

Chapter 19

Job Order Costing

Review Questions

1. Why do managers need to know the cost of their products?

If the manager knows the cost to produce each unit of product, then the manager can plan and control the cost of resources needed to create the product and deliver it to the customer. It enables them to set selling prices that will lead to profits, compute cost of goods sold for the income statement, and compute the cost of inventory for the balance sheet.

2. What types of companies use job order costing systems?

Companies that manufacture unique products or provide specialized services, such as accounting firms, music studios, health-care providers, building contractors, and custom furniture manufacturers, use job order costing systems.

3. What types of companies use process costing systems?

Companies that produce identical units through a series of production steps or processes, such as soft drink companies, surfboard manufacturers, and medical equipment manufacturers, use process costing systems.

4. What is the purpose of a job cost record?

A job cost record is a document that shows the direct materials, direct labor, and manufacturing overhead costs for an individual job and allows the company to track the cost of individual jobs.

5. Explain the difference between cost of goods manufactured and cost of goods sold.

When a company finishes a job, it totals the costs and transfers them to Finished Goods Inventory, an asset account. These costs are called Cost of Goods Manufactured. When the jobs units are sold, the costing system moves the costs from Finished Goods Inventory, an asset, to Cost of Goods Sold, an expense. These costs are called Cost of Goods Sold.

6. A job was started on May 15, completed on June 27, and delivered to the customer on July 6. In which accounts would the costs be recorded on the financial statements dated May 31, June 30, and July 31?

May 31—Work-in-Process Inventory on the balance sheet; June 30—Finished Goods Inventory on the balance sheet; July 31—Cost of Goods Sold on the income statement.

7. Give the journal entry for raw materials purchased on account. Explain how this transaction affects the accounting equation.

Date	Accounts and Explanation	Debit	Credit
	Raw Materials Inventory	XX	
	Accounts Payable		XX

This transaction increases assets (Raw Materials Inventory) and increases liabilities (Accounts Payable).

8. What is the purpose of the raw materials subsidiary ledger? How is it related to the general ledger?

The use of a subsidiary ledger allows for better control of inventory as it helps track the quantity and cost of each type of material used in production. A subsidiary ledger contains the details of a general ledger account, and the sum of the accounts in the subsidiary ledger equals the balance in the general ledger account.

9. How does the use of direct and indirect materials in production affect the accounts?

The cost of direct materials is transferred out of Raw Materials Inventory (credit) and is assigned to Work-in-Process Inventory (debit). The cost of indirect materials is transferred out of the Raw Materials Inventory account (credit) and is accumulated in the Manufacturing Overhead account (debit).

10. Give the journal entry for direct and indirect labor costs incurred. Explain how this transaction affects the accounting equation.

Date	Accounts and Explanation	Debit	Credit
	Work-In-Process Inventory (direct labor)	XX	
	Manufacturing Overhead (indirect labor)	XX	
	Wages Payable		XX

This transaction increases assets (Work-in-Process Inventory), increases liabilities (Wages Payable), and decreases equity (Manufacturing Overhead).

11. Give five examples of manufacturing overhead costs. Why are they considered indirect costs?

The following are examples of manufacturing overhead costs:

- a. Plant utilities
- b. Depreciation on manufacturing plant and equipment
- c. Plant insurance
- d. Plant property taxes
- e. Rent on the manufacturing plant

They are considered indirect costs because they can't be easily traced to individual jobs.

12. What is the predetermined overhead allocation rate?

The predetermined overhead allocation rate is the estimated manufacturing overhead cost per unit of the allocation base, calculated at the beginning of the period.

13. What is an allocation base? Give some examples.

The allocation base is a denominator that links overhead costs to the products. Ideally, the allocation base is the primary cost driver of manufacturing overhead. Examples: direct labor hours, direct labor cost, machine hours.

14. How is manufacturing overhead allocated to jobs?

Manufacturing overhead is allocated to jobs based on a predetermined overhead allocation rate. The rate should be based on the main cost driver.

15. A completed job cost record shows the unit cost of the products. How is this calculated?

Unit product cost = Cost of goods manufactured / Total units produced.

16. Explain the journal entry for the allocation of overhead. What accounts are affected? Are they increased or decreased?

To allocate manufacturing overhead, Work-in-Process Inventory is debited and Manufacturing Overhead is credited. Work-in-Process Inventory, an asset, is increased and Manufacturing Overhead is decreased, which increases equity.

17. Give the journal entry for the completion of a job. How is the accounting equation affected?

When a job is completed, Finished Goods Inventory is debited and Work-in-Process Inventory is credited. The effect on the accounting equation is that one asset (Finished Goods Inventory) is increased and another asset (Work-in-Process Inventory) is decreased.

18. Why does the sale of a completed job require two journal entries? What are they?

One journal entry is required to recognize the revenue earned and another journal entry is required to remove the product from inventory when it is shipped to the customer and recognize the expense incurred.

Date	Accounts and Explanation	Debit	Credit
	Accounts Receivable	XX	
	Sales Revenue		XX
	Cost of Goods Sold	XX	
	Finished Goods Inventory		XX

19. Explain the difference between underallocated overhead and overallocated overhead. What causes each situation?

Underallocated overhead occurs when actual manufacturing overhead costs are more than allocated manufacturing overhead costs. Overallocated overhead occurs when actual manufacturing overhead costs are less than allocated manufacturing costs. This is caused by the fact that overhead is allocated using a predetermined overhead allocation rate that is based on estimates.

20. If a company incurred \$5,250 in actual overhead costs and allocated \$5,575 to jobs, was the overhead overallocated or underallocated? By how much?

The overhead is overallocated because the company allocated more than the actual overhead costs. The amount is \$325 (\$5,575 – \$5,250).

21. Refer to the previous question. Give the journal entry to adjust the Manufacturing Overhead account for overallocated or underallocated overhead.

Date	Accounts and Explanation	Debit	Credit
	Manufacturing Overhead	325	
	Cost of Goods Sold		325

22. Explain the terms *accumulate*, *assign*, *allocate*, and *adjust* as they apply to job order costing.

Costs are *accumulated* in various accounts as they are incurred. Direct costs are *assigned* to individual jobs and recorded on the job cost records. Manufacturing overhead costs (indirect costs) are *allocated* to individual jobs based on a predetermined overhead allocation rate. The Manufacturing Overhead account is *adjusted* at the end of the period for the amount of underallocated or overallocated manufacturing overhead.

23. Why would the manager of a service company need to use job order costing?

Service companies, like manufacturing companies, work on individual, unique jobs and need to know the cost of the jobs. Knowing the full cost of a job allows for better pricing decisions.

24. How is the predetermined overhead allocation rate used by service companies?

Indirect costs are allocated to jobs using the predetermined overhead allocation rate.

Short Exercises

S19-1 Distinguishing between job order costing and process costing

Learning Objective 1

Would the following companies most likely use job order costing or process costing?

- | | |
|---|------------------------------------|
| a. A manufacturer of refrigerators | f. A custom home builder |
| b. A manufacturer of specialty wakeboards | g. A cell phone manufacturer |
| c. A manufacturer of luxury yachts | h. A manufacturer of frozen pizzas |
| d. A professional services firm | i. A manufacturer of multivitamins |
| e. A landscape contractor | j. A manufacturer of tennis shoes |

SOLUTION

- | | |
|---|-----------|
| a. A manufacturer of refrigerators | Process |
| b. A manufacturer of specialty wakeboards | Job Order |
| c. A manufacturer of luxury yachts | Job Order |
| d. A professional services firm | Job Order |
| e. A landscape contractor | Job Order |
| f. A custom home builder | Job Order |
| g. A cell phone manufacturer | Process |
| h. A manufacturer of frozen pizzas | Process |
| i. A manufacturer of multivitamins | Process |
| j. A manufacturer of tennis shoes | Process |

S19-2 Determining the flow of costs in job order costing

Learning Objective 2

For the following accounts, indicate what causes the account to increase and decrease. The first account is completed as an example.

Account	Is increased by:	Is decreased by:
Raw Materials Inventory	Materials purchased	Materials used
Work-in-Process Inventory		
Finished Goods Inventory		
Cost of Goods Sold		

SOLUTION

Account	Is increased by:	Is decreased by:
Raw Materials Inventory	Materials purchased	Materials used
Work-in-Process Inventory	Direct materials used Direct labor incurred Manufacturing overhead allocated	Completion of jobs
Finished Goods Inventory	Completion of jobs	Shipping sold jobs
Cost of Goods Sold	Shipping sold jobs Adjusting entry for underallocated/overallocated overhead	Adjusting entry for underallocated/overallocated overhead

S19-3 Accounting for materials

Learning Objective 2

Pack Rite manufactures backpacks. Its plant records include the following materials-related data:

Raw Materials Inventory, beginning balance	\$ 31,000
Purchases of canvas, on account	65,000
Purchases of sewing machine lubricating oil, on account	1,000
Materials requisitions:	
Canvas	63,000
Sewing machine lubricating oil	400

Journalize the entries to record the transactions, post to the Raw Materials Inventory account, and determine the ending balance in Raw Materials Inventory.

SOLUTION

Date	Accounts and Explanation	Debit	Credit
	Raw Materials Inventory (\$65,000 + \$1,000)	66,000	
	Accounts Payable		66,000
	Work-in-Process Inventory	63,000	
	Manufacturing Overhead	400	
	Raw Materials Inventory		63,400

Raw Materials Inventory			
Bal.	31,000	63,400	Used
Purchased	66,000		
Bal.	33,600		

The ending balance of the Raw Materials Inventory account is \$33,600.

S19-4 Accounting for materials

Learning Objective 2

Analyze the following T-accounts to determine the amount of direct and indirect materials used.

Raw Materials Inventory				Work-in-Process Inventory			
Bal.	15			Bal.	30		
Purchased	245	???	Used	Direct Materials	???	540	Cost of Goods Manufactured
Bal.	30			Direct Labor	310		
				Manufacturing Overhead	130		
				Bal.	40		

SOLUTION

Total materials used	$(\$15 + \$245 - \$30)$	\$230
Direct materials used	$(\$30 + \$310 + \$130 - \$540 - \$40)$	\$110
Indirect materials used	$(\$230 - \$110)$	\$120

S19-5 Accounting for labor

Learning Objective 2

Journalize the following labor-related transactions for Portland Glass at its plant in Portland, Oregon. Assume that the labor has been incurred, but not yet paid.

Plant janitor's wages	\$	650
Plant furnace operator's wages		850
Glass blower's wages		71,000

SOLUTION

Date	Accounts and Explanation	Debit	Credit
	Work-in-Process Inventory	71,000	
	Manufacturing Overhead (\$650 + \$850)	1,500	
	Wages Payable		72,500

S19-6 Accounting for overhead

Learning Objective 3

Sparrow Furniture manufactures wood patio furniture. If the company reports the following costs for June 2016, what is the balance in the Manufacturing Overhead account before overhead is allocated to jobs? Assume that the labor has been incurred, but not yet paid. Prepare journal entries for overhead costs incurred in June.

Wood	\$	180,000
Nails, glue, stain		17,000
Depreciation on saws		4,900
Indirect manufacturing labor		37,000
Depreciation on delivery truck		2,100
Assembly-line workers' wages		52,000

SOLUTION

Manufacturing Overhead = \$17,000 + \$4,900 + \$37,000 = \$58,900

Date	Accounts and Explanation	Debit	Credit
	Manufacturing Overhead Raw Materials Inventory	17,000	17,000
	Manufacturing Overhead Accumulated Depreciation	4,900	4,900
	Manufacturing Overhead Wages Payable	37,000	37,000

These costs are not overhead costs:

- Wood is a direct material
- Depreciation on the delivery truck is a selling and administrative expense (period cost, not a product cost)
- Assembly-line workers' wages are direct labor

S19-7 Allocating overhead

Learning Objective 3

Job 303 includes direct materials costs of \$500 and direct labor costs of \$420. If the predetermined overhead allocation rate is 70% of direct labor cost, what is the total cost assigned to Job 303?

SOLUTION

Direct materials	\$ 500
Direct labor	420
Manufacturing overhead ($\$40 \times 0.70$)	<u>294</u>
Total cost of Job 303	<u><u>\$ 1,214</u></u>

S19-8 Calculating predetermined overhead allocation rate, allocating overhead

Learning Objective 3

Milestone Company estimates the company will incur \$96,900 in overhead costs and 5,100 direct labor hours during the year. Actual direct labor hours were 4,400. Calculate the predetermined overhead allocation rate, and prepare the journal entry for the allocation of overhead.

SOLUTION

$\begin{aligned} \text{Predetermined Overhead Allocation Rate} &= \frac{\text{Total estimated overhead cost}}{\text{Total estimated quantity of the overhead allocation base}} \\ &= \frac{\$96,900}{5,100 \text{ DLHr}} = \$19 \text{ per DLHr} \end{aligned}$

Allocated Manufacturing Overhead Cost	=	Predetermined Overhead Allocation Rate	×	Actual Quantity of the Allocation Based used by Each Job
		= \$19 per DLHr		= 4,400 DLHr
		= \$83,600		

Date	Accounts and Explanation	Debit	Credit
	Work-in-Process Inventory	83,600	
	Manufacturing Overhead		83,600

S19-9 Comparing actual to allocated overhead

Learning Objective 3

Columbia Enterprises reports the following information at December 31, 2016:

Manufacturing Overhead	
3,300	51,700
15,000	
37,000	

Requirements

1. What is the actual manufacturing overhead of Columbia Enterprises?
2. What is the allocated manufacturing overhead?
3. Is manufacturing overhead underallocated or overallocated? By how much?

SOLUTION

Requirement 1

Total debits = \$3,300 + \$15,000 + \$37,000 = \$55,300

Requirement 2

Total credits = \$51,700

Requirement 3

Underallocated by \$3,600 (Difference between total debits and total credits = \$55,300 – \$51,700)

S19-10 Calculating under/overallocated overhead

Learning Objective 3

The T-account showing the manufacturing overhead activity for Edith Corp. for 2016 is as follows:

Manufacturing Overhead	
205,000	209,000

Requirements

1. What is the actual manufacturing overhead?
2. What is the allocated manufacturing overhead?
3. Is manufacturing overhead underallocated or overallocated? By how much?

SOLUTION

Requirements 1, 2 and 3

Allocated overhead	–	Actual Overhead		
\$209,000	–	\$205,000	=	\$4,000 overallocated

S19-11 Completing and selling products

Learning Objective 4

Ford Company completed jobs that cost \$37,000 to produce. In the same period, the company sold jobs for \$86,000 that cost \$45,000 to produce. Prepare the journal entries for the completion and sales of the jobs. All sales are on account.

SOLUTION

Date	Accounts and Explanation	Debit	Credit
	Finished Goods Inventory	37,000	
	Work-in-Process Inventory		37,000
	Accounts Receivable	86,000	
	Sales Revenue		86,000
	Cost of Goods Sold	45,000	
	Finished Goods Inventory		45,000

S19-12 Adjusting Manufacturing Overhead

Learning Objective 5

Robertson Company's Manufacturing Overhead account is given below. Use this information to prepare the journal entry to adjust for overallocated or underallocated overhead.

Manufacturing Overhead	
151,000	147,000

SOLUTION

Date	Accounts and Explanation	Debit	Credit
	Cost of Goods Sold (\$151,000 – \$147,000)	4,000	
	Manufacturing Overhead		4,000

S19-13 Using job order costing in a service company

Learning Objective 6

Blake Accounting pays Jaclyn Sawyer \$63,250 per year.

Requirements

1. What is the hourly cost to Blake Accounting of employing Sawyer? Assume a 25-hour week and a 46-week year.
2. What direct labor cost would be assigned to Client 507 if Sawyer works 16 hours to prepare Client 507's financial statements?

SOLUTION

Requirement 1

Work hours per year	=	Hours per week	×	Weeks per year
	=	25 hours	×	46 weeks
	=	1,150 hours		

Yearly rate	/	Hours per year	=	Cost per hour
\$63,250	/	1,150 hours	=	\$55.00 per hour

Requirement 2

Hours worked	×	Rate per hour	=	Direct Labor Cost
16 hours	×	\$55.00 per hour	=	\$880.00

S19-14 Using job order costing in a service company

Learning Objective 6

Assume that Blake's accountants are expected to work a total of 12,000 direct labor hours in 2016. Blake's estimated total indirect costs are \$192,000 and the allocation base used is direct labor hours.

Requirements

1. What is Blake's predetermined overhead allocation rate?
2. What indirect costs will be allocated to Client 507 if Sawyer works 11 hours to prepare the financial statements?

SOLUTION

Requirement 1

Predetermined Overhead Allocation Rate	=	$\frac{\text{Total estimated overhead costs}}{\text{Total estimated quantity of the overhead allocation base}}$
	=	$\frac{\$192,000}{12,000 \text{ DLHr}} = \16 per DLHr

Requirement 2

Indirect Costs	=	Predetermined Overhead Allocation Rate	×	Actual Quantity of the Allocation Base Used	
	=	\$16 per DLHr	×	11 DLHr	= \$176

Exercises

E19-15 Distinguishing between job order costing and process costing

Learning Objective 1

Following is a list of cost system characteristics and sample companies. Match each to either job order costing or process costing.

- a. Companies that produce small quantities of many different products.
- b. A company that pulverizes wood into pulp to manufacture cardboard.
- c. A company that manufactures thousands of identical files.
- d. Companies that produce large numbers of identical products.
- e. A computer repair service that makes service calls to homes.
- f. A company that assembles electronic parts and software to manufacture millions of portable media players.
- g. A textbook publisher that produces copies of a particular book in batches.
- h. A company that bottles milk into one-gallon containers.
- i. A company that makes large quantities of one type of tankless hot water heaters.
- j. A governmental agency that takes bids for specific items it utilizes where each item requires a separate bid.

SOLUTION

a. Companies that produce small quantities of many different products.	Job Order
b. A company that pulverizes wood into pulp to manufacture cardboard.	Process
c. A company that manufactures thousands of identical files.	Process
d. Companies that produce large numbers of identical products.	Process
e. A computer repair service that makes service calls to homes.	Job Order
f. A company that assembles electronic parts and software to manufacture millions of portable media players.	Process
g. A textbook publisher that produces copies of a particular book in batches.	Job Order
h. A company that bottles milk into one-gallon containers.	Process
i. A company that makes large quantities of one type of tankless hot water heaters.	Process
j. A governmental agency that takes bids for specific items it utilizes where each item requires a separate bid.	Job Order

E19-16 Defining terminology

Learning Objectives 1, 2

Match the following terms to their definitions.

a. A record used to assign direct labor cost to specific jobs.	1. Job
b. A request for the transfer of materials to the production floor.	2. Job Cost Record
c. A document that shows the direct materials, direct labor, and manufacturing overhead costs for an individual job.	3. Job Order Costing System
d. An accounting system that accumulates costs by process.	4. Labor Time Record
e. The production of a unique product or specialized service	5. Materials Requisition
f. Used by companies that manufacture unique products or provide specialized services.	6. Process Costing System

SOLUTION

a. A record used to assign direct labor cost to specific jobs.	4. Labor Time Record
b. Request for the transfer of materials to the production floor.	5. Materials Requisition
c. Document that shows the direct materials, direct labor, and manufacturing overhead costs for an individual job.	2. Job Cost Record
d. An accounting system that accumulates costs by process.	6. Process Costing System
e. The production of a unique product or specialized service	1. Job
f. Used by companies that manufacture unique products or provide specialized services.	3. Job Order Costing System

E19-17 Accounting for job costs

Learning Objective 2

c. COGS \$16,800

Spring Trailers' job cost records yielded the following information:

Job No.	Date			Total Cost of Job at July 31
	Started	Finished	Sold	
1	June 21	July 16	July 17	\$ 3,000
2	June 29	July 21	July 26	13,800
3	July 3	August 11	August 13	6,700
4	July 7	July 29	August 1	4,800

Use the dates in the table to identify the status of each job. Compute the following balances for Spring:

- Work-in-Process Inventory at July 31
- Finished Goods Inventory at July 31
- Cost of Goods Sold for July

SOLUTION

(a) Work-in-Process Inventory		(b) Finished Goods Inventory		(c) Cost of Goods Sold	
<u>Job</u>	<u>Cost</u>	<u>Job</u>	<u>Cost</u>	<u>Job</u>	<u>Cost</u>
3	\$ 6,700	4	\$ 4,800	1	\$ 3,000
				2	13,800
Total	\$ 6,700	Total	\$ 4,800	Total	\$ 16,800

E19-18 Recording materials and labor costs

Learning Objective 2

Azalea Company makes artificial flowers and reports the following data for the month:

Purchases of materials, on account	\$ 52,000
Materials requisitions:	
Direct materials	47,800
Indirect materials	600
Labor incurred (not yet paid):	
Direct labor	26,400
Indirect labor	1,830

Journalize the entries relating to materials and labor.

SOLUTION

Date	Accounts and Explanation	Debit	Credit
	Raw Materials Inventory	52,000	
	Accounts Payable		52,000
	<i>Purchase of raw materials on account.</i>		
	Work-in-Process Inventory	47,800	
	Manufacturing Overhead	600	
	Raw Materials Inventory		48,400
	<i>Raw materials used in production.</i>		
	Work-in-Process Inventory	26,400	
	Manufacturing Overhead	1,830	
	Wages Payable		28,230
	<i>Labor incurred in production.</i>		

E19-19 Allocating and adjusting manufacturing overhead

Learning Objectives 3, 5

3. Underallocated by \$4,800

Selected cost data for Antique Poster Co. are as follows:

Estimated manufacturing overhead cost for the year	\$ 120,000
Estimated direct labor cost for the year	100,000
Actual manufacturing overhead cost for the year	90,000
Actual direct labor cost for the year	71,000

Requirements

1. Compute the predetermined overhead allocation rate per direct labor dollar.
2. Prepare the journal entry to allocate overhead costs for the year.
3. Use a T-account to determine the amount of underallocated or overallocated manufacturing overhead.
4. Prepare the journal entry to adjust for the underallocated or overallocated manufacturing overhead.

SOLUTION

Requirement 1

Predetermined Overhead Allocation Rate	=	$\frac{\text{Total estimated overhead cost}}{\text{Total estimated quantity of the overhead allocation base}}$
	=	$\frac{\$120,000}{\$100,000} = 1.20 \text{ or } 120\% \text{ of direct labor cost}$

Requirement 2

Date	Accounts and Explanation	Debit	Credit
Dec. 31	Work-in-Process Inventory (\$71,000 × 120%) Manufacturing Overhead	85,200	85,200

Requirement 3

<u>Manufacturing Overhead</u>
90,000 85,200

Manufacturing overhead is underallocated by \$4,800 (\$90,000 – \$85,200).

Requirement 4

Date	Accounts and Explanation	Debit	Credit
Dec. 31	Cost of Goods Sold Manufacturing Overhead	4,800	4,800

E19-20 Allocating and adjusting manufacturing overhead

Learning Objectives 3, 5

1. \$12 per MHR

Metal Foundry uses a predetermined overhead allocation rate to allocate overhead to individual jobs, based on the machine hours required. At the beginning of 2016, the company expected to incur the following:

Manufacturing overhead cost	\$ 870,000
Direct labor costs	1,450,000
Machine hours	72,500 hours

At the end of 2016, the company had actually incurred:

Direct labor cost	\$ 1,160,000
Depreciation on manufacturing plant and equipment	610,000
Property taxes on plant	40,000
Sales salaries	27,500
Delivery drivers' wages	24,000
Plant janitor's wages	18,000
Machine hours	65,000 hours

Requirements

1. Compute Metal's predetermined overhead allocation rate.
2. Prepare the journal entry to allocate manufacturing overhead.
3. Post the manufacturing overhead transactions to the Manufacturing Overhead T-account. Is manufacturing overhead underallocated or overallocated? By how much?
4. Prepare the journal entry to adjust for the underallocated or overallocated manufacturing overhead. Does your entry increase or decrease cost of goods sold?

SOLUTION

Requirement 1

Predetermined Overhead Allocation Rate	=	$\frac{\text{Total estimated overhead cost}}{\text{Total estimated quantity of the overhead allocation base}}$
		$= \frac{\$870,000}{72,500 \text{ MHR}} = \12 per MHR

Requirement 2

Date	Accounts and Explanation	Debit	Credit
Dec. 31	Work-in-Process Inventory (65,000 MHR × \$12/MHR) Manufacturing Overhead	780,000	780,000

Requirement 3

Manufacturing Overhead	
610,000	780,000
40,000	
18,000	
	112,000 Bal.

Manufacturing overhead is overallocated by \$112,000.

Requirement 4

Date	Accounts and Explanation	Debit	Credit
Dec. 31	Manufacturing Overhead Cost of Goods Sold	112,000	112,000

This entry decreases Cost of Goods Sold.

E19-21 Allocating and adjusting manufacturing overhead

Learning Objectives 3, 5

2. Underallocated by \$15,500

The manufacturing records for Bob's Boats at the end of the 2016 fiscal year show the following information about manufacturing overhead:

Overhead allocated to production	\$ 409,500
Actual manufacturing overhead costs	425,000
Predetermined overhead allocation rate	45 per machine hour

Requirements

1. How many machine hours did Bob's Boats use in 2016?
2. Was manufacturing overhead overallocated or underallocated for the year, and by how much?
3. Prepare the journal entry to adjust for the underallocated or overallocated manufacturing overhead.

SOLUTION

Requirement 1

Allocated manufacturing overhead	/	Predetermined overhead allocation rate	=	Machine hours
\$409,500	/	\$45 per MHR	=	9,100 MHR

Requirement 2

Allocated overhead	–	Actual Overhead	=	
\$409,500	–	\$425,000	=	\$15,500 underallocated

Requirement 3

Date	Accounts and Explanation	Debit	Credit
Dec. 31	Cost of Goods Sold Manufacturing Overhead	15,500	15,500

E19-22 Completing and selling jobs

Learning Objective 4

4. Gross profit \$12,000

June production generated the following activity in Car Chassis Company's Work-in-Process Inventory account:

June 1 balance	\$ 38,000
Direct materials used	43,000
Direct labor assigned to jobs	42,000
Manufacturing overhead allocated to jobs	29,400

Additionally, Car Chassis has completed Jobs 142 and 143, with total costs of \$46,000 and \$35,000, respectively.

Requirements

1. Prepare the journal entry for production completed in June.
2. Open a T-account for Work-in-Process Inventory. Post the journal entry made in Requirement 1. Compute the ending balance in the Work-in-Process Inventory account on June 30.
3. Prepare the journal entry to record the sale on account of Job 143 for \$47,000. Also, prepare the journal entry to record Cost of Goods Sold for Job 143.
4. What is the gross profit on Job 143?

SOLUTION

Requirement 1

Date	Accounts and Explanation	Debit	Credit
Jun. 30	Finished Goods Inventory (\$46,000 + 35,000) Work-in-Process Inventory	81,000	81,000

Requirement 2

Work-in-Process Inventory			
Jun. 1 Bal.	38,000		
Direct materials used	43,000		
Direct labor assigned to jobs	42,000	46,000	Job 142 completed
MOH allocated to jobs	29,400	35,000	Job 143 completed
Jun. 30 Bal.	71,400		

Requirement 3

Date	Accounts and Explanation	Debit	Credit
Jun. 30	Accounts Receivable	47,000	
	Sales Revenue		47,000
	Cost of Goods Sold	35,000	
	Finished Goods Inventory		35,000

Requirement 4

Sales Revenue	\$ 47,000
Cost of Goods Sold	<u>35,000</u>
Gross Profit	<u>\$ 12,000</u>

E19-23 Preparing a schedule of cost of goods manufactured and an income statement

Learning Objective 5

N.I. \$90

Shaffer Company has the following information for the year ended December 31, 2016. Use the information to prepare a schedule of cost of goods manufactured and an income statement. Assume no indirect materials are used and all amounts are shown in millions.

Inventories:	Beginning	Ending
Raw Materials	\$ 8	\$ 9
Work-in-Process	14	19
Finished Goods	4	11

Other information:	
Sales Revenue	\$ 228
Selling and Administrative Expenses	64
Direct Labor	46
Manufacturing Overhead; actual and allocated	16
Materials Purchases	25

SOLUTION

SHAFFER COMPANY
Schedule of Cost of Goods Manufactured
Year Ended December 31, 2016
(in millions)

Beginning Work-in-Process Inventory		\$ 14
Direct Materials Used:		
Beginning Raw Materials Inventory	\$ 8	
Purchases of Raw Materials	25	
Raw Materials Available for Use	<u>33</u>	
Ending Raw Materials Inventory	<u>(9)</u>	
Direct Materials Used		\$ 24
Direct Labor		46
Manufacturing Overhead		<u>16</u>
Total Manufacturing Costs Incurred during the Year		86
Total Manufacturing Costs to Account for		<u>100</u>
Ending Work-in-Process Inventory		<u>(19)</u>
Cost of Goods Manufactured		<u>\$ 81</u>

E19-23, cont.

SHAFFER COMPANY
Income Statement
Year Ended December 31, 2016
(in millions)

Sales Revenue		\$ 228
Cost of Goods Sold:		
Beginning Finished Goods Inventory	\$ 4	
Cost of Goods Manufactured	81	
Cost of Goods Available for Sale	85	
Ending Finished Goods Inventory	(11)	
Cost of Goods Sold		74
Gross Profit		154
Selling and Administrative Expenses	64	
Total Selling and Admin. Expenses		64
Net Income		<u>\$ 90</u>

E19-24 Preparing job order costing journal entries

Learning Objectives 2, 3, 4, 5

i. Underallocated by \$9,200

Journalize the following transactions for Blanche's Benches:

- a. Incurred and paid Web site expenses, \$2,800.
- b. Incurred manufacturing wages of \$10,000, 70% of which was direct labor and 30% of which was indirect labor.
- c. Purchased raw materials on account, \$19,000.
- d. Used in production: direct materials, \$8,000; indirect materials, \$3,500.
- e. Recorded manufacturing overhead: depreciation on plant, \$14,000; plant insurance (previously paid), \$1,300; plant property tax, \$3,500 (credit Property Tax Payable).
- f. Allocated manufacturing overhead to jobs, 230% of direct labor costs.
- g. Completed production on jobs with costs of \$36,000.
- h. Sold inventory on account, \$26,000; cost of goods sold, \$12,000.
- i. Adjusted for overallocated or underallocated overhead.

SOLUTION

Item	Accounts and Explanation	Debit	Credit
a.	Website Expenses Cash	2,800	2,800
b.	Work-in-Process Inventory Manufacturing Overhead Wages Payable	7,000 3,000	10,000
c.	Raw Materials Inventory Accounts Payable	19,000	19,000
d.	Work-in-Process Inventory Manufacturing Overhead Raw Materials Inventory	8,000 3,500	11,500
e.	Manufacturing Overhead Accumulated Depreciation—Plant	14,000	14,000
	Manufacturing Overhead Prepaid Insurance	1,300	1,300
	Manufacturing Overhead Property Tax Payable	3,500	3,500
f.	Work-in-Process Inventory (\$7,000 × 230%) Manufacturing Overhead	16,100	16,100
g.	Finished Goods Inventory Work-in-Process Inventory	36,000	36,000
h.	Accounts Receivable Sales Revenue	26,000	26,000
	Cost of Goods Sold Finished Goods Inventory	12,000	12,000
i.	Cost of Goods Sold Manufacturing Overhead <i>Actual overhead (\$3,000 + \$3,500 + \$14,000 + \$1,300 + \$3,500) – allocated overhead (\$16,100) = \$9,200</i>	9,200	9,200

E19-25 Identifying job order costing journal entries

Learning Objectives 2, 3, 4, 5

Analyze the following T-accounts, and describe each lettered transaction. Note that some transactions may be compound entries.

Raw Materials Inventory	Work-in-Process Inventory	Finished Goods Inventory	Prepaid Insurance
a) (b) ((b) (f) (c) (e)	f) (g) ((d)
Accounts Payable	Wages Payable	Manufacturing Overhead	Cost of Goods Sold
(a)	(c)	(b) (e) (c) (h) (d)	(g) (h)

SOLUTION

- Purchased materials on account.
- Used direct and indirect materials in production (requisitioned direct and indirect materials).
- Incurred and assigned manufacturing wages as direct and indirect labor.
- Expired insurance on factory plant and/or equipment.
- Allocated manufacturing overhead to jobs.
- Completed jobs (transferred Work-in-Process Inventory to Finished Goods Inventory; Cost of Goods Manufactured).
- Sold inventory (Cost of Goods Sold).
- Adjusted underallocated balance of Manufacturing Overhead to Cost of Goods Sold.

E19-26 Determining missing amounts

Learning Objectives 2, 3, 4, 5

Analyze the following T-accounts, and determine the missing amounts.

Raw Materials Inventory	Work-in-Process Inventory	Finished Goods Inventory	Accumulated Depreciation
25,000 (a) Bal. 3,000	(b) 30,000 4,000 6,750 Bal. 750	(c) (d) Bal. 4,000	9,000
Accounts Payable	Wages Payable	Manufacturing Overhead	Cost of Goods Sold
25,000	(e)	2,000 6,750 500 (f) 9,000 Bal. 0	(g) 4,750 Bal. 30,750

SOLUTION

- a. Requisitioned Raw Materials in the amount of \$22,000.
- b. Direct Materials assigned to Work-in-Process Inventory, \$20,000.
- c. Completed jobs and assigned costs to Finished Goods Inventory, \$30,000.
- d. Sold and shipped completed jobs, \$26,000.
- e. Labor incurred, \$4,500 (direct labor assigned to Work-in-Process, \$4,000; indirect labor accumulated in Manufacturing Overhead, \$500).
- f. Manufacturing Overhead adjusted for underallocated overhead, \$4,750.
- g. Jobs sold and costs assigned to Cost of Goods Sold, \$26,000.

E19-27 Using job order costing in a service company

Learning Objective 6

2. Total cost \$57,000

Martin Realtors, a real estate consulting firm, specializes in advising companies on potential new plant sites. The company uses a job order costing system with a predetermined overhead allocation rate, computed as a percentage of direct labor costs.

At the beginning of 2016, managing partner Jennifer Martin prepared the following budget for the year:

Direct labor hours (professionals)	22,000 hours
Direct labor costs (professionals)	\$ 2,750,000
Office rent	390,000
Support staff salaries	1,685,000
Utilities	400,000

Root Manufacturing, Inc. is inviting several consultants to bid for work. Jennifer Martin wants to submit a bid. She estimates that this job will require about 240 direct labor hours.

Requirements

1. Compute Martin Realtors' (a) hourly direct labor cost rate and (b) predetermined overhead allocation rate.
2. Compute the predicted cost of the Root Manufacturing job.
3. If Martin wants to earn a profit that equals 55% of the job's cost, how much should she bid for the Root Manufacturing job?

SOLUTION

Requirement 1a

Direct labor costs	/	Direct labor hours	=	Direct labor cost rate
\$2,750,000	/	22,000 DLHr	=	\$125 per DLHr

Requirement 1b

Indirect costs:

Office rent	\$ 390,000
Support staff salaries	1,685,000
Utilities	<u>400,000</u>
Total indirect costs	<u>\$ 2,475,000</u>

Predetermined Overhead Allocation Rate	=	$\frac{\text{Total estimated overhead cost}}{\text{Total estimated quantity of the overhead allocation base}}$
	=	$\frac{\$2,475,000}{\$2,750,000} = 0.90 = 90\% \text{ of direct labor costs}$

Requirement 2

Direct labor: 240 DLHr × \$125 per DLHr	\$ 30,000
Indirect costs: \$30,000 × 90%	<u>27,000</u>
Total predicted cost	<u>\$ 57,000</u>

Requirement 3

Predicted cost	\$ 57,000
Desired profit (\$57,000 × 55%)	<u>31,350</u>
Required service revenue	<u>\$ 88,350</u>

Martin should bid \$88,350

Problems (Group A)

P19-28A Analyzing cost data, recording completion and sales of jobs

Learning Objectives 1, 2, 4

5. Gross profit \$1,000

Brandon Manufacturing makes carrying cases for portable electronic devices. Its costing records yield the following information:

Job No.	Date			Total Cost of Job at October 31	Total Manufacturing Costs Added in November
	Started	Finished	Sold		
1	10/03	10/12	10/13	\$ 1,000	
2	10/03	10/30	11/01	1,300	
3	10/17	11/24	11/27	600	\$ 800
4	10/29	11/29	12/03	500	1,600
5	11/08	11/12	11/14		350
6	11/23	12/06	12/09		100

Requirements

1. Which type of costing system is Brandon using? What piece of data did you base your answer on?
2. Use the dates in the table to identify the status of each job at October 31 and November 30. Compute Brandon's account balances at October 31 for Work-in-Process Inventory, Finished Goods Inventory, and Cost of Goods Sold. Compute, by job, account balances at November 30 for Work-in-Process Inventory, Finished Goods Inventory, and Cost of Goods Sold.
3. Prepare journal entries to record the transfer of completed jobs from Work-in-Process Inventory to Finished Goods Inventory for October and November.
4. Record the sale of Job 3 for \$2,400 on account.
5. What is the gross profit for Job 3?

SOLUTION

Requirement 1

Brandon uses a job order costing system. We know this because Brandon's costing records show costs being accumulated for each job.

Requirement 2

BRANDON MANUFACTURING						
Computation of Work-in-Process Inventory, Finished Goods Inventory, and Cost of Goods Sold for October and November						
Date	Work-in-Process Inventory		Finished Goods Inventory		Cost of Goods Sold	
	Job	Cost	Job	Cost	Job	Cost
October 31:	3	\$ 600	2	\$ 1,300	1	\$ 1,000
	4	500				
	Total	<u>\$ 1,100</u>		<u>\$ 1,300</u>		<u>\$ 1,000</u>
November 30:	6	\$ 100	4	\$ 2,100	2	\$ 1,300
					3	1,400
					5	350
	Total	<u>\$ 100</u>	Total	<u>\$ 2,100</u>	Total	<u>\$ 3,050</u>

Requirement 3

Date	Accounts and Explanation	Debit	Credit
Oct. 31	Finished Goods Inventory (Jobs 1 & 2) Work-in-Process Inventory	2,300	2,300
Nov. 30	Finished Goods Inventory (Jobs 3, 4 & 5) Work-in-Process Inventory	3,850	3,850

Requirement 4

Date	Accounts and Explanation	Debit	Credit
Nov. 30	Accounts Receivable Sales Revenue	2,400	2,400
30	Cost of Goods Sold Finished Goods Inventory	1,400	1,400

Requirement 5

The gross profit for Job 3 is:

Sales revenue	\$ 2,400
Cost of goods sold	<u>1,400</u>
Gross profit	<u>\$ 1,000</u>

P19-29A Preparing and using a job cost record to prepare journal entries

Learning Objectives 2, 3, 4

1. Cost per DVD \$0.37

Yu Technology Co. manufactures CDs and DVDs for computer software and entertainment companies. Yu uses job order costing.

On April 2, Yu began production of 5,700 DVDs, Job 423, for Portrait Pictures for \$1.40 sales price per DVD. Yu promised to deliver the DVDs to Portrait Pictures by April 5. Yu incurred the following costs:

Date	Labor Time Record No.	Description	Amount
4/02	655	10 hours @ \$18 per hour	\$ 180
4/03	656	20 hours @ \$13 per hour	260

Materials			
Date	Requisition No.	Description	Amount
4/02	63	31 lbs. polycarbonate plastic @ \$12 per lb.	\$ 372
4/02	64	25 lbs. acrylic plastic @ \$27 per lb.	675
4/03	74	3 lbs. refined aluminum @ \$45 per lb.	135

Yu Technology allocates manufacturing overhead to jobs based on the relation between estimated overhead of \$495,000 and estimated direct labor costs of \$450,000. Job 423 was completed and shipped on April 3.

Requirements

1. Prepare a job cost record for Job 423. Calculate the predetermined overhead allocation rate; then allocate manufacturing overhead to the job.
2. Journalize in summary form the requisition of direct materials and the assignment of direct labor and the allocation of manufacturing overhead to Job 423. Wages are not yet paid.
3. Journalize completion of the job and the sale of the 5,700 DVDs on account.

SOLUTION

Requirement 1

JOB COST RECORD								
Job Number		423						
Customer		Portrait Pictures						
Job Description		5,700 DVDs						
Direct Materials			Direct Labor			Manufacturing Overhead		
Date	Requisition Number	Amount	Date	Labor Time Record Number	Amount	Date	Rate	Amount
4/2	63	\$ 372	4/2	655	\$180	4/3	110% of DL costs*	\$484
4/2	64	675						
4/3	74	135	4/3	656	260			
Cost Summary								
Direct Materials				\$1,182				
Direct Labor				440				
Manufacturing Overhead				484				
Total Cost				\$2,106				
Unit Cost				\$0.37**				

*\$495,000 / \$450,000 = 110%

**\$2,106 / 5,700 DVDs = \$0.37 per DVD (rounded)

Requirement 2

Date	Accounts and Explanation	Debit	Credit
Apr. 3	Work-in-Process Inventory	1,182	
	Raw Materials Inventory		1,182
3	Work-in-Process Inventory	440	
	Wages Payable		440
3	Work-in-Process Inventory	484	
	Manufacturing Overhead		484

P19-29A, cont.
Requirement 3

Date	Accounts and Explanation	Debit	Credit
Apr. 3	Finished Goods Inventory Work-in-Process Inventory	2,106	2,106
3	Accounts Receivable (5,700 DVDs × \$1.40/DVD) Sales Revenue	7,980	7,980
3	Cost of Goods Sold Finished Goods Inventory	2,106	2,106

P19-30A Accounting for transactions, construction company

Learning Objectives 2, 3, 4
 3. WIP Bal. \$284,000

Sunset Construction, Inc. is a home builder in Arizona. Sunset uses a job order costing system in which each house is a job. Because it constructs houses, the company uses an account titled Construction Overhead. The company applies overhead based on estimated direct labor costs. For the year, it estimated construction overhead of \$1,250,000 and total direct labor cost of \$2,500,000. The following events occurred during August:

- a. Purchased materials on account, \$440,000.
- b. Requisitioned direct materials and used direct labor in construction. Recorded the materials requisitioned.

	Direct Materials	Direct Labor
House 402	\$ 56,000	\$ 41,000
House 403	65,000	35,000
House 404	62,000	57,000
House 405	84,000	55,000

- c. The company incurred total wages of \$210,000. Use the data from Item b to assign the wages. Wages are not yet paid.
- d. Depreciation of construction equipment, \$6,800.
- e. Other overhead costs incurred: Equipment rentals paid in cash, \$34,000; Worker liability insurance expired, \$6,000.
- f. Allocated overhead to jobs.
- g. Houses completed: 402, 404.
- h. House sold on account: 404 for \$220,000.

Requirements

1. Calculate Sunset's predetermined overhead allocation rate for the year.
2. Prepare journal entries to record the events in the general journal.
3. Open T-accounts for Work-in-Process Inventory and Finished Goods Inventory. Post the appropriate entries to these accounts, identifying each entry by letter. Determine the ending account balances, assuming that the beginning balances were zero.
4. Add the costs of the unfinished houses, and show that this total amount equals the ending balance in the Work-in-Process Inventory account.
5. Add the cost of the completed house that has not yet been sold, and show that this equals the ending balance in Finished Goods Inventory.
6. Compute gross profit on the house that was sold. What costs must gross profit cover for Sunset Construction?

SOLUTION

Requirement 1

Predetermined Overhead Allocation Rate	=	$\frac{\text{Total estimated overhead costs}}{\text{Total estimated quantity of the overhead allocation base}}$
	=	$\frac{\$1,250,000}{\$2,500,000} = 0.50 = 50\% \text{ of direct labor cost}$

P19-30A, cont.
Requirement 2

Date	Accounts and Explanation	Debit	Credit
Aug. 31			
a.	Raw Materials Inventory Accounts Payable	440,000	440,000
b.	Work-in-Process Inventory ¹ Raw Materials Inventory	267,000	267,000
c.	Work-in-Process Inventory ² Construction Overhead ³ Wages Payable	188,000 22,000	210,000
d.	Construction Overhead Accumulation Depreciation—Equipment	6,800	6,800
e.	Construction Overhead Cash Prepaid Insurance	40,000	34,000 6,000
f.	Work-in-Process Inventory ⁴ Construction Overhead	94,000	94,000
g.	Finished Goods Inventory ⁵ Work-in-Process Inventory	265,000	265,000
h.	Accounts Receivable Sales Revenue	220,000	220,000
	Cost of Goods Sold ⁶ Finished Goods Inventory	147,500	147,500

¹\$56,000 + \$65,000 + \$62,000 + \$84,000 = \$267,000

²\$41,000 + \$35,000 + \$57,000 + \$55,000 = \$188,000

³\$210,000 – \$188,000 = \$22,000

⁴\$188,000 × 50% = \$94,000

⁵House 402: \$56,000 + \$41,000 + (\$41,000 × .50) = \$117,500

House 404: \$62,000 + \$57,000 + (\$57,000 × .50) = \$147,500

Total: \$117,500 + \$147,500 = \$265,000

⁶From above, House 404 = \$147,500

P19-30A, cont.
Requirement 3

Work-in-Process Inventory			Finished Goods Inventory			
(b) DM	267,000	265,000	(g) COGM	265,000	147,500	(h) COGS
(c) DL	188,000		Bal.	117,500		
(f) OH	94,000					
Bal.	284,000					

Requirement 4

SUNSET CONSTRUCTION, INC.
Reconciliation of Work-in-Process Inventory Subsidiary
and Control Accounts
August 31

	House #403	House #405	Total WIP Balance
Unfinished houses:			
Direct Materials	\$ 65,000	\$ 84,000	
Direct Labor	35,000	55,000	
Construction Overhead (50% of direct labor)	<u>17,500</u>	<u>27,500</u>	
Total cost equals Ending Work-in-Process Inventory	<u>\$ 117,500</u>	<u>\$ 166,500</u>	<u>\$ 284,000</u>

Requirement 5

SUNSET CONSTRUCTION, INC.
Reconciliation of Finished Goods Inventory Subsidiary
and Control Accounts
August 31

	<u>House #402</u>
Completed, unsold house:	
Direct Materials	\$ 56,000
Direct Labor	41,000
Construction Overhead (50% of direct labor)	<u>20,500</u>
Total cost equals Ending Finished Goods Inventory	<u>\$ 117,500</u>

P19-30A, cont.
Requirement 6

SUNSET CONSTRUCTION, INC.	
Gross Profit on Homes Sold in August	
	<u>House #404</u>
Sales revenue	\$ 220,000
Cost of goods sold	<u>147,500</u>
Gross profit	<u>\$ 72,500</u>

The gross profit must cover these types of costs: selling and administrative expenses, income tax expense, and other expenses.

P19-31A Accounting for manufacturing overhead

Learning Objectives 3, 5

1. \$8.00 per machine hour

Premium Woods manufactures jewelry boxes. The primary materials (wood, brass, and glass) and direct labor are assigned directly to the products. Manufacturing overhead costs are allocated based on machine hours. Data for 2016 follow:

	Estimated	Actual
Machine hours	26,500 hours	32,600 hours
Maintenance labor (repairs to equipment)	\$ 12,000	\$ 29,500
Plant supervisor's salary	43,000	49,000
Screws, nails, and glue	23,000	48,000
Plant utilities	49,000	90,850
Freight out	35,000	47,500
Depreciation on plant and equipment	85,000	84,000
Advertising expense	44,000	54,000

Requirements

1. Compute the predetermined overhead allocation rate.
2. Post actual and allocated manufacturing overhead to the Manufacturing Overhead T-account.
3. Prepare the journal entry to adjust for underallocated or overallocated overhead.
4. The predetermined overhead allocation rate usually turns out to be inaccurate. Why don't accountants just use the actual manufacturing overhead rate?

SOLUTION

Requirement 1

Predetermined Overhead Allocation Rate	=	$\frac{\text{Total estimated overhead costs}}{\text{Total estimated quantity of the overhead allocation base}}$
	=	$\frac{\$212,000^*}{26,500 \text{ MHrs}} = \8.00 per MHR

$$*\$12,000 + \$43,000 + \$23,000 + \$49,000 + \$85,000 = \$212,000$$

Requirement 2

Manufacturing Overhead	
29,500	260,800*
49,000	
48,000	
90,850	
84,000	
Bal.	40,550

$$*32,600 \text{ MHrs} \times \$8.00 \text{ per MHR}$$

Requirement 3

Date	Accounts and Explanation	Debit	Credit
Dec. 31	Cost of Goods Sold	40,550	
	Manufacturing Overhead		40,550

Requirement 4

The actual manufacturing overhead rate is not known until the end of the period. Managers need to make decisions throughout the period. Accountants use predetermined overhead allocation rates to give managers product cost information when they need it—today.

P19-32A Preparing comprehensive accounting for manufacturing transactions

Learning Objectives 2, 3, 4, 5

4. COGM \$47,275

5. NI \$16,300

Learning Stars produces stars for elementary teachers to reward their students. Learning Stars' trial balance on June 1 follows:

LEARNING STARS Trial Balance June 1, 2016		
Account Title	Balance	
	Debit	Credit
Cash	\$ 18,000	
Accounts Receivable	180,000	
Inventories:		
Raw Materials	6,100	
Work-in-Process	41,100	
Finished Goods	21,100	
Plant Assets	210,000	
Accumulated Depreciation		\$ 74,000
Accounts Payable		131,000
Wages Payable		1,800
Common Stock		145,000
Retained Earnings		124,500
Sales Revenue		
Cost of Goods Sold		
Manufacturing Overhead		
Selling and Administrative Expenses		
Totals	<u>\$ 476,300</u>	<u>\$ 476,300</u>

June 1 balances in the subsidiary ledgers were as follows:

- Raw Materials Inventory subsidiary ledger: Paper, \$4,100; indirect materials, \$2,000
- Work-in-Process Inventory subsidiary ledger: Job 120, \$41,100; Job 121, \$0
- Finished Goods Inventory subsidiary ledger: Large Stars, \$9,400; Small Stars, \$11,700

June transactions are summarized as follows:

- a. Collections on account, \$150,000.
- b. Selling and administrative expenses incurred and paid, \$33,000.
- c. Payments on account, \$40,000.
- d. Materials purchases on account: Paper, \$20,000; indirect materials, \$5,000.
- e. Materials requisitioned and used in production:

Job 120: Paper, \$550
Job 121: Paper, \$7,750
Indirect materials, \$1,800

- f. Wages incurred during June, \$37,000. Labor time records for the month: Job 120, \$3,750; Job 121, \$18,500; indirect labor, \$14,750.
- g. Wages paid in June include the balance in Wages Payable at May 31 plus \$35,000 of wages incurred during June.
- h. Depreciation on plant and equipment, \$3,000.
- i. Manufacturing overhead allocated at the predetermined overhead allocation rate of 50% of direct labor cost.
- j. Jobs completed during the month: Job 120 with 300,000 Large Stars at a total cost of \$47,275.
- k. Sales on account: all of Job 120 for \$105,000.
- l. Adjusted for overallocated or underallocated manufacturing overhead.

Requirements

- 1. Journalize the transactions for the company.
- 2. Open T-accounts for the general ledger, the Raw Materials Inventory subsidiary ledger, the Work-in-Process Inventory subsidiary ledger, and the Finished Goods Inventory subsidiary ledger. Insert each account balance as given, and use the reference Bal. Post the journal entries to the T-accounts using the transaction letters as a reference.
- 3. Prepare a trial balance at June 30, 2016.
- 4. Use the Work-in-Process Inventory T-account to prepare a schedule of cost of goods manufactured for the month of June.
- 5. Prepare an income statement for the month of June.

SOLUTION

Requirement 1

Date	Accounts and Explanation	Debit	Credit
a.	Cash Accounts Receivable	150,000	150,000
b.	Selling and Administrative Expenses Cash	33,000	33,000
c.	Accounts Payable Cash	40,000	40,000
d.	Raw Materials Inventory (\$20,000 + \$5,000) Accounts Payable	25,000	25,000
e.	Work-in-Process Inventory (\$550 + \$7,750) Manufacturing Overhead Raw Materials Inventory	8,300 1,800	10,100
f.	Work-in-Process Inventory (\$3,750 + \$18,500) Manufacturing Overhead Wages Payable	22,250 14,750	37,000
g.	Wages Payable (\$1,800 + \$35,000) Cash	36,800	36,800
h.	Manufacturing Overhead Accumulated Depreciation—plant and equipment	3,000	3,000
i.	Work-in-Process Inventory Manufacturing Overhead (\$22,250 × 50%)	11,125	11,125
j.	Finished Goods Inventory Work-in-Process Inventory	47,275	47,275
k.	Accounts Receivable Sales Revenue	105,000	105,000
	Cost of Goods Sold Finished Goods Inventory	47,275	47,275
l.	Cost of Goods Sold Manufacturing Overhead (\$1,800 + \$14,750 + \$3,000 – \$11,125)	8,425	8,425

P19-32A, cont.
Requirement 2

Cash			
Bal.	18,000	33,000	(b)
(a)	150,000	40,000	(c)
		36,800	(g)
Bal.	58,200		

Accounts Receivable			
Bal.	180,000	150,000	(a)
(k)	105,000		
Bal.	135,000		

Raw Materials Inventory			
Bal.	6,100	10,100	(e)
(d)	25,000		
Bal.	21,000		

Work-in-Process Inventory			
Bal.	41,100	47,275	(j)
(e)	8,300		
(f)	22,250		
(i)	11,125		
Bal.	35,500		

Finished Goods Inventory			
Bal.	21,100	47,275	(k)
(j)	47,275		
Bal.	21,100		

Plant Assets			
Bal.	210,000		

Accumulated Depreciation			
		74,000	Bal.
		3,000	(h)
		77,000	Bal.

Accounts Payable			
(c)	40,000	131,000	Bal.
		25,000	(d)
		116,000	Bal.

Wages Payable			
(g)	36,800	1,800	Bal.
		37,000	(f)
		2,000	Bal.

Common Stock			
		145,000	Bal.

Retained Earnings			
		124,500	Bal.

Sales Revenue			
		105,000	(k)

Cost of Goods Sold			
(k)	47,275		
(l)	8,425		
Bal.	55,700		

Manufacturing Overhead			
(e)	1,800	11,125	(i)
(f)	14,750	8,425	(l)
(h)	3,000		
Bal.	0		

Selling and Administrative Expenses			
(b)	33,000		

P19-32A, cont.
Requirement 2, cont.

Raw Materials Inventory subsidiary ledger:

Paper			Indirect Materials		
Bal.	4,100	8,300 (e)	Bal.	2,000	1,800 (e)
(d)	20,000		(d)	5,000	
Bal.	15,800		Bal.	5,200	

Total balances equal balance of Raw Materials Inventory, \$21,000 (\$15,800 + \$5,200).

Work-in-Process Inventory subsidiary ledger:

Job 120			Job 121		
Bal.	41,100	47,275 (j)	Bal.	0	
(e)	550		(e)	7,750	
(f)	3,750		(f)	18,500	
(i)	1,875		(i)	9,250	
Bal.	0		Bal.	35,500	

Balance equals balance of Work-in-Process Inventory, \$35,500 (\$0 + \$35,500).

Finished Goods Inventory subsidiary ledger:

Large Stars			Small Stars		
Bal.	9,400	47,275 (k)	Bal.	11,700	
(j)	47,275				
Bal.	9,400				

Total balances equal balance of Finished Goods Inventory, \$21,100 (\$9,400 + \$11,700).

P19-32A, cont.
Requirement 3

LEARNING STARS
Trial Balance
June 30, 2016

Account	Debit	Credit
Cash	\$ 58,200	
Accounts Receivable	135,000	
Inventories:		
Raw Materials	21,000	
Work-in-Process	35,500	
Finished Goods	21,100	
Plant Assets	210,000	
Accumulated Depreciation		\$ 77,000
Accounts Payable		116,000
Wages Payable		2,000
Common Stock		145,000
Retained Earnings		124,500
Sales Revenue		105,000
Cost of Goods Sold	55,700	
Selling and Administrative Expenses	33,000	
Totals	\$ 569,500	\$ 569,500

P19-32A, cont.
Requirement 4

LEARNING STARS
Schedule of Cost of Goods Manufactured
Month Ended June 30, 2016

Beginning Work-in-Process Inventory		\$ 41,100
Direct Materials Used:		
Raw Materials Inventory, Beginning	\$ 6,100	
Purchases	25,000	
Raw Materials Available for Use	<u>31,100</u>	
Raw Materials Inventory, Ending	(21,000)	
Indirect Materials Used	<u>(1,800)</u>	
Direct Materials Used	\$ 8,300	
Direct Labor (Trans. f)	22,250	
Manufacturing Overhead Allocated	<u>11,125</u>	
Total Manufacturing Costs Incurred during the month		<u>41,675</u>
Total Manufacturing Costs to Account for		82,775
Ending Work-in-Process Inventory		<u>(35,500)</u>
Cost of Goods Manufactured		<u>\$ 47,275</u>

Requirement 5

LEARNING STARS
Income Statement
Month ended June 30, 2016

Sales Revenue		\$ 105,000
Cost of Goods Sold:		
Beginning Finished Goods Inventory	\$ 21,100	
Cost of Goods Manufactured	<u>47,275</u>	
Cost of Goods Available for Sale	68,375	
Ending Finished Goods Inventory	<u>(21,100)</u>	
Cost of Goods Sold Before Adjustment	47,275	
Underallocated Overhead	<u>8,425</u>	
Cost of Goods Sold After Adjustment	<u>55,700</u>	
Gross Profit		49,300
Selling and Administrative Expenses		<u>33,000</u>
Net Income		<u>\$ 16,300</u>

P19-33A Using job order costing in a service company

Learning Objective 6

2. Delicious Treats \$313,400

(Requirements 1 and 2 only)

Hummingbird Design, Inc. is a Web site design and consulting firm. The firm uses a job order costing system in which each client is a different job. Hummingbird Design assigns direct labor, licensing costs, and travel costs directly to each job. It allocates in- direct costs to jobs based on a predetermined overhead allocation rate, computed as a percentage of direct labor costs.

At the beginning of 2016, managing partner Sally Simone prepared the following budget estimates:

Direct labor hours (professionals)	6,250 hours
Direct labor costs (professionals)	\$ 1,800,000
Support staff salaries	767,000
Computer leases	46,000
Office supplies	27,000
Office rent	60,000

In November 2016, Hummingbird Design served several clients. Records for two clients appear here:

	Delicious Treats	Mesilla Chocolates
Direct labor hours	700 hours	100 hours
Software licensing costs	\$ 5,000	\$ 300
Travel costs	6,000	0

Requirements

1. Compute Hummingbird Design's direct labor rate and its predetermined overhead allocation rate for 2016.
2. Compute the total cost of each job.
3. If Simone wants to earn profits equal to 20% of service revenue, what fee should she charge each of these two clients?
4. Why does Hummingbird Design assign costs to jobs?

SOLUTION

Requirement 1

$$\text{Hourly rate to the employer} = \frac{\$1,800,000 \text{ per year}}{6,250 \text{ hours per year}} = \$288 \text{ per hour}$$

$$\begin{aligned} \text{Predetermined Overhead Allocation Rate} &= \frac{\text{Total estimated overhead costs}}{\text{Total estimated quantity of the overhead allocation base}} \\ &= \frac{\$900,000^*}{\$1,800,000} = 0.50 = 50\% \text{ of direct labor costs} \end{aligned}$$

$$*\$767,000 + \$46,000 + \$27,000 + \$60,000 = \$900,000$$

Requirement 2

HUMMINGBIRD DESIGN, INC.		
Total Cost of Delicious Treats' and Mesilla Chocolates' Jobs		
For the month of November		
	Delicious Treats	Mesilla Chocolates
Direct Costs:		
Direct Labor		
700 hours × \$288 per hour	\$ 201,600	
100 hours × \$288 per hour		\$ 28,800
Software licensing costs	5,000	300
Travel costs	6,000	0
Total Direct Costs	\$ 212,600	\$ 29,100
Allocated Indirect Costs:		
50% × \$201,600	100,800	
50% × \$ 28,800		14,400
Total Costs	\$ 313,400	\$ 43,500

P19-33A, cont.
Requirement 3

If profits are 20% of sales, then total costs are 80% of sales.
Therefore, Sales Revenue = Total Costs / 80%.

Delicious Treats: \$391,750

Service Revenue	=	Total costs	/	80%
Service Revenue	=	\$313,400	/	80%
Service Revenue	=	\$391,750		

Mesilla Chocolates: \$54,375

Service Revenue	=	Total costs	/	80%
Service Revenue	=	\$43,500	/	80%
Service Revenue	=	\$54,375		

Requirement 4

Hummingbird Design, Inc. assigns costs to jobs to help the company set fees that cover all costs and contribute to profit. Assigning costs to individual clients can also help Hummingbird Design, Inc. control costs.

Problems (Group B)

P19-34B Analyzing cost data, recording completion and sales of jobs

Learning Objectives 1, 2, 4

5. Gross profit \$400

Sloan Manufacturing makes carrying cases for portable electronic devices. Its costing records yield the following information:

Job No.	Date			Total Cost of Job at October 31	Total Manufacturing Costs Added in November
	Started	Finished	Sold		
1	10/03	10/12	10/13	\$ 1,100	
2	10/03	10/30	11/01	2,000	
3	10/17	11/24	11/27	1,000	\$ 800
4	10/29	11/29	12/03	900	1,500
5	11/08	11/12	11/14		550
6	11/23	12/06	12/09		500

Requirements

1. Which type of costing system is Sloan using? What piece of data did you base your answer on?
2. Use the dates in the table to identify the status of each job at October 31 and November 30. Compute Sloan's account balances at October 31 for Work-in-Process Inventory, Finished Goods Inventory, and Cost of Goods Sold. Compute, by job, account balances at November 30 for Work-in-Process Inventory, Finished Goods Inventory, and Cost of Goods Sold.
3. Prepare journal entries to record the transfer of completed jobs from Work-in- Process Inventory to Finished Goods Inventory for October and November.
4. Record the sale of Job 3 for \$2,200 on account.
5. What is the gross profit for Job 3?

SOLUTION

Requirement 1

Sloan Manufacturing uses a job order costing system. We know this because Sloan's costing records show costs being accumulated for each job.

Requirement 2

SLOAN MANUFACTURING						
Computation of Work-in-Process Inventory, Finished Goods Inventory, and Cost of Goods Sold for October and November						
Date	Work-in-Process Inventory		Finished Goods Inventory		Cost of Goods Sold	
	Job	Cost	Job	Cost	Job	Cost
October 31:	3	\$ 1,000	2	\$ 2,000	1	\$ 1,100
	4	900				
	Total	<u>\$1,900</u>	Total	<u>\$ 2,000</u>	Total	<u>\$ 1,100</u>
November 30:	6	\$500	4	\$ 2,400	2	\$ 2,000
					3	1,800
					5	550
	Total	<u>\$ 500</u>	Total	<u>\$ 2,400</u>	Total	<u>\$ 4,350</u>

Requirement 3

Date	Accounts and Explanation	Debit	Credit
Oct. 31	Finished Goods Inventory (Jobs 1 & 2) Work-in-Process Inventory	3,100	3,100
Nov. 30	Finished Goods Inventory (Jobs 3, 4, & 5) Work-in-Process Inventory	4,750	4,750

Requirement 4

Date	Accounts and Explanation	Debit	Credit
Nov. 30	Accounts Receivable Sales Revenue	2,200	2,200
30	Cost of Goods Sold Finished Goods Inventory	1,800	1,800

Requirement 5

The gross profit for Job 3 is:

Sales Revenue	\$ 2,200
Cost of Goods Sold	<u>1,800</u>
Gross Profit	<u>\$ 400</u>

P19-35B Preparing and using a job cost record to prepare journal entries

Learning Objectives 2, 3, 4

1. Cost per DVD \$0.39

Tu Technology Co. manufactures CDs and DVDs for computer software and entertainment companies. Tu uses job order costing.

On November 2, Tu began production of 5,700 DVDs, Job 423, for Cyclorama Pictures for \$1.50 sales price per DVD. Tu promised to deliver the DVDs to Cyclorama by November 5. Tu incurred the following costs:

Date	Labor Time Record No.	Description	Amount
11/02	655	10 hours @ \$16 per hour	\$ 160
11/03	656	20 hours @ \$15 per hour	300

Materials			
Date	Requisition No.	Description	Amount
11/02	63	31 lbs. polycarbonate plastic @ \$12 per lb.	\$ 372
11/02	64	25 lbs. acrylic plastic @ \$27 per lb.	675
11/03	74	3 lbs. refined aluminum @ \$48 per lb.	144

Tu Technology allocates manufacturing overhead to jobs based on the relation between estimated overhead of \$564,000 and estimated direct labor costs of \$470,000. Job 423 was completed and shipped on November 3.

Requirements

1. Prepare a job cost record for Job 423. Calculate the predetermined overhead allocation rate; then allocate manufacturing overhead to the job.
2. Journalize in summary form the requisition of direct materials and the assignment of direct labor and the allocation of manufacturing overhead to Job 423. Wages are not yet paid.
3. Journalize completion of the job and the sale of the 5,700 DVDs on account.

SOLUTION

Requirement 1

JOB COST RECORD								
Job Number		423						
Customer		Cyclorama Pictures						
Job Description		5,700 DVDs						
Direct Materials			Direct Labor			Manufacturing Overhead		
Date	Requisition Number	Amount	Date	Labor Time Record Number	Amount	Date	Rate	Amount
11/2	63	\$372	11/2	655	\$160	11/3	120% of DL costs*	\$552
11/2	64	675						
11/3	74	144	11/3	656	300			
Cost Summary								
Direct Materials				\$1,191				
Direct Labor				460				
Manufacturing Overhead				552				
Total Cost				<u>\$2,203</u>				
Unit Cost				<u>\$0.39**</u>				

*\$564,000 / \$470,000 = 120%

**\$2,203 / 5,700 DVDs = \$0.39 per DVD (rounded)

Requirement 2

Date	Accounts and Explanation	Debit	Credit
Nov. 3	Work-in-Process Inventory	1,191	
	Raw Materials Inventory		1,191
3	Work-in-Process Inventory	460	
	Wages Payable		460
3	Work-in-Process Inventory	552	
	Manufacturing Overhead		552

P19-35B, cont.
Requirement 3

Date	Accounts and Explanation	Debit	Credit
Nov. 3	Finished Goods Inventory Work-in-Process Inventory	2,203	2,203
3	Accounts Receivable (5,700 DVDs × \$1.50 per DVD) Sales Revenue	8,550	8,550
3	Cost of Goods Sold Finished Goods Inventory	2,203	2,203

P19-36B Accounting for transactions, construction company

Learning Objectives 2, 3, 4

3. WIP Bal. \$272,200

Sunrise Construction, Inc. is a home builder in Arizona. Sunrise uses a job order costing system in which each house is a job. Because it constructs houses, the company uses an account titled Construction Overhead. The company applies overhead based on estimated direct labor costs. For the year, it estimated construction overhead of \$1,300,000 and total direct labor cost of \$3,250,000. The following events occurred during August:

- a. Purchased materials on account, \$450,000.
- b. Requisitioned direct materials and used direct labor in construction. Recorded the materials requisitioned.

	Direct Materials	Direct Labor
House 402	\$ 51,000	\$ 43,000
House 403	66,000	36,000
House 404	63,000	57,000
House 405	83,000	52,000

- c. The company incurred total wages of \$250,000. Use the data from Item b to assign the wages. Wages are not yet paid.
- d. Depreciation of construction equipment, \$6,800.
- e. Other overhead costs incurred: Equipment rentals paid in cash, \$34,000; Worker liability insurance expired, \$8,000.
- f. Allocated overhead to jobs.
- g. Houses completed: 402, 404.
- h. House sold on account: 404 for \$230,000.

Requirements

1. Calculate Sunrise's predetermined overhead allocation rate for the year.
2. Prepare journal entries to record the events in the general journal.
3. Open T-accounts for Work-in-Process Inventory and Finished Goods Inventory. Post the appropriate entries to these accounts, identifying each entry by letter. Determine the ending account balances, assuming that the beginning balances were zero.
4. Add the costs of the unfinished houses, and show that this total amount equals the ending balance in the Work-in-Process Inventory account.
5. Add the cost of the completed house that has not yet been sold, and show that this equals the ending balance in Finished Goods Inventory.
6. Compute gross profit on the house that was sold. What costs must gross profit cover for Sunrise Construction?

SOLUTION

Requirement 1

Predetermined Overhead Allocation Rate	=	$\frac{\text{Total estimated overhead costs}}{\text{Total estimated quantity of the overhead allocation base}}$
	=	$\frac{\$1,300,000}{\$3,250,000} = 0.40 = 40\% \text{ of direct labor cost}$

P19-36B, cont.
Requirement 2

Date	Accounts and Explanation	Debit	Credit
Aug. 31			
a.	Raw Materials Inventory Accounts Payable	450,000	450,000
b.	Work-in-Process Inventory ¹ Raw Materials Inventory	263,000	263,000
c.	Work-in-Process Inventory ² Construction Overhead ³ Wages Payable	188,000 62,000	250,000
d.	Construction Overhead Accumulated Depreciation—Equipment	6,800	6,800
e.	Construction Overhead Cash Prepaid Insurance	42,000	34,000 8,000
f.	Work-in-Process Inventory ⁴ Construction Overhead	75,200	75,200
g.	Finished Goods Inventory ⁵ Work-in-Process Inventory	254,000	254,000
h.	Accounts Receivable Sales Revenue	230,000	230,000
	Cost of Goods Sold ⁶ Finished Goods Inventory	142,800	142,800

¹\$51,000 + \$66,000 + \$63,000 + \$83,000 = \$263,000

²\$43,000 + \$36,000 + \$57,000 + \$52,000 = \$188,000

³\$250,000 – \$188,000 = \$62,000

⁴\$188,000 × 40% = \$75,200

⁵House 402: \$51,000 + \$43,000 + (\$43,000 × 0.40) = \$111,200

House 404: \$63,000 + \$57,000 + (\$57,000 × 0.40) = \$142,800

Total: \$111,200 + \$142,800 = \$254,000

⁶From above, House 404 = \$142,800

P19-36B, cont.
Requirement 3

Work-in-Process Inventory			Finished Goods Inventory		
(b) DM	263,000	254,000	(g) COGM	254,000	142,800
(c) DL	188,000		Bal.	111,200	(h) COGS
(f) OH	75,200				
Bal.	272,200				

Requirement 4

SUNRISE CONSTRUCTION, INC.
 Reconciliation of Work-in-Process Inventory Subsidiary
 and Control Accounts
 August 31

	House #403	House #405	Total WIP Balance
Unfinished houses:			
Direct Materials	\$ 66,000	\$ 83,000	
Direct Labor	36,000	52,000	
Construction Overhead (40% of direct labor)	<u>14,400</u>	<u>20,800</u>	
Total cost equals Ending Work-in-Process Inventory	<u>\$ 116,400</u>	<u>\$ 155,800</u>	<u>\$ 272,200</u>

Requirement 5

SUNRISE CONSTRUCTION, INC.
 Reconciliation of Finished Goods Inventory Subsidiary
 and Control Accounts
 August 31

	<u>House #402</u>
Completed, unsold house:	
Direct Materials	\$ 51,000
Direct Labor	43,000
Construction Overhead (40% of direct labor)	<u>17,200</u>
Total cost equals Ending Finished Goods Inventory	<u>\$ 111,200</u>

P19-36B, cont.
Requirement 6

SUNRISE CONSTRUCTION, INC.	
Gross Profit on Homes Sold in August	
	<u>House #404</u>
Sales Revenue	\$ 230,000
Cost of Goods Sold	<u>142,800</u>
Gross Profit	<u>\$ 87,200</u>

The gross profit must cover these types of costs: selling and administrative expenses, income tax expense, and non-operating expenses.

P19-37B Accounting for manufacturing overhead

Learning Objectives 3, 5

1. \$7.50 per machine hour

Custom Woods manufactures jewelry boxes. The primary materials (wood, brass, and glass) and direct labor are assigned directly to the products. Manufacturing overhead costs are allocated based on machine hours. Data for 2016 follow:

	Estimated	Actual
Machine hours	28,960 hours	32,800 hours
Maintenance labor (repairs to equipment)	\$ 14,000	\$ 29,500
Plant supervisor's salary	45,000	48,000
Screws, nails, and glue	25,000	49,000
Plant utilities	46,000	93,850
Freight out	36,000	45,500
Depreciation on plant and equipment	87,200	86,000
Advertising expense	41,000	59,000

Requirements

1. Compute the predetermined overhead allocation rate.
2. Post actual and allocated manufacturing overhead to the Manufacturing Overhead T-account.
3. Prepare the journal entry to adjust for underallocated or overallocated overhead.
4. The predetermined overhead allocation rate usually turns out to be inaccurate. Why don't accountants just use the actual manufacturing overhead rate?

SOLUTION

Requirement 1

Predetermined Overhead Allocation Rate	=	$\frac{\text{Total estimated overhead costs}}{\text{Total estimated quantity of the overhead allocation base}}$
	=	$\frac{\$217,200^*}{28,960 \text{ MHrs}} = \7.50 per MHR

*\$14,000 + \$45,000 + \$25,000 + \$46,000 + \$87,200 = \$217,200

Requirement 2

Manufacturing Overhead		
	29,500	246,000*
	48,000	
	49,000	
	93,850	
	86,000	
Bal.	60,350	

*32,800 MHrs × \$7.50 per MHR

Requirement 3

Date	Accounts and Explanation	Debit	Credit
Dec 31	Cost of Goods Sold	60,350	
	Manufacturing Overhead		60,350

Requirement 4

The actual manufacturing overhead rate is not known until the end of the period. Managers need to make decisions throughout the period. Accountants use predetermined overhead allocation rates to give managers product cost information when they need it—today.

P19-38B Preparing comprehensive accounting for manufacturing transactions

Learning Objectives 2, 3, 4, 5

4. COGM \$46,750

5. NI \$19,150

Student Stars produces stars for elementary teachers to reward their students. Student Stars' trial balance on June 1 follows:

STUDENT STARS Trial Balance June 1, 2016		
Account Title	Balance	
	Debit	Credit
Cash	\$ 24,000	
Accounts Receivable	175,000	
Inventories:		
Raw Materials	5,700	
Work-in-Process	41,000	
Finished Goods	21,300	
Plant Assets	220,000	
Accumulated Depreciation		\$ 73,000
Accounts Payable		133,000
Wages Payable		2,000
Common Stock		143,000
Retained Earnings		136,000
Sales Revenue		
Cost of Goods Sold		
Manufacturing Overhead		
Selling and Administrative Expenses		
Totals	<u>\$ 487,000</u>	<u>\$ 487,000</u>

June 1 balances in the subsidiary ledgers were as follows:

- Raw Materials Inventory subsidiary ledger: Paper, \$4,300; indirect materials, \$1,400
- Work-in-Process Inventory subsidiary ledger: Job 120, \$41,000; Job 121, \$0
- Finished Goods Inventory subsidiary ledger: Large Stars, \$9,100; Small Stars, \$12,200

June transactions are summarized as follows:

- a. Collections on account, \$154,000.
- b. Selling and administrative expenses incurred and paid, \$30,000.
- c. Payments on account, \$41,000.
- d. Materials purchases on account: Paper, \$21,600; indirect materials, \$4,000.
- e. Materials requisitioned and used in production:

Job 120: Paper, \$550

Job 121: Paper, \$7,850

Indirect materials, \$1,200

- f. Wages incurred during June, \$35,000. Labor time records for the month: Job 120, \$3,250; Job 121, \$18,500; indirect labor, \$13,250.
- g. Wages paid in June include the balance in Wages Payable at May 31 plus \$33,000 of wages incurred during June.
- h. Depreciation on plant and equipment, \$2,700.
- i. Manufacturing overhead allocated at the predetermined overhead allocation rate of 60% of direct labor cost.
- j. Jobs completed during the month: Job 120 with 900,000 Large Stars at a total cost of \$46,750.
- k. Sales on account: all of Job 120 for \$100,000.
- l. Adjusted for overallocated or underallocated manufacturing overhead.

Requirements

- 1. Journalize the transactions for the company.
- 2. Open T-accounts for the general ledger, the Raw Materials Inventory subsidiary ledger, the Work-in-Process Inventory subsidiary ledger, and the Finished Goods Inventory subsidiary ledger. Insert each account balance as given, and use the reference Bal. Post the journal entries to the T-accounts using the transaction letters as a reference.
- 3. Prepare a trial balance at June 30, 2016.
- 4. Use the Work-in-Process Inventory T-account to prepare a schedule of cost of goods manufactured for the month of June.
- 5. Prepare an income statement for the month of June.

SOLUTION
Requirement 1

Date	Accounts and Explanation	Debit	Credit
June 30			
a.	Cash Accounts Receivable	154,000	154,000
b.	Selling and Administrative Expenses Cash	30,000	30,000
c.	Accounts Payable Cash	41,000	41,000
d.	Raw Materials Inventory (\$21,600 + \$4,000) Accounts Payable	25,600	25,600
e.	Work-in-Process Inventory (\$550 + \$7,850) Manufacturing Overhead Raw Materials Inventory	8,400 1,200	9,600
f.	Work-in-Process Inventory (\$3,250 + \$18,500) Manufacturing Overhead Wages Payable	21,750 13,250	35,000
g.	Wages Payable (\$2,000 + \$33,000) Cash	35,000	35,000
h.	Manufacturing Overhead Accumulated Depreciation—plant and equipment	2,700	2,700
i.	Work-in-Process Inventory Manufacturing Overhead (\$21,750 × 60%)	13,050	13,050
j.	Finished Goods Inventory Work-in-Process Inventory	46,750	46,750
k.	Accounts Receivable Sales Revenue	100,000	100,000
	Cost of Goods Sold Finished Goods Inventory	46,750	46,750
l.	Cost of Goods Sold Manufacturing Overhead (<i>\$1,200 + \$13,250 + \$2,700 - \$13,050</i>)	4,100	4,100

P19-38B, cont.
Requirement 2

Cash			
Bal.	24,000	30,000	(b)
(a)	154,000	41,000	(c)
		35,000	(g)
Bal.	72,000		

Accounts Receivable			
Bal.	175,000	154,000	(a)
(k)	100,000		
Bal.	121,000		

Raw Materials Inventory			
Bal.	5,700	9,600	(e)
(d)	25,600		
Bal.	21,700		

Work-in-Process Inventory			
Bal.	41,000	46,750	(j)
(e)	8,400		
(f)	21,750		
(i)	13,050		
Bal.	37,450		

Finished Goods Inventory			
Bal.	21,300	46,750	(k)
(j)	46,750		
Bal.	21,300		

Plant Assets			
Bal.	220,000		

Accumulated Depreciation			
		73,000	Bal.
		2,700	(h)
		75,700	Bal.

Accounts Payable			
(c)	41,000	133,000	Bal.
		25,600	(d)
		117,600	Bal.

Wages Payable			
(g)	35,000	2,000	Bal.
		35,000	(f)
		2,000	Bal.

Common Stock			
		143,000	Bal.

Retained Earnings			
		136,000	Bal.

Sales Revenue			
		100,000	(k)

Cost of Goods Sold			
(k)	46,750		
(l)	4,100		
Bal.	50,850		

Manufacturing Overhead			
(e)	1,200	13,050	(i)
(f)	13,250	4,100	(l)
(h)	2,700		
Bal.	0		

Selling and Administrative Expenses			
(b)	30,000		

P19-38B, cont.
Requirement 2, cont.

Raw Materials Inventory subsidiary ledger:

Paper				Indirect Materials			
Bal.	4,300	8,400	(e)	Bal.	1,400	1,200	(e)
(d)	21,600			(d)	4,000		
Bal.	17,500			Bal.	4,200		

Total balances equal balance of Raw Materials Inventory, \$21,700 (\$17,500 + \$4,200).

Work-in-Process Inventory subsidiary ledger:

Job 120				Job 121			
Bal.	41,000	46,750	(j)	Bal.	0		
(e)	550			(e)	7,850		
(f)	3,250			(f)	18,500		
(i)	1,950			(i)	11,100		
Bal.	0			Bal.	37,450		

Balance equals balance of Work-in-Process Inventory, \$37,450 (\$0 + \$37,450).

Finished Goods Inventory subsidiary ledger:

Large stars				Small stars			
Bal.	9,100	46,750	(k)	Bal.	12,200		
(j)	46,750			Bal.	12,200		
Bal.	9,100						

Total balances equal balance of Finished Goods Inventory, \$21,300 (\$9,100 + \$12,200).

P19-38B, cont.
Requirement 3

STUDENT STARS
Trial Balance
June 30, 2016

Account Title	Debit	Credit
Cash	\$ 72,000	
Accounts Receivable	121,000	
Inventories:		
Raw Materials	21,700	
Work-in-Process	37,450	
Finished Goods	21,300	
Plant Assets	220,000	
Accumulated Depreciation		\$ 75,700
Accounts Payable		117,600
Wages Payable		2,000
Common Stock		143,000
Retained Earnings		136,000
Sales Revenue		100,000
Cost of Goods Sold	50,850	
Selling and Administrative Expenses	30,000	
Totals	\$ 574,300	\$ 574,300

P19-38B, cont.
Requirement 4

STUDENT STARS
Schedule of Cost of Goods Manufactured
Month Ended June 30, 2016

Beginning Work-in-Process Inventory		\$ 41,000
Direct Materials Used:		
Raw Materials Inventory, Beginning	\$ 5,700	
Purchases	25,600	
Raw Materials Available for Use	<u>31,300</u>	
Raw Materials Inventory, Ending	(21,700)	
Indirect Materials Used	<u>(1,200)</u>	
Direct Materials Used (Trans. e)	\$ 8,400	
Direct Labor (Trans. f)	21,750	
Manufacturing Overhead Allocated	<u>13,050</u>	
Total Manufacturing Costs Incurred during the Month		<u>43,200</u>
Total Manufacturing Costs to Account for		84,200
Ending Work-in-Process Inventory		<u>(37,450)</u>
Cost of Goods Manufactured		<u><u>\$ 46,750</u></u>

Requirement 5

STUDENT STARS
Income Statement
Month Ended June 30, 2016

Sales Revenue		\$ 100,000
Cost of Goods Sold:		
Beginning Finished Goods Inventory	\$ 21,300	
Cost of Goods Manufactured	<u>46,750</u>	
Cost of Goods Available for Sale	68,050	
Ending Finished Goods Inventory	<u>(21,300)</u>	
Cost of Goods Sold Before Adjustment	46,750	
Underallocated Overhead	<u>4,100</u>	
Cost of Goods Sold After Adjustment	<u>50,850</u>	
Gross Profit		49,150
Selling and Administrative Expense		<u>30,000</u>
Net Income		<u><u>\$ 19,150</u></u>

P19-39B Using job order costing in a service company

Learning Objective 6

2. Food Co-op \$277,600

Robin Design, Inc. is a Web site design and consulting firm. The firm uses a job order costing system in which each client is a different job. Robin Design assigns direct labor, licensing costs, and travel costs directly to each job. It allocates indirect costs to jobs based on a predetermined overhead allocation rate, computed as a percentage of direct labor costs.

At the beginning of 2016, managing partner Judi Jacquin prepared the following budget estimates:

Direct labor hours (professionals)	10,000 hours
Direct labor costs (professionals)	\$ 2,100,000
Support staff salaries	706,000
Computer leases	49,000
Office supplies	25,000
Office rent	60,000

In November 2016, Robin Design served several clients. Records for two clients appear here:

	Food Co-op	Martin Chocolates
Direct labor hours	900 hours	100 hours
Software licensing costs	\$ 3,000	\$ 300
Travel costs	10,000	0

Requirements

1. Compute Robin Design's direct labor rate and its predetermined overhead allocation rate for 2016.
2. Compute the total cost of each job.
3. If Judi wants to earn profits equal to 20% of service revenue, what fee should she charge each of these two clients?
4. Why does Robin Design assign costs to jobs?

SOLUTION

Requirement 1

$$\text{Hourly rate to the employer} = \frac{\$2,100,000 \text{ per year}}{10,000 \text{ hours per year}} = \$210 \text{ per hour}$$

$$\begin{aligned} \text{Predetermined Overhead Allocation Rate} &= \frac{\text{Total estimated overhead costs}}{\text{Total estimated quantity of the overhead allocation base}} \\ &= \frac{\$840,000^*}{\$2,100,000} = 0.40 = 40\% \text{ of direct labor costs} \end{aligned}$$

$$*\$706,000 + \$49,000 + \$25,000 + \$60,000 = \$840,000$$

Requirement 2

ROBIN DESIGN, INC.		
Total Cost of Food Co-ops' and Martin Chocolates' Jobs		
For the Month of November		
	Food Co-op	Martin Chocolates
Direct Costs:		
Direct labor		
900 hours × \$210 per hour	\$ 189,000	
100 hours × \$210 per hour		\$ 21,000
Software licensing costs	3,000	300
Travel costs	10,000	0
Total Direct Costs	\$ 202,000	\$ 21,300
Allocated Indirect Costs:		
40% × \$189,000	75,600	
40% × \$ 21,000		8,400
Total Costs	\$ 277,600	\$ 29,700

P19-39B, cont.
Requirement 3

If profits are 20% of sales, then total costs are 80% of sales. Therefore, Sales Revenue = Total Costs / 80%.

Food Co-op: \$347,000

Service Revenue	=	Total costs	/	80%
Service Revenue	=	\$277,600	/	80%
Service Revenue	=	\$347,000		

Martin Chocolates: \$37,125

Service Revenue	=	Total costs	/	80%
Service Revenue	=	\$29,700	/	80%
Service Revenue	=	\$37,125		

Requirement 4

Robin Design, Inc. assigns costs to jobs to help the company set fees that cover all costs and contribute to profit. Assigning costs to individual clients also can help Robin Design, Inc. control costs.

Continuing Problem

P19-40 Accounting for manufacturing overhead

This problem continues the Daniels Consulting situation from Problem P18-42 of Chapter 18. Daniels Consulting uses a job order costing system in which each client is a different job. Daniels assigns direct labor, meal per diem, and travel costs directly to each job. It allocates indirect costs to jobs based on a predetermined overhead allocation rate, computed as a percentage of direct labor costs.

At the beginning of 2018, the controller prepared the following budget:

Direct labor hours (professionals)	6,250 hours
Direct labor costs (professionals)	\$ 1,100,000
Support staff salaries	90,000
Computer leases	57,000
Office supplies	40,000
Office rent	55,000

In November 2018, Daniels served several clients. Records for two clients appear here:

	Tommy's Trains	Marcia's Cookies
Direct labor hours	720 hours	200 hours
Meal per diem	\$ 2,700	\$ 600
Travel costs	8,000	0

Requirements

1. Compute Daniels's predetermined overhead allocation rate for 2018.
2. Compute the total cost of each job.
3. If Daniels wants to earn profits equal to 25% of sales revenue, what fee should it charge each of these two clients?
4. Why does Daniels assign costs to jobs?

SOLUTION

Requirement 1

Predetermined Overhead Allocation Rate	=	$\frac{\text{Total estimated overhead costs}}{\text{Total estimated quantity of the overhead allocation base}}$
	=	$\frac{\$242,000}{\$1,100,000} = 0.22 = 22\% \text{ of direct labor cost}$

*\$90,000 + \$57,000 + \$40,000 + \$55,000 = \$242,000

Requirement 2

DANIELS CONSULTING		
Total Cost of Tommy's Trains and Marcia's Cookies Jobs		
For the Month of November		
	Tommy's Trains	Marcia's Cookies
Direct Costs:		
Direct labor		
720 hours × \$176 per hour*	\$ 126,720	
200 hours × \$176 per hour*		\$ 35,200
Meal per diem	2,700	600
Travel costs	8,000	0
Total Direct Costs	137,420	35,800
Allocated Indirect Costs:		
22% × \$126,720	27,878	
22% × \$ 35,200		7,744
Total Cost	<u>\$ 165,298</u>	<u>\$ 43,544</u>

*\$1,100,000 estimated direct labor costs / 6,250 estimated direct labor hours = \$176 per direct labor hour

P19-40, cont.
Requirement 3

If profits are 25% of sales, then total costs are 75% of sales. Therefore, Sales Revenue = Total Costs / 75%.

Tommy's Trains: \$220,397

Service Revenue	=	Total costs	/	75%
Service Revenue	=	\$165,298	/	75%
Service Revenue	=	\$220,397		

Marcia's Cookies: \$58,059

Service Revenue	=	Total costs	/	75%
Service Revenue	=	\$43,544	/	75%
Service Revenue	=	\$58,059		

Requirement 4

Daniels assigns costs to jobs to help the company set fees that cover all costs and contribute to profit. Assigning costs to individual clients can also help Daniels Consulting to control costs.

Critical Thinking

Decision Case 19-1

Hiebert Chocolate, Ltd. is located in Memphis. The company prepares gift boxes of chocolates for private parties and corporate promotions. Each order contains a selection of chocolates determined by the customer, and the box is designed to the customer's specifications. Accordingly, Hiebert uses a job order costing system and allocates manufacturing overhead based on direct labor cost.

One of Hiebert's largest customers is the Goforth and Leos law firm. This organization sends chocolates to its clients each Christmas and also provides them to employees at the firm's gatherings. The law firm's managing partner, Bob Goforth, placed the client gift order in September for 500 boxes of cream-filled dark chocolates. But Goforth and Leos did not place its December staff-party order until the last week of November. This order was for an additional 100 boxes of chocolates identical to the ones to be distributed to clients.

Hiebert budgeted the cost per box for the original 500-box order as follows:

Chocolate, filling, wrappers, box	\$ 14.00
Employee time to fill and wrap the box (10 min.)	2.00
Manufacturing overhead	1.00
Total manufacturing cost	<u>\$ 17.00</u>

Ben Hiebert, president of Hiebert Chocolate, Ltd., priced the order at \$20 per box.

In the past few months, Hiebert has experienced price increases for both dark chocolate and direct labor. All other costs have remained the same. Hiebert budgeted the cost per box for the second order as follows:

Chocolate, filling, wrappers, box	\$ 15.00
Employee time to fill and wrap the box (10 min.)	2.20
Manufacturing overhead	1.10
Total manufacturing cost	<u>\$ 18.30</u>

Requirements

1. Do you agree with the cost analysis for the second order? Explain your answer.
2. Should the two orders be accounted for as one job or two in Hiebert's system?
3. What sale price per box should Ben Hiebert set for the second order? What are the advantages and disadvantages of this price?

SOLUTION

Requirement 1

The cost analysis for the second order is correct. The problem tells us that overhead is allocated “based on direct labor cost,” and we can see from the first order that the allocation rate is 50% of direct labor cost. Some students may point out that labor costs have gone up during the year, but overhead costs presumably have not. This situation could result in an overallocation of overhead. However, overallocated or underallocated amounts are adjusted at the end of the year.

Furthermore, all amounts, including both overhead costs and labor costs, were estimated at the beginning of the year to calculate the predetermined overhead allocation rate. Estimates are, by their nature, only “educated guesses.” They may very well include “contingency amounts” or “cushions” for unknown factors, and it is expected that actual costs will differ from the amounts estimated. (Alternatively, it may be pointed out that companies are free to revise their allocation rates at any time if they feel it is warranted.)

Requirement 2

Hiebert should account for each order as a separate job. The orders were received at different times, for different amounts, and the costs per box of the orders are not the same.

Requirement 3

Student responses will vary. Answers should make it clear that Hiebert is free to price his products any way he sees fit. He may choose to keep the price per box the same as it was before, and sacrifice a portion of the gross profit in order to keep his sales volume up and maintain customer loyalty. Or, he could “pass along” the cost increases by raising his prices, risking a reduction in sales. Or, he could pick a price strategy somewhere in between these two points. Hiebert will have to consider a number of factors such as supply and demand, current market conditions, competition, and customer relations before deciding on whether to change the price of the product.

Fraud Case 19-1

Jerry never imagined he'd be sitting there in Washington being grilled mercilessly by a panel of congressmen. But a young government auditor picked up on his scheme last year. His company produced high-tech navigation devices that were sold to both military and civilian clients. The military contracts were "cost-plus," meaning that payments were calculated based on actual production costs plus a profit markup. The civilian contracts were bid out in a very competitive market, and every dollar counted. Jerry knew that because all the jobs were done in the same factory, he could manipulate the allocation of overhead costs in a way that would shift costs away from the civilian contracts and into the military "cost-plus" work. That way, the company would collect more from the government and be able to shave its bids down on civilian work. He never thought anyone would discover the alterations he had made in the factory workers' time sheets, but one of his accountants had noticed and tipped off the government auditor. Now, as the congressman from Michigan rakes him over the coals, Jerry is trying to figure out his chances of dodging jail time.

Requirements

1. Based on what you have read above, what was Jerry's company using as a cost driver to allocate overhead to the various jobs?
2. Why does the government consider Jerry's actions fraudulent?
3. Name two ways that reducing costs on the civilian contracts would benefit the company and motivate Jerry to commit fraud.

SOLUTION

Requirement 1

The company is using direct labor hours as a cost driver to allocate overhead. By showing more hours spent on military jobs, more overhead would be allocated to these jobs over civilian contracts.

Requirement 2

By shifting costs from other contracts to the government contracts, the company is overcharging the government and violating the contract agreement.

Requirement 3

Lower costs translate into higher profits. Additionally, the company can place bids lower than its competitors because they have lower costs, thereby increasing their chances of being awarded contracts.