Chapter 4: Process Costing and Hybrid Product-Costing Systems

MULTIPLE CHOICE QUESTIONS

1. Process costing is used to account for:
   A. large numbers of identical products that are produced in a continuous manufacturing environment.
   B. small numbers of products that are produced in batches.
   C. raw materials that are converted directly to finished goods.
   D. finished goods that are refined and processed further.
   E. large numbers of products that are produced in a non-repetitive process.

   Answer: A LO: 1 Type: RC

2. Which of the following manufacturers would most likely not use a process-cost accounting system?
   A. A producer of computer monitors.
   B. A paint manufacturer.
   C. A producer of frozen orange juice.
   D. A builder of customized yachts.
   E. A lumber mill.

   Answer: D LO: 1 Type: RC

3. Process costing would be used in all of the following industries except:
   A. petroleum refining.
   B. chemicals.
   C. truck tire manufacturing.
   D. wood pulp production.
   E. automobile repair.

   Answer: E LO: 1 Type: RC

4. Which of the following companies would likely use a process-costing system?

	Custom Furniture Manufacturer	Chemical Producer	Soft Drink Bottler
A.	Yes	Yes	Yes
B.	Yes	Yes	No
C.	No	Yes	No
D.	No	Yes	Yes
E.	No	No	Yes

   Answer: D LO: 1 Type: RC

5. Which of the following statements regarding similarities between process costing and job-order costing are true?

   I. Both systems assign production costs to units of output.
   II. Both systems require extensive knowledge of financial accounting.
   III. The flow of costs through the manufacturing accounts is essentially the same.

   A. I only.
   B. I and III.
   C. II and III.
   D. III only.
   E. I, II, and III.

   Answer: B LO: 1 Type: RC

6. Companies that use a process-cost accounting system would:
   A. establish a separate Work-in-Process Inventory account for each manufacturing department.
   B. establish a separate Finished-Goods Inventory account for each manufacturing department.
   C. pass completed production directly to Cost of Goods Sold.
   D. charge goods produced with actual overhead amounts rather than applied overhead amounts.
   E. eliminate the need for the Finished-Goods Inventory account.

   Answer: A LO: 1 Type: RC

7. Which of the following statements is <u>false</u>?
   A. In job-order costing, costs are accumulated by job order.
   B. In process costing, costs are accumulated by department.
   C. In process costing, the cost per unit in a department is found by spreading the period's manufacturing costs over the production activity.
   D. In process costing, the total cost of each unit is found by dividing the total factory costs by the number of units completed.
   E. In job-order costing, the unit cost is found by dividing the job's total cost by the job's total units.

   Answer: D LO: 1 Type: RC

8. In a process-costing system, manufacturing costs are accumulated by:
   A. batch.
   B. batch and time period.
   C. department.
   D. department and time period.
   E. department or process, and time period.

   Answer: E LO: 1 Type: N

9. Which of the following choices correctly shows how costs are accumulated in a process-costing system?

	By Batch	By Time Period	By Process or Department
A.	Yes	Yes	Yes
B.	Yes	Yes	No
C.	No	Yes	No
D.	No	Yes	Yes
E.	No	No	Yes

Answer: D LO: 1 Type: N

10. Morrison, Inc., which uses a process-cost accounting system, passes completed production from Department A to Department B for further manufacturing. The journal entry to record completed production in Department A requires:
    A. a debit to Work-in-Process Inventory and a credit to Finished-Goods Inventory.
    B. a debit to Finished-Goods Inventory and a credit to Work-in-Process Inventory.
    C. a debit to Finished-Goods Inventory and a credit to Work-in-Process Inventory: Department A.
    D. a debit to Work-in-Process Inventory: Department A and a credit to Work-in-Process Inventory: Department B.
    E. a debit to Work-in-Process Inventory: Department B and a credit to Work-in-Process Inventory: Department A.

Answer: E LO: 2 Type: A

11. Greene, Inc., which uses a process-costing system, transfers completed production from Department no. 1 to Department no. 2 for further work. Which of the following best describes the account that would be debited to record this transfer?
    A. Cost of Goods Transferred.
    B. Finished-Goods Inventory: Department no. 1.
    C. Finished-Goods Inventory: Department no. 2.
    D. Work-in-Process Inventory: Department no. 1.
    E. Work-in-Process Inventory: Department no. 2.

Answer: E LO: 2 Type: A

12. Barnes, Inc., which uses a process-costing system, transfers completed production from Department no. 1 to Department no. 2 for further work. Which of the following best describes the account that would be credited to record this transfer?
    A. Cost of Goods Transferred.
    B. Finished-Goods Inventory: Department no. 1.
    C. Finished-Goods Inventory: Department no. 2.
    D. Work-in-Process Inventory: Department no. 1.
    E. Work-in-Process Inventory: Department no. 2.

Answer: D LO: 2 Type: A

13. Hamilton, which uses a process-costing system, had a balance in its Work-in-Process account of $68,000 on January 1. The account was charged with direct materials, direct labor, and manufacturing overhead of $450,000 throughout the year. If a review of the accounting records determined that $86,000 of goods were still in production at year-end, Hamilton should make a journal entry on December 31 that includes:
    A. a debit to Cost of Goods Sold for $432,000.
    B. a credit to Finished-Goods Inventory for $432,000.
    C. a credit to Work-in-Process Inventory for $432,000.
    D. a debit to Finished-Goods Inventory for $86,000.
    E. a credit to Work-in-Process Inventory for $86,000.

    Answer: C LO: 2 Type: A

14. Unit costs in a process-costing system are derived by using:
    A. in-process units.
    B. completed units.
    C. physical units.
    D. equivalent units.
    E. a measure of activity other than those listed above.

    Answer: D LO: 3 Type: RC

15. Barnett Corporation had 6,500 units of work in process on April 1. During April, 19,100 units were completed and as of April 30, 5,100 units remained in production. How many units were started during April?
    A. 11,600.
    B. 17,700.
    C. 20,500.
    D. 30,700.
    E. None of the above.

    Answer: B LO: 3 Type: A

16. XYZ Co., had 3,000 units of work in process on April 1 that were 60% complete. During April, 10,000 units were completed and as of April 30, 4,000 units that were 40% complete remained in production. How many units were started during April?
    A. 8,600.
    B. 9,800.
    C. 11,000.
    D. 12,200.
    E. None of the above.

    Answer: C LO: 3 Type: A

17. Ohio, Inc., which uses a process-cost accounting system, began operations on January 1 of the current year. The company incurs conversion cost evenly throughout manufacturing. If Ohio started work on 3,000 units during the period and these units were 70% of the way through manufacturing, it would be correct to say that the company has:
    A. 3,000 physical units in production.
    B. 2,100 completed units.
    C. 900 in-process units.
    D. 900 equivalent units of production.
    E. 3,000 equivalent units of production.

    Answer: A LO: 3 Type: A

18. Which of the following data are needed to calculate total equivalent units under the weighted-average method?
    A. Work-to-date on ending work in process, units started during the period.
    B. Units completed during the period, work-to-date on ending work in process.
    C. Work to complete beginning work in process, work-to-date on ending work in process.
    D. Work to complete beginning work in process, units completed, work done on ending work in process.
    E. Units completed, work to complete beginning work in process.

    Answer: B LO: 3 Type: RC

19. Kentucky Corporation uses a process-cost accounting system. The company adds direct materials at the start of its production process; conversion cost, on the other hand, is incurred evenly throughout manufacturing. The firm has no beginning work-in-process inventory; its ending work in process is 40% complete. Which of the following sets of percentages would be used to calculate the correct number of equivalent units in the ending work-in-process inventory?
    A. Materials, 40%; conversion cost, 40%.
    B. Materials, 40%; conversion cost, 100%.
    C. Materials, 100%; conversion cost, 40%.
    D. Materials, 100%; conversion cost, 60%.
    E. Materials, 100%; conversion cost, 100%.

    Answer: C LO: 3 Type: A

20. Agora Company uses a process-cost system for its single product. Material A is added at the beginning of the process; in contrast, material B is added when the units are 75% complete. The firm's ending work-in-process inventory consists of 6,000 units that are 80% complete. Which of the following correctly expresses the equivalent units of production with respect to materials A and B in the ending work-in-process inventory?
    A. A, 4,800; B, 0.
    B. A, 4,800; B, 4,800.
    C. A, 6,000; B, 0.
    D. A, 6,000; B, 4,800.
    E. A, 6,000; B, 6,000.

    Answer: E LO: 3 Type: A, N

21. Willingham uses a process-costing system for its single product, which is manufactured from Material X and Material Y. X and Y are introduced to the product as follows:

    Material X: Added at the beginning of manufacturing
    Material Y: Added at the 75% stage of completion

    The company started and completed 40,000 units during the period, and had an ending work-in-process inventory amounting to 8,000 units, 20% complete. Which of the following choices correctly expresses the total equivalent units of production with respect to Material X and Material Y?

	Material X	Material Y
A.	46,000	41,600
B.	46,000	46,000
C.	48,000	40,000
D.	48,000	41,600
E.	48,000	46,000

    Answer: C LO: 3 Type: A, N

Use the following to answer questions 22-23:

Hampton Textile Co., manufactures a variety of fabrics. All materials are introduced at the beginning of production; conversion cost is incurred evenly through manufacturing. The Weaving Department had 2,000 units of work in process on April 1 that were 30% complete as to conversion costs. During April, 9,000 units were completed and on April 30, 4,000 units remained in production, 40% complete with respect to conversion costs.

22. The equivalent units of direct materials for April total:
    A. 9,000.
    B. 13,000.
    C. 13,600.
    D. 14,400.
    E. 15,000.

    Answer: B LO: 3 Type: A

23. The equivalent units of conversion for April total:
    A. 9,000.
    B. 10,600.
    C. 11,200.
    D. 12,000.
    E. 12,600.

    Answer: B LO: 3 Type: A

24. Columbia Corporation adds all materials at the beginning of production and incurs conversion cost evenly throughout manufacturing. The company completed 50,000 units during the year and had 15,000 units in process at December 31, 30% complete with respect to conversion cost. Equivalent units for the year total:
    A. materials, 50,000; conversion, 50,000.
    B. materials, 50,000; conversion, 4,500.
    C. materials, 54,500; conversion, 54,500.
    D. materials, 65,000; conversion, 54,500.
    E. materials, 65,000; conversion, 65,000.

    Answer: D LO: 3 Type: A

25. Gregory, which uses a process-costing system, adds all material at the beginning of production and incurs conversion cost evenly throughout manufacturing. The information that follows relates to the period just ended:

    Units started and completed: 75,000
    Units in ending work-in-process inventory: 15,000, 60% complete

    Which of the following choices correctly expresses the total equivalent units of production with respect to material and conversion cost?

	Material	Conversion
A.	75,000	75,000
B.	84,000	84,000
C.	90,000	81,000
D.	90,000	84,000
E.	90,000	90,000

    Answer: D LO: 3 Type: A

26. Gorski began operations on January 1 of the current year. The company uses a process-costing system, and conversion cost is incurred evenly throughout manufacturing. By January 31, the firm had completed 56,000 units. Which of the following statements could be true about the ending work-in-process inventory if equivalent units for conversion cost totaled 59,000 units?
    A. There is no ending work-in-process inventory.
    B. The ending work-in-process inventory totaled 3,000 physical units.
    C. The ending work-in-process inventory of 10,000 physical units was 30% complete.
    D. The ending work-in-process inventory of 20,000 physical units was 85% complete.
    E. More than one of the above could be true.

    Answer: C LO: 3 Type: A, N

27. Majestic, which uses a process-costing system, adds material at the beginning of production and incurs conversion cost evenly throughout manufacturing. The following selected information was taken from the company's accounting records:

    Total equivalent units of materials: 5,000
    Total equivalent units of conversion: 4,400
    Units started and completed during the period: 3,500

    On the basis of this information, the ending work-in-process inventory's stage of completion is:
    A. 40%.
    B. 60%.
    C. 70%.
    D. 80%.
    E. some other percentage not listed above.

    Answer: B LO: 3 Type: A, N

28. Corruption, Inc., overstated the percentage of work completed with respect to conversion cost on the ending work-in-process inventory. What is the effect of this overstatement on conversion-cost equivalent units and physical units manufactured, respectively?
    A. Overstated, overstated.
    B. Overstated, understated.
    C. Overstated, none.
    D. None, overstated.
    E. None, none.

    Answer: C LO: 3 Type: N

29. Michael, Inc., uses a process-costing system. A newly hired accountant has identified the following procedures that must be performed by the close of business on Friday:

    1—Calculation of equivalent units
    2—Analysis of physical flows of units
    3—Assignment of costs to completed units and units still in process
    4—Calculation of unit costs

    Which of the following choices correctly expresses the proper order of the preceding tasks?
    A. 1, 2, 3, 4.
    B. 1, 2, 4, 3.
    C. 1, 4, 3, 2.
    D. 2, 1, 4, 3.
    E. 2, 1, 3, 4.

    Answer: D LO: 3 Type: RC

30. When calculating unit costs under the weighted-average process-costing method, the unit cost is based on:
    A. only the current period's manufacturing costs.
    B. only costs in the period's beginning work-in-process inventory.
    C. a summation of the costs in the beginning work-in-process inventory plus costs incurred in the current period.
    D. only costs incurred in previous accounting periods.
    E. a summation of the costs in the beginning work-in-process inventory plus costs to be incurred in the upcoming period.

    Answer: C LO: 4 Type: RC

31. When computing the conversion cost per equivalent unit under the weighted-average method of process costing, all of the following information would be needed except:
    A. the number of units completed during the current accounting period.
    B. the conversion work performed during the current period on the ending work-in-process inventory.
    C. the conversion work performed during the current period on the beginning work-in-process inventory.
    D. the conversion cost in the beginning work-in-process inventory.
    E. the conversion cost incurred during the current accounting period.

    Answer: C LO: 4 Type: RC

32. Tulsa Corporation, which adds materials at the beginning of production, uses a weighted-average process-costing system. Consider the data that follow.

	Number of Units	Cost of Materials
Beginning work in process	40,000	$ 80,600
Started in June	60,000	124,400
Production completed	75,000	
Ending work in process	25,000	

    The company's cost per equivalent unit for materials is:
    A. $1.24.
    B. $1.66.
    C. $1.67.
    D. $2.05.
    E. some other amount.

    Answer: D LO: 4 Type: A

33. Garrison Company uses a weighted-average process-costing system. Company records disclosed that the firm completed 50,000 units during the month and had 10,000 units in process at month-end, 25% complete. Conversion costs associated with the beginning work-in-process inventory amounted to $105,000, and amounts that relate to the current month totaled $840,000. If conversion is incurred uniformly throughout manufacturing, Garrison's equivalent-unit cost is:
    A. $15.75.
    B. $16.43.
    C. $18.00.
    D. $18.90.
    E. some other amount.

    Answer: C LO: 4 Type: A

Use the following to answer questions 34-35:

Universal Manufacturing uses a weighted-average process-costing system. All materials are introduced at the start of manufacturing, and conversion costs are incurred evenly throughout the process. The company's beginning and ending work-in-process inventories totaled 10,000 units and 15,000 units, respectively, with the latter units being 2/3 complete at the end of the period. Universal started 30,000 units into production and completed 25,000 units. Manufacturing costs follow.

Beginning work in process: Materials, $60,000; conversion cost, $150,000
Current costs: Materials, $180,000; conversion cost, $480,000

34. Universal's equivalent-unit cost for materials is:
    A. $4.50.
    B. $6.00.
    C. $8.00.
    D. $9.60.
    E. some other amount.

    Answer: B LO: 4 Type: A

35. Universal's equivalent-unit cost for conversion cost is:
    A. $13.71.
    B. $18.00.
    C. $21.00.
    D. $25.20.
    E. some other amount.

    Answer: B LO: 4 Type: A

36. Gilbert adds materials at the beginning of production and incurs conversion cost uniformly throughout manufacturing. Consider the data that follow.

	Units
Beginning work in process	20,000
Started in August	60,000
Production completed	55,000
Ending work in process, 40% complete	25,000

Conversion cost in the beginning work-in-process inventory totaled $120,000, and August conversion cost totaled $270,000. Assuming use of the weighted-average method, which of the following choices correctly depicts the number of equivalent units for materials and the conversion cost per equivalent unit?

	Equivalent Units: Materials	Conversion Cost Per Equivalent Unit
A.	55,000	$4.91
B.	65,000	$4.88
C.	65,000	$6.00
D.	80,000	$4.88
E.	80,000	$6.00

Answer: E LO: 4 Type: A

37. Which of the following are needed to calculate the total cost of the ending work-in-process inventory under the weighted-average process-costing method?

	Unit Cost	Equivalent Units
A.	Yes	Yes
B.	Yes	No
C.	No	Yes
D.	No	No
E.	Yes	Yes, but only in specialized cases

Answer: A LO: 5 Type: RC

38. Which of the following are needed under weighted-average process costing to calculate the cost of goods completed during the period?

	Unit Cost	Equivalent Units
A.	Yes	Yes
B.	Yes	No
C.	No	Yes
D.	No	No
E.	Yes	Yes, but only in specialized cases

Answer: A LO: 5 Type: RC

39. Equivalent-unit calculations are necessary to allocate manufacturing costs between:
    A. units completed and ending work in process.
    B. beginning work in process and units completed.
    C. units sold and ending work in process.
    D. cost of goods manufactured and beginning work in process.
    E. cost of goods manufactured and cost of goods sold.

    Answer: A LO: 5 Type: RC

Use the following to answer questions 40-45:

South River Chemical manufactures a product called Zbek. Direct materials are added at the beginning of the process, and conversion activity occurs uniformly throughout production. The beginning work-in-process inventory is 60% complete with respect to conversion; the ending work-in-process inventory is 20% complete. The following data pertain to May:

	Units
Work in process, May 1	15,000
Units started during May	60,000
Units completed and transferred out	68,000
Work in process, May 31	7,000

	Total	Direct Materials	Conversion Costs
Costs:			
Work in process, May 1	$ 41,250	$16,500	$ 24,750
Costs incurred during May	234,630	72,000	162,630
Totals	$275,880	$88,500	$187,380

40. Using the weighted-average method of process costing, the equivalent units of direct materials total:
    A. 68,000.
    B. 69,400.
    C. 74,000.
    D. 75,000.
    E. some other amount.

    Answer: D LO: 3 Type: A

41. Using the weighted-average method of process costing, the equivalent units of conversion activity total:
    A. 60,400.
    B. 68,000.
    C. 69,400.
    D. 74,000.
    E. some other amount.

    Answer: C LO: 3 Type: A

42. Using the weighted-average method of process costing, the cost per unit of direct materials is:
    A. $1.17.
    B. $1.18.
    C. $1.20.
    D. $1.28.
    E. some other amount.

    Answer: B LO: 4 Type: A

43. Using the weighted-average method of process costing, the cost per unit of conversion activity is:
    A. $2.50.
    B. $2.53.
    C. $2.70.
    D. $2.76.
    E. some other amount.

    Answer: C LO: 4 Type: A

44. Using the weighted-average method of process costing, the cost of goods completed and transferred during May is:
    A. $249,560.
    B. $250,240.
    C. $258,400.
    D. $263,840.
    E. some other amount.

    Answer: D LO: 5 Type: A

45. Using the weighted-average method of process costing, the total costs remaining in work in process on May 31 are:
    A. $0.
    B. $12,040.
    C. $17,480.
    D. $25,640.
    E. some other amount.

    Answer: B LO: 5 Type: A

Use the following to answer questions 46-47:

Chen Corporation, a new company, adds material at the beginning of its production process; conversion cost, in contrast, is incurred evenly throughout manufacturing. During May, the firm completed 15,000 units and had ending work in process of 2,000 units, 60% complete. Equivalent-unit costs were: materials, $15; conversion, $22.

46. The cost of Chen's completed production is:
    A. $225,000.
    B. $330,000.
    C. $333,000.
    D. $555,000.
    E. some other amount.

    Answer: D LO: 5 Type: A

47. The cost of the company's ending work-in-process inventory is:
    A. $26,640.
    B. $44,400.
    C. $56,400.
    D. $74,000.
    E. some other amount.

    Answer: C LO: 5 Type: A

Use the following to answer questions 48-49:

Copley uses a weighted-average process-costing system. All materials are added at the beginning of the process; conversion costs are incurred evenly throughout production. The company finished 40,000 units during the period and had 15,000 units in progress at year-end, the latter at the 40% stage of completion. Total material costs amounted to $220,000; conversion costs were $414,000.

48. The cost of goods completed is:
    A. $312,000.
    B. $414,000.
    C. $520,000.
    D. $634,000.
    E. some other amount.

    Answer: C LO: 5 Type: A

49. The cost of the ending work in process is:
    A. $54,000.
    B. $78,000.
    C. $114,000.
    D. $195,000.
    E. some other amount.

    Answer: C LO: 5 Type: A

50. Which of the following is a key document in a typical process-costing system?
    A. Departmental production report.
    B. Master schedule.
    C. Production budget.
    D. Sequential product report.
    E. Materials requirement report.

    Answer: A LO: 6 Type: RC

51. Which of the following statements about operation costing is (are) true?

    I. Conversion costs are accumulated by department.
    II. Direct material costs are accumulated by batch.
    III. Operation costing is a hybrid product-costing system.

    A. I only.
    B. I and II.
    C. I and III.
    D. II and III.
    E. I, II, and III.

    Answer: E LO: 7 Type: RC

52. Operation costing:
    A. tends to parallel job-order costing with respect to the treatment of conversion cost.
    B. tends to parallel process costing with respect to the treatment of conversion cost.
    C. tends to parallel process costing with respect to the treatment of direct materials.
    D. would likely be used by a manufacturing plant that produces one model of a single product.
    E. is commonly known as a joint-costing system.

    Answer: B LO: 7 Type: RC

53. Which of the following best describes the procedures used in operation costing to assign direct-material and conversion costs to production?

	Direct-Material Costs	Conversion Costs
A.	Similar to those in job costing	Similar to those in job costing
B.	Similar to those in job costing	Similar to those in process costing
C.	Similar to those in process costing	Similar to those in job costing
D.	Similar to those in process costing	Similar to those in process costing

    E. None of the above, as operation costing is totally unlike both job costing and process costing.

    Answer: B LO: 7 Type: RC

54. When determining the cost of a manufactured good under an operation-costing system, a company would:
    A. trace direct-material cost and actual conversion cost to each product produced.
    B. trace direct-material cost to each product produced and use a predetermined application rate for conversion cost.
    C. trace actual conversion cost to each product produced and use a predetermined application rate for direct material.
    D. use a predetermined application rate for both direct-material cost and conversion cost.
    E. often switch to a job-costing system to simplify recordkeeping procedures.

    Answer: B LO: 7 Type: RC

55. The first processing department in a sequence of three production departments must account for which of the following costs?
    A. Direct material and transferred-in costs.
    B. Direct material costs only.
    C. Conversion and transferred-in costs.
    D. Direct material and conversion costs.
    E. Direct material, conversion, and transferred-in costs.

    Answer: D LO: 8 Type: RC

56. The second processing department in a sequence of three production departments would typically account for which of the following costs?
    A. Direct material and transferred-in costs.
    B. Direct material costs only.
    C. Transferred-in costs only.
    D. Direct material and conversion costs.
    E. Direct material, conversion, and transferred-in costs.

    Answer: E LO: 8 Type: RC

57. Department no. 2 receives goods from Department no. 1, adds material, completes the units, and transfers the units to Department no. 3 for final processing. The cost of goods completed by Department no. 2 would include charges for:
    A. direct materials.
    B. conversion cost.
    C. direct materials and conversion cost.
    D. transferred-in costs.
    E. transferred-in costs, direct materials, and conversion cost.

    Answer: E LO: 8 Type: N

58. Roberts uses process costing and has two manufacturing departments. Goods are started in Department no. 1, passed along to Department no. 2 where additional parts are attached and processing occurs, and then transferred out to the finished-goods warehouse. The following equivalent-unit costs relate to Department no. 2 for the current period:

Transferred-in	$19
Parts	11
Conversion cost	6

Production that is completed and transferred to the finished-goods warehouse should be assigned a unit cost of:
A. $6.
B. $11.
C. $17.
D. $30.
E. $36.

Answer: E LO: 8 Type: A

EXERCISES

Equivalent Units

59. Superior Chemical Company refines a variety of petrochemical products. The following data pertain to the firm's Cincinnati plant:

Work in process, August 1:	100,000 gallons
Direct material	100% complete
Conversion	25% complete
Units started into production	1,375,000 gallons
Work in process, August 31:	120,000 gallons
Direct material	100% complete
Conversion	80% complete

Required:
Compute the equivalent units of direct materials and conversion for August.

LO: 3 Type: A

Answer:

		Units
Completed and transferred out during August		1,355,000*
Work in process at August 31	120,000	
Percentage complete as to material	x 100%	120,000
Equivalent units: materials		1,475,000

		Units
Completed and transferred out during August		1,355,000*
Work in process at August 31	120,000	
Percentage complete as to conversion	x 80%	96,000
Equivalent units: conversion		1,451,000

*100,000 + 1,375,000 - 120,000 = 1,355,000

Equivalent Units

60. Coronado Products employs a process-costing system for its manufacturing operations. All materials are added at the beginning of the process, and conversion costs are incurred uniformly throughout production. The information that follows relates to September.

	Units
Work in process, September 1 (30% complete as to conversion)	8,900
Units started during September	28,500
Total units to account for	37,400
Units completed during September	29,700
Work in process, September 30 (80% complete as to conversion)	7,700
Total units accounted for	37,400

Required:
A. Calculate equivalent units of direct material for September.
B. Calculate equivalent units of conversion activity for September.

LO: 3 Type: A

Answer:

			Units
A	Completed and transferred out during September		29,700
	Work in process at September 30	7,700	
	Percentage complete as to material	x 100%	7,700
	Equivalent units: materials		37,400

			Units
B.	Completed and transferred out during September		29,700
	Work in process at September 30	7,700	
	Percentage complete as to conversion	x 80%	6,160
	Equivalent units: conversion		35,860

Equivalent Units

61. State Chemical uses a weighted-average process-costing system. The following data relate to May:

Work in process, May 1:	25,000 pounds
Direct material	70% complete
Conversion	80% complete
Units started into production	80,000 pounds
Work in process, May 31:	30,000 pounds
Direct material	40% complete
Conversion	65% complete

Required:

A. Calculate the number of pounds completed during May.
B. Calculate equivalent units of materials and conversion for May.
C. Does State introduce all of its direct materials at the very beginning of production? Explain your answer.

LO: 3 Type: A, N

Answer:

A. 25,000 + 80,000 - 30,000 = 75,000

B.

		Units
Completed and transferred out during May		75,000
Work in process at May 31	30,000	
Percentage complete as to material	x 40%	12,000
Equivalent units: materials		87,000

		Units
Completed and transferred out during May		75,000
Work in process at May 31	30,000	
Percentage complete as to conversion	x 65%	19,500
Equivalent units: conversion		94,500

C. No. The ending work-in-process inventory is only 40% complete with respect to material. If material were introduced at the very beginning of the process, this number would be 100%.

Interpretation of Data: Process Costing

62. Portal Manufacturing, which began business in 1956, uses a weighted-average process-costing system. The following figures pertain to July:

	Physical	Equivalent Units	
	Units	Materials	Conversion
Units completed	120,000	120,000	120,000
Ending work in process	40,000	40,000	18,000

All materials are introduced at the start of the process, and conversion cost is incurred evenly throughout production. The company used direct materials that cost $640,000; conversion amounted to $8 per equivalent unit.

Required:
A. Calculate the direct materials cost per equivalent unit.
B. Calculate the cost of units completed and transferred.
C. What percentage of conversion work will be performed on the 40,000-unit ending work-in-process inventory during August?
D. In all likelihood, were all of the 120,000 completed units begun in July? Explain.

LO: 3, 4, 5 Type: A, N

Answer:
A. $640,000 ÷ (120,000 + 40,000) = $4

B. 120,000 x ($4 + $8) = $1,440,000

C. Forty-five percent (18,000 ÷ 40,000) of the work was performed in July, leaving 55% for August.

D. No. In a continuous processing environment, the beginning work-in-process inventory is often the first batch of goods to be completed. These units entered production in a previous month.

Process Costing: Miscellaneous Computations and Concepts

63. National, Inc., uses a weighted-average process-costing system. All materials are introduced at the start of manufacturing; in contrast, conversion cost is incurred uniformly throughout production. The company had respective work-in-process inventories on May 1 and May 31 of 42,000 units and 50,000 units, the latter of which was 70% complete. The production supervisor noted that National completed 85,000 units during the month.

Costs in the May 1 work-in-process inventory were subdivided as follows: materials, $51,000; conversion, $148,000. During May, National charged production with $124,500 of material and $956,000 of conversion, resulting in a material cost per equivalent unit of $1.30.

Required:
A. Determine the number of units that National started during May.
B. Compute the number of equivalent units with respect to conversion cost.
C. Determine the conversion cost per equivalent unit.
D. Compute the cost of the May 31 work-in-process inventory.
E. What account would have been credited to record National's completed production?

LO: 2, 3, 4, 5 Type: RC, A

Answer:
A. Since National had accounted for 135,000 units (85,000 + 50,000), the company must have started 93,000 units in May (135,000 - 42,000).

B. Equivalent units for conversion cost total 120,000 [85,000 + (50,000 x 70%)].

C. The conversion cost per equivalent unit is $9.20 [($148,000 + $956,000) ÷ 120,000 units].

D. Ending work in process totals $387,000: materials, $65,000 (50,000 x $1.30) + conversion, $322,000 [(50,000 x 70%) x $9.20].

E. Work-in-Process Inventory

Cost of Goods Completed, Ending Work in Process

64. Manhattan, Inc., uses a weighted-average process-costing system. All materials are introduced at the beginning of production; conversion cost is incurred evenly throughout manufacturing. The following information pertains to April:

Beginning work in process (80% complete)	9,000 units
Goods completed during April	53,000 units
Ending work in process (30% complete)	12,000 units

The company's accountant has already computed the cost per equivalent unit, as follows: materials, $5; conversion, $14.

Required:
Calculate the cost of goods completed during April and the cost of the ending work-in-process inventory.

LO: 3, 5 Type: A

Answer:
Cost of goods completed:
53,000 x ($5 + $14) = $1,007,000

Cost of ending work in process:
(12,000 x $5) + (12,000 x 30% x $14) = $110,400

Calculation of Equivalent Units, Unit Costs, Transfer, and Inventory

65. Edwards Company had a beginning work-in-process inventory of 30,000 units on June 1. These units contained $120,000 of direct materials and $272,000 of conversion cost. The following data relate to activity during June:

Production completed (units)	70,000
Ending work in process, 60% complete (units)	20,000
Direct materials used ($)	258,000
Conversion cost ($)	695,600

Edwards uses a weighted-average process-costing system. All materials are added at the start of manufacturing; in contrast, conversion cost is incurred evenly throughout production.

Required:
A. Compute the total equivalent units for direct material and conversion cost.
B. Compute the cost per equivalent unit of direct material and conversion cost.
C. Determine the cost of completed production.
D. Determine the cost of the June 30 work in process.

LO: 3, 4, 5 Type: A

Answer:

A. Equivalent units:

	Direct Material	Conversion
Transferred to finished goods	70,000	70,000
Work in process, June 30	20,000	12,000
Total	90,000	82,000

B. Cost per equivalent unit:

Work in process, June 1	$120,000	$272,000
Costs added during June	258,000	695,600
Total costs	$378,000	$967,600
Equivalent units	÷ 90,000	÷ 82,000
Cost per equivalent unit	$4.20	$11.80

C. Cost of completed production:

Material (70,000 x $4.20)	$ 294,000
Conversion (70,000 x $11.80)	826,000
Total	$1,120,000

D. Cost of work in process at June 30:

Material (20,000 x $4.20)	$ 84,000
Conversion (12,000 x $11.80)	141,600
Total	$ 225,600

Calculation of Equivalent Units, Unit Costs, Transfer, and Inventory

66. On May 1, Dandy Company had a work-in-process inventory of 10,000 units. The units were 100% complete for material and 30% complete for conversion, with respective costs of $30,000 and $1,850.

During the month, 150,000 units were completed and transferred to finished goods. The May 31 ending work-in-process inventory consisted of 10,000 units that were 100% complete with respect to materials and 80% complete with respect to conversion.

Costs added during the month were $330,000 for materials and $503,750 for conversion.

Required:
Using the weighted-average method, calculate:
A. total equivalent units for material and conversion.
B. the cost per equivalent unit for material and conversion.
C. the cost transferred to finished goods.
D. the cost of ending work in process.

LO: 3, 4, 5 Type: A

Answer:

A. Equivalent units:

	Direct Material	Conversion
Transferred to finished goods	150,000	150,000
Work in process, May 31	10,000	8,000
Total	160,000	158,000

B. Cost per equivalent unit:

Work in process, May 1	$ 30,000	$ 1,850
Costs added during May	330,000	503,750
Total costs	$360,000	$505,600
Equivalent units	÷160,000	÷158,000
Cost per equivalent unit	$2.25	$3.20

C. Cost of completed production:

Material (150,000 x $2.25)	$337,500
Conversion (150,000 x $3.20)	480,000
Total	$817,500

D. Cost of work in process at May 31:

Material (10,000 x $2.25)	$ 22,500
Conversion (8,000 x $3.20)	25,600
Total	$ 48,100

Analysis of Work-in-Process Account

67. Baxter Products manufactures office furniture by using an assembly-line process. All direct materials are introduced at the start of the process, and conversion cost is incurred evenly throughout manufacturing. An examination of the company's Work-in-Process account for August revealed the following selected information:

    Debit side—
    August 1 balance: 600 units, 40% complete; cost, $44,600*
    Production started: 1,800 units
    Direct materials used during August: $90,000
    August conversion cost: $51,400

    Credit side—
    Production completed: 1,400 units

    *Supplementary records disclosed direct material cost of $30,000 and conversion cost of $14,600.

    Conversations with manufacturing personnel revealed that the ending work in process was 80% complete.

    Required:
    A. Determine the number of units in the August 31 work-in-process inventory.
    B. Calculate the cost of goods completed during August, and prepare the appropriate journal entry to record completed production.
    C. Determine the cost of the August 31 work-in-process inventory.

    LO: 3, 4, 5 Type: A

Answer:

A. The ending work in process consisted of 1,000 units (600 + 1,800 - 1,400).

B. The cost of goods completed during August totaled $112,000 (1,400 units x $80):

	Physical Units	Percentage of Completion With Respect to Conversion	Equivalent Units: Direct Material	Equivalent Units: Conversion
Work in process, August 1	600	40%		
Units started during August	1,800			
Total units to account for	2,400			
Units completed and transferred during August	1,400	100%	1,400	1,400
Work in process, August 31	1,000	80%	1,000	800
Total units accounted for	2,400			
Total equivalent units			2,400	2,200

	Direct Material	Conversion	Total
Work in process, August 1	$ 30,000	$14,600	$ 44,600
Costs incurred during August	90,000	51,400	141,400
Total costs to account for	$120,000	$66,000	$186,000
Equivalent units	2,400	2,200	
Cost per equivalent unit	$50	$30	$80

Finished-Goods Inventory	112,000	
Work-in-Process Inventory		112,000

C. The cost of the August 31 work-in-process inventory is $74,000:

Direct materials (1,000 x $50)	$50,000
Conversion cost (800 x $30)	24,000
	$74,000

Process Costing: Data Interpretation and Working Backwards

68. Lakey uses a weighted-average process-costing system. Material A is added at the start of production; packaging material is introduced at the end. Conversion costs are incurred evenly throughout manufacturing.

The following selected data were extracted from the company's production report:

Units completed	15,000
Ending work in process (units)	6,000
Equivalent units: conversion cost	16,800
Equivalent-unit cost: material A ($)	5
Equivalent-unit cost: packaging ($)	2
Total conversion cost ($)	134,400

Required:
A. Compute the equivalent-unit cost for conversion cost.
B. How far into the manufacturing process is the ending work-in-process inventory?
C. Would the total equivalent units for Material A and the packaging material be the same? Why?
D. Compute the cost of goods completed during the period.
E. Compute the cost of the ending work-in-process inventory.
F. What account would be debited to record the cost of goods completed during the period?

LO: 2, 3, 4, 5 Type: A, N

Answer:
A. $134,400 ÷ 16,800 = $8

B.

Total conversion units	16,800
Conversion units for completed production	15,000
Conversion units for work in process	1,800

1,800 ÷ 6,000 = 30%

C. No. Material A is added at the beginning of production and would be part of the ending work-in-process inventory. Given that the ending work in process is only 30% complete, these goods have yet to reach the completion of manufacturing where packaging is introduced.

D. 15,000 x ($5 + $2 + $8) = $225,000

E.

Material A: 6,000 x $5	$30,000
Packaging material	---
Conversion cost: 1,800 x $8	14,400
Total	$44,400

F. Finished-Goods Inventory

Operation Costing

69. Levitt Corporation, which uses an operation-costing system, has three processing departments. All units pass through Department no. 1; upon completion, 70% of the goods are sent to Department no. 2 and 30% are sent to Department no. 3. Additional data follow.
    - Forty thousand units were manufactured during the year.
    - Conversion cost in each department was: No. 1, $380,000; no. 2, $196,000; and no. 3, $150,000.
    - Batch no. 67, which consisted of 500 units, was sent to Department no. 3 for its additional processing. Direct materials of $23,500 and $11,900 were introduced to this batch in Department nos. 1 and 3, respectively.

    Levitt assigns conversion cost to goods manufactured on the basis of units produced.

    Required:
    A. Determine the conversion cost per unit in Department no. 1, Department no. 2, and Department no. 3.
    B. Compute the total cost of batch no. 67.
    C. Operation costing is sometimes referred to as a hybrid costing system. Briefly explain.

    LO: 7 Type: RC, A

    Answer:
    A. Department no. 1: $380,000 ÷ 40,000 units = $9.50
    Department no. 2: $196,000 ÷ 28,000 units (40,000 x 70%) = $7.00
    Department no. 3: $150,000 ÷ 12,000 units (40,000 x 30%) = $12.50

    B.

Direct materials ($23,500 + $11,900)	$35,400
Department no. 1 conversion (500 x $9.50)	4,750
Department no. 3 conversion (500 x $12.50)	6,250
Total cost	$46,400

    C. Operation costing is a hybrid system because it contains features that are present in both a job-costing system and a process-costing system. Direct materials are assigned directly to the batches of goods produced; in contrast, conversion costs are accumulated by department and are then assigned to manufactured goods by using an averaging technique.

Operation Costing

70. Orville Knitters manufactures sweaters and uses an operation-costing system. All sweaters are processed through Department no. 1, with subsequent processing taking place in Department no. 2 or Department no. 3 depending on the type of fabric used. Twenty thousand sweaters were produced during the year; there was no beginning or ending work in process. Sixty percent of the goods were sent to Department no. 2 for manufacturing.

Conversion cost incurred in the three departments totaled $504,000, subdivided as follows: Department no. 1, $360,000; Department no. 2, $60,000; and Department no. 3, $84,000.

Data pertaining to two representative orders, nos. 545 and 567, were:

	No. 545	No. 567
Direct materials	$112,000	$94,000
Number of sweaters	800	1,300
Subsequent processing department	No. 3	No. 2

Required:
A. Explain the nature of operation costing.
B. Determine the cost of order nos. 545 and 567.

LO: 7 Type: RC, A

Answer:
A. Operation costing is used by firms that produce different models of similar products. The products go through essentially the same manufacturing process, so conversion costs can be assigned in a manner similar to that used in process-costing systems. Materials, on the other hand, are unique to the individual goods being produced and, accordingly, the cost is assigned by batch (or in a manner similar to that used in job costing).

B. Conversion cost per sweater:
Department no. 1: $360,000 ÷ 20,000 sweaters = $18.00
Department no. 2: $60,000 ÷ (20,000 x 60%) sweaters = $5.00
Department no. 3: $84,000 ÷ (20,000 x 40%) sweaters = $10.50

	No. 545	No. 567
Direct materials	$112,000	$ 94,000
Conversion cost: No. 1		
800 sweaters x $18.00; 1,300 sweaters x $18.00	14,400	23,400
Conversion cost: No. 2		
1,300 sweaters x $5.00		6,500
Conversion cost: No. 3		
800 sweaters x $10.50	8,400	
Total	$134,800	$123,900

Cost Flows in Sequential Departments, Journal Entries

71. Ottawa Company manufactures window glass in two sequential departments. The following cost data pertain to October:

	Department A	Department B
Direct material entered into production	$ 160,000	$ 40,000
Direct labor	555,000	560,000
Applied manufacturing overhead	1,360,000	875,000
Cost of goods completed and transferred:		
From Department A	1,925,000	
From Department B		2,800,000

Required:
Prepare journal entries to record the following:
A. Costs incurred for direct material and direct labor, and application of manufacturing overhead in Department A.
B. Transfer of goods from Department A to Department B.
C. Transfer of goods from Department B.

LO: 8 Type: A

Answer:

A.	Oct. 31	Work-in-Process Inventory: Dept. A	2,075,000	
		Raw-Material Inventory		160,000
		Wages Payable		555,000
		Manufacturing Overhead		1,360,000
B.	Oct. 31	Work-in-Process Inventory: Dept. B	1,925,000	
		Work-in-Process Inventory: Dept. A		1,925,000
C.	Oct. 31	Finished-Goods Inventory	2,800,000	
		Work-in-Process Inventory: Dept. B		2,800,000

DISCUSSION QUESTIONS

Equivalent Units

72. Professor Jones is concerned that her students do not understand the concept of equivalent units. She has therefore prepared the following questions, to appear on an upcoming examination:

    Equivalent units are used in a process-costing accounting system.

    A. Explain the need for equivalent units and why separate equivalent-unit totals are calculated for direct materials and conversion cost.
    B. If an examination of goods in production at the end of the period revealed 12,000 units that are, on average, 75% complete, would it be correct to say that 9,000 units were finished during the period? Why?

    Required:
    Prepare a complete answer key that can be used in grading the examination questions.

    LO: 3 Type: RC, N

    Answer:
    A. Equivalent units are needed as a measure of production volume. At the end of the period, manufacturing costs must be spread over the units produced, and it is incorrect to combine fully completed units with those that are still in production (akin to adding apples and oranges). Separate totals are needed because materials are often introduced at specific points in production whereas conversion is often introduced uniformly throughout manufacturing.

    B. No. The units are still in production, so none of them are fully completed. It would be correct to say that the firm has done the work equivalent to manufacturing 9,000 finished units.

Operation Costing

73. Operation costing is a popular type of accounting system, one that combines selected features of job-order and process-cost accounting.

    Required**:**
    A. Briefly discuss the basic features that are associated with an operation-costing system.
    B. Explain why a sweater manufacturer may have a need for an operation-costing system.

    LO: 7 Type: RC, N

Answer:

A. Operation costing is used by firms that produce different models of similar products. The products go through essentially the same manufacturing process, so conversion costs can be assigned in a manner similar to that used in process-costing systems. Materials, on the other hand, are unique to the individual goods being produced and, accordingly, the cost is assigned by batch (or in a manner similar to that used in job costing).

B. A sweater manufacturer produces multiple versions of its single product: sweaters. The garments likely incur roughly the same labor and overhead cost, with the major difference among models being in the areas of fabric, color, and patterns (i.e., materials). Thus, the material cost will often differ and the manufacturer should take these differences into account, not spread costs equally over all units produced as would be done in a process-cost-type of procedure.

Sequential Production

74. Transferred-in costs typically arise in sequential-processing operations.

Required**:**

A. Briefly discuss the concept of transferred-in costs, including the nature (composition) of this cost element in your response.
B. Transferred-in costs are the costs associated with transferred-in units. From the receiving department's perspective, how should these units be viewed? Explain.

LO: 8 Type: RC, N

Answer:

A. Transferred-in costs are costs attached to units that are transferred from one processing department to the next. More specifically, these are the manufacturing costs incurred in the "sending" department (i.e., direct materials, direct labor, and applied manufacturing overhead).

B. The receiving department should view these units to be the equivalent of direct materials (namely, partially completed units), or units to be worked on and processed by the addition of (possibly still) more material, direct labor, and manufacturing overhead.