

Chapter 2 – Product costing: Manufacturing processes, cost terminology and cost flows**MULTIPLE CHOICE**

1. Which of the following types of organisations is most likely to have a raw materials inventory account?
- A retailer
 - A manufacturer
 - A service provider
 - A government unit

ANS: B PTS: 1 DIF: Easy OBJ: 2.1
NAT: AACSB: Analytic

2. Which of the following statements about manufacturing in a traditional environment is true?
- Factories are organised so that machines that are dissimilar are grouped together.
 - It is not desirable to accumulate raw materials inventory to serve as buffers in case of unexpected demand for products.
 - The process begins with a customer order and products are 'pulled' through the manufacturing process.
 - Partially completed inventory is accumulated in a work-in-process inventory account.

ANS: D PTS: 1 DIF: Easy OBJ: 2.1
NAT: AACSB: Analytic

3. A traditional manufacturing environment does not have which of the following?
- An automated production process
 - Trained employees
 - Extremely low levels of work-in-process inventory
 - Product cost information available

ANS: C PTS: 1 DIF: Easy OBJ: 2.1
NAT: AACSB: Analytic

4. Which of the following statements is true about manufacturing companies over the past 20 years?
- The grouping of machines into 'manufacturing cells' has increased.
 - Carrying large amounts of inventory is often less costly than carrying small amounts of inventory.
 - They have moved from a 'pull' approach to more of a 'push' approach.
 - The basic production process has changed very little over the past 20 years.

ANS: A PTS: 1 DIF: Medium OBJ: 2.1
NAT: AACSB: Analytic

5. Which of the following statements regarding the traditional manufacturing environment is not true?
- Machines are often put into 'manufacturing cells' whereby dissimilar machines are grouped together.
 - Raw material is 'pushed' to the next production area in anticipation of customer demand.
 - Manufacturers often have raw material, work-in-process, and finished goods inventory on hand.
 - Buffers of inventory may result in workers being less efficient.

ANS: A PTS: 1 DIF: Medium OBJ: 2.1
NAT: AACSB: Analytic

6. Lean production is focused on eliminating waste associated with all of the following except:
- moving products farther than required.
 - down time caused by people waiting for work to do.
 - providing excessive customer service.
 - over-processing a product.

ANS: C PTS: 1 DIF: Easy OBJ: 2.2
NAT: AACSB: Analytic

7. Under ideal conditions, companies operating in a _____ environment would reduce inventories of raw materials, work-in-process and finished goods to very low levels or even zero.
- volatile
 - just-in-time
 - traditional manufacturing
 - favourable

ANS: B PTS: 1 DIF: Easy OBJ: 2.2
NAT: AACSB: Analytic

8. Companies that operate in a lean production and just-in-time manufacturing environment are more likely to experience which of the following?
- Reduced manufacturing flexibility
 - Increased levels of raw materials inventory
 - Increased production time
 - Increased product quality

ANS: D PTS: 1 DIF: Easy OBJ: 2.2
NAT: AACSB: Analytic

9. A 'manufacturing cell' is defined as:
- grouping of all the machinery and equipment that are needed to make a product being available in one area of the factory.
 - restructuring of the factory so that the companies are able to manufacture products quickly.
 - an area in the warehouse where similar raw materials are grouped together.
 - grouping of all the factories that are engaged in manufacturing similar products.

ANS: A PTS: 1 DIF: Easy OBJ: 2.2
NAT: AACSB: Analytic

10. In a just-in-time environment, the production process often begins when:
- products are moved from raw materials to work-in-process.
 - a customer places an order.
 - the product is delivered to a customer.
 - products are moved from work-in-process to finished goods.

ANS: B PTS: 1 DIF: Easy OBJ: 2.2
NAT: AACSB: Analytic

11. Which of the following is an advantage of lean production and just-in-time (JIT) manufacturing systems?
- Deliver the product to the customer on time, even if the workers go on a strike.
 - Improved product quality and reduced processing time.

- c. Reduced reliance on highly skilled employees
- d. Increased reliance on few suppliers.

ANS: B PTS: 1 DIF: Easy OBJ: 2.2
NAT: AACSB: Analytic

12. Which of the following is a disadvantage of lean production and just-in-time (JIT) manufacturing systems?
- a. Increased customer delivery time
 - b. Increased product defects
 - c. Decreased flexibility of manufacturing facilities
 - d. Increased reliance on fewer suppliers

ANS: D PTS: 1 DIF: Medium OBJ: 2.2
NAT: AACSB: Analytic

13. Which of the following statements is true regarding the lean production and just-in-time (JIT) manufacturing systems?
- a. Customers are often less satisfied with the purchased product.
 - b. The number of product defects often increases.
 - c. The number of suppliers the company can purchase raw materials from often increases.
 - d. The factory is often restructured where dissimilar machines are grouped together.

ANS: D PTS: 1 DIF: Medium OBJ: 2.2
NAT: AACSB: Analytic

14. Which of the following is a characteristic of a lean production and just-in-time (JIT) manufacturing environment but not of a traditional manufacturing environment?
- a. Increased inventory levels
 - b. Increased product defects
 - c. Increased reliance on a select number of suppliers
 - d. Increased production time

ANS: C PTS: 1 DIF: Medium OBJ: 2.2
NAT: AACSB: Analytic

15. Which of the following is a characteristic of a traditional production environment but not of a lean production and just-in-time (JIT) manufacturing environment?
- a. Increase in the need for highly skilled labour
 - b. Increase in the need for highly reliable suppliers
 - c. Reduction in the motivation of the work force
 - d. Reduction in the processing time

ANS: C PTS: 1 DIF: Medium OBJ: 2.2
NAT: AACSB: Analytic

16. Which of the following is a risk that would more likely be seen in a lean production and just-in-time manufacturing environment than in a traditional production environment?
- a. Reduced customer satisfaction due to higher product defects
 - b. Reduced raw material supply bringing the production process to a halt
 - c. Increased inventory storage costs
 - d. Increased production time resulting in lost sales

ANS: B PTS: 1 DIF: Medium OBJ: 2.2
NAT: AACSB: Analytic

NAT: AACSB: Analytic

23. Which of the following types of employees would most likely have their wage be classified as direct labour?
- a. Factory maintenance worker
 - b. Factory supervisor
 - c. Managerial accountant
 - d. Assembly-line factory worker

ANS: D PTS: 1 DIF: Easy OBJ: 2.3
NAT: AACSB: Analytic

24. Which of the following types of employees would most likely have their wage be classified as indirect labour?
- a. Factory supervisor
 - b. Managerial accountant
 - c. Salesperson
 - d. Machine operator

ANS: A PTS: 1 DIF: Easy OBJ: 2.3
NAT: AACSB: Analytic

25. Manufacturing overhead includes:
- a. advertising costs.
 - b. indirect materials.
 - c. sales commissions.
 - d. shipping charges for finished goods.

ANS: B PTS: 1 DIF: Easy OBJ: 2.3
NAT: AACSB: Analytic

26. Which of the following is not an example of a manufacturing overhead cost?
- a. Shipping charges on finished products
 - b. Indirect materials
 - c. Indirect labour
 - d. Depreciation on factory equipment

ANS: A PTS: 1 DIF: Easy OBJ: 2.3
NAT: AACSB: Analytic

27. Which of the following is an example of a manufacturing overhead cost?
- a. Supplies used by administrative staff
 - b. Supplies used by a salesperson
 - c. Materials easily traced to a specific product
 - d. Lubricants used by factory maintenance workers

ANS: D PTS: 1 DIF: Easy OBJ: 2.3
NAT: AACSB: Analytic

28. Which of the following is not an example of manufacturing overhead costs?
- a. Fringe benefits paid to assembly-line workers
 - b. Depreciation of factory machinery
 - c. Overtime pay to factory supervisors
 - d. Insurance on factory machinery

ANS: A PTS: 1 DIF: Easy OBJ: 2.3
NAT: AACSB: Analytic

29. Which of the following is a product cost?
- a. Insurance on factory machinery
 - b. Insurance on delivery trucks
 - c. Lease expense on office computer
 - d. Advertising costs

ANS: A PTS: 1 DIF: Easy OBJ: 2.3
NAT: AACSB: Analytic

Refer to the Jasper Corporation information below.

Jasper Corporation

Jasper Corporation incurred the following costs in April:

| | | | |
|---------------------------|----------|------------------------------|----------|
| Salesperson's salaries | \$40 000 | Factory maintenance worker | \$20 000 |
| Factory insurance | 12 000 | Administrative utilities | 4000 |
| Factory supervisor salary | 30 000 | Administrative supplies | 1000 |
| Advertising | 15 000 | Delivery truck insurance | 2000 |
| Factory machine operator | 22 000 | Factory machine depreciation | 6000 |
| Direct materials used | 25 000 | Receptionist salary | 18 000 |

30. Total product costs are:
- a. \$130 000
 - b. \$155 000
 - c. \$115 000
 - d. \$117 000

ANS: C PTS: 1 DIF: Medium OBJ: 2.3
NAT: AACSB: Analytic

31. Total period costs are:
- a. \$86 000
 - b. \$38 000
 - c. \$40 000
 - d. \$80 000

ANS: D PTS: 1 DIF: Medium OBJ: 2.3
NAT: AACSB: Analytic

32. Products and their costs flow through a production facility in the following order:
- a. Work-in-process, finished goods, cost of goods sold
 - b. Raw materials, work-in-process, finished goods, cost of goods sold
 - c. Work-in-process, raw materials, cost of goods sold, finished goods
 - d. Work-in-process, cost of goods manufactured, cost of goods sold

ANS: B PTS: 1 DIF: Easy OBJ: 2.4
NAT: AACSB: Analytic

33. Which of the following increases the work-in-process account?
- a. Cost of goods sold
 - b. Raw material purchased
 - c. Administrative costs
 - d. Raw material used

ANS: D PTS: 1 DIF: Easy OBJ: 2.4
NAT: AACSB: Analytic

34. Which of the following decreases the work-in-process account?
- a. Raw materials used
 - b. Cost of goods manufactured
 - c. Direct labour
 - d. Manufacturing overhead

ANS: B PTS: 1 DIF: Easy OBJ: 2.4
NAT: AACSB: Analytic

35. Product costs that transfer into finished goods inventory are called:
- a. cost of goods manufactured.
 - b. cost of goods sold.
 - c. period costs.
 - d. raw materials used.

ANS: A PTS: 1 DIF: Easy OBJ: 2.4
NAT: AACSB: Analytic

36. Product costs that transfer out of finished goods are called:
- a. work-in-process.
 - b. cost of goods manufactured.
 - c. cost of goods sold.
 - d. period costs.

ANS: C PTS: 1 DIF: Easy OBJ: 2.4
NAT: AACSB: Analytic

37. Which of the following statements accurately describes manufacturing cost flows in a just-in-time (JIT) environment?
- a. Direct labour and overhead are maintained in a work-in-process account for long periods of time.
 - b. There is little need to maintain a cost of goods sold account.
 - c. There is little need to maintain raw materials, work-in-process, or finished goods accounts.
 - d. Manufacturing costs are maintained in the finished goods account for long periods of time.

ANS: C PTS: 1 DIF: Medium OBJ: 2.2|2.4
NAT: AACSB: Analytic

38. Which of the following types of companies would be the least likely to have the following cost pattern?

Raw materials → Work-in-Process → Finished Goods → Cost of goods sold

- a. Tyre manufacturer
- b. Computer software manufacturer
- c. Retailer/merchandiser
- d. Construction company

ANS: C PTS: 1 DIF: Easy OBJ: 2.4
NAT: AACSB: Reflective thinking

- b. net income.
- c. sales.
- d. non-manufacturing income.

ANS: B PTS: 1 DIF: Easy OBJ: 2.4
 NAT: AACSB: Analytic

Refer to the Michael's Manufacturing, Inc. information below.

Michael's Manufacturing, Inc.

Michael's Manufacturing, Inc. has the following information available for the month of July:

| | <u>Beginning</u> | <u>Ending</u> |
|---------------------------|------------------|---------------|
| Raw materials inventory | \$50 000 | \$ 62 000 |
| Work-in-process inventory | 80 000 | 55 000 |
| Finished goods inventory | 24 000 | 35 000 |
| Raw materials purchased | | \$120 000 |
| Direct labour costs | | 60 000 |
| Overhead costs | | 45 000 |

45. Raw materials used for July is:
- a. \$112 000
 - b. \$108 000
 - c. \$120 000
 - d. \$132 000

ANS: B PTS: 1 DIF: Easy OBJ: 2.4
 NAT: AACSB: Analytic

46. Cost of goods manufactured for July is:
- a. \$188 000
 - b. \$250 000
 - c. \$238 000
 - d. \$213 000

ANS: C PTS: 1 DIF: Medium OBJ: 2.4
 NAT: AACSB: Analytic

47. Cost of goods sold for July is:
- a. \$227 000
 - b. \$202 000
 - c. \$249 000
 - d. \$239 000

ANS: A PTS: 1 DIF: Medium OBJ: 2.4
 NAT: AACSB: Analytic

Refer to the Nate's Novelties, Inc. information below.

Nate's Novelties, Inc.

Nate's Novelties, Inc. has the following information available for July:

| | <u>Beginning</u> | <u>Ending</u> |
|---------------------------|------------------|---------------|
| Raw materials inventory | \$12 000 | \$ 9000 |
| Work-in-process inventory | 35 000 | 20 000 |
| Finished goods inventory | 20 000 | 44 000 |

| | |
|-------------------------|----------|
| Raw materials purchased | \$25 000 |
| Direct labour costs | 55 000 |
| Overhead costs | 35 000 |

48. Raw materials used for July is:

- a. \$21 000
- b. \$22 000
- c. \$25 000
- d. \$28 000

ANS: D PTS: 1 DIF: Easy OBJ: 2.4
 NAT: AACSB: Analytic

49. Cost of goods manufactured for July is:

- a. \$153 000
- b. \$103 000
- c. \$130 000
- d. \$133 000

ANS: D PTS: 1 DIF: Medium OBJ: 2.4
 NAT: AACSB: Analytic

50. Cost of goods sold for July is:

- a. \$106 000
- b. \$157 000
- c. \$129 000
- d. \$109 000

ANS: D PTS: 1 DIF: Medium OBJ: 2.4
 NAT: AACSB: Analytic

Refer to the Scott Products information below.

Scott Products

Scott Products manufactures high-quality running shoes. The following information is available for 2009:

| | <u>Beginning</u> | <u>Ending</u> |
|---------------------------|------------------|---------------|
| Raw materials inventory | \$ 65 000 | \$ 82 000 |
| Work-in-process inventory | 280 000 | 130 000 |
| Finished goods inventory | 90 000 | 120 000 |
| Raw materials purchased | | \$250 000 |
| Direct labour costs | | 340 000 |
| Factory rent | | 60 000 |
| Factory supplies | | 20 000 |
| Factory utilities | | 15 000 |
| Factory depreciation | | 30 000 |
| Marketing costs | | 25 000 |
| Administrative costs | | 100 000 |

In addition, 42 400 pairs were produced in 2009 out of which 40 900 pairs were sold for \$70 each.

51. Cost of goods manufactured for 2009 is:

- a. \$990 000

- b. \$973 000
- c. \$848 000
- d. \$865 000

ANS: C PTS: 1 DIF: Medium OBJ: 2.4
 NAT: AACSB: Analytic

52. What is net income for 2009? (ignore taxes)

- a. \$1 920 000
- b. \$2 025 000
- c. \$1 890 000
- d. \$2 045 000

ANS: A PTS: 1 DIF: Hard OBJ: 2.5
 NAT: AACSB: Analytic

53. Thompson Inc. has the following selected information available for 2009:

| | |
|------------------------------|-----------|
| Cost of goods manufactured | \$180 000 |
| Cost of goods sold | 150 000 |
| Direct labour costs incurred | 45 000 |
| Raw material purchased | 90 000 |
| Raw material used | 80 000 |
| Beginning work-in-process | 15 000 |
| Ending work-in-process | 9000 |

Manufacturing overhead costs in 2009 amounted to:

- a. \$39 000
- b. \$55 000
- c. \$49 000
- d. \$31 000

ANS: C PTS: 1 DIF: Medium OBJ: 2.4
 NAT: AACSB: Analytic

Refer to the Hillsborough Street Manufacturing Inc. information below.

Hillsborough Street Manufacturing Inc.

Hillsborough Street Manufacturing Inc. incurred the following costs in 2009:

| | |
|--------------------------------|----------|
| Direct materials used | \$37 000 |
| Direct labour costs | 45 000 |
| Factory rent and utilities | 18 000 |
| Factory equipment depreciation | 10 000 |
| Marketing expenses | 3000 |
| Administrative expenses | 9000 |

50 000 units were produced during the year out of which 40 000 units were sold for \$10 each. There was no beginning or ending raw materials or work-in-process inventory.

54. What is the product cost per unit?

- a. \$3.05
- b. \$2.75
- c. \$2.44
- d. \$2.20

ANS: D PTS: 1 DIF: Medium OBJ: 2.3
NAT: AACSB: Analytic

55. What is cost of goods sold for the year?
- a. \$ 88 000
 - b. \$ 97 600
 - c. \$122 000
 - d. \$110 000

ANS: A PTS: 1 DIF: Medium OBJ: 2.4
NAT: AACSB: Analytic

56. What is net income for the year?
- a. \$278 000
 - b. \$312 000
 - c. \$378 000
 - d. \$300 000

ANS: D PTS: 1 DIF: Hard OBJ: 2.4
NAT: AACSB: Analytic

Refer to the Hudson Inc. information below.

Hudson Inc.

Hudson Inc. has the following information available for September:

| | <u>Beginning</u> | <u>Ending</u> |
|------------------------------|------------------|---------------|
| Raw materials | \$ 8000 | \$ 5000 |
| Work-in-process | 30 000 | 40 000 |
| Finished goods | 7000 | 3000 |
| Raw materials purchased | | 25 000 |
| Direct labour costs | | 70 000 |
| Manufacturing overhead costs | | 30 000 |
| Administrative costs | | 12 000 |
| Marketing costs | | 6000 |

57. Total non-manufacturing costs for September are:
- a. \$113 000
 - b. \$161 000
 - c. \$ 18 000
 - d. \$ 43 000

ANS: C PTS: 1 DIF: Easy OBJ: 2.3
NAT: AACSB: Analytic

58. Cost of goods manufactured for September is:
- a. \$118 000
 - b. \$136 000
 - c. \$115 000
 - d. \$133 000

ANS: A PTS: 1 DIF: Medium OBJ: 2.4
NAT: AACSB: Analytic

59. Cost of goods sold for September is:

- a. \$119 000
- b. \$143 000
- c. \$140 000
- d. \$122 000

ANS: D PTS: 1 DIF: Medium OBJ: 2.4
NAT: AACSB: Analytic

60. Sales revenue for September totalled \$400 000. Net income for September is:

- a. \$257 000
- b. \$260 000
- c. \$264 000
- d. \$278 000

ANS: B PTS: 1 DIF: Medium OBJ: 2.4
NAT: AACSB: Analytic

61. In a traditional manufacturing environment, as the cost of goods sold account increases, which account is most likely decreasing?

- a. Work-in-process inventory
- b. Finished goods inventory
- c. Raw materials inventory
- d. Cash

ANS: B PTS: 1 DIF: Medium OBJ: 2.4
NAT: AACSB: Analytic

Refer to the Jones Manufacturing Inc. information below.

Jones Manufacturing Inc.

Jones Manufacturing Inc. incurred the following costs in November:

| | | | |
|----------------------------|----------|-----------------------------|---------|
| Direct labour | \$50 000 | Advertising costs | \$ 3000 |
| Indirect labour | 20 000 | Factory rent | 10 000 |
| Administrative salaries | 25 000 | Factory depreciation | 6000 |
| Direct materials purchased | 23 000 | Administrative rent | 5000 |
| Indirect materials used | 4000 | Administrative depreciation | 7000 |

In addition, the following information is also available:

| | <u>Beginning</u> | <u>Ending</u> |
|--|------------------|---------------|
| Raw materials | \$ 5000 | \$ 8000 |
| Work-in-process | 60 000 | 55 000 |
| Finished goods | 17 250 | 9200 |
| Number of units produced | | 20 000 units |
| Number of units sold (sales price of \$25 per unit) | | 21 400 units |

62. Cost of goods manufactured in November is:

- a. \$ 91 000
- b. \$115 000
- c. \$155 000
- d. \$143 000

ANS: B PTS: 1 DIF: Medium OBJ: 2.4
NAT: AACSB: Analytic

63. The product cost per unit in November is:
- a. \$4.55
 - b. \$7.75
 - c. \$5.75
 - d. \$5.37

ANS: C PTS: 1 DIF: Hard OBJ: 2.5
NAT: AACSB: Analytic

64. Net income for November is: (ignore taxes)
- a. \$371 950
 - b. \$411 950
 - c. \$369 150
 - d. \$382 000

ANS: A PTS: 1 DIF: Hard OBJ: 2.4
NAT: AACSB: Analytic

65. Johnson Manufacturing has the following selected information available for the year:

| | |
|---------------------------------|-----------|
| Direct material purchased | \$ 40 000 |
| Direct material used | 45 000 |
| Direct labour incurred | 75 000 |
| Manufacturing overhead incurred | 50 000 |
| Cost of goods manufactured | 100 000 |

In addition, the cost of the finished goods inventory increased by \$10 000 from the beginning to the end of the year. Cost of goods sold for the year is:

- a. \$ 80 000
- b. \$170 000
- c. \$ 90 000
- d. \$110 000

ANS: C PTS: 1 DIF: Hard OBJ: 2.4
NAT: AACSB: Analytic

66. Chancellor Industries, a manufacturing company, prepays its insurance coverage for a two-year period. The premium for two-year's worth of coverage is \$14 400 and is paid at the beginning of the first year. Two-thirds of the premium relates to factory operations and one-third relates to selling and administrative activities.

The amount of premium that should be recorded as a product cost for the first year is:

- a. \$ 4800
- b. \$ 2400
- c. \$ 9600
- d. \$14 400

ANS: A PTS: 1 DIF: Hard OBJ: 2.5
NAT: AACSB: Analytic

67. Clapton Inc. would like to prepare an income statement for March. Their production department records show that total product costs in March were \$225 000 when 50 000 units were produced. Their sales department records show that 46 000 units were sold for \$16 each. Monthly administrative and marketing expenses totalled \$60 000. What should be net income for March?
- a. \$529 000
 - b. \$473 800
 - c. \$451 000
 - d. \$469 000

ANS: D PTS: 1 DIF: Hard OBJ: 2.5
NAT: AACSB: Analytic

68. Which of the following statements is true regarding period costs?
- a. They 'attach' themselves to the product.
 - b. They will appear on the balance sheet until the product is sold.
 - c. They will appear on the income statement in the year they are incurred.
 - d. They will not impact gross margin or net income.

ANS: C PTS: 1 DIF: Easy OBJ: 2.5
NAT: AACSB: Analytic

Refer to the Franklin Street Manufacturing information below.

Franklin Street Manufacturing

Franklin Street Manufacturing has the following cost information available for 2009:

| | |
|-------------------------|----------|
| Direct materials used | \$10 000 |
| Direct labour costs | 25 000 |
| Factory overhead | 20 000 |
| Marketing expenses | 4000 |
| Administrative expenses | 6000 |

20 000 units were produced during the year out of which 19 000 units were sold for \$10 each.

69. What is cost of goods sold for 2009?
- a. \$55 000
 - b. \$52 250
 - c. \$61 750
 - d. \$65 000

ANS: B PTS: 1 DIF: Medium OBJ: 2.4
NAT: AACSB: Analytic

70. What is net income for 2009?
- a. \$127 750
 - b. \$137 750
 - c. \$125 000
 - d. \$128 250

ANS: A PTS: 1 DIF: Hard OBJ: 2.4
NAT: AACSB: Analytic

71. Brenda's Bakery has the following information available for October:

| | | |
|---------------|------------------|---------------|
| | <u>Beginning</u> | <u>Ending</u> |
| Raw materials | \$ 4000 | \$ 2000 |

| | | |
|-------------------------------|--------|--------|
| Work-in-process | 32 000 | 17 000 |
| Finished goods | 5000 | 3000 |
| Cost of goods manufactured | | 88 000 |
| Cost of goods sold | | 90 000 |
| Direct labour costs | | 35 000 |
| Factory rent and depreciation | | 10 000 |
| Selling expenses | | 3000 |

How much raw material was purchased in October?

- a. \$23 000
- b. \$25 000
- c. \$26 000
- d. \$28 000

ANS: C PTS: 1 DIF: Hard OBJ: 2.4
 NAT: AACSB: Analytic

SHORT ANSWER

1. Provide specific examples of why accurate product or service costing information is important for internal purposes.

ANS:

It may be useful for the following reasons:

- to determine accurate pricing information
- to determine a product's profitability
- for cash budgeting purposes

PTS: 1 DIF: Easy OBJ: 2.1 NAT: AACSB: Analytic

2. Briefly compare a traditional manufacturing environment with a lean production and just-in-time (JIT) manufacturing environment.

ANS:

In a traditional environment, inventories of raw materials, work-in-process, and finished goods are accumulated in order to act as buffers in the event of unexpected demand. Typically, there is a 'push' approach where the manufacturing process is started before the customer order is taken and inventory is subsequently pushed through the manufacturing process. In addition, the factory is organised where similar machines are grouped together. Machine operators do not need to be highly trained because they use very few different machines.

In a lean production and just-in-time (JIT) environment, there is a 'pull' approach where the manufacturing process is not started until a customer order is taken. Buffers of inventory are not accumulated. In addition, the factory is laid out in manufacturing cells where all the machinery needed to make a product is available in one area. There is usually a limited number of highly reliable suppliers used and employees need to be highly trained and reliable as well. Emphasis is placed on reducing waste by not producing more product than is needed, not over-processing a product, not moving products or people more than is needed, and eliminating down time caused by people waiting for work to do and products waiting in mid-assembly.

PTS: 1 DIF: Medium OBJ: 2.2 NAT: AACSB: Analytic

3. Describe the cost accumulation process in a traditional manufacturing environment versus a just-in-time (JIT) environment.

ANS:

In a traditional manufacturing environment, when raw materials are received, their cost is recorded in the raw materials account until they are needed for production. When raw materials are needed for production, their costs are moved from the raw materials account to the work-in-process account to be added to direct labour and overhead costs. Once production is complete, all product costs related to the completed units are transferred from work-in-process to the finished goods account until the units are sold. When sold, associated costs are transferred to cost of goods sold. In a just-in-time environment, very little, if any, inventories are maintained. As raw materials, direct labour, and overhead costs are incurred for a specific job, the costs are often put directly into the cost of goods sold account. The cost accumulation process in a just-in-time environment is called backflush costing.

PTS: 1

DIF: Easy

OBJ: 2.4

NAT: AACSB: Analytic

4. Identify at least two characteristics of a lean production and just-in-time (JIT) manufacturing environment.

ANS:

Some of the characteristics are as follows:

- the absence of inventories
- the use of manufacturing cells
- a 'pull' system
- fewer but highly reliable suppliers
- focus on reduction of waste and scrap
- trained and reliable employees

PTS: 1

DIF: Easy

OBJ: 2.2

NAT: AACSB: Analytic

5. Identify some of the benefits and risks of a lean production and just-in-time (JIT) environment.

ANS:

Benefits:

- Greater efficiency in the time it takes to make a product
- Reduced inventory storage and holding costs
- Higher quality products (reduction in product defects)
- Increased customer satisfaction
- Increased employee motivation
- A reduction of waste and scrap
- Lower overall production costs
- Lower labour costs
- Increased manufacturing flexibility

Risks:

- Increased raw materials cost (sometimes)
- Disruption in raw material or direct labour supply can halt the production process leading to lost sales.

PTS: 1

DIF: Medium

OBJ: 2.2

NAT: AACSB: Analytic

6. Describe each of the following as either a *product* or *period* cost.

- | | |
|----------------------------------|---|
| a. Factory depreciation | f. Direct materials |
| b. Indirect labour | g. Indirect materials |
| c. Administrative salaries | h. Advertising |
| d. Direct labour | i. Factory insurance |
| e. Utilities used in the factory | j. Utilities used in the administrative offices |

ANS:

- | | |
|------------|------------|
| a. product | f. product |
| b. product | g. product |
| c. period | h. period |
| d. product | i. product |
| e. product | j. period |

PTS: 1

DIF: Easy

OBJ: 2.3

NAT: AACSB: Analytic

7. Briefly describe the difference between a manufacturing and a non-manufacturing cost.

ANS:

A manufacturing cost is a cost incurred in the factory as a result of the production process. Manufacturing costs consist of direct materials, direct labour, and overhead. These costs are often called product costs because the costs attach themselves to the product and are considered to be inventory on the balance sheet until the product is sold. Non-manufacturing costs are incurred outside of the factory. These costs are often called period costs and are expensed on the income statement in the period incurred.

PTS: 1

DIF: Easy

OBJ: 2.3

NAT: AACSB: Analytic

8. Identify with an 'X' the following costs as either a manufacturing (product) or non-manufacturing (period) cost. If it is a manufacturing cost, further identify it as either direct material (DM), direct labour (DL), or overhead (OH).

| | Manufacturing Cost | | | Non-manufacturing Cost |
|-----------------------------------|--------------------|----|----|------------------------|
| | DM | DL | OH | |
| Indirect labour | | | | |
| Factory supplies | | | | |
| Material easily traced to product | | | | |
| Administrative salaries | | | | |
| Factory rent | | | | |
| Indirect materials | | | | |
| Shipping costs | | | | |
| Administrative building utilities | | | | |
| Factory equipment depreciation | | | | |
| Machine operator | | | | |

ANS:

| | Manufacturing Cost | | | Non-manufacturing Cost |
|-----------------|--------------------|----|----|------------------------|
| | DM | DL | OH | |
| Indirect labour | | | X | |

| | | | | |
|-----------------------------------|---|---|---|---|
| Factory supplies | | | X | |
| Material easily traced to product | X | | | |
| Administrative salaries | | | | X |
| Factory rent | | | X | |
| Indirect materials | | | X | |
| Shipping costs | | | | X |
| Administrative building utilities | | | | X |
| Factory equipment depreciation | | | X | |
| Machine operator | | X | | |

PTS: 1 DIF: Medium OBJ: 2.3 NAT: AACSB: Analytic

9. Classify the following as either direct labour (DL), indirect labour (IL), or a period cost (P).

- a. Factory maintenance worker
- b. Company president
- c. Assembly-line worker
- d. Salesperson working on commission
- e. Factory supervisor
- f. Administrative assistant
- g. Machine operator

ANS:

- a. IL b. P c. DL d. P e. IL f. P g. DL

PTS: 1 DIF: Easy OBJ: 2.3 NAT: AACSB: Analytic

10. Classify each of the following as either a direct material (DM), indirect material (IM), or period cost (P).

- a. Wood used to build custom bookshelves
- b. Sandpaper, glue, and nails used to build customer bookshelves
- c. Paper supplies used in the administrative offices
- d. Computer chips used in computer
- e. Cleaning supplies used in the factory

ANS:

- a. DM b. IM c. P d. DM e. IM

PTS: 1 DIF: Easy OBJ: 2.3 NAT: AACSB: Analytic

PROBLEM

1. Capital Manufacturing produces a unique souvenir product for various museums around the country. During the year, the company incurred the following costs:

| | |
|------------------------|----------|
| Direct material used | \$50 000 |
| Direct labour | 80 000 |
| Manufacturing overhead | 30 000 |
| Marketing expenses | 10 000 |

Administrative expenses

20 000

During the year, 25 000 units were produced out of which 20 000 units were sold for \$15 each.

Required:

- A. Calculate the total product costs incurred for the year.
- B. What is the product cost per unit?
- C. What is cost of goods sold for the year?
- D. What is net income for the year?

ANS:

- A. Total product costs = \$160 000 (\$50 000 + \$80 000 + \$30 000)
- B. Product cost per unit = \$6.40 (\$160 000/25 000 units)
- C. Cost of goods sold = \$128 000 (\$6.40 per unit × 20 000 units sold)
- D. Net income = \$142 000 [(20 000 × \$15) – 128 000 – 30 000]

PTS: 1

DIF: Medium

OBJ: 2.4

NAT: AACSB: Analytic

2. McClintock Manufacturing Inc. has the following information available for the month of July:

| | Beginning | Ending |
|----------------------------------|-----------|----------|
| Raw materials inventory | \$12 000 | \$ 8000 |
| Work-in-process inventory | 45 000 | 55 000 |
| Finished goods inventory | 9000 | 11 000 |
| Raw materials purchased | | \$45 000 |
| Direct labour costs | | 80 000 |
| Overhead costs | | 30 000 |
| Selling and administrative costs | | 20 000 |

Required:

- A. Calculate raw materials used for July.
- B. Calculate cost of goods manufactured for July.
- C. Calculate cost of goods sold for July.
- D. Assume that sales revenue totalled \$250 000, calculate net income for July. (ignore taxes)

ANS:

- A. Raw materials used = \$49 000 (\$12 000 + \$45 000 – \$8000)
- B. Cost of goods manufactured = \$149 000 (\$45 000 + \$49 000 + \$80 000 + \$30 000 – \$55 000)
- C. Cost of goods sold = \$147 000 (\$9000 + \$149 000 – \$11 000)
- D. Net Income = \$83 000 (\$250 000 – \$147 000 – \$20 000)

PTS: 1

DIF: Medium

OBJ: 2.4

NAT: AACSB: Analytic

3. Pearce Manufacturing Inc. incurred the following costs in February:

| | | | |
|-------------------------|----------|-----------------------------|--------|
| Direct labour | \$40 000 | Advertising costs | \$1000 |
| Indirect labour | 15 000 | Factory rent | 4000 |
| Administrative salaries | 8000 | Factory depreciation | 2000 |
| Raw materials purchased | 10 000 | Administrative rent | 3000 |
| Indirect materials used | 4000 | Administrative depreciation | 1000 |

In addition, the following information is also available:

| | <u>Beginning</u> | <u>Ending</u> |
|--|------------------|---------------|
| Raw materials | \$ 2000 | \$ 4000 |
| Work-in-process | 25 000 | 18 000 |
| Finished goods | 4000 | 12 000 |
| Number of units produced | | 10 000 units |
| Number of units sold (sales price of \$25 per unit) | | 9000 units |

Required:

- Calculate total period costs.
- Calculate raw materials used.
- Calculate cost of goods manufactured.
- Calculate the product cost per unit.
- Calculate cost of goods sold.
- Calculate net income. (ignore taxes)

ANS:

- Total period costs = \$13 000 (8000 + 1000 + 3000 + 1000)
- Raw Material used = \$8000 (2000 + 10 000 – 4000)
- Cost of goods manufactured = \$80 000
(25 000 + 8000 + 40 000 + 15 000 + 4000 + 4000 + 2000 – 18 000)
- Product cost = \$8.00 per unit (\$80 000/10 000 units)
- Cost of goods sold = \$72 000 (9000 units sold × \$8.00)
- NI = \$140 000 [(9000 × \$25) – 72 000 – 13 000]

PTS: 1

DIF: Hard

OBJ: 2.4

NAT: AACSB: Analytic

- Creative Products Inc. incurred the following costs (in alphabetical order) during 2005 related to one of its products:

| | |
|--------------------------------|---------|
| Administrative costs | \$ 2000 |
| Advertising costs | 1000 |
| Direct material used | 8000 |
| Direct labour | 20 000 |
| Factory equipment depreciation | 1000 |
| Factory rent | 5000 |
| Indirect labour | 3000 |
| Indirect materials | 2000 |

During the year, 3000 units were produced out of which 2750 units were sold for \$30 each.

Required:

- Calculate the total product costs incurred for the year.

- B. What is the product cost per unit?
- C. What is cost of goods sold for the year?
- D. What is net income for the year?

ANS:

- A. Total product costs = \$39 000 (8000 + 20 000 + 5000 + 3000 + 2000 + 1000)
- B. Product cost per unit = \$13.00 (\$39 000/3000)
- C. Cost of goods sold = \$35 750 (2750 × \$13)
- D. Net Income = 43 750 [(\$30 × 2750) – 35 750 – 2000 – 1000]

PTS: 1

DIF: Hard

OBJ: 2.4

NAT: AACSB: Analytic

5. The following information is available for the Brown Company for the month ended 31 July:

| | |
|--------------------------------|-----------|
| Direct materials purchased | \$ 21 000 |
| Direct labour (2500 hrs@\$12) | 30 000 |
| Indirect labour | 3000 |
| Indirect materials | 2500 |
| Office supplies expense | 100 |
| Factory equipment depreciation | 2000 |
| Office Equipment depreciation | 750 |
| Administrative expenses | 20 000 |
| Office utilities | 75 |
| Factory utilities | 200 |
| Marketing expense | 2500 |
| Sales revenue | 150 000 |
| Sales commissions expense | 1500 |

| | <u>Beginning</u> | <u>Ending</u> |
|----------------------------|------------------|---------------|
| Direct materials inventory | \$27 000 | \$ 24 500 |
| Work in process inventory | 25 000 | 29 000 |
| Finished Goods inventory | 22 000 | 15 000 |

Required:

- A. Determine the direct materials used in July.
- B. Determine cost of goods manufactured in July.
- C. Determine cost of goods sold for July.
- D. Prepare an income statement for July. (ignore taxes)

ANS:

- A.

| | |
|----------------------------|-----------------|
| Beginning direct materials | \$27 000 |
| Direct materials purchased | <u>21 000</u> |
| Direct materials available | 48 000 |
| Ending direct materials | <u>(24 500)</u> |
| Direct materials used | \$23 500 |

- B.

| | |
|-------------------------------------|----------|
| Beginning work-in-process inventory | \$25 000 |
| Direct material used | 23 500 |
| Direct labour | 30 000 |
| Overhead: | |

| | | | |
|----|------------------------------------|------------|-----------------|
| | Indirect labour | \$3000 | |
| | Indirect materials | 2500 | |
| | Factory equipment depreciation | 2000 | |
| | Factory utilities | <u>200</u> | |
| | Total overhead | | <u>7700</u> |
| | Total manufacturing costs | | 86 200 |
| | Ending work-in-process inventory | | <u>(29 000)</u> |
| | Cost of goods manufactured | | \$57 200 |
| C. | Beginning finished goods inventory | | \$22 000 |
| | Cost of goods manufactured | | <u>57 200</u> |
| | Cost of goods available | | 79 200 |
| | Ending finished goods inventory | | <u>(15 000)</u> |
| | Cost of goods sold | | \$64 200 |

D.

Brown Company
Income Statement
For the Month Ended 31 July

| | | |
|-------------------------------|-------------|------------------|
| Sales revenue | | \$150 000 |
| Cost of goods sold | | <u>(64 200)</u> |
| Gross Profit | | 85 800 |
| Operating expenses: | | |
| Office Supplies expense | \$ 100 | |
| Office equipment depreciation | 750 | |
| Administrative expenses | 20 000 | |
| Office utilities | 75 | |
| Marketing expense | 2500 | |
| Sales commissions | <u>1500</u> | <u>(24 925)</u> |
| Net income | | <u>\$ 60 875</u> |

PTS: 1

DIF: Hard

OBJ: 2.4

NAT: AACSB: Analytic