

# 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 materials 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 that 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) required safety stock.

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 that 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 telecommunications, 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.
  - b. The receiving clerk is responsible for supervising the receipt of incoming shipments. These duties include checking the quantity and quality of the goods received.
  - 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. An enterprise resource planning (ERP) system is a sophisticated computer system that coordinates the sales and production scheduling functions with the purchase and control of materials.
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. Many firms now use enterprise resource planning systems to control materials and electronic data interchange to communicate with suppliers and expedite the receipt of orders which might eliminate the use of some forms.
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 it is matched to the receiving report and purchase order and the following details are checked:
    - (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 bill of materials is a file contained in an enterprise resource planning system that lists all of the materials and components that make up a finished product. When orders are received from customers, the bill of material is used to compute the quantities of materials required. This information is used to prepare lists for the storeroom clerk or trigger purchase requisitions.
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 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. Weighted 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 materials 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 materials 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.

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".

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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 that 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.  
 Safety stock required ..... 2,500  
 Order point..... 6,000 lbs.
- b. 500 lbs. × 4 days ..... 2,000 lbs.

## E2-2

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

- 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

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

**E2-3 Concluded**

b.  $225,000 \text{ gals. (annual usage)} \div 3,000 \text{ gals. (per order)} = 75 \text{ orders}$

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

**E2-4**

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

\* \$20,000 + \$18,000 + \$16,000 + \$3,000 + \$9,000 + \$2,000

\*\* \$1,800 + \$1,300 + \$1,700

**E2-5**

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

**E2-6**

**FIFO method**

Date	RECEIVED			ISSUED			BALANCE		
	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount
8/1							1,250	250	312,500
8/8	1,000	275	275,000				1,250	250	
8/15				1,250	250	312,500	1,000	275	587,500
8/24	1,000	285	285,000	550	275	151,250	450	275	123,750
8/27				450	275	123,750	450	275	
				750	285	213,750	1,000	285	408,750
							250	285	71,250

Cost of materials used (issued): \$801,250; Cost of 8/31 inventory: \$71,250

**LIFO method**

Date	RECEIVED			ISSUED			BALANCE		
	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount
8/1							1,250	250	312,500
8/8	1,000	275	275,000				1,250	250	
8/15				800	250	200,000	1,000	275	587,500
8/24	1,000	285	285,000	1,000	275	275,000	450	250	112,500
8/27				200	250	50,000	450	250	
				1,000	285	285,000	1,000	285	397,500
							250	250	62,500

Cost of materials used (issued): \$810,000; Cost of 8/31 inventory: \$62,500

**E2-6 Concluded**

**Weighted average method**

Date	RECEIVED			ISSUED			BALANCE		
	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount	Quantity	Unit Price	Amount
8/1							1,250	250	312,500
8/8	1,000	275	275,000				2,250	261.111 <sup>1</sup>	587,500
8/15				1,800	261.111	470,000	450	261.111	117,500
8/24	1,000	285	285,000				1,450	277.586 <sup>2</sup>	402,500
8/27				1,200	277.586	333,103	250	277.586	69,397

Cost of materials used (issued): \$803,103; Cost of 8/31 inventory: \$69,397

1.
 
$$\begin{array}{r}
 1,250 \times 250 = 312,500 \\
 \underline{1,000 \times 275 = 275,000} \\
 2,250 \text{ kg.} \quad 587,500 / 2,250 = \$261.111 \text{ per kg.}
 \end{array}$$
  
2.
 
$$\begin{array}{r}
 450 \times 261.111 = 117,500 \\
 \underline{1,000 \times 285.000 = 285,000} \\
 1,450 \text{ kg.} \quad 402,500 / 1,450 = \$277.586 \text{ per kg.}
 \end{array}$$



**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
7/10				110	4.00	440.00	500	4.00	4,650.00
7/11				(10)	4.00	(40.00)	490	4.00	
7/15	500	5.00	2,500.00				500	4.50	4,210.00
7/20	(300)	5.00	(1,500.00)				500	4.00	
7/26				500	4.00	2,000.00	500	4.50	6,750.00
				100	4.50	450.00	500	4.00	
							200	5.00	5,250.00
							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	5,250.00
7/6				150	4.50	675.00	750	4.00	
							350	4.50	4,575.00
7/10				110	4.50	495.00	750	4.00	
							240	4.50	4,080.00
7/11				(10)	4.50	(45.00)	750	4.00	
							250	4.50	4,125.00
7/15	500	5.00	2,500.00				750	4.00	
							250	4.50	
							500	5.00	6,625.00
7/20	(300)	5.00	(1,500.00)				750	4.00	
							250	4.50	
7/26				200	5.00	1,000.00			
				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**

Weighted 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 <sup>1</sup>	(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

1. Material will be returned to vendor at its original purchase cost
2.
 

$750 \times 4.00 = 3,000$	4. $1,500 \times 4.4667 = 6,700$
$\underline{500 \times 4.50 = 2,250}$	$(300) \times 5.00 = (1,500)$
1,250 units	5,200/1,250 = 4.20
	1,200 units
	5,200/1,200 = 4.3333
3.
 

$1,000 \times 4.20 = 4,200$
$\underline{500 \times 5.00 = 2,500}$
1,500 units
$6,700/1,500 = 4.4667$

**E2-10**

<b>Inventory Method</b>	<b>Cost Transferred to Work in Process</b>	<b>Cost of Ending Inventory</b>
FIFO	\$4,450	\$2,800
LIFO	4,850	2,400
Weighted 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 cost of goods sold; the FIFO method will result in the lowest cost being charged to cost of goods sold; and the weighted 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 weighted 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, given that the number of units in inventory did not change.
- b. FIFO would show the highest net income for 2017. 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 2018, because it would continue to charge the latest and highest costs to cost of goods 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

**E2-13 Concluded**

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**

1.  $25,000 / 5,000 = 5$  days
2.  $25,000 - (25,000 \times 0.50) = 12,500$   
 $12,500 / 5,000 = 2.5$  days
3. a.  $0.15 \times \$500,000 = \$75,000$   
 b.  $0.15 \times (0.5 \times \$500,000) = \$37,500$

**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

**E2-15 Concluded**

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 Inventory.....	995	
	Factory Overhead (Loss Due to Spoiled Work).....	355*	
	Work in Process.....		1,350

\*Unit cost of completed work:  
 $\$108,000 \div 8,000 \text{ skirts} = \$13.50$   
 Sale of spoiled work as seconds..... 9.95  
 Loss due to spoiled work..... \\$ 3.55  
 100 units  $\times$   $\$3.55 = \$355$



**E2-20 Concluded**

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

**E2-21**

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

## PROBLEMS

### P2-1

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

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

$$\begin{aligned}
 3. \text{ } 25,000 \text{ units (annual usage)} \div 5,000 \text{ units (per order)} &= 5 \text{ orders} \\
 \text{Ordering cost: } 5 \text{ orders @ } \$50 \text{ per order} &= \underline{\$250}
 \end{aligned}$$

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

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

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

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

### P2-2

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

**P2-2 Concluded**

$$\begin{aligned}
 2. \text{ EOQ} &= \sqrt{\frac{2 \text{ CN}}{\text{K}}} \\
 &= \sqrt{\frac{2 \times \$194.45 \times 63,000}{\$ .50}} \\
 &= \sqrt{49,001,400} \\
 &= 7,000 \text{ units (rounded)}
 \end{aligned}$$

3. 63,000 units (annual usage)  $\div$  7,000 units (per order) = 9 orders  
 Ordering cost: 9 orders @ \$194.45 per order = \$1,750 (rounded)

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

$$\begin{aligned}
 \text{Carrying Cost} &= \text{Average Inventory} \times \text{Carrying Cost per Unit} \\
 &= 5,000 \times \$ .50 = \underline{\underline{\$2,500}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Total Cost} &= \text{Order Costs} + \text{Carrying Costs} \\
 &= \$1,750 + \$2,500 = \underline{\underline{\$4,250}}
 \end{aligned}$$

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

**P2-3**

Order Size <sup>1</sup>	Number of Orders <sup>2</sup>	Order Cost <sup>3</sup>	Avg Inv <sup>4</sup>	Carrying Cost <sup>5</sup>	Order & C. C. <sup>6</sup>
300	67	\$1,340	150	\$ 750	\$2,090
<b>400</b>	<b>50</b>	<b>1,000</b>	<b>200</b>	<b>1,000</b>	<b>2,000</b>
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

**P2-3 Concluded**

2. Annual requirement of 20,000 gallons divided by order size in column 1.
3. Number of orders  $\times$  \$20 cost per order.
4. Order size in column 1 divided by 2.
5. Average inventory in column 4  $\times$  \$5 per gallon carrying cost.
6. Total order cost in column 3 + total carrying cost in column 5.

**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  $\times$  Carrying Cost per Unit  
 $= 700 \text{ gals.} \times \$5 = \$3,500$
3. Since the EOQ does not change, the number of orders (50) does not change; therefore, the total order cost is still \$1,000 (or  $50 \times \$20$ ).

**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

		<b>MATERIALS LEDGER</b>									
		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 Continued**

c. Weighted average 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					40,000	3.025 <sup>1</sup>	121,000.00
11/5					49	30,000	3.025	90,750.00	10,000	3.025	30,250.00
11/8	113	50,000	3.30	165,000.00					60,000	3.25417 <sup>2</sup>	195,250.00
11/15					50	20,000	3.25417	65,083.40	40,000	3.25417	130,166.60
11/22	114	25,000	3.50	87,500.00					65,000	3.34872 <sup>3</sup>	217,666.60
11/28					51	30,000	3.34872	100,461.60	35,000	3.34872	117,205.00

$$\begin{aligned}
 1. \quad & 30,000 \times 3.00 = 90,000 \\
 & \underline{10,000 \times 3.10 = 31,000} \\
 & 40,000 \text{ units} \quad 121,000/40,000 = 3.025 \\
 2. \quad & 10,000 \times 3.025 = 30,250 \\
 & \underline{50,000 \times 3.300 = 165,000} \\
 & 60,000 \text{ units} \quad 195,250/60,000 = 3.25417 \\
 3. \quad & 40,000 \times 3.25417 = 130,166.80 \\
 & \underline{25,000 \times 3.50000 = 87,500.00} \\
 & 65,000 \text{ units} \quad 217,666.80/65,000 = 3.34872
 \end{aligned}$$

**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
Weighted 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. 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	4,834.40	
2/15					274	400	2.76	1,104.00	800	2.80		
2/16	Ret.	(90)	2.80	(252.00)					540	2.76	3,730.40	
2/18	712	1,000	2.83	2,830.00					710	2.80		
2/21					318	540	2.76	1,490.40	1,000	2.83	6,308.40	
						100	2.80	280.00	610	2.80	4,538.00	
									1,000	2.83		

P2-6 Continued

2. LIFO method

MATERIALS LEDGER												
Description <u>Plastic tubing ( ft. )</u>										Materials Ledger Account No. <u>906</u>		
RECEIVED						ISSUED				BALANCE		
Date	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. Weighted average method**

<b>MATERIALS LEDGER</b>											
<b>Description</b> <u>Plastic tubing ( ft. )</u>						<b>Materials Ledger Account No.</b> <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 <sup>1</sup>	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 <sup>2</sup>	3,471.04
2/18	712	1,000	2.83	2,830.00					2,250	2.8005 <sup>3</sup>	6,301.04
2/21					318	640	2.8005	1,792.32	1,610	2.8005	4,508.72

$$\begin{array}{r}
 1. \quad 940 \times 2.76 = 2,594.40 \\
 \quad 800 \times 2.80 = \underline{2,240.00} \\
 1,740 \text{ units} \quad 4,834.40/1,740 = 2.7784
 \end{array}$$

$$\begin{array}{r}
 2. \quad 1,340 \times 2.7784 = 3,723.04 \\
 \quad (90) \times 2.8000 = \underline{(252.00)} \\
 1,250 \text{ units} \quad 3,471.04/1,250 = 2.7768
 \end{array}$$

$$\begin{array}{r}
 3. \quad 1,250 \times 2.7768 = 3,471.04 \\
 \quad 1,000 \times 2.8300 = \underline{2,830.00} \\
 2,250 \text{ units} \quad 6,301.04/2,250 = 2.8005
 \end{array}$$

**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 .....	\$ 13,750
b. Materials .....	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.....	\$ 12,750
b. Materials.....	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.

	a.	b.	c.	d.
Date	Form	Journal Entry	Book of Original Entry	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 Payable .....2,500 (100 sheets @ \$25)	Purchases Journal	Materials Ledger
Apr. 16	Approved Invoice	Accounts Payable.....42,500 Cash .....41,650 Purchases Discount..... 850	Cash Payments Journal	None

**P2-10 Concluded**

Date	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  $\left[ \begin{array}{r} 500 \times \$23 = \$11,500 \\ 500 \times \$23 = \$11,500 \\ 1,400 \times \$25 = \underline{34,500} \\ \$46,500 \end{array} \right]$	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

\*Beg. Bal. 500 + purchased 1,800 – requisitioned 1,900 + returned 20 = 420

**2.**

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

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



**P2-11**

1.  $200,000/50,000 = 4$  days
2.  $25\% \times \$1,000,000 = \$250,000$
3.  $[(200,000 \times (1 - 0.50))/50,000 = 2$  days
4. By reducing the average work in process by 50% while keeping the daily production constant, the velocity of production doubled.
5.  $25\% \times (1/2 \times \$1,000,000) = \$125,000$
6. The cost of carrying inventory has been reduced by 50%.

**P2-12**

<b>1.</b>			
<b>a.</b>	Raw and In-Process.....	150,000	
	Accounts Payable .....		150,000
<b>b.</b>	No entry		
<b>c.</b>	Conversion Costs.....	25,000	
	Payroll.....		25,000
<b>d.</b>	Conversion Costs.....	100,000	
	Various Credits .....		100,000
<b>e.</b>	Finished Goods .....	275,000	
	Raw and In-Process.....		150,000
	Conversion Costs.....		125,000
<b>f.</b>	Accounts Receivable .....	400,000	
	Sales.....		400,000
	Cost of Goods Sold.....	275,000	
	Finished Goods.....		275,000
<b>2.</b>			
<b>e.</b>	No entry		
<b>f.</b>	Cost of Goods Sold.....	275,000	
	Raw and In-Process.....		150,000
	Conversion Costs.....		125,000

**P2-13**

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

**P2-14**

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

**P 2-14 Concluded**

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 (6 × \$50) .....	300
		Factory Overhead (Loss Due to Spoiled Goods).....	150
		Work in Process (6 × \$75) .....	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 (18 × \$75) .....  | 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 (18 × \$300) .....   | 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 |
| 5. | NOTE: You may want students to read the Differential Cost Analysis section of Ch. 10 before attempting Part 5 of this problem. Alternatively, you may wish to challenge them with Part 5 to see if they can determine the relevant items to this decision without first teaching them the concept. |       |       |

The cost of reconditioning the 15 defective motors is \$4,350 or \$290 each. Lloyd would be better off reconditioning the motors and selling them for \$400 for a gain of \$110 per unit versus selling them as is for \$75 each.

## REVIEW PROBLEM FOR CHAPTERS 1 &amp; 2

## P2-17R

1. and 3.

<i>Cash</i>			
Bal.	12,000	(b)	1,000
(e)	72,500	(g)	32,800
	84,500	(j)	6,000
6,950		(k)	2,000
		(l)	33,750
		(n)	2,000
			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
(b)	1,000	(h)	650
(c)	22,000		54,990
	74,000		
19,010			

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

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

**P2-17R Continued**

<i>Accounts Payable</i>	
(l) 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) 32,800	(a) 32,800
<i>Factory Overhead</i>	
(a) 4,800	(p) 11,950
(h) 650	
(i) 3,000	
(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	
	8,680

**2.**

<b>a.</b> Work in Process .....	28,000	
Factory Overhead .....	4,800	
Payroll .....		32,800
<b>b.</b> Materials .....	1,000	
Cash .....		1,000
<b>c.</b> Materials .....	22,000	
Accounts Payable .....		22,000
<b>d.</b> Accounts Receivable .....	126,375	
Sales .....		126,375
<b>e.</b> 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 lbs.	@	\$ .50			2,000
	Steel plates:					
	3,800 units	@	\$ .50		<u>1,900</u>	
					<u>\$ 54,340</u>	
g.	Payroll .....				32,800	
	Cash .....					32,800
h.	Factory Overhead .....				650	
	Materials .....					650
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.	Accounts Payable .....				33,750	
	Cash .....					33,750
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
	(Beg. Bal. \$35,000 + Dir. Labor \$28,000 + Dir. Materials \$54,340 + Factory OH 11,950 – End. Bal. \$31,000)		
r.	Cost of Goods Sold .....	84,250	
	Finished Goods.....		84,250



## P2-17R Continued

4.

**UltraLift Corp.**  
**Statement of Cost of Goods Manufactured**  
**For the Month Ended October 31, 20—**

## Materials:

Inventory, October 1 .....	\$51,000	
Purchases.....	<u>23,000</u>	
Total cost of available materials .....	\$74,000	
Less inventory, October 31 .....	<u>19,010</u>	
Cost of materials used.....	\$54,990	
Less indirect materials used.....	<u>650</u>	
Cost of materials used in production .....		\$ 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.

**UltraLift Corp.**  
**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.

**UltraLift Corp.  
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>19,010</u>	64,050		
Prepaid insurance .....		<u>2,600</u>		
Total current assets .....			<u>\$127,475</u>	

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><u>\$282,895</u></u>	

Liabilities

Current liabilities:

Accounts payable.....		\$ 21,250		
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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><u>\$282,895</u></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 ( $300,000 \times \$.35$ ).....	<u>105,000</u>
Total savings.....	\$280,000
Less: Increase in changeover costs.....	<u>200,000</u>
Net advantage of JIT.....	<u>\$ 80,000</u>

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 Phillips' 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.