

INSTRUCTOR'S SOLUTIONS MANUAL

to accompany

PRINCIPLES OF COST ACCOUNTING

Sixteenth Edition

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CHAPTER 1

QUESTIONS

1. The function of cost accounting is to provide the cost accounting information that is the basis for planning and controlling current and future operations. It provides the cost figures and analyses that management needs in order to find the most efficient methods of operating, achieving control of costs, and determining selling prices.
 2. *Originally issued* for companies marketing products in Europe, a set of international standards for quality management, known as the ISO 9000 family, was designed by the International Organization for Standardization. Obtaining ISO 9000 is important because many companies will only contract with ISO 9000 suppliers.
 3. A company meeting the requirements of ISO 14000 has an environmental management system that (1) identifies and controls the environmental impact of its activities, products, or services, (2) improves its environmental performance continually, and (3) implements a systematic approach to setting environmental objectives and targets.
 4. Reasons given by U.S. companies for “reshoring” their manufacturing operations include (1) Chinese wages and shipping costs have risen sharply in the past few years, (2) frustration with the sometimes poor quality of goods made by foreign contractors, (3) the desire to bring production managers and assembly-line workers closer to engineers, suppliers, and customers, (4) an effort to protect a company’s intellectual property, and (5) weariness from midnight phone calls and multiple annual trips to Asian producers.
 5. Manufacturers convert purchased materials into finished goods by using labor, technology, and facilities. Merchandisers purchase completed products for resale. Service businesses or agencies sell or provide services rather than products.
 6. A manufacturer differs from a merchandiser in these ways:
 - a. The merchandiser buys items to sell while the manufacturing business must make the items it markets.
 - b. Usually the manufacturer has a greater investment in physical facilities.
 - c. The manufacturer will incur some costs peculiar to this type of industry, such as machine maintenance, materials handling, and inspection of manufactured goods.
- The two types of operations are similar in that they are both concerned with purchasing, storing, and selling goods; they must have efficient management and adequate sources of capital; and they may employ many workers.
7. *Cost accounting information* is used by management in the following ways:
 - a. Determining product costs which are necessary for: determining cost of goods sold and valuing inventories; determining product selling price; meeting competition; bidding on contracts; and analyzing profitability.
 - b. Planning by providing historical costs that serve as a basis for projecting data.
 - c. Controlling operations by providing cost data that enable management to periodically measure results, to take corrective action where necessary, and to search for ways to reduce costs.
 8. *Unit cost information* is important to management because the unit costs of one period can be compared with those of other periods, and significant trends can be identified and analyzed. Unit costs are also used in making important marketing decisions related to selling prices, competition, bidding.
 9. For a manufacturer, the planning process involves the selection of clearly defined objectives of the manufacturing operation and the development of a detailed program to guide the organization in reaching the objectives. Cost accounting provides historical cost information that is used as the basis for planning future operations.
 10. In a manufacturing concern, effective control is achieved in the following ways:
 - a. Responsibility must be assigned for each detail of the master production plan.
 - b. There must be a periodic measurement of the actual results as compared with predetermined objectives.
 - c. Management must take corrective action as necessary to improve or eliminate inefficient and unprofitable operations.

11. *Responsibility accounting* is the assigning of accountability for costs or production results to those individuals who have the authority to influence costs or production. It involves an information system that traces these data to the managers who are responsible for them.
12. The criteria for a *cost center* are:
 - a. A reasonable basis on which manufacturing costs can be allocated.
 - b. A person who has control over and is accountable for many of the costs
13. The requirements for becoming a CMA include a four-year college degree, two years of relevant work experience, and passing a rigorous two-day examination.
14. The four major categories of ethical conduct that must be adhered to by management accountants include competence, confidentiality, integrity, and objectivity.
15. The steps that should be taken by the management accountant include:
 - a. Discuss the problem with the immediate supervisor except when it appears that the supervisor is involved, in which case it should be taken to the next higher management level.
 - b. Clarify relevant ethical issues by confidential discussion with an objective advisor.
 - c. Consult your own attorney as to legal obligations and rights.
 - d. If the ethical issue still exists after exhausting all levels of internal review, there may be no other recourse on significant matters than to resign from the organization.
16. *Corporate governance* is the means by which a company is directed and controlled. Good corporate governance is important to all stakeholders because, due to recent accounting scandals, the need for ethical conduct in managing corporate affairs has never.
17. The recent accounting scandals where management, including controllers and chief financial officers, has “cooked the books” to make reported financial results seem better than actual created the need for the Sarbanes-Oxley Act. To help curb future abuses the act holds CEO’s and CFO’s accountable for the accuracy of their firms’ financial statements.
18. Key elements of the *Sarbanes-Oxley Act* include: certification by the CEO and CFO that the financial statements fairly reflect the results of operations; the establishment of the Public Company Accounting Oversight Board to provide oversight of the accounting profession; prohibiting a public accounting firm from providing many nonauditing services to a company that it audits; requiring that a company’s annual report contain management’s opinion on the effectiveness of its internal controls; placing the responsibility for hiring, compensating, and terminating the audit firm in the hands of the board of director’s audit committee; criminal penalties for the destruction or alteration of business documents and for retaliating against “whistleblowers.”
19. *Financial accounting* focuses upon financial statements which meet the decision-making needs of external parties, such as investors, creditors, and governmental agencies, and to some extent the needs of management. *Management accounting* focuses on both historical and estimated data that management needs to conduct ongoing business operations and do long-range planning. *Cost accounting* includes those parts of both financial and management accounting that collects and analyzes cost information. It provides the product cost data required for special reports to management (management accounting) and for inventory costing in the financial statements (financial accounting).
20. With regard to methods for computing the cost of goods sold, the difference between a manufacturer and a merchandiser is in the determination of the cost of goods available for sale. Since the manufacturing business makes the products it has available for sale, the cost of goods manufactured must be determined and added to beginning finished goods inventory to determine the cost of finished goods available for sale. Since the merchandiser purchases rather than makes goods to sell, the cost of purchases is added to beginning merchandise inventory to compute the cost of goods available for sale.
21. **Finished Goods**—this is an inventory account reflecting the total cost incurred in manufacturing goods on hand that are ready for sale to customers.
Work in Process—this inventory account includes all of the costs incurred to date in manufacturing goods that are not yet completed.
Materials—this account represents the cost of materials on hand that will be used in the manufacturing process.

22. Manufacturers, such as aircraft producers and home builders, make tangible products by applying labor and technology to raw materials. They may have as many as three inventory accounts: Finished Goods, Work in Process, and Raw Materials. Merchandisers, such as wholesalers and department stores, purchase tangible products in finished form from suppliers. They have only one inventory account, Merchandise Inventory. Service businesses, such as airlines and sports franchises, provide intangible benefits such as transportation and entertainment. They have no inventory account.
23. A *perpetual inventory system* involves maintaining a continuous record of purchases, issues, and new balances of all goods in stock. Under a *periodic inventory system* no attempt is made to record the cost of merchandise sold at the time of sale. At the end of the accounting period a physical inventory is taken for the purpose of determining the cost of goods sold and the ending inventory.
24. The basic elements of production cost are:
- Direct materials.
 - Direct labor.
 - Factory overhead.
25. **Direct materials**—the cost of those materials which become part of the item being manufactured and can be readily identified with it.
- Indirect materials**—the cost of those items which are necessary for the manufacturing process but cannot be identified specifically with any particular item manufactured, and the cost of those materials which do become a part of the manufactured product but whose cost is too insignificant to track to individual jobs.
- Direct labor**—the labor cost for employees who work directly on the product manufactured.
- Indirect labor**—the cost of labor for those employees who are required for the manufacturing process but who do not work directly on the item being manufactured.
- Factory overhead**—includes all costs related to the manufacturing process except direct materials and direct labor, such as indirect materials, indirect labor, and all other factory expenses.
26. As manufacturing processes have become increasingly automated, direct labor cost as a percentage of total product cost has decreased for many companies. In the case of Harley-Davidson, it was only 10% of product cost but required an inordinate amount of time to trace directly to the products being manufactured.
27. *Prime cost* is the cost of direct materials and direct labor; it represents cost specifically identified with the product.
- Conversion cost* is the cost of direct labor and factory overhead; it is the expense incurred to convert raw materials into finished goods.
- No, one of the component costs, direct labor, would be added twice. The cost of manufacturing includes direct materials, direct labor, and factory overhead. Both prime cost and conversion cost include the cost of direct labor.
28. Costs for direct materials and direct labor are charged directly to the work in process account, while the factory overhead costs are first accumulated in the factory overhead account and are then transferred to the work.
29. *Cost of goods sold* represents the total manufacturing cost of the goods sold during a given accounting period, while the *cost of goods manufactured* represents the total manufacturing cost of all goods that were finished during the accounting period.
30. *Non-factory costs* are charged to selling or general administrative expense accounts and do not affect the determination of manufacturing costs. Costs which benefit both factory and non-factory operations must be allocated in some equitable manner.
31. A *mark-on percentage* is a percentage of the total manufacturing cost that is added to the manufacturing cost to establish a selling price that covers the product's share of selling and administrative expenses and earns a satisfactory profit.
32. *Job order costing* is appropriate when the output of an enterprise consists of custom-made or specially ordered goods. Manufacturers such as machine shops and shipbuilders, merchandisers such as computer retailers, and service firms, such as CPAs and architects, all use job order costing.
33. *Process costing* is appropriate when an enterprise's operations involve the continuous or mass production of large quantities of homogeneous items. Manufacturers such as chemical producers and candy makers, merchandisers such as newspapers and agricultural wholesalers, and services such as hospital X-ray departments and airlines all use process costing.

- 34.** An advantage of accumulating costs by departments (process costing) or by jobs (job order costing) is that the information provided aids management in achieving control of costs. With a process cost system, management can make departmental comparisons of current period costs with prior period costs and can take corrective action as needed. If costs were accumulated for the factory as a whole, management would have difficulty identifying specific sources of excessive costs and inefficiencies. The information provided by a job order cost system aids management in the determination of selling prices, the profit on each job, and costs applicable to similar jobs produced in future periods.
- 35.** A *job cost sheet* is a form on which all of the individual costs applicable to a job are recorded. Since the job cost sheets show detailed costs and gross profit for each job, they are useful to management in bidding on similar jobs in the future.
- 36.** *Standard costs* are reasonably attainable costs which are estimated by management in advance of production. Standard costs are then compared with actual costs, and differences called variances are calculated and analyzed. A standard cost system is not a separate cost accounting system but is applied in conjunction with either process costing or job order costing to increase cost control effectiveness.
- 37.** Square footage occupied by each of the areas would be a good cost allocation base to use in allocating the depreciation expense between the factory operations and the selling and administrative function. This distinction is important because the depreciation allocated to factory operations is a manufacturing expense that becomes part of inventory cost and eventually cost of goods sold, whereas the portion allocated to selling and administrative expense is a period cost that is always expensed in the period incurred.

EXERCISES

E1-1

The variances for kitchen wages and utilities were favorable for September, whereas the variances for food and supplies were unfavorable. On a year-to-date basis, the only expense that did not have the same pattern as September was utilities which had a \$120 F variance for the month, but an \$850 U year-to-date variance.

E1-2

No, the performance report should not be prepared just once a year. It should be furnished to managers at regular intervals, in this case monthly, on a timely basis. If it is not provided in a timely fashion, it will not be effective in controlling future operations.

E1-3

Merchandise inventory, January 1	\$ 22,000
Plus purchases	<u>183,000</u>
Merchandise available for sale	\$ 205,000
Less merchandise inventory, January 31	<u>17,000</u>
Cost of goods sold	<u><u>\$ 188,000</u></u>

E1-4

Finished goods, July 1	\$ 85,000
Plus cost of goods manufactured	<u>343,000</u>
Finished goods available for sale	\$ 428,000
Less finished goods, July 31	<u>93,000</u>
Cost of goods sold	<u><u>\$ 335,000</u></u>

E1-5

Items	Direct Materials	Direct Labor	Factory Overhead	Selling & Admin. Expense
a. Steel used in an overhead door plant	✓			
b. Cloth used in a shirt factory	✓			
c. Fiberglass used by a sailboat builder	✓			
d. Cleaning solvent for the factory floor			✓	
e. Wages of a binder employed in a printing plant		✓		
f. Insurance on factory machines			✓	
g. Rent paid for factory buildings.....			✓	
h. Wages of the Machining Department supervisor.....			✓	
i. Leather used in a shoe factory.....	✓			
j. Wages of a factory janitor			✓	
k. Electric power consumed in operating factory machines			✓	
l. Depreciation on corporate offices				✓
m. Fuel used in heating a factory			✓	
n. Paint used in the manufacture of jet skis	✓			
o. Wages of an ironworker in the construction business		✓		
p. Electricity used in lighting sales offices				✓

E1-6

When direct materials and supplies are purchased, the materials account is debited. When direct materials and supplies are issued to the factory, the materials account is credited, Work in Process is debited for the cost of the direct materials, and the factory overhead account is debited for the cost of indirect materials.

When labor costs are distributed, the payroll account is credited, Work in Process is debited for the cost of direct labor, and Factory Overhead is debited for the cost of indirect labor.

As other costs related to manufacturing are recorded, the factory overhead account is charged. The debit to Work in Process for factory overhead is made by allocating overhead expenses to this account. At the same time, the factory overhead account is credited. The total cost of goods completed is recorded by debiting Finished Goods and crediting Work in Process. When units are sold, Cost of Goods Sold is debited and Finished Goods is credited.

E1-7

Valley View Manufacturing Co.
Statement of Cost of Goods Manufactured
For the Month Ended January 31, 20—

a. Materials:

Inventory, January 1	\$ 25,000	
Purchases	<u>21,000</u>	
Total cost of available materials	\$ 46,000	
Less inventory, January 31	<u>22,000</u>	
Cost of materials used	\$ 24,000	
Less indirect materials used	<u>1,000</u>	
Cost of direct materials used in production		\$ 23,000
Direct labor		18,000
Factory overhead:		
Indirect materials	\$ 1,000	
Indirect labor	3,000	
Other	<u>8,000</u>	
Total factory overhead		<u>12,000</u>
Total manufacturing cost		\$ 53,000
Add work in process inventory, January 1		<u>24,000</u>
		\$ 77,000
Less work in process inventory, January 31		<u>20,000</u>
Cost of goods manufactured		<u>\$ 57,000</u>

b. Finished goods inventory, January 1	\$ 32,000
Add cost of goods manufactured	<u>57,000</u>
Goods available for sale	\$ 89,000
Less finished goods inventory, January 31	<u>30,000</u>
Cost of goods sold	<u>\$ 59,000</u>

E1-8

Viejas Manufacturing Co.
Statement of Cost of Goods Manufactured
For the Month Ended January 31, 20—

a. Materials:

Inventory, January 1	\$ 22,000	
Purchases	<u>18,000</u>	
Total cost of available materials	\$ 40,000	
Less inventory, January 31	<u>25,000</u>	
Cost of materials used	\$ 15,000	
Less indirect materials used	<u>1,000</u>	
Cost of direct materials used in production		\$ 14,000
Direct labor		21,000
Factory overhead:		
Indirect materials	\$ 1,000	
Indirect labor	4,000	
Other	<u>11,000</u>	
Total factory overhead		<u>16,000</u>
Total manufacturing cost		\$ 51,000
Add work in process inventory, January 1		<u>20,000</u>
		\$ 71,000
Less work in process inventory, January 31		<u>24,000</u>
Cost of goods manufactured		<u>\$ 47,000</u>

b. Finished goods inventory, January 1	\$ 30,000	
Add cost of goods manufactured	<u>47,000</u>	
Goods available for sale	\$ 77,000	
Less finished goods inventory, January 31	<u>32,000</u>	
Cost of goods sold	<u>\$ 45,000</u>	

E1-9

a.	Direct materials used during the period.....		\$ 205,000
	Add inventory of direct materials at the end of the period .		<u>95,000</u>
	Direct materials available during the period		\$ 300,000
	Less inventory of direct materials at the beginning of the period		<u>90,000</u>
	Direct materials purchased during the period.....		<u>\$ 210,000</u>
b.	Total manufacturing costs incurred during the period		\$ 675,000
	Less: Direct materials used	\$ 205,000	
	Factory overhead incurred	<u>175,000</u>	<u>380,000</u>
	Direct labor costs incurred during the period.....		<u>\$ 295,000</u>
c.	Cost of goods available for sale		\$ 775,000
	Less finished goods inventory at the end of the period		<u>75,000</u>
	Cost of goods sold during the period.....		<u>\$ 700,000</u>
d.	Sales		\$ 900,000
	Costs of goods sold.....		<u>700,000</u>
	Gross profit.....		<u>\$ 200,000</u>

E1-10

Work in Process (Direct Materials).....	21,000	
Factory Overhead (Indirect Materials).....	5,000	
Materials		26,000
Work in Process (Direct Labor).....	15,000	
Factory Overhead (Indirect Labor).....	3,000	
Payroll		18,000
Factory Overhead	7,200	
Accounts Payable (or Prepaid Rent)		4,000
Accounts Payable (Utilities).....		1,200
Accounts Payable (or Prepaid Insurance)		500
Accumulated Depreciation—Machinery and Equipment....		1,500
Work in Process.....	15,200	
Factory Overhead.....		15,200
(\$5,000+\$3,000+\$7,200)		

E1-11

a.	Work in Process—(Jobs 1040, 1065, 1120)	7,780	
	Materials		7,780
	Work in Process—(Jobs 1040, 1065, 1120)	8,200	
	Payroll		8,200
	Work in Process—(Jobs 1040, 1065, 1120)	3,280	
	Factory Overhead		3,280

b.

Jobs Completed	Direct Materials Cost	Direct Labor Cost	Factory Overhead	Total Production Cost
1040	\$ 3,600	\$ 4,000	\$ 1,600	\$ 9,200
1065	2,380	2,500	1,000	5,880
1120	<u>1,800</u>	<u>1,700</u>	<u>680</u>	<u>4,180</u>
Total	<u>\$ 7,780</u>	<u>\$ 8,200</u>	<u>\$ 3,280</u>	<u>\$ 19,260</u>

c.	Finished Goods	19,260	
	Work in Process—(Jobs 1040, 1065, 1120)		19,260

d.

Unit Cost	
Job 1040 ($\$9,200 \div 400$)	\$23.00
Job 1065 ($\$5,880 \div 240$)	\$24.50
Job 1120 ($\$4,180 \div 200$)	\$20.90

e.

Selling Price Per Unit	
Job 1040 ($\$23.00 \times 140\%$)	\$32.20
Job 1065 ($\$24.50 \times 140\%$)	\$34.30
Job 1120 ($\$20.90 \times 140\%$)	\$29.26

E1-12

a.	Work in Process—(Jobs 1100, 1200, 1300).....	10,800	
	Materials		10,800
	Work in Process—(Jobs 1100, 1200, 1300).....	13,600	
	Payroll		13,600
	Work in Process—(Jobs 1100, 1200, 1300).....	23,100	
	Factory Overhead		23,100

b.

Jobs Completed	Direct Materials Cost	Direct Labor Cost	Factory Overhead	Total Production Cost
1100	\$4,200	\$5,000	\$9,000	\$18,200
1200	3,700	4,500	7,800	16,000
1300	<u>2,900</u>	<u>4,100</u>	<u>6,300</u>	<u>13,300</u>
Total	<u>\$10,800</u>	<u>\$13,600</u>	<u>\$23,100</u>	<u>\$47,500</u>

c.	Finished Goods	47,500	
	Work in Process—(Jobs 1100, 1200, 1300).....		47,500

d.

Unit Cost	
Job 1100 ($\$18,200 \div 500$)	\$36.40
Job 1200 ($\$16,000 \div 400$)	\$40.00
Job 1300 ($\$13,300 \div 300$)	\$44.33

e.

Selling Price Per Unit	
Job 1100 ($\$36.40 \times 150\%$)	\$54.60
Job 1200 ($\$40.00 \times 150\%$)	\$60.00
Job 1300 ($\$44.33 \times 150\%$)	\$66.50

E1-13

a.	Work in Process	14,500	
	Factory Overhead (Indirect Materials)	1,200	
	Materials		15,700
b.	Work in Process	11,500	
	Factory Overhead (Indirect Labor)	900	
	Payroll		12,400
c.	Work in Process	9,500	
	Factory Overhead		9,500
d.	Finished Goods	27,500	
	Work in Process*		27,500
	*Jobs completed:		
	Racers	\$12,000	
	Cruisers	<u>15,500</u>	
	Total	<u>\$27,500</u>	
e.	Cost of Goods Sold	27,500	
	Finished Goods		27,500
	Accounts Receivable	49,000	
	Sales		49,000

PROBLEMS

P1-1

Saito's Sushi Bar

Performance Report—Dining Room

February 28, 2013

Expense	Budgeted		Actual		Variance	
	February	Year-to-Date	February	Year-to-Date	February	Year-to-Date
Dining room wages	\$4,150	\$8,450	\$4,400	\$9,100	\$250U	\$650U
Laundry and housekeeping	1,500	3,150	1,400	3,000	100F	150F
Utilities	2,050	4,250	2,100	4,450	50U	200U
Depreciation	<u>1,500</u>	<u>3,000</u>	<u>1,500</u>	<u>3,000</u>	<u>-----</u>	<u>-----</u>
Total	<u>\$9,200</u>	<u>\$18,850</u>	<u>\$9,400</u>	<u>\$19,550</u>	<u>\$200U</u>	<u>\$700U</u>

P1- 2

1. Merchandise inventory, April 1	\$ 38,000
Plus purchases	<u>121,000</u>
Merchandise available for sale	\$159,000
Less merchandise inventory, April 30	<u>33,000</u>
Cost of goods sold	<u>\$126,000</u>
2. Finished goods, April 1	\$ 67,000
Plus cost of goods manufactured	<u>287,000</u>
Finished goods available for sale	\$354,000
Less finished goods, April 30	<u>61,000</u>
Cost of goods sold	<u>\$293,000</u>

P1-3

1. Merchandise inventory, Sept. 1	\$ 33,000
Plus purchases	<u>111,000</u>
Merchandise available for sale	\$144,000
Less merchandise inventory, Sept. 30	<u>38,000</u>
Cost of goods sold	<u>\$106,000</u>
2. Finished goods, Sept. 1	\$ 61,000
Plus cost of goods manufactured	<u>267,000</u>
Finished goods available for sale	\$328,000
Less finished goods, Sept. 30	<u>67,000</u>
Cost of goods sold	<u>\$261,000</u>

P1-4

1.

Kokomo Furniture Company
Statement of Cost of Goods Manufactured
For the Month Ended November 30, 2013

Direct materials:

Inventory, November 1	\$ 0	
Purchases	<u>33,000</u>	
Total cost of available materials	\$33,000	
Less inventory, November 30	<u>7,400</u>	
Cost of materials used	\$25,600	
Less indirect materials used	<u>1,400</u>	
Cost of direct materials used in production		\$ 24,200
Direct labor		18,500
Factory overhead:		
Indirect materials	\$ 1,400	
Indirect labor	4,300	
Depreciation of building	3,000	
Depreciation of machinery and equipment	2,200	
Utilities	<u>2,750</u>	
Total factory overhead		<u>13,650</u>
Cost of goods manufactured during the month		<u>\$ 56,350</u>

P1-4 Continued**2.**

Kokomo Furniture Company
Income Statement
For the Month Ended November 30, 2013

Sales		\$ 68,300
Cost of goods sold:		
Finished goods inventory, November 1.....	\$ 0	
Add cost of goods manufactured	<u>56,350</u>	
Goods available for sale	\$56,350	
Less finished goods inventory, November 30	<u>13,900</u>	<u>42,450</u>
Gross profit on sales		\$ 25,850
Selling and administrative expenses.....		<u>15,200</u>
Net income		<u>\$ 10,650</u>

P1-4 Concluded**3.**

Kokomo Furniture Company
Balance Sheet
November 30, 2013

Assets

Current assets:

Cash		\$ 21,800
Accounts receivable		16,200
Inventories:		
Finished goods	\$ 13,900	
Work in process	0	
Materials	<u>7,400</u>	<u>21,300</u>
Total current assets		\$ 59,300

Plant and equipment:

Building	\$300,000	
Less accumulated depreciation	<u>3,000</u>	\$ 297,000
Machinery and equipment	\$ 88,000	
Less accumulated depreciation	<u>2,200</u>	<u>85,800</u>

Total plant and equipment 382,800

Total assets \$ 442,100

Liabilities and Stockholders' Equity

Current liabilities:

 Accounts payable \$ 8,900

Stockholders' equity:

Capital stock	\$422,550
Retained earnings	<u>10,650</u>

Total stockholders' equity 433,200

Total liabilities and stockholders' equity \$442,100

P1-5**1.**

Terre Haute Plastics, Inc.
Statement of Cost of Goods Manufactured
For the Month Ended November 30, 2013

Direct materials:

Inventory, November 1	\$ 0	
Purchases	<u>23,000</u>	
Total cost of available materials	\$23,000	
Less inventory, November 30	<u>4,700</u>	
Cost of materials used	\$18,300	
Less indirect materials used	<u>1,400</u>	
Cost of direct materials used in production		\$ 16,900
Direct labor		15,800
Factory overhead:		
Indirect materials	\$ 1,400	
Indirect labor	6,010	
Depreciation of building	4,000	
Depreciation of machinery and equipment	1,650	
Utilities	<u>2,750</u>	
Total factory overhead		<u>15,810</u>
Cost of goods manufactured during the month		<u><u>\$48,510</u></u>

2.

Terre Haute Plastics, Inc.
Income Statement
For the Month Ended June 30, 2013

Sales		\$63,800
Cost of goods sold:		
Finished goods inventory, November 1	\$ 0	
Add cost of goods manufactured	<u>48,510</u>	
Goods available for sale	\$48,510	
Less finished goods inventory, November 30	<u>19,300</u>	<u>29,210</u>
Gross profit on sales		\$34,590
Selling and administrative expenses		<u>12,500</u>
Net income		<u><u>\$22,090</u></u>

P1-5 Concluded

Terre Haute Plastics, Inc.
Balance Sheet
November 30, 2013

Assets

Current assets:

Cash		\$ 18,200
Accounts receivable		12,600
Inventories:		
Finished goods	\$ 19,300	
Work in process	0	
Materials	<u>4,700</u>	<u>24,000</u>
Total current assets		\$ 54,800

Plant and equipment:

Building	\$400,000	
Less accumulated depreciation	<u>4,000</u>	\$ 396,000
Machinery and equipment	\$ 66,000	
Less accumulated depreciation	<u>1,650</u>	<u>64,350</u>

Total plant and equipment 460,350

Total assets \$ 515,150

Liabilities and Stockholders' Equity

Current liabilities:

Accounts payable \$ 9,800

Stockholders' equity:

Capital stock	\$483,260
Retained earnings	22,090

Total stockholders' equity 505,350

Total liabilities and stockholders' equity \$ 515,150

P1-6

1. a.	Materials	58,000	
	Accounts Payable		58,000
b.	Work in Process	47,000	
	Factory Overhead (Indirect Materials)	15,000	
	Materials		62,000
c.	Payroll	48,000	
	Wages Payable		48,000
	Wages Payable	48,000	
	Cash		48,000
	Work in Process	29,000	
	Factory Overhead (Indirect Labor)	12,000	
	Selling and Administrative Expenses		
	(Salaries)	7,000	
	Payroll		48,000
d.	Factory Overhead (Depreciation of Building)	1,600	
	Factory Overhead (Depreciation of Factory		
	Equipment)	1,833*	
	Selling and Administrative Expenses		
	(Depreciation of Building)	400	
	Selling and Administrative Expenses		
	(Depreciation of Office Equipment)	1,000	
	Accumulated Depreciation—Building		2,000
	Accumulated Depreciation—Factory Equipment		1,833*
	Accumulated Depreciation—Office Equipment		1,000
	*Rounded		

P1-6 Continued

e. Factory Overhead (Miscellaneous)	8,250	
Selling and Administrative Expenses (Miscellaneous).....	2,750	
Accounts Payable		11,000
f. Work in Process.....	38,683	
Factory Overhead.....		38,683
g. Finished Goods.....	91,000	
Work in Process		91,000
h. Accounts Receivable	362,000	
Sales		362,000
Cost of Goods Sold.....	188,000	
Finished Goods		188,000
i. Cash	345,000	
Accounts Receivable		345,000
j. Accounts Payable	158,000	
Cash		158,000

P1-6 Continued**2.**

<i>Cash</i>			
4/30	25,000	(c)	48,000
(i)	345,000	(j)	158,000
	370,000		206,000
	164,000		

<i>Accounts Receivable</i>			
4/30	65,000	(i)	345,000
(h)	362,000		
	427,000		
	82,000		

<i>Finished Goods</i>			
4/30	120,000	(h)	188,000
(g)	91,000		
	211,000		
	23,000		

<i>Work in Process</i>			
4/30	35,000	(g)	91,000
(b)	47,000		
(c)	29,000		
(f)	38,683		
	149,683		
	58,683		

<i>Materials</i>			
4/30	18,000	(b)	62,000
(a)	58,000		
	76,000		
	14,000		

<i>Building</i>			
4/30	480,000		

<i>Accumulated Depreciation—Building</i>			
	4/30	72,000	
	(d)	2,000	
		74,000	

<i>Factory Equipment</i>			
4/30	220,000		

<i>Accumulated Depreciation—Factory Equipment</i>			
	4/30	66,000	
	(d)	1,833	
		67,833	

<i>Office Equipment</i>			
4/30	60,000		

*Accumulated
Depreciation—Office Equipment*

	4/30	36,000
	(d)	1,000
		37,000

Accounts Payable

(j)	158,000	4/30	95,000
		(a)	58,000
		(e)	11,000
			164,000
			6,000

Payroll

(c)	(c)
48,000	48,000

Wages Payable

(c)	(c)
48,000	48,000

Capital Stock

	4/30	250,000
--	------	---------

Retained Earnings

	4/30	504,000
--	------	---------

Sales

	(h)	362,000
--	-----	---------

Cost of Goods Sold

(h)	188,000
-----	---------

Factory Overhead

(b)	15,000	(f)	38,683
(c)	12,000		
(d)	1,600		
(d)	1,833		
(e)	8,250		
	38,683		

*Selling and Administrative
Expenses*

(c)	7,000
(d)	400
(d)	1,000
(e)	2,750
	11,150

P1-6 Continued

3. Hokie Manufacturing Co.
Statement of Cost of Goods Manufactured
For the Month Ended May 31, 2013

Materials:		
Inventory, May 1	\$ 18,000	
Purchases	<u>58,000</u>	
Total cost of available materials	\$ 76,000	
Less inventory, May 31	<u>14,000</u>	
Cost of materials used	\$ 62,000	
Less indirect materials used	<u>15,000</u>	
Cost of direct materials used in production		\$ 47,000
Direct labor		29,000
Factory overhead:		
Indirect materials	\$ 15,000	
Indirect labor	12,000	
Depreciation of building	1,600	
Depreciation of factory equipment	1,833	
Miscellaneous expenses	<u>8,250</u>	
Total factory overhead		<u>38,683</u>
Total manufacturing cost		\$114,683
Add work in process inventory, May 1		<u>35,000</u>
		\$149,683
Less work in process inventory, May 31		<u>58,683</u>
Cost of goods manufactured		<u>\$ 91,000</u>

Hokie Manufacturing Co.
Income Statement
For the Month Ended May 31, 2013

Sales		\$362,000
Cost of goods sold:		
Finished goods inventory, May 1	\$120,000	
Add cost of goods manufactured	<u>91,000</u>	
Goods available for sale	\$211,000	
Less finished goods inventory, May 31	<u>23,000</u>	<u>188,000</u>
Gross profit on sales		\$174,000
Selling and administrative expenses		<u>11,150</u>
Net income		<u>\$162,850</u>

P1-6 Concluded

**Hokie Manufacturing Co.
Balance Sheet
May 31, 2013**

Assets			
Current assets:			
Cash			\$164,000
Accounts receivable			82,000
Inventories:			
Finished goods	\$ 23,000		
Work in process	58,683		
Materials	<u>14,000</u>	<u>95,683</u>	
Total current assets			\$341,683
Plant and equipment:			
Building	\$ 480,000		
Less accumulated depreciation	<u>74,000</u>	\$ 406,000	
Factory equipment	\$ 220,000		
Less accumulated depreciation	<u>67,833</u>	152,167	
Office equipment	\$ 60,000		
Less accumulated depreciation	<u>37,000</u>	<u>23,000</u>	
Total plant and equipment			<u>581,167</u>
Total assets			<u><u>\$922,850</u></u>

Liabilities and Stockholders' Equity

Current liabilities:			
Accounts payable			\$ 6,000
Stockholders' equity:			
Capital stock	\$250,000		
Retained earnings*	<u>666,850</u>		
Total stockholders' equity			<u>916,850</u>
Total liabilities and stockholders' equity			<u><u>\$922,850</u></u>

*\$504,000 (bal. on 4/30) + \$162,850 (Net income for May) = \$666,850

P1-7

1. Materials.....	55,000	
Accounts Payable		55,000
2. Work in Process (Materials)	45,500	
(Beginning balance + Purchases – Ending balance = \$6,000 + \$45,000 – \$5,500)		
Factory Overhead (Indirect Materials).....	9,900	
(Beginning balance + Purchases – Ending balance = \$800 + \$10,000 – \$900)		
Materials		55,400
3. Payroll	65,000	
Wages Payable		65,000
4. Work in Process (Labor).....	50,000	
Factory Overhead (Indirect Labor)	15,000	
Payroll		65,000
5. Wages Payable.....	65,000	
Cash.....		65,000
6. Factory Overhead	42,000	
Accounts Payable		42,000
7. Factory Overhead	10,000	
Various Credits (Prepaid Insurance, Accumulated Depreciation, etc.)		10,000
8. Work in Process (Factory Overhead)	76,900	
(Indirect materials + Indirect labor + Factory overhead paid + Factory overhead recorded = \$9,900 + \$15,000 + \$42,000 + \$10,000)		
Factory Overhead		76,900
9. Finished Goods	169,400	
(Work in process, beginning balance + Materials + Labor + Factory overhead – Work in process, ending balance = \$3,500 + \$45,500 + \$50,000 + \$76,900 – \$6,500)		
Work in Process		169,400

P1-7 Concluded

10. Cost of Goods Sold	168,200
(Finished goods, beginning balance + Goods finished during the month – Finished goods, ending balance = \$12,000 + \$166,400 – \$13,200)	
Finished Goods.....	168,200

P1-8

1.

Dennis Manufacturing Company
Statement of Cost of Goods Manufactured
For the Month Ended July 31, 20—

Direct materials:

Inventory, July 1	\$ 20,000	
Purchases.....	<u>110,000</u>	
Total cost of available materials	\$ 130,000	
Less inventory, July 31	<u>26,000</u>	
Cost of direct materials used in production.....		\$104,000 ^e
Direct labor		160,000 ^f
Factory overhead.....		<u>80,000^g</u>
Total manufacturing cost		\$344,000 ^d
Add work in process inventory, July 1		<u>40,000</u>
Total		\$384,000 ^c
Less work in process inventory, July 31		<u>36,000^b</u>
Cost of goods manufactured.....		<u><u>\$348,000^a</u></u>

^a Cost of goods manufactured = cost of goods sold + ending finished goods inventory – beginning finished goods inventory (\$345,000 + \$105,000 – \$102,000 = \$348,000)

^b Ending work in process (90% × \$40,000 = \$36,000)

^c Total manufacturing cost to be accounted for (\$348,000 + \$36,000 = \$384,000)

^d Total manufacturing cost = total manufacturing cost to be accounted for – beginning work in process inventory (\$384,000 – \$40,000 = \$344,000)

^e Direct materials used = beginning inventory + purchases – ending inventory =
(\$20,000 + \$110,000 – \$26,000 = \$104,000)

^f Direct labor = total manufacturing cost – direct materials – factory overhead
X = \$344,000 – \$104,000 – .5X
X = \$160,000

^g Factory overhead = 50% × \$160,000 = \$80,000

2.

**Dennis Manufacturing Company
Schedule to Compute Prime Cost
For the Month Ended July 31, 20—**

Direct materials used	\$ 104,000 ^e
Direct labor incurred.....	<u>160,000 ^f</u>
Prime cost incurred during July.....	<u><u>\$ 264,000</u></u>

3.

**Dennis Manufacturing Company
Schedule to Compute Conversion Cost
For the Month Ended July 31, 20—**

Direct labor incurred.....	\$ 160,000 ^f
Factory overhead	<u>80,000 ^g</u>
Conversion cost incurred during July	<u><u>\$ 240,000</u></u>

P1-9

Manlius Manufacturing Co.
Statement of Cost of Goods Manufactured
For the Year Ended December 31, 2013

Direct materials used	\$ 370,000 ^c
Direct labor	360,000 ^b
Factory overhead.....	<u>270,000</u> ^a
Total manufacturing cost	\$1,000,000
Add work in process inventory, January 1	<u>20,000</u> ^d
	\$1,020,000
Less work in process inventory, December 31	<u>50,000</u> ^d
Cost of goods manufactured.....	<u>\$ 970,000</u>

Supporting Computations:

^a Factory overhead: $27\% \times \text{total manufacturing cost}$ ($27\% \times \$1,000,000$) = \$270,000

^b Direct labor: 75% of direct labor equals \$270,000, so direct labor was \$360,000
 (\$270,000 \div 75%)

^c Direct materials used equals total manufacturing cost less direct labor and factory overhead [$\$1,000,000 - (\$360,000 + \$270,000)$]

^d Work in process inventories:

Let X = ending work in process inventory

$$\$1,000,000 + 0.4X - X = \$970,000$$

$$X = \$50,000$$

$$0.4 \quad X = \underline{\underline{\$20,000}}$$

P1-10**1.**

	Job 101	Job 102	Job 103	Job 104	Total
Direct materials	\$2,200	\$ 5,700	\$ 7,100	\$ 1,700	\$ 16,700
Direct labor	2,700	6,800	9,200	2,100	20,800
Factory overhead	<u>1,200</u>	<u>2,000</u>	<u>3,800</u>	<u>1,000</u>	<u>8,000</u>
Total	<u>\$6,100</u>	<u>\$14,500</u>	<u>\$20,100</u>	<u>\$ 4,800</u>	<u>\$45,500</u>

2. a. Materials	37,000	
Accounts Payable		37,000
b. Work in Process	16,700	
Factory Overhead	1,350	
Materials		18,050
c. Payroll	23,050	
Wages Payable		23,050
Work in Process	20,800	
Factory Overhead	2,250	
Payroll		23,050

P1-10 Concluded

d. Factory Overhead	2,400	
Accounts Payable		2,400
e. Factory Overhead	2,000	
Accumulated Depreciation—Machinery		2,000
f. Work in Process	8,000	
Factory Overhead		8,000
g. Finished Goods*	40,700	
Work in Process		40,700
h. Accounts Receivable	39,000	
Sales		39,000
Cost of Goods Sold**	20,600	
Finished Goods		20,600

	*Completed	**Billed
Job 101	\$ 6,100	\$ 6,100
Job 102	14,500	14,500
Job 103	<u>20,100</u>	<u>—</u>
	<u>\$40,700</u>	<u>\$20,600</u>

3. Added to work in process:	
Direct materials	\$16,700
Direct labor	20,800
Factory overhead	<u>8,000</u>
Total	\$45,500
Transferred to finished goods	<u>40,700</u>
Balance (represented by the cost of Job 104)	<u>\$ 4,800</u>
4. Added to finished goods	\$40,700
Less costs of goods sold	<u>20,600</u>
Balance (represented by the cost of Job 103)	<u>\$20,100</u>

P1-11

1.	Work in Process (Jobs 312,411,510)	69,000	
	Materials		69,000
	Work in Process (Jobs 312,411,510)	185,000	
	Payroll		185,000
	Work in Process (Jobs 312,411,510)	153,000	
	Factory Overhead		153,000
	Finished Goods	407,000	
	Work in Process (Jobs 312,411,510)		407,000
	Accounts Receivable (or Cash)	447,250	
	Sales		447,250
	Cost of Goods Sold	407,000	
	Finished goods		407,000
2.	a. Sales		\$447,250
	Manufacturing costs of goods sold:		
	Materials	\$ 69,000	
	Direct labor	185,000	
	Factory overhead	153,000	407,000
	Gross profit on sales		<u>\$40,250</u>

b.

	312	411	510
Sales	\$152,000	\$120,000	\$175,250
Manufacturing cost:			
Materials	\$25,000	\$15,000	\$29,000
Direct labor	70,000	60,000	55,000
Factory overhead	<u>50,000</u>	<u>40,000</u>	<u>63,000</u>
Total mfg. cost	<u>\$145,000</u>	<u>\$115,000</u>	<u>\$147,000</u>
Gross profit	<u>\$7,000</u>	<u>\$5,000</u>	<u>\$ 28,250</u>

c.

	312	411	510
Number of units completed	10,000	5,000	14,000
Selling price per unit	\$15.20	\$24.00	\$12.52
Manufacturing cost per unit	<u>14.50</u>	<u>23.00</u>	<u>10.50</u>
Gross profit	<u>\$.70</u>	<u>\$ 1.00</u>	<u>\$2.02</u>

P1-12

1. Work in Process (Jobs 10AX,11BX,12CX)	138,000	
Materials		138,000
Work in Process (Jobs 10AX,11BX,12CX)	370,000	
Payroll		370,000
Work in Process (Jobs 10AX,11BX,12CX)	306,000	
Factory Overhead		306,000
Finished Goods	814,000	
Work in Process (Jobs 10AX,11BX,12CX)		814,000
Accounts Receivable (or Cash)	900,000	
Sales		900,000
Cost of Goods Sold	814,000	
Finished goods		814,000

2. a. Sales
\$900,000

Manufacturing costs of goods sold:

Materials	\$ 138,000	
Direct labor	370,000	
Factory overhead	<u>306,000</u>	<u>814,000</u>
Gross profit on sales		<u>\$86,000</u>

P1-12 Concluded

b.	10AX	11BX	12CX
Sales		\$300,000	\$250,000	\$350,000
Manufacturing costs:				
Materials	\$ 50,000		\$30,000	\$58,000
Direct labor	140,000		120,000	110,000
Factory overhead	<u>100,000</u>		<u>80,000</u>	<u>126,000</u>
Gross profit.....	<u>\$10,000</u>		<u>\$20,000</u>	<u>\$56,000</u>
c.	10AX	11BX	12CX
Number of units completed.....	10,000		5,000	14,000
Selling price per unit	\$30		\$50	\$25
Manufacturing cost per unit	<u>29</u>		<u>46</u>	<u>21</u>
Gross profit per unit.....	<u>\$ 1</u>		<u>\$4</u>	<u>\$4</u>

P1-13

1. Work in Process	98,500	
Materials		98,500
Work in Process	155,000	
Payroll		155,000
Work in Process	120,000	
Factory Overhead		120,000

2.

Job	Direct Materials Cost	Direct Labor Cost	Factory Overhead	Total Production Cost
007	\$ 50,000	\$ 80,000	\$ 60,000	\$190,000
008	22,000	40,000	32,000	94,000
009	18,500	23,000	17,500	59,000
010	<u>8,000</u>	<u>12,000</u>	<u>10,500</u>	<u>30,500</u>
Total	<u>\$98,500</u>	<u>\$155,000</u>	<u>\$120,000</u>	<u>\$373,500</u>

Finished Goods Inventory (Job 009)..... \$59,000

Work in Process Inventory
(Job 010)..... \$30,500

3. Finished Goods	343,000	
Work in Process (Jobs 007, 008, 009)		343,000
Accounts Receivable	426,000	
Sales		426,000
Cost of Goods Sold	284,000	
Finished Goods		284,000

P1-13 Concluded

4.

Adirondack Manufacturing Co.
Statement of Cost of Goods Manufactured
For the Month Ended January 31, 20—

Direct materials used	\$ 98,500
Direct labor	155,000
Factory overhead	<u>120,000</u>
Total manufacturing cost.....	\$ 373,500
Less work in process inventory, January 31	<u>30,500</u>
Cost of goods manufactured	<u><u>\$ 343,000</u></u>

MINI-CASE

1. The ethical standards which apply to this case are competency, integrity, and objectivity. Competency requires that Gates perform his professional duties in accordance with relevant laws, regulations, and technical standards. Integrity requires that Gates refrain from either actively or passively subverting the attainment of the organization's legitimate and ethical objectives. Objectivity requires that Gates communicate information fairly and objectively.
2. Gates should first explain to Allen that recording the revenue in 2013 would be a violation of generally accepted accounting principles (GAAP). If Allen persists, Gates should report the matter to the corporate controller. If there is no support from top management, Gates should resign.

INTERNET EXERCISE 1

Students' answers will vary depending upon articles chosen.

INTERNET EXERCISE 2

Students' answers will vary, but key points include:

- Most significant legislation affecting the accounting profession since 1934.
- Applies to over 15,000 publicly-held companies.
- Creates a Public Company Accounting Oversight Board (PCAOB).
- Establishes standards related to the preparation of audits reports and the conduct of audits relative to: the length of time that audit workpapers must be kept; the prohibition of certain nonaudit services for audit clients; the requirement that audit partners rotate off an audit every five years; the requirement that the audit committee of a company's board of directors approve all accounting services to be performed; and the requirement that a company's CEO and CFO attest to the accuracy of the financial statements.

CHAPTER 2

QUESTIONS

1. The two major objectives of materials control are (1) physical control or safeguarding the materials and (2) control of the investment in materials.
2. The controls established for safeguarding materials include limiting access to the materials area, segregating the duties of employees involved with materials, and assuring that materials records are being maintained accurately.

Limiting access involves placing inventories in storage areas that can be entered only by authorized personnel and restricting the release of any material or finished goods to individuals who have properly authorized documents. Control procedures that limit access to work in process areas should be established within each department or production station.

The segregation of duties involves assigning different people to different functions. Employees assigned to purchasing should not also be assigned to receiving, storage, or recording functions, etc.

The accurate recording of purchases and issuances of materials facilitates comparing the recorded materials on hand to the actual materials on hand. If a substantial difference between the recorded and actual quantities is discovered, it can be quickly determined and investigated.

3. Management should consider production and working capital requirements along with alternative uses of available funds which might yield a greater return. Consideration should also be given to the cost of materials handling, storage, and insurance protection against fire, theft, and other casualty losses. In addition, the possibility of loss from damage, spoilage, and obsolescence should not be overlooked.
4. *Order point* is the time to place an order for additional material because the level of stock has reached a predetermined minimum established by management.
5. In order to determine an order point, the information available should include the:
 - (1) anticipated daily usage of the material,
 - (2) lead time interval, and
 - (3) safety stock required.

The anticipated usage requirement should be founded upon the number of units expected to be completed daily and the quantity of material each completed unit will require.

The lead time interval involves the typical period of time required between placing the order and receiving the shipment.

The safety stock is the minimum stock on hand needed to prevent running out of stock due to errors in calculations of usage, delivery delays, poor quality of merchandise received, and so on.

6. The *economic order quantity (EOQ)* is the calculated size of an order which minimizes the total cost of ordering and carrying the inventory over a specified period of time. It is a function of the cost of placing an order, the number of units required annually, and the carrying cost per unit of inventory.
7. The cost of placing an order, the number of units required annually, and the annual carrying cost per unit in inventory are the items needed to calculate the economic order quantity.
8. The cost of an order includes the salaries and wages of employees who purchase, receive, and inspect materials; the expenses incurred for telephone, fax usage, postage, and forms; and the accounting and record keeping associated with inventories.
9. The *carrying cost* of materials inventory includes the cost of storage and handling; the amount of interest lost on alternative investments; the losses due to obsolescence, spoilage, and theft; the cost of insurance and property taxes; and the cost of maintaining accounting records and controls over the inventory.
10. The *supply chain* is the system that links a manufacturer with its suppliers. If the system is especially "lean", in an effort to be cost efficient, it is quite possible that parts may not be available when needed due to work stoppages, strikes, or natural disasters.
11. a. Purchasing agent duties include:
 - (1) Coordinating materials requirements with production to prevent delays in production due to inadequate materials supply on hand.

- (2) Compiling and maintaining a vendor file from which materials can be promptly obtained at the best available prices. (*Note to Instructor:* You may take this opportunity to explain to the student that the “lowest” price may not always be the “best” price.) The purchasing agent should also consider the quantity to be ordered at one time to get a lower unit price, the quality of the material, the time lapse before delivery, the credit terms, and the reliability of the vendor.
 - (3) Placing purchase orders for materials needed.
 - (4) Supervising the purchase order process until materials are received.
 - (5) Verifying purchase invoices and approvals for payment.
 - b. The receiving clerk is responsible for supervising the receipt of incoming shipments. These duties include checking the quantity and quality. At times, the assignment may include checking the process.
 - c. The storeroom keeper's usual duties include properly storing all materials received, issuing materials only when proper authorization is presented, and keeping the purchasing agent informed of the quantities on hand.
 - d. The production supervisor is responsible for maintaining production and for preparing or approving requisitions for the quantities and kinds of materials needed for current production.
12. A *purchase requisition* is used by the storeroom keeper to provide the purchasing agent with information concerning the materials to be ordered. A *purchase order* is a document completed by the purchasing agent and sent to a vendor to order the materials.
 13. The purchasing agent compares the vendor's invoice to the purchase order to ascertain that there is agreement between the description of the materials, the prices, and the terms of purchase. The method of shipment and the date of delivery are checked to see that they conform with the instructions on the purchase order.
 14. Many manufacturing firms use forms somewhat similar to those shown in the text; however, most firms design forms to meet their specific requirements. These specially designed forms usually perform the same functions as those depicted in the text but may vary in appearance. For example, a purchase order will provide for recording all essential information to obtain materials from selected vendors, regardless of the design or format. Also, many firms now use electronic data interchange to communicate with suppliers and expedite the receipt of orders.
 15. The internal control procedures established for incoming shipments should provide the following safeguards:
 - a. A receiving report prepared by the receiving clerk authenticates the quantity of specific items ordered and verifies that they were received in good condition.
 - b. A copy of the receiving report should accompany the materials received when they are moved from the receiving area to the storeroom. As materials are placed in location, the storeroom keeper should review and substantiate the quantities received per the receiving report.
 - c. The cost and quantity of each item on the approved invoice are independently recorded in the materials ledger.
 - d. The total of the invoice is independently recorded in the purchases journal to be subsequently posted to the appropriate general ledger accounts.
 - e. The invoice for materials purchased should not be approved for payment until the purchasing agent reviews and approves the following details on the invoice:
 - (1) The unit prices and materials descriptions on the invoice are compared with similar data on the purchase order.
 - (2) The extensions of unit prices and totals are verified.
 - (3) The terms of payment and any other charges are verified with the purchase order.
 - (4) The method of shipment and date of delivery are verified.

16. The purpose of a *debit-credit memorandum* is to inform the vendor that an adjustment has been made to the vendor's account. The information on the memo includes the amount of the adjustment, the reason for the adjustment, and the type and quantity of materials involved.

17. The originators of the various forms are:

Forms	Source
a. Purchase requisition	Storeroom keeper
b. Purchase order	Purchasing agent
c. Receiving report	Receiving clerk
d. Materials requisition	Production supervisor
e. Debit-credit memorandum	Purchasing agent

18. A *materials ledger* is a subsidiary ledger in which individual accounts are kept for each item of material carried in stock. The materials account in the general ledger is the control account for the materials ledger.

19. a. *First-in, first-out*: It is assumed that materials issued are from the oldest materials in stock. They were the first purchased and are costed at the prices paid for these earliest purchases. The cost of the ending inventory will reflect the most recent prices paid for the most recent purchases.

b. *Last-in, first-out*: It is assumed that materials issued are from the most recent stock. The last purchased will be the first used at the prices paid for these latest purchases. The ending inventory will be costed at the prices paid for the earliest purchases.

c. *Moving average*: Under this method, no attempt is made to identify the materials issued as to the time of purchase. The average unit price of all materials in stock is maintained; therefore, materials issued are costed on a basis of average prices. Unit cost changes each time unit purchase prices change; therefore, ending inventory will be priced at the latest average cost.

20. In a period of rising prices, the LIFO method estimates the cost of goods sold using the material purchased at the highest prices. Such costs, when matched to sales for the period are believed to more accurately reflect the gross margin earned. The lower income, resulting from the use of LIFO, means that a smaller amount of taxes will be

paid than if some other method were used. Since LIFO leaves the earlier costs of purchases in inventory, the overall value of the material on hand at the end of a period will be more conservatively stated than if FIFO were used. This lower valuation of materials inventory, which affects both the income statement and the balance sheet, may be an advantage or a disadvantage depending on the use made of the balance sheet. The lower valuation is an advantage when property taxes are assessed on the dollar amount of inventory on hand. However, it may be a disadvantage if the financial statements are to be used with a loan application and a larger dollar value of inventory would add to the appearance of the company's financial position.

Many companies, when prices are rising, adopt LIFO to minimize the income tax effects and believe that in such economic trends the costs charged against sales more accurately depict reality.

21.	Entries	Source of Data
a.	Debits in materials ledger to record materials purchased	Receiving report
b.	Credits in materials ledger to record materials requisitioned	Materials requisition form
c.	Debits in job cost ledger to record materials placed in process	Materials requisition form

22. In a just-in-time manufacturing system, materials are not received from suppliers until they are ready to be put into process. The work is not done in one department until the subsequent department is ready to work on it. This approach differs from a traditional manufacturing system where materials are ordered and stored well in advance of production, and departments stockpile partially completed units until the next department is ready for them.

23. A traditional "push" manufacturing system produces goods for inventory in the hope that the demand for these goods will then be created. In a JIT "pull" manufacturing system, the credo is "Don't make anything for anybody until they ask for it".

24. Disadvantages of a “push” manufacturing system include having too many dollars invested in inventory; defects not being detected because partially completed goods are inventoried rather than completed immediately; obsolete products due to the long lead time from start to finish.
25. The *throughput time* is the time that it takes a unit to make it through the production system, and it is computed by dividing the number of units in work in process by the number of units completed each day to obtain a measure in days. *Velocity* also measures the speed with which units are produced in the system, but in percentage terms relative to past production; for example, velocity increased by 50%.
26. Advantages of producing all units in a single cell include: fewer and shorter movements of materials; production in smaller lot sizes because other products do not have to be made in the same cell; more worker motivation and satisfaction due to the teamwork approach within the cell.
27. Critics of “backflush” costing argue that it is not consistent with GAAP because it does not accurately account for inventories. Proponents of “backflush” costing argue that Work in Process and Finished Goods are immaterial in a lean production environment and, therefore, their omission does not materially misstate the financial statements.
28. Six Sigma is a process improvement method that uses data gathering, analytical techniques, and customer feedback, and whose aim is to have no more than 3.4 defects per one million process occurrences. It is an important goal because the manufacture and sale of defective items is costly and tends to damage a company’s reputation.
29. If the value of the scrap is high, an inventory file should be prepared showing the quantity and market value. If both quantity and market value are known, an inventory account should be debited while an account such as Scrap Revenue is credited. If the market value of the scrap is unknown, a journal entry cannot be made until the scrap is sold, at which time Cash (or Accounts Receivable) is debited and Scrap Revenue is credited.
30. *Spoiled work* represents products which are not first quality by the company’s standards and have imperfections that will not be corrected. They are sold as irregular units, called *seconds*. *Defective work* also includes goods that are not first quality by the established standard but have imperfections that will be corrected, making them first-quality products.

EXERCISES

E2-1

- a. 500 lbs. × 7 days = 3,500 lbs.
 Required safety stock 2,500
 Order point..... 6,000 lbs.
- b. 500 lbs. × 4 days = 2,000 lbs.

E2-2

$$\begin{aligned} \text{a. EOQ} &= \sqrt{\frac{2 \text{ CN}}{K}} \\ &= \sqrt{\frac{2 \times \$72 \times 360,000}{\$4}} \\ &= \sqrt{\frac{\$51,840,000}{\$4}} \\ &= \sqrt{12,960,000} \\ &= 3,600 \text{ gallons} \end{aligned}$$

- b. 360,000 gals. (annual usage) ÷ 3,600 gals. (per order) = 100 orders
- | | |
|---|-----------------|
| Ordering cost: 100 orders @ \$72 per order | \$ 7,200 |
| Carrying cost: (3,600 gals. ÷ 2) @ \$4.00 per gals..... | <u>7,200</u> |
| Total order and carrying cost | <u>\$14,400</u> |

E2-3

$$\begin{aligned} \text{a. EOQ} &= \sqrt{\frac{2 \text{ CN}}{K}} \\ &= \sqrt{\frac{2 \times \$40 \times 225,000}{\$2}} \\ &= \sqrt{\frac{\$18,000,000}{\$2}} \\ &= \sqrt{9,000,000} \\ &= 3,000 \text{ gallons} \end{aligned}$$

b. 225,000 gals. (annual usage) ÷ 3,000 gals. (per order) = 75 orders		
Ordering cost: 75 orders @ \$40 per order		\$3,000
Carrying cost: (3,000 gals. ÷ 2) @ \$2.00 per gals.		<u>3,000</u>
Total order and carrying cost		<u>\$6,000</u>

E2-4

- a. Storeroom keeper
- b. Purchasing agent
- c. Receiving clerk
- d. Purchasing agent
- e. Production department supervisor

E2-5

Work in Process	68,000	
Factory Overhead	4,800	
Materials		72,800
To record materials used during the month of June.		

E2-6

a. Materials	200,000	
Accounts Payable		200,000
b. Work in Process	175,000	
Materials		175,000
c. Factory Overhead	12,000	
Materials		12,000
d. Materials	2,500	
Work in Process		2,500
e. Accounts Payable	1,800	
Materials		1,800
f. Accounts Payable	165,000	
Cash		165,000

E2-7

First-in, first-out method

Date	RECEIVED			ISSUED			BALANCE		
	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount
7/1							1,000	4.00	4,000.00
7/3				250	4.00	1,000.00	750	4.00	3,000.00
7/5	500	4.50	2,250.00				750	4.00 }	
7/6				150	4.00	600.00	500	4.50 }	5,250.00
							600	4.00 }	
7/10				110	4.00	440.00	500	4.50 }	4,650.00
							490	4.00 }	
7/11				(10)	4.00	(40.00)	500	4.50 }	4,210.00
							500	4.00 }	
7/15	500	5.00	2,500.00				500	4.50 }	4,250.00
							500	4.00 }	
							500	4.50 }	
7/20	(300)	5.00	(1,500.00)				500	5.00 }	6,750.00
							500	4.00 }	
							500	4.50 }	
7/26				500	4.00	2,000.00	200	5.00 }	5,250.00
				100	4.50	450.00	400	4.50 }	
							200	5.00 }	2,800.00

Cost of materials used (issued): \$4,450

Cost of 7/31 inventory: \$2,800

E2-8

Last-in, first-out method

Date	RECEIVED			ISSUED			BALANCE		
	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount
7/1							1,000	4.00	4,000.00
7/3				250	4.00	1,000.00	750	4.00	3,000.00
7/5	500	4.50	2,250.00				750	4.00	
							500	4.50	
7/6				150	4.50	675.00	750	4.00	5,250.00
							350	4.50	
7/10				110	4.50	495.00	750	4.00	4,575.00
							240	4.50	
7/11				(10)	4.50	(45.00)	750	4.00	4,080.00
							250	4.50	
7/15	500	5.00	2,500.00				750	4.00	4,125.00
							250	4.50	
7/20	(300)	5.00	(1,500.00)				500	5.00	
							750	4.00	6,625.00
							250	4.50	
7/26				200	5.00	1,000.00	200	5.00	5,125.00
				250	4.50	1,125.00			
				150	4.00	600.00	600	4.00	2,400.00

Cost of materials used (issued): \$4,850

Cost of 7/31 inventory: \$2,400

E2-9

Moving average method

Date	RECEIVED			ISSUED			BALANCE		
	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount
7/1							1,000	4.00	4,000.00
7/3				250	4.00	1,000.00	750	4.00	3,000.00
7/5	500	4.50	2,250.00				1,250	4.20 }	5,250.00
7/6				150	4.20	630.00	1,100	4.20 }	4,620.00
7/10				110	4.20	462.00	990	4.20 }	4,158.00
7/11				(10)	4.20	(42.00)	1,000	4.20 }	4,200.00
7/15	500	5.00	2,500.00				1,500	4.4667	6,700.00
7/20	(300)	5.00	(1,500.00)				1,200	4.3333	5,200.00
7/26				600	4.3333	2,600.00	600	4.3333	2,600.00

Cost of materials used (issued): \$4,650

Cost of 7/31 inventory: \$2,600

E2-10

Inventory Method	Cost Transferred to Work in Process	Cost of Ending Inventory
FIFO	\$4,450	\$2,800
LIFO	4,850	2,400
Moving average	4,650	2,600

In a period of constantly rising prices as illustrated in the problem, the LIFO method of inventory pricing will result in the highest cost being charged to revenue; the FIFO method will result in the lowest cost being charged against revenue; and the moving average method will result in a cost between the other two. Theoretically, LIFO provides a better “matching of costs with revenue” because the inventory sold will have to be replaced at current prices. In a period of falling prices, the reverse will be true, with the moving average method again falling in between the other two.

E2-11

- a. The FIFO method which results in the most recent purchases being costed in ending inventory indicates that materials costs have continued to increase over the three-year period.
- b. FIFO would show the highest net income for 2013. The information given indicates that prices rose during the year. Using FIFO, the cost of goods sold would be charged with the oldest materials costs, which during a time of rising prices would be the lowest materials costs.
- c. LIFO would show the lowest net income for 2015, because it would continue to charge the latest and highest costs to the products sold while the other two methods would be less affected by the rising cost of the more recent purchases.
- d. FIFO would show the highest net income for the three years combined, because it consistently charges the earliest, lower costs to the product, thereby increasing the yearly net income.

E2-12

a.	1.	Materials	23,750	
		Accounts Payable		23,750
	2.	Work in Process	19,250	
		Materials		19,250
	3.	Materials	1,200	
		Work in Process		1,200
	4.	Factory Overhead.....	2,975	
		Materials		2,975
	5.	Materials	385	
		Factory Overhead		385

b.

Materials				Factory Overhead			
Bal.	5,000	(2)	19,250	(4)	2,975	(5)	385
(1)	23,750	(4)	2,975				
(3)	1,200		22,225		2,590		
(5)	385						
	30,335						
	8,110						

Work in Process				Accounts Payable			
(2)	19,250	(3)	1,200		(1)	23,750	
	18,050						

c. \$8,110**E2-13**

a.	1.	Materials	35,750	
		Accounts Payable		35,750
	2.	Work in Process	29,250	
		Materials		29,250
	3.	Materials	2,200	
		Work in Process		2,200
	4.	Factory Overhead.....	3,975	
		Materials		3,975
	5.	Materials	585	
		Factory Overhead		585

b.

Materials				Factory Overhead			
Bal.	10,000	(2)	29,250	(4)	3,975	(5)	585
(1)	35,750	(4)	3,975				
(3)	2,200		33,225		3,390		
(5)	585						
	48,535						
	15,310						
Work in Process				Accounts Payable			
(2)	29,250	(3)	2,200		(1)	35,750	
	27,050						

c. \$15,310

E2-14

- $40,000/10,000 = 4$ days
- $40,000 - (40,000 \times .75) = 10,000$
 $10,000/10,000 = 1$ day

E2-15

a.	Raw and In-Process	80,000	
	Accounts Payable		80,000
b.	No entry.		
c.	Conversion Costs	10,000	
	Payroll		10,000
d.	Conversion Costs	60,000	
	Various Credits		60,000
e.	Finished Goods	150,000	
	Raw and In-Process		80,000
	Conversion Costs		70,000
f.	Accounts Receivable	225,000	
	Sales		225,000
	Cost of Goods Sold	150,000	
	Finished Goods		150,000

E2-16

e. No entry

f. Cost of Goods Sold.....	150,000	
Raw and In-Process.....		80,000
Conversion Costs		70,000

E2-17

a. Raw and In-Process.....	70,000	
Accounts Payable		70,000

b. No entry.

c. Conversion Costs	15,000	
Payroll.....		15,000

d. Conversion Costs	45,000	
Various Credits		45,000

e. Finished Goods.....	130,000	
Raw and In-Process.....		70,000
Conversion Costs.....		60,000

f. Accounts Receivable	195,000	
Sales.....		195,000

Cost of Goods Sold.....	130,000	
Finished Goods.....		130,000

E2-18

e. No entry

f. Cost of Goods Sold.....	130,000	
Raw and In-Process.....		70,000
Conversion Costs		60,000

E2-19

a.	Scrap Materials.....	125	
	Factory Overhead (Scrap)		125
	Cash	125	
	Scrap Materials.....		125
b.	No entry at the time scrap is identified		
	At the time of sale:		
	Cash	75	
	Factory Overhead (Scrap)		75
c.	No entry at the time scrap is identified		
	At the time of sale:		
	Accounts Receivable.....	85	
	Work in Process		85
d.	No entry at the time scrap is identified		
	At the time of sale:		
	Cash	40	
	Scrap Revenue.....		40

E2-20

a.	Work in Process	108,000	
	Materials.....		36,000
	Payroll		48,000
	Factory Overhead.....		24,000
	Spoiled Goods	995	
	Factory Overhead (Loss Due to Spoiled Work)	355*	
	Work in Process		1,350

*Unit cost of completed work:

\$108,000 ÷ 8,000 skirts \$13.50

Sale of spoiled work as seconds 9.95

Loss due to spoiled work..... \$ 3.55

100 units x \$3.55 = \$355

b.	Work in Process.....	108,000	
	Materials		36,000
	Payroll		48,000
	Factory Overhead		24,000
	Spoiled Goods	995	
	Work in Process.....		995

E2-21

a.	Factory Overhead (Loss Due to Defective Work)	300	
	Materials		150
	Payroll		100
	Factory Overhead		50
b.	Work in Process.....	300	
	Materials		150
	Payroll		100
	Factory Overhead		50

PROBLEMS

P2-1

$$\begin{aligned}
 1. \text{ Order Point} &= \text{Expected Usage During Lead Time} &+& \text{Safety Stock} \\
 &= (200 \text{ units per day} \times 5 \text{ days}) &+& 500 \text{ units} \\
 &= 1,500 \text{ units}
 \end{aligned}$$

$$\begin{aligned}
 2. \text{ EOQ} &= \sqrt{\frac{2 \text{ CN}}{K}} \\
 &= \sqrt{\frac{2 \times \$50 \times 25,000}{\$.10}} \\
 &= \sqrt{25,000,000} \\
 &= 5,000 \text{ units}
 \end{aligned}$$

$$3. \text{ 25,000 units (annual usage)} \div 5,000 \text{ units (per order)} = 5 \text{ orders}$$

$$\text{Ordering cost: } 5 \text{ orders @ } \$50 \text{ per order} = \underline{\underline{\$250}}$$

$$\begin{aligned}
 \text{Average number of units in inventory} &= (1/2 \times \text{EOQ}) + \text{Safety Stock} \\
 &= (1/2 \times 5,000) + 500 \\
 &= 3,000
 \end{aligned}$$

$$\begin{aligned}
 \text{Carrying Cost} &= \text{Average Inventory} \times \text{Carrying Cost per Unit} \\
 &= 3,000 \times \$.10 = \underline{\underline{\$300}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Total Cost} &= \text{Order Costs} + \text{Carrying Costs} \\
 &= \$250 + \$300 = \underline{\underline{\$550}}
 \end{aligned}$$

(Note that when there is safety stock, the carrying cost does not equal the order cost at the EOQ.)

P2-2

$$\begin{aligned}
 1. \text{ Order Point} &= \text{Expected Usage During Lead Time} &+& \text{Safety Stock} \\
 &= (500 \text{ units per day} \times 5 \text{ days}) &+& 1,500 \text{ units} \\
 &= 4,000 \text{ units}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad \text{EOQ} &= \sqrt{\frac{2 \text{ CN}}{\text{K}}} \\
 &= \sqrt{\frac{2 \times \$194.4 \times 6,000}{\$50}} \\
 &= \sqrt{49,008} \\
 &= 7,000 \text{ units (rounded)}
 \end{aligned}$$

$$3. \quad 63,000 \text{ units (annual usage)} \div 7,000 \text{ units (per order)} = 9 \text{ orders (rounded)}$$

$$\text{Ordering cost: } 9 \text{ orders @ } \$200 \text{ per order} = \underline{\$1,800}$$

$$\begin{aligned}
 \text{Average number of units in inventory} &= (1/2 \times \text{EOQ}) + \text{Safety Stock} \\
 &= (1/2 \times 7,000) + 1,500 \\
 &= 5,000
 \end{aligned}$$

$$\begin{aligned}
 \text{Carrying Cost} &= \text{Average Inventory} \times \text{Carrying Cost per Unit} \\
 &= 5,000 \times \$0.50 = \underline{\$2,500}
 \end{aligned}$$

$$\begin{aligned}
 \text{Total Cost} &= \text{Order Costs} + \text{Carrying Costs} \\
 &= \$1,800 + \$2,500 = \underline{\$4,300}
 \end{aligned}$$

(Note that when there is safety stock, the carrying cost does not equal the order cost at the EOQ.)

P2-3

Order Size	Number of Orders	Order Cost	Ave Inv	Carrying Cost	Order & C. C.
300	67	\$1,340	150	\$ 750	\$2,090
400	50	1,000	200	1,000	2,000
500	40	800	250	1,250	2,050
600	34	680	300	1,500	2,180
700	29	580	350	1,750	2,330
800	25	500	400	2,000	2,500

P2-4

1. Average number of gals. In inventory = $(1/2 \times \text{EOQ}) + \text{Safety Stock}$
 $= (1/2 \times 400) + 500 = 700 \text{ gals.}$
2. Carrying costs = Average inventory x Carrying Cost per Unit
 $= 700 \text{ gals.} \times \$5 = \$3,500$
3. The total order cost is still \$1,000. It does not differ from the answer in P2-3, because the number of orders will be the same.

P 2-5

1. a. FIFO costing

MATERIALS LEDGER												
Description <u>Rubber gaskets</u>										Materials Ledger Account No. <u>11216</u>		
RECEIVED						ISSUED				BALANCE		
Date	Rec. No.	Quantity	Unit Price	Amount	Mat. Req. No.	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount	
11/1									30,000	3.00	90,000.00	
11/4	112	10,000	3.10	31,000.00					30,000	3.00 }		
									10,000	3.10 }	121,000.00	
11/5					49	30,000	3.00	90,000.00	10,000	3.10	31,000.00	
11/8	113	50,000	3.30	165,000.00					10,000	3.10 }		
									50,000	3.30 }	196,000.00	
11/15					50	10,000	3.10 }					
						10,000	3.30 }	64,000.00	40,000	3.30 }	132,000.00	
11/22	114	25,000	3.50	87,500.00					40,000	3.30 }		
									25,000	3.50 }	219,500.00	
11/28					51	30,000	3.30	99,000.00	10,000	3.30 }		
									25,000	3.50 }	120,500.00	

P2-5 Continued

b. LIFO costing

MATERIALS LEDGER											
Description <u>Rubber gaskets</u>								Materials Ledger Account No. <u>11216</u>			
RECEIVED						ISSUED			BALANCE		
Date	Rec. Rep. No.	Quantity	Unit Price	Amount	Mat. Req. No.	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount
11/1									30,000	3.00	90,000.00
11/4	112	10,000	3.10	31,000.00					30,000	3.00 }	
									10,000	3.10 }	121,000.00
11/5					49	10,000	3.10 }				
						20,000	3.00 }	91,000.00	10,000	3.00	30,000.00
11/8	113	50,000	3.30	165,000.00					10,000	3.00 }	
									50,000	3.30 }	195,000.00
11/15					50	20,000	3.30	66,000.00	10,000	3.00 }	
									30,000	3.30 }	129,000.00
11/22	114	25,000	3.50	87,500.00					10,000	3.00 }	
									30,000	3.30 }	
									25,000	3.50 }	216,500.00
11/28					51	25,000	3.50 }				
						5,000	3.30 }	104,000.00	10,000	3.00 }	
									25,000	3.30 }	112,500.00

P2-5 Concluded

2.

Inventory Method	Cost Transferred to Work in Process	Cost of Ending Inventory
FIFO	\$253,000	\$120,500
LIFO	261,000	112,500
Moving average	256,295	117,205

3. Probably LIFO because it will come closer to matching current costs with current revenues. When costs are rising, revenues are usually increasing; therefore, the resulting gross profit under LIFO will reflect the company's product profitability more accurately. Other inventory factors that should be given consideration in selecting any method are: the dollar amount of the inventories; the magnitude of the price changes; the direction of the price changes, whether rising or falling; and the length of the inventory cycle. Also, adopting LIFO in periods of rising prices will result in the minimization of income taxes.
4. In a period of rising prices, the balance sheet inventory under either method will most likely be less than the current market prices. However, as shown by the problem, the lowest figure for ending inventory will be reported when LIFO is used. LIFO charges the higher materials cost to Cost of Goods Sold whereas FIFO defers more of the higher cost to the inventory on hand.

P2-6

1. FIFO method

MATERIALS LEDGER												
Description <u>Plastic tubing (ft.)</u>							Materials Ledger Account No. <u>906</u>					
RECEIVED							ISSUED			BALANCE		
Date	Rec. No.	Quantity	Unit Price	Amount	Mat. Req. No.	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount	
2/1									1,200	2.76	3,312.00	
2/5					108	60	2.76	165.60	1,140	2.76	3,146.40	
2/11					210	200	2.76	552.00	940	2.76	2,594.40	
2/14	634	800	2.80	2,240.00					940	2.76		
2/15					274	400	2.76	1,104.00	800	2.80	4,834.40	
2/16	Ret. (90)		2.80	(252.00)					540	2.76		
2/18	712	1,000	2.83	2,830.00					710	2.80	3,478.40	
									540	2.76		
									710	2.80		
									1,000	2.83	6,308.40	
2/21					318	540	2.76	1,490.40				
						100	2.80	280.00	610	2.80		
									1,000	2.83	4,538.00	

P2-6 Continued

2. LIFO method

MATERIALS LEDGER											
Description Plastic tubing (ft.) _____								Materials Ledger Account No. 906 _____			
Date	RECEIVED				ISSUED				BALANCE		
	Rec. Rep. No.	Quantity	Unit Price	Amount	Mat. Req. No.	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount
2/1									1,200	2.76	3,312.00
2/5					108	60	2.76	165.60	1,140	2.76	3,146.40
2/11					210	200	2.76	552.00	940	2.76	2,594.40
2/14	634	800	2.80	2,240.00					940	2.76	
									800	2.80	4,834.40
2/15					274	400	2.80	1,120.00	940	2.76	
									400	2.80	3,714.40
2/16	Ret. (90)		2.80	(252.00)					940	2.76	
									310	2.80	3,462.40
2/18	712	1,000	2.83	2,830.00					940	2.76	
									310	2.80	
									1,000	2.83	6,292.40
2/21					318	640	2.83	1,811.20	940	2.76	
									310	2.80	
									360	2.83	4,481.20

P2-6 Concluded

3. Moving average method

MATERIALS LEDGER											
Description <u>Plastic tubing (ft.)</u>						Materials Ledger Account No. <u>906</u>					
RECEIVED				ISSUED				BALANCE			
Date	Rec. No.	Quantity	Unit Price	Amount	Mat. Req. No.	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount
2/1									1,200	2.76	3,312.00
2/5					108	60	2.76	165.60	1,140	2.76	3,146.40
2/11					210	200	2.76	552.00	940	2.76	2,594.40
2/14	634	800	2.80	2,240.00					1,740	2.7784	4,834.40
2/15					274	400	2.7784	1,111.36	1,340	2.7784	3,723.04
2/16	Ret. (90)		2.80	(252.00)					1,250	2.7768	3,471.04
2/18	712	1,000	2.83	2,830.00					2,250	2.8005	6,301.04
2/21					318	640	2.8005	1,792.32	1,610	2.8005	4,508.72

P2-7**1.**

a. Materials	74,000	
Accounts Payable		74,000
b. Work in Process	57,000	
Factory Overhead	11,000	
Materials		68,000
c. Materials	1,100	
Work in Process		1,100
d. Accounts Payable	2,500	
Materials		2,500
e. Accounts Payable	68,500	
Cash		68,500

2.

<i>Cash</i>		<i>Accounts Payable</i>	
Bal. 82,250	(e) 68,500	(d) 2,500	Bal. 21,000
13,750		(e) 68,500	(a) 74,000
		71,000	95,000
			24,000
<i>Materials</i>		<i>Factory Overhead</i>	
Bal. 29,500	(b) 68,000	(b) 11,000	
(a) 74,000	(d) 2,500		
(c) 1,100	70,500		
104,600			
34,100			
<i>Work in Process</i>			
Bal. 27,000	(c) 1,100		
(b) 57,000			
84,000			
82,900			

3. a. Cash balance	\$ 13,750
b. Inventory of materials on hand	34,100
c. Accounts payable	24,000

P2-8**1.**

a. Materials.....	58,000	
Accounts Payable		58,000
b. Work in Process	45,000	
Factory Overhead	8,000	
Materials		53,000
c. Materials.....	900	
Work in Process.....		900
d. Accounts Payable	1,500	
Materials		1,500
e. Accounts Payable	51,500	
Cash		51,500

2.

<i>Cash</i>		<i>Accounts Payable</i>	
Bal. 64,250	(e) 51,500	(d) 1,500	Bal. 29,000
12,750		(e) 51,500	(a) 58,000
		53,000	87,000
			34,000
<i>Materials</i>		<i>Factory Overhead</i>	
Bal. 23,500	(b) 53,000	(b) 8,000	
(a) 58,000	(d) 1,500		
(c) 900	54,500		
82,400			
27,900			
<i>Work in Process</i>			
Bal. 31,000	(c) 900		
(b) 45,000			
76,000			
75,100			

3. a. Cash balance	\$ 12,750
b. Inventory of materials on hand	27,900
c. Accounts payable	34,000

P2-9

1. and 2.

- a. The company purchased materials costing \$22,000. (Forms used: receiving report and vendor's invoice.)
- b. The storeroom issued direct materials to the factory in the amount of \$19,000. (Form used: materials requisitions.)
- c. The direct labor cost was \$17,000.
- d. Factory overhead in the amount of \$12,000 was charged to jobs in process.
- e. Jobs having a total cost of \$47,500 were completed in the factory and transferred to the finished goods storeroom.
- f. Total cost of goods sold during the month was \$55,000.

3. Ending Inventories:

Materials	\$10,000
Work in Process.....	4,100
Finished Goods.....	4,150

P2-10

1.

Date	a. Form	b. Journal Entry	c. Book of Original Entry	d. Subsidiary Ledger
Mar. 31	Purchase Requisition (for 1,800 aluminum sheets)	None	None	None
Apr. 1	Purchase Order	None	None	Materials Ledger (if "On Order" column is used)
Apr. 6	Receiving Report Vendor's Invoice	Materials..... 42,500 Accounts Payable.....42,500 (1,700 sheets @ \$25)	Purchases Journal	Materials Ledger
Apr. 11	Receiving Report Vendor's Invoice	Materials..... 2,500 Accounts Payable2,500 (100 sheets @ \$25)	Purchases Journal	Materials Ledger
Apr. 16	Approved Invoice	Accounts Payable.....42,500 Cash41,650 Purchases Discount..... 850	Cash Payments Journal	None

P2-10 Concluded

	a. Form Used	b. Journal Entry	c. Book of Original Entry Used	d. Subsidiary Records Affected
Apr. 30	Materials Requisition	Work in Process..... 46,500 Materials..... 46,500 $\left[\begin{array}{rcl} 500 & \times & \$23 & = & \$11,500 \\ 1,400 & \times & \$25 & = & \underline{35,000} \\ & & & & \$46,500 \end{array} \right]$	General Journal	Materials Ledger Job Cost Ledger
Apr. 30	Returned Materials Report	Materials..... 500 Work in Process..... 500 (20 sheets @ \$25)	General Journal	Materials Ledger Job Cost Ledger
Apr. 30	Inventory Report	Factory Overhead (Inventory Short and Over).... 550 Materials..... 550 (22 sheets* @ \$25) *420 unused sheets - 398 sheets on hand	General Journal	Stores Ledger Factory Overhead Ledger

2.

$$\left[\begin{array}{rcl} 500 & \times & \$23 & = & \$11,500 \\ 1,380 & \times & \$25 & = & \underline{34,500} \\ & & & & \$46,000 \end{array} \right]$$

a. \$9,950 (398 × \$25) **b.** \$46,000 (\$46,500 - \$500)

P2-11

1. $200,000/50,000 = 4$ days
2. $25\% \times \$1,000,000 = \$250,000$
3. $[(200,000 \times (1 - .50))/50,000 = 2$ days
4. By reducing the average work in process by 50% while keeping the daily production constant, the velocity of production doubled.
5. $25\% \times (1/2 \times \$1,000,000) = \$125,000$

P2-12

1.

a. Raw and In-Process.....	150,000	
Accounts Payable		150,000
b. No entry		
c. Conversion Costs.....	25,000	
Payroll		25,000
d. Conversion Costs.....	100,000	
Various Credits		100,000
e. Finished Goods	275,000	
Raw and In-Process.....		150,000
Conversion Costs.....		125,000
f. Accounts Receivable	400,000	
Sales		400,000
Cost of Goods Sold.....	275,000	
Finished Goods.....		275,000
2.

e. No entry		
f. Cost of Goods Sold.....	275,000	
Raw and In-Process.....		150,000
Conversion Costs.....		125,000

P2-13

1.			
a.	Raw and In-Process	135,000	
	Accounts Payable		135,000
b.	No entry		
c.	Conversion Costs	20,000	
	Payroll.....		20,000
d.	Conversion Costs	80,000	
	Various Credits		80,000
e.	Finished Goods.....	235,000	
	Raw and In-Process		135,000
	Conversion Costs		100,000
f.	Accounts Receivable	355,000	
	Sales.....		355,000
	Cost of Goods Sold	235,000	
	Finished Goods		235,000
2.			
e.	No entry		
f.	Cost of Goods Sold	235,000	
	Raw and In-Process.....		135,000
	Conversion Costs.....		100,000

P2-14

a.	Factory Overhead (Inventory Over and Short)	26	
	Materials		26
	To adjust materials account to physical inventory count: $(10,000 - 9,950) \times \$0.52 = \$546$		
b.	Materials	775	
	Work in Process.....		775
c.	Work in Process	770	
	Factory Overhead (Repairs and Maintenance).....		770
d.	Accounts Payable.....	234	
	Factory Overhead (Shipping Charges on Returned Materials).....	35	
	Materials		234
	Cash		35

e.	Sales Returns and Allowances	5,000	
	Accounts Receivable.....		5,000
	Finished Goods.....	2,500	
	Cost of Goods Sold		2,500
f.	Work in Process.....	20,200	
	Factory Overhead (Supplies)	2,100	
	Materials		22,300
g.	Materials	25,685	
	Accounts Payable		25,685
h.	Materials	950	
	Work in Process.....		950
i.	Scrap Materials.....	685	
	Factory Overhead		685
j.	Spoiled Goods	60	
	Work in Process.....		60
k.	Cash	685	
	Scrap Materials		685

P2-15

1.			
a.	Work in Process	7,500	
	Materials		3,500
	Payroll.....		1,500
	Factory Overhead		2,500
b.	Spoiled Goods.....	300	
	Factory Overhead (Loss Due to Spoiled Goods).....	150	
	Work in Process.....		450
c.	Cash.....	300	
	Spoiled Goods		300
2.			
a.	Same as 1a above.		
b.	Spoiled Goods.....	300	
	Work in Process.....		300
c.	Same as 1c above.		

P2-16

1.	Spoiled Goods Inventory	1,350	
	Work in Process.....		1,350
2.	Work in Process	4,350	
	Materials		1,650
	Payroll.....		1,500
	Factory Overhead		1,200
3.	Work in Process	5,400	
	Materials (18 × \$117)		2,106
	Payroll (18 × \$100).....		1,800
	Factory Overhead (18 × \$83).....		1,494
4.	Cash	1,350	
	Spoiled Goods Inventory		1,350

REVIEW PROBLEM FOR CHAPTERS 1 & 2

P2-17R

1. and 3.

<i>Cash</i>			
Bal.	12,000	(b)	1,000
(e)	72,500	(g)	31,000
	84,500	(j)	6,000
6,950		(k)	2,000
		(l)	1,800
		(n)	2,000
		(s)	33,750
			77,550

<i>Prepaid Insurance</i>			
Bal.	3,000	(m)	400
2,600			

<i>Machinery</i>	
Bal.	125,000

<i>Accounts Receivable</i>			
(d)	126,375	(e)	72,500
53,875			

<i>Accum. Depr./Machinery</i>			
		Bal.	10,500
		(o)	1,200
			11,700

<i>Finished Goods</i>			
(q)	98,290	(r)	84,250
14,040			

<i>Office Equipment</i>	
Bal.	30,000

<i>Work in Process</i>			
Bal.	35,000	(q)	98,290
(a)	28,000		
(f)	54,340		
(p)	11,950		
	129,290		
31,000			

<i>Accum. Depr./Office Equipment</i>			
		Bal.	4,800
		(o)	400
			5,200

<i>Materials</i>			
Bal.	51,000	(f)	54,340
(c)	22,000		
	73,000		
18,660			

<i>Office Furniture</i>	
Bal.	20,000

<i>Factory Supplies</i>			
(b)	1,000	(h)	650
350			

<i>Accum. Depr./Office Furniture</i>			
		Bal.	2,500
		(o)	180
			2,680

P2-17R Continued

<i>Accounts Payable</i>			
(s)	33,750	Bal.	30,000
		(c)	22,000
		(i)	3,000
			55,000
		21,250	
<i>Capital Stock</i>			
		Bal.	182,200
<i>Retained Earnings</i>			
		Bal.	46,000
<i>Sales</i>			
		(d)	126,375
<i>Cost of Goods Sold</i>			
(r)	84,250		

<i>Payroll</i>			
(g)	31,000	(a)	31,000
<i>Factory Overhead</i>			
(a)	3,000	(p)	11,950
(h)	650		
(i)	3,000		
(l)	1,800		
(m)	300		
(n)	2,000		
(o)	1,200		
	11,950		
<i>Selling and Admin. Expense</i>			
(j)	6,000		
(k)	2,000		
(m)	100		
(o)	580		
(o)			
	8,680		

2.

a. Work in Process	28,000	
Factory Overhead	3,000	
Payroll		31,000
b. Factory Supplies	1,000	
Cash		1,000
c. Materials.....	22,000	
Accounts Payable		22,000
d. Accounts Receivable.....	126,375	
Sales.....		126,375
e. Cash.....	72,500	
Accounts Receivable.....		72,500

P2-17R Continued

f.	Work in Process	54,340	
	Materials		54,340
	Chain:		
	12,000 lbs. @ \$2.00	\$24,000	
	2,000 lbs. @ \$2.20	<u>4,400</u>	\$28,400
	Pulleys:		
	4,000 sets @ \$5.00	\$20,000	
	400 sets @ \$5.10	<u>2,040</u>	22,040
	Bolts and taps:		
	4,000 pounds @ \$.50		2,000
	Steel plates:		
	3,800 units @ \$.50		<u>1,900</u>
			<u>\$54,340</u>
g.	Payroll	31,000	
	Cash		31,000
h.	Factory Overhead	650	
	Factory Supplies		650
	(\$1,000 - \$350)		
i.	Factory Overhead	3,000	
	Accounts Payable		3,000
j.	Selling and Administrative Expense (Salaries)	6,000	
	Cash		6,000
k.	Selling and Administrative Expense (Advertising)	2,000	
	Cash		2,000
l.	Factory Overhead	1,800	
	Cash		1,800
m.	Selling and Administrative Expense (Insurance)	100	
	Factory Overhead	300	
	Prepaid Insurance		400

P2-17R Continued

n.	Factory Overhead	2,000	
	Cash		2,000
o.	Selling and Administrative Expense		
	(Depreciation of Office Equipment and Office Furniture) .	580	
	Factory Overhead	1,200	
	Accumulated Depreciation/Office Equipment.....		400
	Accumulated Depreciation/Office Furniture.....		180
	Accumulated Depreciation/Machinery		1,200
p.	Work in Process.....	11,950	
	Factory Overhead		11,950
q.	Finished Goods.....	98,290	
	Work in Process.....		98,290
	(\$35,000 + \$28,000 + \$54,340 + \$11,950 – \$31,000)		
r.	Cost of Goods Sold.....	84,250	
	Finished Goods		84,250
s.	Accounts Payable	33,750	
	Cash		33,750

P2-17R Continued**4.**

Pullman, Inc.
Statement of Cost of Goods Manufactured
For the Month Ended October 31, 20—

Materials:

Inventory, October 1	\$51,000	
Purchases	<u>22,000</u>	
Total cost of available materials	\$73,000	
Less inventory, October 31	<u>18,660</u>	
Cost of materials used		\$ 54,340
Direct labor		28,000
Factory overhead		<u>11,950</u>
Total manufacturing costs		\$ 94,290
Add work in process inventory, October 1		<u>35,000</u>
		\$ 129,290
Less work in process inventory, October 31		<u>31,000</u>
Cost of goods manufactured		<u>\$ 98,290</u>

5.

Pullman, Inc.
Income Statement
For the Month Ended October 31, 20—

Net sales		\$ 126,375
Cost of goods sold:		
Finished goods inventory, October 1	0	
Add cost of goods manufactured (see statement)	<u>\$98,290</u>	
Goods available for sale	\$98,290	
Less finished goods inventory, October 31	<u>14,040</u>	
Cost of goods sold		<u>84,250</u>
Gross profit on sales		\$ 42,125
Selling and administrative expenses		<u>8,680</u>
Net income		<u>\$ 33,445</u>

P2-17R Concluded

6.

Pullman, Inc. Balance Sheet October 31, 20—

Assets

Current assets:

Cash		\$ 6,950
Accounts receivable		53,875
Inventories:		
Finished goods	\$ 14,040	
Work in process	31,000	
Materials.....	<u>18,660</u>	63,700
Factory supplies		350
Prepaid insurance.....		<u>2,600</u>
Total current assets.....		\$127,475

Plant and equipment:

Machinery	\$ 125,000	
Less accumulated depreciation.....	<u>11,700</u>	\$113,300
Office equipment	\$ 30,000	
Less accumulated depreciation	<u>5,200</u>	24,800
Office furniture	\$ 20,000	
Less accumulated depreciation	<u>2,680</u>	<u>17,320</u>
Total plant and equipment.....		<u>155,420</u>
Total assets		<u>\$282,895</u>

Liabilities

Current liabilities:

Accounts payable	\$ 21,250
------------------------	-----------

Stockholders' Equity

Capital stock	\$182,200
Retained earnings, October 1	\$ 46,000
Net income for October	<u>33,445</u>
Retained earnings, October 31	<u>79,445</u>
Total stockholders' equity	<u>261,645</u>
Total liabilities and stockholders' equity	<u>\$282,895</u>

MINI-CASE 1

1. Savings from implementing JIT:

Reduction in rework costs ($\$300,000 \times 25\%$).....	\$75,000
Reduction in storage and handling ($\$250,000 \times 40\%$).....	100,000
Savings in carrying costs ($300,000 \times \$0.35$).....	<u>105,000</u>
Total savings.....	\$280,000
Less: Increase in changeover costs.....	<u>200,000</u>
Net advantage of JIT.....	\$80,000

2. Non-financial advantages:

- * Anticipated improvement in product quality
- * Frees up factory space for other uses.

Non-financial disadvantages:

- Interruptions in materials supply or strike by their own workers resulting in lost sales.
- Difficulty of workers to master JIT processes.

MINI-CASE 2

1. Inventory carrying costs such as storage space for raw materials, security, insurance, and spoilage and obsolescence should be reduced by a JIT system. Also, a JIT system can reduce nonvalue-added production activities such as moving materials and work in process, storage of work in process and finished goods, and inspection of work in process.
2. Yes, benefits to Torre's customers would include increased customer satisfaction due to quicker delivery, decreased cost of products due to some of the savings in carrying costs and production costs being passed on to the consumer, and higher quality products due to quality control techniques being practiced at the time an individual unit is produced.
3. Yes, inventory should not be accounted for using traditional job costing techniques. Products move through the system so rapidly in a JIT environment that it would not be cost effective to track production costs to them while in process. For example, a Raw and In-Process account may replace the Materials account, and the Work in Process and Finished Goods accounts may disappear in a backflush costing system.

INTERNET EXERCISE

1. The authors state that Whitney's biggest contribution to modern manufacturing was the development of interchangeable parts on a contract with the U.S. Army for the manufacture of 10,000 muskets.
 2. Ford took all of the elements of a manufacturing system---people, machines, tooling, and products---and arranged them in a continuous system for manufacturing the Model T automobile.
 3. The authors state that the breakdown of the "Ford system" resulted from: (a) the prosperity of the 1920's and the advent of labor unions which conflicted with the Ford system of marginalizing worker dignity and self esteem, and (b) product proliferation such as model changes, multiple colors, and options which did not fit well with Ford's standardization of manufacturing.
 4. The authors contend that after World War II Toyota was more successful than Ford in implementing "lean manufacturing" because: (a) it discovered that factory workers had more to contribute than sheer muscle power, and (b) it reduced setups to minutes and seconds, thus allowing small batches to be produced at one time, and an almost continuous flow of production.
-
1. General principles for using "lean metrics" include:
 - a. Keep it simple--- use metrics that are easy to compile and update.
 - b. Use tripwires---the daily or weekly metrics only need to alert you that a problem exists
 - c. Limit the metrics---each person or team should have no more than three to six metrics
 - d. Drill down when problems arise---when a "tripwire metric" indicates a deviation, you can investigate further to determine the source of the problem
 2. Materials handling benefits that result from using lean manufacturing principles include fewer moves, shorter travel distances, and simpler route structures. Also, the cellular layout reduces the queuing, delays, tracking effort, and confusion that accompany materials movement.
 3. Lot sizes tend to be larger in a functional environment due to the complexity of scheduling. It seems easier to schedule a small number of large lots rather than a large number of small lots.
 4. Employees benefit from a lean manufacturing environment because workcells are more self-contained and much information flow is within the cell. Workcells require teamwork to function effectively and instill motivations such as pride in the team and feelings of accomplishment.

5. Functional layouts require the product to move many times between departments with a separate operation at each. When the product is defective, it is often difficult to pinpoint where the defect occurred.
6. Customers benefit when a supplier adopts lean manufacturing by seeing improvement in quality. They also see faster response to requests for customized products or expedited delivery. In cellular layouts, it is easier and less costly to manufacture in smaller lots, thus more closely matching customer needs.