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**Instructor's Manual
to accompany**

Introduction to Materials Management

Eighth Edition

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INTRODUCTION TO MATERIALS MANAGEMENT

CHAPTER 1

ANSWERS TO PROBLEMS

1.1	Sales		100%		100%
	Cost of manufacturing	60%		50%	
	Other costs	<u>30%</u>	<u>90%</u>	<u>30%</u>	<u>80%</u>
	Profit (percent of Sales)		10%		20%

Therefore a 10% reduction in the cost of manufacturing would produce a 100% increase in profit.

$$\begin{aligned}
 1.2 \quad \text{Profit} &= \text{Sales} - (\text{direct costs} + \text{overhead}) \\
 0.20 &= \text{Sales} - (0.60 \times \text{Sales} + 0.30) \\
 \text{Sales} &= \frac{0.5}{0.4} = 1.25 = 125\%
 \end{aligned}$$

To increase profits from 10% to 20% takes a 25% increase in sales but only a 10% decrease in costs. Good materials management can have a direct impact on profit. Note the cost of overhead has been left unchanged in this problem.

$$1.3 \quad \text{a. Weekly cost of goods sold} = \frac{\$12,000,000}{50} = \$240,000$$

$$\text{Value of 8 weeks' WIP} = 8 \times \$240,000 = \$1,920,000$$

$$\begin{aligned}
 \text{b. Value of 6 weeks' WIP} &= 6 \times \$240,000 = \$1,440,000 \\
 \text{Reduction in WIP} &= \$480,000
 \end{aligned}$$

$$1.4 \quad \text{a. Weekly cost of goods sold} = \frac{\$30,000,000}{50} = \$600,000$$

$$\text{Value of 10 weeks' WIP} = 10 \times \$600,000 = \$6,000,000$$

$$\begin{aligned}
 \text{b. Value of 5 weeks' WIP} &= 5 \times \$600,000 = \$3,000,000 \\
 \text{Reduction in WIP} &= \$3,000,000
 \end{aligned}$$

$$\text{Annual saving} = 20\% \times \$3,000,000 = \$600,000$$

1.5 Using \$1 million as the units:

			<u>As a % of sales</u>	
Sales	\$10.0			100%
Direct material	\$3.5		35%	
Direct labor	2.5		25%	
Overhead	<u>3.5</u>	<u>9.5</u>	<u>35%</u>	<u>95%</u>
Profit		\$0.5		5%

- a. From the above we can say: (in millions or M\$)

$$\begin{aligned} \text{Sales} &= \text{direct material} + \text{direct labor} + \text{overhead} + \text{profit (now 1M\$)} \\ &= .35(\text{sales}) + .25(\text{sales}) + 3.5 \text{ M\$} + 1.0 \text{ M\$} \\ .40 (\text{Sales}) &= 4.5 \text{ M\$} \end{aligned}$$

$$\text{Sales} = 11.25 \text{ M\$} = 11.25 \times \$1,000,000 = \$11,250,000$$

- Therefore there must be a \$1.25 million increase in sales.
- b. To increase profit by \$500,000 there must be a \$500,000 reduction in cost. Therefore direct material must be reduced by \$500,000. It therefore takes 2 ½ times the sales dollars to obtain the profit that would be realized in material reductions.
- c. As for b. Direct labor would have to be reduced by \$500,000.

MULTIPLE CHOICE QUESTIONS

1. Select the best answer to the following:
 - a. traditionally the supply-production-distribution functions have reported to different departments
 - b. the supply, production and distribution functions are part of a total system
 - c. materials flow into an organization, are processed in some way and distributed to the consumer
 - d. all the above are correct

2. Manufacturing is important to the economy because:
 - a. it generates wealth
 - b. it supports service industries
 - c. it adds value to products
 - d. all of the above

3. Which of the following is the best statement about the operating environment in which operations management functions?
 - a. most organizations do not need to worry about competition
 - b. customers are more demanding
 - c. government regulation is not important for companies
 - d. price is more important than quality

4. Which of the following statements is best regarding order winners?
 - a. they persuade a company's customers to choose its product
 - b. they are the same in every market
 - c. they are the same as order qualifiers, only better
 - d. they are present in every product

5. Which of the following strategies has the shortest delivery lead time and the least customer input?
 - a. make-to-order
 - b. configure-to-order
 - c. assemble-to-order
 - d. make-to-stock

6. Which of the following statements is best?
 - a. the supply chain includes all activities and processes to provide a product or service to a customer.
 - b. material in the supply chain usually flows from producer to customer.
 - c. the supply chain contains only one supplier.
 - d. all of the above are true.
 - e. a and b only are true.

7. Companies A and B supply company C, which supplies customers D and E. Which of the following statements is best?
- the supply chain for company A includes B, C, D, and E.
 - the supply chain for company B includes A, C, D and E.
 - the supply chain for company C includes A, B, D, and E.
 - all the above are true.
8. Which of the following statements is best?
- the basic elements of a supply chain are supply, production, and distribution
 - the elements of a supply chain are interdependent
 - design information generally flows from customer to supplier
 - all the above are true
9. Delivery lead time for an engineer-to-order product includes which of the following?
- Design, purchase, manufacture, assemble, ship
 - Design, manufacture, assemble, ship
 - Purchase, manufacture, assemble, ship
 - Purchase, assemble, ship
10. If a firm wishes to maximize profit, which of the following objectives are in conflict?
- Maximize customer service.
 - Minimize production costs.
 - Minimize inventory costs.
 - Minimize distribution costs.
- all the above
 - I and II only
 - I and III only
 - II and III only
11. Which of the following statements is best?
- The conflict between marketing, finance and production centers on customer service, disruption to production, and inventory levels.
 - Marketing's objectives can be met with higher inventories.
 - Finance's objectives can be met with higher inventories.
 - Production's objectives can be met with higher inventories.
- all of the above are true
 - I and II only are true
 - I, II and III only are true
 - I, II and IV only are true
 - II, III and IV only are true
12. Which of the following is normally a major activity of materials management?
- Manufacturing planning and control.
 - Physical supply/distribution.
- both I and II
 - neither I nor II
 - I only
 - II only

13. The objective of materials management is to:
- I. Provide the required level of customer service.
 - II. Maximize the use of the firm's resources.
- a. I only
 - b. II only
 - c. I and II
 - d. neither I nor II
14. Which of the following is/are primary activities of manufacturing planning and control?
- I. Production planning.
 - II. Implementation and control.
 - III. Inventory management.
- a. I and II only
 - b. II and III only
 - c. I and III only
 - d. all the above are primary activities
15. Which of the following is (are) input(s) to manufacturing planning and control?
- a. product description
 - b. process description
 - c. available facilities
 - d. quantities to be produced
 - e. all the above are inputs
16. Which of the following is NOT an activity of physical supply/distribution?
- a. transportation
 - b. factory inventory
 - c. warehousing
 - d. packaging
 - e. material handling
17. Materials management can be considered a balancing act because:
- I. There are trade-offs between customer service and the cost of providing the service.
 - II. Priority and capacity must be balanced.
- a. neither I nor II
 - b. I only
 - c. II only
 - d. I and II
18. If the cost of manufacturing (direct labor and materials) is 50% of sales and profit is 15% of sales, what would the profit percentage be if the direct costs of manufacturing was reduced from 50% to 47%?
- a. 3%
 - b. 6%
 - c. 12%
 - d. 15%
 - e. 18%

19. Which of the following are generally considered overall objectives of an organization?
- I. Providing good customer service.
 - II. Maintaining low levels of inventory investment.
 - III. Optimizing use of resources.
 - IV. Providing sufficient return on investment.
- a. I and II only
 - b. I, II and III only
 - c. I, III and IV only
 - d. all the above
20. The purpose of the materials management concept is:
- I. To manage materials in a production operation.
 - II. To have purchasing support the needs of production.
 - III. To have production support the needs of purchasing.
- a. II and III only
 - b. I and II only
 - c. I, II and III
 - d. I and III only
21. Making a pizza at a fast-food restaurant would be considered a form of:
- a. Engineer to order
 - b. Assemble to order
 - c. Make to stock
 - d. Make to order
22. Metrics in a supply chain are:
- a. Governed by the International Metric Commission
 - b. Measurements of performance
 - c. A charge passed on to customers
 - d. Not used on transportation
23. Performance measures in a supply chain:
- a. Should be objective
 - b. Are viewed mostly by finance
 - c. Must be measurements of one parameter only
 - d. Concentrate on cost only
 - e. Are not used once a process is automated
24. Which statement is best?
- a. Performance standards are set by the supplier
 - b. Performance standards set the goal
 - c. Performance measurements show how well you did
 - d. Both b and c are correct
25. Savings in the supply chain mostly are the result of:
- a. Members in the chain sharing information
 - b. Being able to ship in larger quantities
 - c. Members having clout with suppliers

- d. Sticking with local competition
 - e. Cutting cost after the design phase
26. Postponement is best described as:
- a. Delaying payment to a supplier until the goods have been sold
 - b. Delaying the removal of inventory until the last possible moment
 - c. Delaying the customer-specific differentiation until the last possible moment
 - d. Delaying the change to the BOM until the old components have been used up
27. Postponement is best used with items that:
- a. Have a long lead time and many product configurations
 - b. Are standardized and have short lead times
 - c. Experience a yield that you won't know until the product is complete
 - d. Suppliers with poor delivery performance
28. A channel master in a supply chain
- a. Initiates integration of a supply chain
 - b. Is the final customer in a supply chain
 - c. Is the largest member of a supply chain
 - d. Controls the raw material supplies in a supply chain
29. The process of managing the recovery, recycling and reuse of material is called
- a. Kaizen
 - b. Heijunka
 - c. Reverse logistics
 - d. Return material authorization
30. If the manufacturing lead time of an item is reduced by 50% the work in process inventory:
- a. Does not change
 - b. Is reduced by approximately 70%
 - c. Is reduced by approximately 50%
 - d. More information is needed for this problem

Answers.

1 d	2 d	3 b	4 a	5 e	6 e	7 c	8 d	9 a
10 a	11 d	12 a	13 c	14 d	15 e	16 b	17 d	18 e
19 d	20 b	21 b	22 b	23 a	24 d	25 a	26 c	27 a
28 a	29 c	30 c						