labor | 100,000 |
| Manufacturing overhead applied | 125,000 |
| Total current manufacturing costs | $318,850 |
| Plus: Beginning work in process inventory | 12,000 |
| Less: Ending work in process inventory | (9,600) |
| Cost of goods manufactured | $321,250 |
| Plus: Beginning finished goods inventory | 25,000 |
| Less: Ending finished goods inventory | (31,250) |
| Unadjusted cost of goods sold | $315,000 |
| Over/Underapplied overhead | 10,000 |
| Adjusted cost of goods sold | $325,000 |

**PA2–7**

Req. 1
a. Predetermined overhead rate = $594,000 / 16,500 DLH = $36.00 per DLH
b. Applied manufacturing overhead = 18,000 actual direct labor hours × $36 = $648,000
c. $655,000 Actual − $648,000 Applied = $7,000 Underapplied

Req. 2
a. Predetermined overhead rate = $594,000 / $396,000 direct labor cost = 150% of direct labor cost
b. Applied manufacturing overhead = $450,000 × 150% = $675,000
c. $655,000 Actual − $675,000 Applied = $20,000 Overapplied

Req. 3
a. Predetermined overhead rate = $594,000 / 7,500 machine hours = $79.20 per machine hour
b. Applied manufacturing overhead = 8,500 actual machine hours × $79.20 = $673,200
c. $655,000 Actual − $673,200 Applied = $18,200 Overapplied

Req. 4
Based on last year's data, direct labor hours was the most accurate allocation base for applying manufacturing overhead, because it results in the lowest amount of over- or underapplied manufacturing overhead, or the smallest difference between actual and applied manufacturing overhead cost.



Req. 5
Ideally, companies should choose an allocation base that has a cause and effect relationship with the incurrence of manufacturing overhead cost. In addition, the allocation measure must be something that can be reasonably measured for each individual unit or job, and the benefits must outweigh cost of measurement. This is one reason that many companies choose to use direct labor hours to apply manufacturing overhead to production. This measure is already captured in the accounting system and often has a direct relationship with the incurrence of manufacturing overhead cost. However, with advances in automation and the changing nature of the labor force, direct labor hours is not necessarily the best measure for applying manufacturing overhead to production.

**PA2–8**

Req. 1

Predetermined overhead rate = $91,000 / $65,000 Direct labor cost = 140% of Direct labor cost

Req. 2

| Raw Materials Inventory | |
|---|---|
| Beg. Balance 15,000 | 80,000 (15,000 + |
| Purchases 95,000 | 95,000 − 30,000) |
| Ending Bal. 30,000 | |

| Work in Process Inventory | | |
|---|---|---|
| Beginning Balance | 30,000 | 200,000 (30,000 + |
| Direct Materials | 70,000 | 70,000 + 50,000 + |
| Direct Labor | 50,000 | 70,000 − 20,000) |
| Applied Overhead ($50,000 × 140%) | 70,000 | |
| Ending Balance | 20,000 | |

| Finished Goods Inventory | |
|---|---|
| Beginning Bal. 40,000 | 190,000 |
| Cost of Goods Completed 200,000 | (40,000 + 200,000 − 50,000) |
| Ending Balance 50,000 | |

| Cost of Goods Sold | |
|---|---|
| Unadjusted Cost of Goods Sold 190,000 | 12,000 Adjustment |
| Adjusted Cost of Goods Sold 178,000 | |

| Manufacturing Overhead | |
|---|---|
| Indirect Materials 10,000 | 70,000 Applied |
| Indirect Labor 15,000 | |
| Factory Depreciation 13,000 | |
| Factory Rent 7,000 | |
| Factory Utilities 3,000 | |
| Other Factory Costs 10,000 | |
| | 12,000 Overapplied |
| Adjustment 12,000 | |

| Sales Revenue | |
|---|---|
| | 300,000 |

| Selling and Administrative Expenses | |
|---|---|
| Adm. Salaries 28,000 | |
| Office Depreciation 20,000 | |
| Advertising 15,000 | |
| Ending Balance 63,000 | |

**PA2–8 (continued)**

Req. 3
$58,000 Actual − $70,000 Applied = $12,000 Overapplied manufacturing overhead

Req. 4

| Dobson Manufacturing Company<br>Cost of Goods Manufactured Report and Sold | |
|---|---|
| Beginning Raw Materials Inventory | $15,000 |
| Plus: Raw Material Purchases | 95,000 |
| Less: Indirect Material Used | (10,000) |
| Less: Ending Raw Materials Inventory | (30,000) |
| Direct Materials Used in Production | $70,000 |
| Direct Labor | 50,000 |
| Manufacturing Overhead | 70,000 |
| Total Current Manufacturing Costs | $190,000 |
| Plus: Beginning Work in Process Inventory | 30,000 |
| Total Work in Process | $220,000 |
| Less: Ending Work in Process Inventory | (20,000) |
| Cost of Goods Manufactured | $200,000 |
| Plus: Beginning Finished Goods Inventory | 40,000 |
| Cost of Goods Available for Sale | $240,000 |
| Less: Ending Finished Goods Inventory | (50,000) |
| Unadjusted Cost of Goods Sold | $190,000 |
| Adjustment for Overapplied Overhead | (12,000) |
| Adjusted Cost of Goods Sold | $178,000 |

Req. 5

| Dobson Manufacturing Company<br>Income Statement | |
|---|---|
| Sales Revenue | $300,000 |
| Less: Cost of Goods Sold | 178,000 |
| Gross Profit | $122,000 |
| Less: Selling and Administrative Expenses | 63,000 |
| Net Income from Operations | $59,000 |

## ANSWERS TO GROUP B PROBLEMS

### PB2-1

Req. 1 and 2

| Raw Materials Inventory | |
|---|---|
| Bal. 62,000 | b. 195,500 |
| a. 270,500 | |
| Bal. 137,000 | |

| Work in Process Inventory | |
|---|---|
| Bal. 22,900 | f. 607,250 |
| b. 180,000 | |
| c. 213,600 | |
| e. 290,000 | |
| Bal. 99,250 | |

| Finished Goods Inventory | |
|---|---|
| Bal. 130,000 | g. 557,700 |
| f. 607,250 | |
| Bal. 179,550 | |

| Manufacturing Overhead | |
|---|---|
| b. 15,500 | e. 290,000 |
| c. 53,400 | |
| d. 68,300 | |
| d. 125,000 | |
| d. 64,800 | |
| 37,000 Underapplied | |

| Cost of Goods Sold | |
|---|---|
| g. 557,700 | |
| Bal. 557,700 | |

| Sales Revenue | |
|---|---|
| | h. 850,000 |
| | Bal. 850,000 |

| Non-Manufacturing Expenses | |
|---|---|
| d. 65,300 | |
| d. 92,500 | |
| Bal. 157,800 | |

Req. 3

Manufacturing overhead is underapplied by $37,000. If this amount is closed directly to Cost of Goods Sold, it will INCREASE Cost of Goods Sold.

**PB2-1 (continued)**

Req. 4

| Coda Industries<br>Cost of Goods Manufactured Report<br>For the Month of November | |
|---|---|
| Beginning Raw Materials Inventory | $62,000 |
| Plus: Raw Material Purchases | 270,500 |
| Less: Indirect Material Used | (15,500) |
| Less: Ending Raw Materials Inventory | (137,000) |
| Direct Materials Used in Production | $180,000 |
| Direct Labor | 213,600 |
| Manufacturing Overhead | 290,000 |
| Total Current Manufacturing Costs | $683,600 |
| Plus: Beginning Work in Process Inventory | 22,900 |
| Total Work in Process | $706,500 |
| Less: Ending Work in Process Inventory | (99,250) |
| Cost of Goods Manufactured | $607,250 |

Req. 5

| Coda Industries<br>Income Statement<br>For the Month of November | | |
|---|---|---|
| Sales Revenue | | $850,000 |
| Less: Cost of Goods Sold | | |
| Beginning Finished Goods Inventory | $130,000 | |
| Plus: Cost of Goods Manufactured (see schedule above) | 607,250 | |
| Less: Ending Finished Goods Inventory | (179,550) | |
| Unadjusted Cost of Goods Sold | 557,700 | |
| Plus: Underapplied Manufacturing Overhead | 37,000 | |
| Adjusted Cost of Goods Sold | | ($594,700) |
| Gross Profit | | $255,300 |
| Less: Operating (Period) Expenses | | (157,800) |
| Net Income from Operations | | $97,500 |

**PB2-2**

a.

| | | |
|---|---|---|
| Raw Materials Inventory | 270,500 | |
| Accounts Payable | | 270,500 |

b.

| | | |
|---|---|---|
| Manufacturing Overhead | 15,500 | |
| Work In Process Inventory | 180,000 | |
| Raw Materials Inventory | | 195,500 |

c.

| | | |
|---|---|---|
| Work In Process Inventory | 213,600 | |
| Manufacturing Overhead | 53,400 | |
| Salaries/Wages Payable | | 267,000 |

d.

| | | |
|---|---|---|
| Selling and Administrative Expenses (65,300 + 92,500) | 157,800 | |
| Manufacturing Overhead (68,300 + 125,000 + 64,800) | 258,100 | |
| Miscellaneous Accounts (Payables, Cash, Prepaid Assets, Accumulated Dep.) | | 415,900 |

e.

| | | |
|---|---|---|
| Work in Process Inventory | 290,000 | |
| Manufacturing Overhead | | 290,000 |

f.

| | | |
|---|---|---|
| Finished Goods Inventory | 607,250 | |
| Work in Process Inventory | | 607,250 |

g

| | | |
|---|---|---|
| Cost of Goods Sold | 557,700 | |
| Finished Goods Inventory | | 557,700 |

h.

| | | |
|---|---|---|
| Accounts Receivable | 850,000 | |
| Sales Revenue | | 850,000 |

Entry to close manufacturing overhead to Cost of Goods Sold:

| | | |
|---|---|---|
| Cost of Goods Sold | 37,000 | |
| Manufacturing Overhead | | 37,000 |

**PB2–3**

Req. 1
Predetermined overhead rate = $450,000 / 150,000 machine hours = $3.00 per machine hour

Req. 2
Applied manufacturing overhead = 17,000 machine hours × $3.00 = $51,000

Req. 3
Ending Work in Process Inventory (Job 103) = $8,500 + $13,600 + (5,000 machine hours × $3.00) = $37,100

Req. 4
Cost of Job 101 = $25,500 + $11,900 + (8,000 × $3.00) = $61,400

Since this was the only job sold, the gross profit before the adjustment for over or underapplied manufacturing overhead is $75,000 − $61,400 = $13,600.

Req. 5

| Manufacturing Overhead | | | |
|---|---|---|---|
| Actual | 56,000 | 51,000 | Applied |
| Balance (Underapplied) | 5,000 | | |

**PB2-4**

Req. 1

Cost of Job 102 = $17,000 + $8,500 + (4,000 machine hours × $3.00) = $37,500

| | | |
|---|---|---|
| Finished Goods Inventory…… | 37,500 | |
| Work in Process Inventory…….. | | 37,500 |

Req. 2

Cost of Job 101 = $25,500 + $11,900 + (8,000 × $3.00) = $61,400

| | | |
|---|---|---|
| Cash or Accounts Receivable……. | 75,000 | |
| Sales Revenue…….. | | 75,000 |
| Cost of Goods Sold……... | 61,400 | |
| Finished Goods Inventory……... | | 61,400 |

Req. 3

| | | |
|---|---|---|
| Cost of Goods Sold ……. | 5,000 | |
| Manufacturing Overhead……. | | 5,000 |

**PB2–5**

1.

| Raw Materials Inventory | |
|---|---|
| 1/1 15,600 | b. 45,000 |
| a. 42,000 | |
| Bal. 12,600 | |

| Work in Process Inventory | |
|---|---|
| 1/1 33,500 | h. 84,650 |
| b. 38,250 | |
| c. 17,300 | |
| g. 34,600 | |
| Bal. 39,000 | |

| Finished Goods Inventory | |
|---|---|
| 1/1 42,300 | i. 40,000 |
| h. 84,650 | |
| Bal. 86,950 | |

| Cost of Goods Sold | |
|---|---|
| i. 40,000 | |
| Bal. 40,000 | |

| Manufacturing Overhead | |
|---|---|
| b. 6,750 | g. 34,600 |
| c. 8,400 | |
| d. 9,000 | |
| e. 5,400 | |
| f. 7,900 | |
| Bal. 2,850 Underapplied | |

| Selling and Administrative Expenses | |
|---|---|
| c. 4,300 | |
| d. 25,000 | |
| e. 3,600 | |
| Bal. 32,900 | |

| Sales Revenue | |
|---|---|
| | i. 50,000 |
| | Bal. 50,000 |



Req. 2
Unadjusted gross profit = $50,000 − $40,000 = $10,000

Req. 3
Manufacturing overhead is $2,850 underapplied

Req. 4
Adjusted Gross Profit = $50,000 − ($40,000 + $2,850) = $7,150

**PB2-6**

| Item | Amount |
|---|---|
| Direct materials used in production | $146,500 |
| Direct labor | 70,000 |
| Manufacturing overhead applied | 122,500 |
| Current manufacturing costs | $339,000 |
| Plus: Beginning work in process inventory | 32,000 |
| Less: Ending work in process inventory | (24,000) |
| Cost of goods manufactured | $347,000 |
| Plus: Beginning finished goods inventory | 15,000 |
| Less: ending finished goods inventory | (19,500) |
| Unadjusted cost of goods sold | $342,500 |
| Overhead adjustment | (17,500) |
| Adjusted cost of goods sold | $325,000 |

**PB2–7**

Req. 1
a. Predetermined overhead rate = $700,000 / 25,000 DLH = $28.00 per DLH
b. Applied manufacturing overhead = 27,000 actual hours × $28 = $756,000
c. $750,000 Actual − $756,000 Applied = $6,000 Overapplied

Req. 2
a. Predetermined overhead rate = $700,000 / $437,500 direct labor cost = 160% of direct labor cost
b. Applied manufacturing overhead = $464,000 × 160% = $742,400
c. $750,000 Actual − $742,400 Applied = $7,600 Underapplied

Req. 3
a. Predetermined overhead rate = $700,000 / 12,500 machine hours = $56 per machine hour
b. Applied manufacturing overhead = 13,000 actual machine hours × $56 = $728,000
c. $750,000 Actual − $728,000 Applied = $22,000 Underapplied

Req. 4
Based on last year's data, direct labor hours was the most accurate allocation base for applying manufacturing overhead, because it results in the lowest amount of over- or underapplied manufacturing overhead, or the smallest difference between actual and applied manufacturing overhead cost.



Req. 5
Ideally, companies should choose an allocation base that has a cause and effect relationship with the incurrence of manufacturing overhead cost. In addition, the allocation measure must be something that can be reasonably measured for each individual unit or job, and the benefits must outweigh cost of measurement. This is one reason that many companies choose to use direct labor hours to apply manufacturing overhead to production. This measure is already captured in the accounting system and often has a direct relationship with the incurrence of manufacturing overhead cost. However, with advances in automation and the changing nature of the labor force, direct labor hours is not necessarily the best measure for applying manufacturing overhead to production.

**PB2–8**

Req. 1
Predetermined overhead rate = $75,600 / $42,000 direct labor cost = 180% of Direct labor cost

Req. 2

| Raw Materials Inventory | | |
|---|---|---|
| Beginning Balance | 10,000 | 76,500 (10,000 + 85,000 − 18,500) |
| Purchases | 85,000 | |
| Ending Balance | 18,500 | |

| Work in Process Inventory | | |
|---|---|---|
| Beginning Balance | 30,000 | 174,500 (30,000 + 66,500 + 35,000 + 63,000 − 20,000) |
| Direct Materials | 66,500 | |
| Direct Labor | 35,000 | |
| Applied Overhead ($35,000 × 180%) | 63,000 | |
| Ending Balance | 20,000 | |

| Finished Goods Inventory | | |
|---|---|---|
| Beginning Balance | 60,000 | 194,500 (60,000 + 174,500 − 40,000) |
| Cost of Goods Completed | 174,500 | |
| Ending Balance | 40,000 | |

| Cost of Goods Sold | |
|---|---|
| Unadjusted Cost of Goods Sold | 194,500 |
| Adjustment | 11,000 |
| Adjusted Cost of Goods Sold | 205,500 |

| Manufacturing Overhead | | | |
|---|---|---|---|
| Indirect Materials | 10,000 | 63,000 | Applied |
| Indirect Labor | 20,000 | | |
| Factory Depreciation | 13,000 | | |
| Factory Rent | 12,000 | | |
| Factory Utilities | 5,000 | | |
| Other Factory Costs | 14,000 | | |
| Underapplied | 11,000 | | |
| | | 11,000 | Adjustment |



| Sales Revenue | |
|---|---|
| | 280,000 Sales Revenue |

| Selling, General, and Administrative Expenses | | |
|---|---|---|
| Adm. Salaries | 30,000 | |
| Office Depreciation | 20,000 | |
| Advertising | 19,000 | |
| Ending Balance | 69,000 | |

**PB2–8 (continued)**

Req. 3
$74,000 Actual − $63,000 Applied = $11,000 Underapplied manufacturing overhead

Req. 4

| Carlton Manufacturing Company<br>Cost of Goods Manufactured Report and Sold | |
|---|---|
| Beginning Raw Materials Inventory | $10,000 |
| Plus: Raw Material Purchases | 85,000 |
| Less: Indirect Material Used | (10,000) |
| Less: Ending Raw Materials Inventory | (18,500) |
| Direct Materials Used in Production | $66,500 |
| Direct Labor | 35,000 |
| Manufacturing Overhead | 63,000 |
| Total Current Manufacturing Costs | $164,500 |
| Plus: Beginning Work in Process Inventory | 30,000 |
| Total Work in Process | $194,500 |
| Less: Ending Work in Process Inventory | (20,000) |
| Cost of Goods Manufactured | $174,500 |
| Plus: Beginning Finished Goods Inventory | 60,000 |
| Cost of Goods Available for Sale | $234,500 |
| Less: Ending Finished Goods Inventory | (40,000) |
| Unadjusted Cost of Goods Sold | $194,500 |
| Adjustment for Underapplied Overhead | 11,000 |
| Adjusted Cost of Goods Sold | $205,500 |

Req. 5

| Carlton Manufacturing Company<br>Income Statement | |
|---|---|
| Sales Revenue | $280,000 |
| Less: Cost of Goods Sold | 205,500 |
| Gross Profit | $74,500 |
| Less: Selling and Administrative Expenses | 69,000 |
| Net Income from Operations | $5,500 |

# ANSWERS TO SKILLS DEVELOPMENT CASES

## S2–1

The solution to this case will depend on the particular item that the student chooses to investigate. The primary purpose of this case is to get students to think more concretely about what is involved in manufacturing a product. Since most students at this level will have very limited work experience, and may never have been inside a manufacturing facility, this exercise will help make the definitions in the chapter more concrete. Tying it to an everyday item that they use will also allow them to visualize the end product and the different types of costs that go into making that product.

## S2–2

Solutions to this case will vary depending on the business venture that students select.

## S2–3

Req. 1

$$\text{Predetermined Overhead Rate} = \frac{\text{Estimated Total Overhead}}{\text{Estimated Allocation Base}}$$

$$\text{Predetermined Overhead Rate} = \frac{\$720{,}000}{24{,}000 \text{ DL Hours}}$$

$$\text{Predetermined Overhead Rate} = \$30 \text{ per DL Hour}$$

This rate means the company needs to apply $30 in overhead for each direct labor hour worked in order to cover all of the indirect costs of production, such as factory rent, utilities, supervision, depreciation, etc.

**S2–3 (continued)**

Req. 2

| | | | |
|---|---|---|---|
| a. | Raw Materials Inventory | 10,000 | |
| | Accounts Payable | | 10,000 |
| b. | Work in Process Inventory | 7,000 | |
| | Manufacturing Overhead | 2,000 | |
| | Raw Materials Inventory | | 9,000 |
| c. | Work in Process Inventory | 10,000 | |
| | Manufacturing Overhead | 4,000 | |
| | Administrative Salary Expense | 5,000 | |
| | Salaries and Wages Payable | | 19,000 |
| d. | Work in Process Inventory | 15,000 | |
| | Manufacturing Overhead | | 15,000 |
| e. | Manufacturing Overhead | 16,000 | |
| | Cash | | 6,000 |
| | Accumulated Depreciation—Factory Equipment | | 5,000 |
| | Prepaid Insurance | | 3,000 |
| | Utilities Payable | | 2,000 |
| f. | Advertising Expense | 2,000 | |
| | Cash | | 2,000 |
| | Depreciation Expense | 3,000 | |
| | Accumulated Depreciation—Office Equipment | | 3,000 |
| | General and Administrative Expenses | 1,000 | |
| | Accounts Payable | | 1,000 |
| g. | Accounts Receivable or Cash | 55,000 | |
| | Sales Revenue | | 55,000 |
| | Cost of Goods Sold | 30,000 | |
| | Finished Goods Inventory | | 30,000 |
| h. | Finished Goods Inventory | 32,000 | |
| | Work in Process Inventory | | 32,000 |

**S2–3 (continued)**

Postings to the general ledger T-accounts and job cost sheets are shown below.

| Raw Materials Inventory | | | |
|---|---|---|---|
| 1/1 Balance | 10,000 | 9,000 | (b) |
| (a) | 10,000 | | |
| 1/31 Balance | 11,000 | | |

| Manufacturing Overhead | | | |
|---|---|---|---|
| (b) | 2,000 | 15,000 | (d) |
| (c) | 4,000 | | |
| (e) | 16,000 | | |
| | 7,000 Underapplied | | |
| | | 7,000 | Adjustment (Req. 6) |

| Work In Process Inventory | | | |
|---|---|---|---|
| 1/1 Bal. | 15,000 | 32,000 | (h) |
| (b) | 7,000 | | |
| (c) | 10,000 | | |
| (d) | 15,000 | | |
| 1/31 Bal. | 15,000 | | |

Individual Job Cost Sheets
(Subsidiary Ledgers to WIP)

| | Job 102 | Job 103 |
|---|---|---|
| 1/1 Balance | 15,000 | - |
| Direct Materials | 2,000 | 5,000 |
| Direct Labor | 6,000 | 4,000 |
| Applied Manuf. Overhead | 9,000 | 6,000 |
| Total Manufacturing Cost | 32,000 | 15,000 |

| Finished Goods Inventory | | | |
|---|---|---|---|
| 1/1 Bal. | 30,000 | 30,000 | (g) |
| (h) | 32,000 | | |
| 1/31 Bal. | 32,000 | | |

| Cost of Goods Sold | | | |
|---|---|---|---|
| (g) | 30,000 | | |
| Adjustment | 7,000 | | |
| 1/31 Bal. | 37,000 | | |

| Sales Revenue | | | |
|---|---|---|---|
| | | 55,000 | (g) |
| | | 55,000 | Bal. |

| Selling, General, and Administrative Expenses | | | |
|---|---|---|---|
| (c) | 5,000 | | |
| (f) | 2,000 | | |
| (f) | 3,000 | | |
| (f) | 1,000 | | |
| 1/31 Bal. | 11,000 | | |

| Cash and Other Assets | | | |
|---|---|---|---|
| 1/1 Balance | 100,000 | 6,000 | (e) |
| (g) | 55,000 | 5,000 | (e) |
| | | 3,000 | (e) |
| | | 2,000 | (f) |
| | | 3,000 | (f) |
| 1/31 Bal. | 136,000 | | |

| Payables and Other Liabilities | | | |
|---|---|---|---|
| | | 85,000 | 1/1 Balance |
| | | 10,000 | (a) |
| | | 19,000 | (c) |
| | | 2,000 | (e) |
| | | 1,000 | (f) |
| | | 117,000 | 1/31 Bal. |

| Stockholders' Equity | |
|---|---|
| | 70,000 |
| | Bal. 70,000 |

**S2–3 (continued)**

Req. 3

Applied Overhead = Predetermined Overhead Rate × Actual DL Hours

| | |
|---|---|
| Applied to Job 102 = $30 × 300 hours = | $ 9,000 |
| Applied to Job 103 = $30 × 200 hours = | 6,000 |
| Total Overhead Applied = $30 × 500 hours = | $15,000 |

Req. 4

| | Job 102 | Job 103 |
|---|---|---|
| Beginning balance of jobs in process | $ 15,000 | $ - |
| Direct materials | 2,000 | 5,000 |
| Direct labor | 6,000 | 4,000 |
| Manufacturing overhead applied | 9,000 | 6,000 |
| Total manufacturing cost | $32,000 | $15,000 |

Since Job 102 was completed, but not sold, its cost of $32,000 would appear in Finished Goods Inventory. The $15,000 balance of Job 103 would appear in Work in Process inventory since it is not yet completed.

Req. 5: Actual $22,000 − Applied $15,000 = $7,000 Underapplied



Req. 6

| | | |
|---|---|---|
| Cost of Goods Sold…….... | 7,000 | |
| Manufacturing Overhead……..……. | | 7,000 |

Req. 7

**Sampson Company**
**Cost of Goods Manufactured**
**For the Month Ended January 31, 2021**

| | |
|---|---|
| Beginning Raw Materials Inventory | $10,000 |
| Plus: Raw Materials Purchased | 10,000 |
| Less: Indirect Materials Issued | (2,000) |
| Less: Ending Raw Materials Inventory | (11,000) |
| Direct Materials Used In Production | $7,000 |
| Direct Labor | 10,000 |
| Manufacturing Overhead Applied | 15,000 |
| Total Current Manufacturing Costs | $32,000 |
| Plus: Beginning Work in Process Inventory | 15,000 |
| Less: Ending Work in Process Inventory | (15,000) |
| Cost of Goods Manufactured | $32,000 |

**S2–3 (continued)**

Req. 8

| Sampson Company<br>Income Statement<br>For the Month Ended January 31, 2021 | | |
|---|---|---|
| Sales Revenue | | $55,000 |
| Less: Cost of Goods Sold | | |
| Beginning Finished Goods Inventory | $30,000 | |
| Plus: Cost of Goods Manufactured | 32,000 | |
| Less: Ending Finished Goods Inventory | 32,000 | |
| Unadjusted Cost of Goods Sold | $30,000 | |
| Plus: Underapplied Overhead | 7,000 | 37,000 |
| Gross Profit | | $18,000 |
| Less: Selling and Administrative Expenses | | 11,000 |
| Net Income from Operations | | $ 7,000 |

## DISCUSSION QUESTIONS FOR INTEGRATED ANALYTICS CASE

These questions are intended to generate open dialogue and discussion with students. The following are some key points for each question.

1. Taylor needs to know how much it will cost to provide meals to customers so that she can determine how much to charge her customers. She also needs cost information in order to better manage her costs.
2. It is likely that Bene Petit would use a hybrid cost system that combines some elements of job costing and process costing. For example, Taylor may want to determine the cost of different menu items based on the ingredients required, the amount of time it takes to prepare the meals, the batch size, delivery frequency, and other factors. The donated meals are produced in much larger batches and are less customized, so process or average costing would be more appropriate for the donated meals.
3. Direct materials: Main ingredients used in each meal (e.g., protein, vegetables) and major packaging materials. Indirect materials: Miscellaneous ingredients, spices, oil.
4. Direct labor: Wages of workers who prepare and package the meals. Indirect: Taylor and other supervisors. Drivers who deliver the meals.
5. Manufacturing overhead: Miscellaneous ingredients, supervision, utilities, depreciation on equipment.
6. Nonmanufacturing costs: Delivery expenses, marketing expenses, web site development and hosting, insurance.
7. $5 per serving × 12 services = $60 in revenue – $35 cost = $25 gross profit ($25 / $60 = 41.7%). This is gross profit *before* taking into account the donated meals.
8. The cost of the donated meals is likely to be expensed as an administrative expense and would not be included in Cost of Goods Sold (since donated meals are not sold).