Chapter 3 (Complementary)

1. The following information relates to October:

   Production supervisor's salary  $2,500
   Factory maintenance wages       250 hours at $8 per hour

   The journal entry to record the preceding information is:
   A. Manufacturing Overhead 4,500
      Wages Payable 4,500
   B. Wages Payable 4,500
      Manufacturing Overhead 4,500
   C. Work-in-Process Inventory 4,500
      Wages Payable 4,500
   D. Wages Payable 4,500
      Work-in-Process Inventory 4,500
   E. Work-in-Process Inventory 2,500
      Manufacturing Overhead 2,000
      Wages Payable 4,500

2. Dale Company, which applies overhead at the rate of 190% of direct labor cost, began work on job no. 101 during June. The job was completed in July and sold during August, having accumulated direct material and labor charges of $27,000 and $15,000, respectively. On the basis of this information, the total overhead applied to job no. 101 amounted to:
   A. $0.
   B. $28,500.
   C. $51,300.
   D. $70,500.
   E. $79,800.

3. Gopher charges manufacturing overhead to products by using a predetermined application rate, computed on the basis of machine hours. The following data pertain to the current year:

   Budgeted manufacturing overhead: $360,000
   Actual manufacturing overhead: $315,000
   Budgeted machine hours: 15,000
   Actual machine hours: 10,000

   Overhead applied to production totaled:
   A. $210,000.
   B. $240,000.
   C. $472,500.
   D. $540,000.
   E. some other amount.
4. Barney Company applies manufacturing overhead by using a predetermined rate of 200% of direct labor cost. The data that follow pertain to job no. 764:

<table>
<thead>
<tr>
<th>Direct material cost</th>
<th>$55,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor cost</td>
<td>40,000</td>
</tr>
</tbody>
</table>

If Barney adds a 40% markup on total cost to generate a profit, which of the following choices depicts a portion of the accounting needed to record the sale of job no. 764?

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Cost of Goods Sold</td>
<td>$175,000</td>
</tr>
<tr>
<td>B. Cost of Goods Sold</td>
<td>$245,000</td>
</tr>
<tr>
<td>C. Finished-Goods Inventory</td>
<td>$175,000</td>
</tr>
<tr>
<td>D. Finished-Goods Inventory</td>
<td>$245,000</td>
</tr>
<tr>
<td>E. Sales Revenue</td>
<td>$245,000</td>
</tr>
</tbody>
</table>

5. Lancer charges manufacturing overhead to products by using a predetermined application rate, computed on the basis of labor hours. The following data pertain to the current year:

- Budgeted manufacturing overhead: $1,080,000
- Actual manufacturing overhead: $945,000
- Budgeted labor hours: 45,000
- Actual labor hours: 31,500

Which of the following choices denotes the correct status of manufacturing overhead at year-end?

A. Overapplied by $135,000.
B. Underapplied by $135,000.
C. Overapplied by $189,000.
D. Underapplied by $189,000.
E. Overapplied by $270,000.

6. Fletcher, Inc., disposes of under- or overapplied overhead at year-end as an adjustment to cost of goods sold. Prior to disposal, the firm reported cost of goods sold of $590,000 in a year when manufacturing overhead was underapplied by $15,000. If sales revenue totaled $1,400,000, determine (1) Fletcher's adjusted cost of goods sold and (2) gross margin.

<table>
<thead>
<tr>
<th>Adjusted Cost of Goods Sold</th>
<th>Gross Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. $575,000</td>
<td>$810,000</td>
</tr>
<tr>
<td>B. $575,000</td>
<td>$825,000</td>
</tr>
<tr>
<td>C. $590,000</td>
<td>$810,000</td>
</tr>
<tr>
<td>D. $605,000</td>
<td>$795,000</td>
</tr>
<tr>
<td>E. $605,000</td>
<td>$810,000</td>
</tr>
</tbody>
</table>

7. Dexter Corporation, which uses a job costing system, had two jobs in process at the start of 20x1: job no. 59 ($95,000) and job no. 60 ($39,500). The following information is available:

- The company applies manufacturing overhead on the basis of machine hours. Budgeted overhead and machine activity for the year were anticipated to be $720,000 and 20,000 hours, respectively.
- The company worked on three jobs during the first quarter. Direct materials used, direct labor incurred, and machine hours consumed were:

<table>
<thead>
<tr>
<th>Job No.</th>
<th>Direct Material</th>
<th>Direct Labor</th>
<th>Machine Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>$18,000</td>
<td>$45,000</td>
<td>900</td>
</tr>
<tr>
<td>60</td>
<td>----</td>
<td>25,000</td>
<td>600</td>
</tr>
<tr>
<td>61</td>
<td>37,000</td>
<td>35,000</td>
<td>1,200</td>
</tr>
</tbody>
</table>

Manufacturing overhead during the first quarter included charges for depreciation ($20,000), indirect labor ($50,000), indirect materials used ($4,000), and other factory costs ($108,700).

- Dexter completed job no. 59 and job no. 60. Job no. 59 was sold for cash, producing a profit of $24,600 for the firm.
Required:
A. Determine the company's predetermined overhead application rate.
B. Prepare journal entries as of March 31 to record the following. (Note: Use summary entries where appropriate by combining individual job data.)
   1. The issuance of direct material to production, and the direct labor incurred.
   2. The manufacturing overhead incurred during the quarter.
   3. The application of manufacturing overhead to production.
   4. The completion of job no. 59 and no. 60.
   5. The sale of job no. 59.

8. Boston Products uses a predetermined overhead application rate of $12 per labor hour. A review of the company's accounting records revealed budgeted manufacturing overhead for the period of $312,000, applied manufacturing overhead of $288,000, and underapplied overhead of $4,700.
   Required:
   A. Determine Boston's actual labor hours, budgeted labor hours, and actual manufacturing overhead.
   B. Present the necessary year-end journal entry to handle the underapplied overhead, assuming that the firm allocates over- or underapplied overhead to Cost of Goods Sold.

9. Woodland Canning Company incurred the following costs during the year:

   Direct material used $185,000
   Direct labor 60,000
   Manufacturing overhead 126,000

The firm's predetermined overhead rate is 210% of direct labor cost. The January 1 inventory balances were as follows:

   Raw-material inventory $ 12,500
   Work-in-process inventory 19,500
   Finished-goods inventory 21,000

Each of these inventory balances was 10% higher at the end of the year.

Required:
A. Determine the overapplied or underapplied overhead for the year.
B. Prepare a schedule of cost of goods manufactured for the year.
C. What was cost of goods sold for the year?
Chapter 4: Process Costing and Hybrid Product-Costing Systems

MULTIPLE CHOICE QUESTIONS

1. 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, determine the ending work-in-process inventory's stage of completion.
   A. 40%.
   B. 60%.
   C. 70%.
   D. 80%.
   E. Some other percentage not listed above.

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

<table>
<thead>
<tr>
<th>Number of Units</th>
<th>Cost of Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning work in process</td>
<td>$45,200</td>
</tr>
<tr>
<td>Started in June</td>
<td>$144,000</td>
</tr>
<tr>
<td>Production completed</td>
<td>$85,000</td>
</tr>
<tr>
<td>Ending work in process</td>
<td></td>
</tr>
</tbody>
</table>

   The company's cost per equivalent unit for materials is:
   A. $1.69.
   B. $1.72.
   C. $2.23.
   D. $2.37.
   E. an amount other than those listed above.

   Use the following to answer questions 3-4:
   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

   3. Universal's equivalent-unit cost for materials is:
   A. $4.50.
   B. $6.00.
   C. $8.00.
   D. $9.60.
   E. an amount other than those listed above.

   4. Universal's equivalent-unit cost for conversion cost is:
   A. $13.71.
   B. $18.00.
   C. $21.00.
   D. $25.20.
   E. an amount other than those listed above.
Use the following to answer questions 5-10:

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:

<table>
<thead>
<tr>
<th>Units</th>
<th>Total</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, May 1</td>
<td>15,000</td>
<td>$41,250</td>
<td>$24,750</td>
</tr>
<tr>
<td>Units started during May</td>
<td>60,000</td>
<td>$16,500</td>
<td>$72,000</td>
</tr>
<tr>
<td>Units completed and transferred out</td>
<td>68,000</td>
<td>$234,630</td>
<td>$162,630</td>
</tr>
<tr>
<td>Work in process, May 31</td>
<td>7,000</td>
<td>$275,880</td>
<td>$88,500</td>
</tr>
</tbody>
</table>

5. 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. 75,400.

6. 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. 75,000.

7. 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. $1.30.

8. 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. $3.10.

9. 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. $275,880.
10. 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. $26,320.

Chapter 5: Activity-Based Costing and Cost Management Systems

MULTIPLE CHOICE QUESTIONS

1. The following tasks are associated with an activity-based costing system:
   1—Calculation of cost application rates
   2—Identification of cost drivers
   3—Assignment of cost to products
   4—Identification of cost pools

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

2. In an activity-based costing system, direct materials used would typically be classified as a:
   A. unit-level cost.
   B. batch-level cost.
   C. product-sustaining cost.
   D. facility-level cost.
   E. matrix-level cost.

Use the following to answer questions 3-4:
Riverside Florists uses an activity-based costing system to compute the cost of making floral bouquets and delivering the bouquets to its commercial customers. Company personnel who earn $180,000 typically perform both tasks; other firm-wide overhead is expected to total $70,000. These costs are allocated as follows:

<table>
<thead>
<tr>
<th></th>
<th>Bouquet</th>
<th>Production</th>
<th>Delivery</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages and salaries</td>
<td>60%</td>
<td>30%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Other overhead</td>
<td>50%</td>
<td>35%</td>
<td>15%</td>
<td></td>
</tr>
</tbody>
</table>

Riverside anticipates making 20,000 bouquets and 4,000 deliveries in the upcoming year.

3. The cost of wages and salaries and other overhead that would be charged to each bouquet made is:
   A. $7.15.
   B. $8.75.
   C. $12.50.
   D. $13.75.
   E. some other amount.

4. The cost of wages and salaries and other overhead that would be charged to each delivery is:
   A. $19.63.
   B. $20.31.
   C. $26.75.
   D. $40.63.
   E. some other amount.
HiTech Products manufactures three types of DVD players: Economy, Standard, and Deluxe. The company, which uses activity-based costing, has identified five activities (and related cost drivers). Each activity, its budgeted cost, and related cost driver is identified below.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost Driver</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material handling</td>
<td>Number of parts</td>
<td>$225,000</td>
</tr>
<tr>
<td>Material insertion</td>
<td>Number of parts</td>
<td>$2,475,000</td>
</tr>
<tr>
<td>Automated machinery</td>
<td>Machine hours</td>
<td>$840,000</td>
</tr>
<tr>
<td>Finishing</td>
<td>Direct labor hours</td>
<td>$170,000</td>
</tr>
<tr>
<td>Packaging</td>
<td>Orders shipped</td>
<td>$170,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$3,880,000</strong></td>
</tr>
</tbody>
</table>

The following information pertains to each product line of DVD players for next year:

<table>
<thead>
<tr>
<th></th>
<th>Economy</th>
<th>Standard</th>
<th>Deluxe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units to be produced</td>
<td>10,000</td>
<td>5,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Orders to be shipped</td>
<td>1,000</td>
<td>500</td>
<td>200</td>
</tr>
<tr>
<td>Number of parts per unit</td>
<td>10</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Machine hours per unit</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Labor hours per unit</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

5. What is HiTech's cost application rate for the material-handling activity?
   A. $1.00 per part.
   B. $2.25 per part.
   C. $6.62 per labor hour.
   D. $13.23 per part.
   E. An amount other than those listed above.

6. What is HiTech's cost application rate for the automated machinery activity?
   A. $24.00 per machine hour.
   B. $24.50 per labor hour.
   C. $49.42 per unit.
   D. $50.00 per machine hour.
   E. An amount other than those listed above.

7. What is HiTech's cost application rate for the finishing activity?
   A. $5.00 per labor hour.
   B. $5.00 per machine hour.
   C. $5.00 per unit.
   D. $7.50 per unit.
   E. An amount other than those listed above.

8. What is HiTech's cost application rate for the packaging activity?
   A. $4.86 per machine hour.
   B. $5.00 per labor hour.
   C. $10.00 per unit.
   D. $100.00 per order shipped.
   E. An amount other than those listed above.

9. Under an activity-based costing system, what is the per-unit cost of Economy?
   A. $141.
   B. $164.
   C. $225.
   D. $228.
   E. An amount other than those listed above.

10. Under an activity-based costing system, what is the per-unit cost of Standard?
    A. $164.
    B. $228.
    C. $272.
    D. $282.
    E. An amount other than those listed above.
11. Under an activity-based costing system, what is the per-unit cost of Deluxe?
   A. $272.
   B. $282.
   C. $320.
   D. $440.
   E. An amount other than those listed above.

12. Assume that HiTech is using a volume-based costing system, and the preceding manufacturing costs are applied to all products based on direct labor hours. How much of the preceding cost is assigned to Deluxe?
   A. $456,471.
   B. $646,471.
   C. $961,176.
   D. $1,141,176.
   E. An amount other than those listed above.

13. Assume that HiTech is using a volume-based costing system, and the preceding manufacturing costs are applied to all products based on direct labor hours. How much of the preceding cost is assigned to Standard?
   A. $456,471.
   B. $646,471.
   C. $961,176.
   D. $1,141,176.
   E. An amount other than those listed above.

EXERCISE

1. Vernon Company had a beginning work-in-process inventory of 20,000 units on June 1. These units contained $60,000 of direct materials and $136,000 of conversion cost.

   The following data relate to activity during June:
   
   Production completed (units) 50,000
   Ending work in process, 40% complete (units) 15,000
   Direct materials used ($) 135,000
   Conversion cost ($) 345,600

   Vernon 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.
2. 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.

3. 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:

<table>
<thead>
<tr>
<th></th>
<th>No. 545</th>
<th>No. 567</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$112,000</td>
<td>$94,000</td>
</tr>
<tr>
<td>Number of sweaters</td>
<td>800</td>
<td>1,300</td>
</tr>
<tr>
<td>Subsequent processing department</td>
<td>No. 3</td>
<td>No. 2</td>
</tr>
</tbody>
</table>

Required:
A. Explain the nature of operation costing.
B. Determine the cost of order nos. 545 and 567.
Chapter 5-6: Activity-Based Costing and Cost Management Systems

MULTIPLE CHOICE QUESTIONS

1. Alamo's customer service department follows up on customer complaints by telephone inquiry. During a recent period, the department initiated 7,000 calls and incurred costs of $203,000. If 2,940 of these calls were for the company's wholesale operation (the remainder were for the retail division), costs allocated to the retail division should amount to:
   A. $0.
   B. $29.
   C. $85,260.
   D. $117,740.
   E. $203,000.

Use the following to answer questions 2-5:

Ernst Company currently uses traditional costing procedures, applying $300,000 of overhead to products X and Y on the basis of direct labor hours. The firm is considering a shift to activity-based costing and the creation of individual cost pools that will use direct labor hours (DLH), production setups (SU), and number of parts components (PC) as cost drivers. Data on the cost pools and respective driver volumes follow:

<table>
<thead>
<tr>
<th>Product</th>
<th>Pool No. 1 (Driver: DLH)</th>
<th>Pool No. 2 (Driver: SU)</th>
<th>Pool No. 3 (Driver: PC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>400</td>
<td>25</td>
<td>1,300</td>
</tr>
<tr>
<td>Y</td>
<td>600</td>
<td>75</td>
<td>700</td>
</tr>
</tbody>
</table>

| Pool Cost | $60,000 | $140,000 | $100,000 |

2. The overhead cost allocated to product X by using traditional costing procedures would be:
   A. $120,000.
   B. $124,000.
   C. $176,000.
   D. $180,000.
   E. an amount other than those listed above.

3. The overhead cost allocated to product Y by using traditional costing procedures would be:
   A. $120,000.
   B. $124,000.
   C. $176,000.
   D. $180,000.
   E. an amount other than those listed above.

4. The overhead cost allocated to product X by using activity-based costing procedures would be:
   A. $120,000.
   B. $124,000.
   C. $176,000.
   D. $180,000.
   E. an amount other than those listed above.

5. The overhead cost allocated to product Y by using activity-based costing procedures would be:
   A. $120,000.
   B. $124,000.
   C. $176,000.
   D. $180,000.
   E. an amount other than those listed above.
Use the following to answer questions 6-7:

Kelly and Logan, an accounting firm, provides consulting and tax planning services. A recent analysis found that 65% of the firm's billable hours to clients resulted from tax planning and for many years, the firm's total administrative cost (currently $250,000) has been allocated to services on this basis. The firm, contemplating a change to activity-based costing, has identified three components of administrative cost, as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff support</td>
<td>$180,000</td>
</tr>
<tr>
<td>In-house computing charges</td>
<td>$50,000</td>
</tr>
<tr>
<td>Miscellaneous office costs</td>
<td>$20,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$250,000</strong></td>
</tr>
</tbody>
</table>

A recent analysis of staff support found a strong correlation with the number of clients served (consulting, 20; tax planning, 60). In contrast, in-house computing and miscellaneous office cost varied directly with the number of computer hours logged and number of client transactions, respectively. Consulting consumed 30% of the firm's computer hours and had 20% of the total client transactions.

6. Assuming the use of activity-based costing, the proper percentage to use in allocating staff support costs to tax planning services is:
   A. 20%.
   B. 60%.
   C. 65%.
   D. 75%.
   E. 80%.

7. If Kelly and Logan switched from its current accounting method to an activity-based costing system, the amount of administrative cost chargeable to consulting services would:
   A. decrease by $32,500.
   B. decrease by $23,500.
   C. increase by $23,500.
   D. change by an amount other than those listed above.
   E. change, but the amount cannot be determined based on the information presented.

**EXERCISE**

1. The controller for Mitchell Supply Company has established the following overhead cost pools and cost drivers:

<table>
<thead>
<tr>
<th>Overhead Cost Pool</th>
<th>Budgeted Overhead Cost</th>
<th>Cost Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine setups</td>
<td>$150,000</td>
<td>Number of setups</td>
</tr>
<tr>
<td>Material handling</td>
<td>52,500</td>
<td>Units of raw material</td>
</tr>
<tr>
<td>Quality control inspection</td>
<td>37,500</td>
<td>Number of inspections</td>
</tr>
<tr>
<td>Other overhead costs</td>
<td>90,000</td>
<td>Machine hours</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$330,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overhead Cost Pool</th>
<th>Budgeted Level for Cost Driver</th>
<th>Overhead Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine setups</td>
<td>100 setups</td>
<td>$1,500 per setup</td>
</tr>
<tr>
<td>Material handling</td>
<td>50,000 units</td>
<td>$1.05 per unit</td>
</tr>
<tr>
<td>Quality control</td>
<td>1,000 inspections</td>
<td>$37.50 per inspection</td>
</tr>
<tr>
<td>Other overhead</td>
<td>15,000 machine hours</td>
<td>$6 per machine hour</td>
</tr>
</tbody>
</table>

   **Order no. 610 has the following production requirements:**
   - Machine setups: 5 setups
   - Raw material: 10,000 units
   - Inspections: 12 inspections
   - Machine hours: 600 machine hours

   **Required:**
   A. Compute the total overhead that should be assigned to order no. 610 by using activity-based costing.
   B. Suppose that Mitchell were to use a single, predetermined overhead rate based on machine hours. Compute the rate per hour and the total overhead assigned to order no. 610.
C. Discuss the merits of an activity-based costing system in comparison with a traditional costing system.

2. Lennox Industries manufactures two products: A and B. A review of the company's accounting records revealed the following per-unit costs and production volumes:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production volume (units)</td>
<td>2,500</td>
<td>5,000</td>
</tr>
<tr>
<td>Direct material</td>
<td>$40</td>
<td>$60</td>
</tr>
<tr>
<td>Direct labor:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 hours at $12</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>3 hours at $12</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Manufacturing overhead:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 hours at $93</td>
<td>186</td>
<td></td>
</tr>
<tr>
<td>3 hours at $93</td>
<td>279</td>
<td></td>
</tr>
</tbody>
</table>

Manufacturing overhead is currently computed by spreading overhead of $1,860,000 over 20,000 direct labor hours. Management is considering a shift to activity-based costing in an effort to improve the firm's accounting procedures, and the following data are available:

<table>
<thead>
<tr>
<th>Cost Pool</th>
<th>Cost</th>
<th>Cost Driver Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setups</td>
<td>$240,000</td>
<td>Number of setups A B Total</td>
</tr>
<tr>
<td>General factory</td>
<td>1,500,000</td>
<td>Direct labor hours 5,000 15,000 20,000</td>
</tr>
<tr>
<td>Machine processing</td>
<td>120,000</td>
<td>Machine hours 2,200 800 3,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,860,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

Lennox determines selling prices by adding 40% to a product's total cost.

Required:
A. Compute the per-unit cost and selling price of product B by using Lennox's current costing procedures.
B. Compute the per-unit overhead cost of product B if the company switches to activity-based costing.
C. Compute the total per-unit cost and selling price under activity-based costing.
D. Lennox has recently encountered significant international competition for product B, with considerable business being lost to very aggressive suppliers. Will activity-based costing allow the company to be more competitive with product B from a price perspective? Briefly explain.
E. Will the cost and selling price of product A likely increase or decrease if Lennox changes to activity-based costing? Why? Hint: No calculations are necessary.

3. Management of Laredo Enterprises recently decided to adopt a just-in-time inventory policy to curb steadily rising costs and free-up cash for purposes of investment. The company anticipates that inventory will decrease by $4,450,000, with the released funds to be invested at a 10% return for the firm. Additional data follow.

(1) Reduced inventories should produce savings in insurance and property taxes of $46,000.
(2) Reduced raw-material inventory levels and accompanying stockouts will cost Laredo $85,000.
(3) Laredo will lease 80% of an existing warehouse to another firm for $2.50 per square foot. The warehouse has 40,000 square feet.
(4) Four employees who currently earn $35,000 each will be directly affected by the just-in-time adoption decision. Three employees will be transferred to other positions with Laredo; one will be terminated.
(5) A shift in suppliers is expected to result in the purchase and use of more expensive raw materials. However, these materials should give rise to fewer warranty and repair problems after Laredo's finished product is sold, resulting in a net savings for the firm of $38,000.
(6) Because of the need to handle an increased number of small shipments from suppliers, Laredo will remodel production and receiving-dock facilities at a cost of $750,000. The construction costs will be depreciated over a 10-year life.

Required:
A. Compute the annual financial impact of Laredo's decision to adopt a just-in-time inventory system.
B. In comparison with those of a traditional purchasing system, why would the number and size of incoming supplier shipments change under a just-in-time system?

4. Putnam Enterprises currently purchases a total of 50,000 sensors annually from Utah Electronics at $80 per unit. The firm places 25 purchase orders during the year at an average cost of $10 per order. Putnam's management is contemplating a switch to a just-in-time purchasing system that would require an increase in orders to 200.

Required:
A. Compute the average order size under both the current system and the proposed just-in-time system. Also, calculate the change in annual purchase-order processing cost.
B. Explain why the number of orders will increase under a just-in-time system.
C. What benefits might Putnam experience to help offset the increase in purchase-order processing cost?
D. What might Utah do to the $80 price, given the company's need to process an additional 175 orders?

5. Fargo Enterprises, which manufactures lawn mowers, recently installed a just-in-time purchasing system and an activity-based management program.

Required:
A. Determine whether the following items would be apt to increase or decrease as a result of the just-in-time system:
   1. Inventory storage costs.
   2. Number of suppliers used.
   3. Number of raw material shipments handled.
   4. Dollars available for alternative investment opportunities.
   5. Quality of raw materials purchased.

B. Identify the following items as value-added activities, non-value-added activities, or both.
   1. Attaching the engine to the mower's body.
   2. Installing a new air-conditioning system in the executive offices.
   3. Replacing a defective wheel with a new wheel.
   5. Moving completed mowers to the finished-goods warehouse.
   6. Attaching the handle to the mower's body. The process took longer than normal because of a worker slowdown caused by disgruntled employees.
6. Clark Corporation manufactures cooling system components. The company has gathered the following information about two of its customers: Engle Equipment and Midwest Refrigeration.

<table>
<thead>
<tr>
<th></th>
<th>Engle Equipment</th>
<th>Midwest Refrigeration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales revenue</td>
<td>$215,000</td>
<td>$154,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>95,000</td>
<td>68,000</td>
</tr>
<tr>
<td>General selling costs</td>
<td>30,000</td>
<td>21,500</td>
</tr>
<tr>
<td>General administrative costs</td>
<td>21,000</td>
<td>15,050</td>
</tr>
</tbody>
</table>

Cost-driver data used by the firm and traceable to Engle and Midwest are:

<table>
<thead>
<tr>
<th>Customer Activity</th>
<th>Cost Driver</th>
<th>Rate per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales activity</td>
<td>Sales visits</td>
<td>$900</td>
</tr>
<tr>
<td>Order taking</td>
<td>Sales orders</td>
<td>250</td>
</tr>
<tr>
<td>Special handling</td>
<td>Units handled</td>
<td>30</td>
</tr>
<tr>
<td>Special shipping</td>
<td>Shipments</td>
<td>600</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer Activity</th>
<th>Rate per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales activity</td>
<td>Engle Equipment</td>
</tr>
<tr>
<td>Order taking</td>
<td></td>
</tr>
<tr>
<td>Special handling</td>
<td>Midwest Refrigeration</td>
</tr>
<tr>
<td>Special shipping</td>
<td></td>
</tr>
</tbody>
</table>

Required:
A. Perform a customer profitability analysis for Clark. Compute the gross margin and operating income on transactions related to Engle Equipment and Midwest Refrigeration.
B. Compute gross margin as a percentage of sales revenue. Then compute (1) general selling and administrative costs as a percentage of gross margin and (2) total customer-related costs (i.e., costs that arise from sales visits, order taking, and special handling and shipping) as a percentage of gross margin.
C. On the basis of your calculations, which of the two customers is "more costly" to deal with? Briefly explain.

7. Jackson Corporation sells a line of power tools to home improvement chains, generating a cost of goods sold equal to 70% of sales. The selected data that follow relate to the period just ended for the company's three largest customers: Home Barn, Tool Mart, and Fix-It Depot.

<table>
<thead>
<tr>
<th></th>
<th>Home Barn</th>
<th>Tool Mart</th>
<th>Fix-It Depot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross sales volume:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dollars</td>
<td>$2,000,000</td>
<td>$4,900,000</td>
<td>$4,600,000</td>
</tr>
<tr>
<td>Number of orders</td>
<td>50</td>
<td>175</td>
<td>100</td>
</tr>
<tr>
<td>Type of order:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>43</td>
<td>135</td>
<td>90</td>
</tr>
<tr>
<td>Rush</td>
<td>7</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>Sales returns:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dollars</td>
<td>$100,000</td>
<td>$400,000</td>
<td>$240,000</td>
</tr>
<tr>
<td>Number of returns</td>
<td>2</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Total customer-related costs</td>
<td>$228,000</td>
<td>$918,000</td>
<td>$457,800</td>
</tr>
</tbody>
</table>

Jackson's management recently attended a seminar and learned that customers with excessive requests and demands can have a significant, negative impact on corporate profitability.

Required:
A. For each of the three chains, compute:
1. Total customer-related costs as a percentage of gross margin.
2. The average order size (ignoring sales returns).
3. The ratio of regular orders to rush orders.
4. The number of sales returns as a percentage of the number of total orders.
B. Prepare a brief summary of your findings. Should Jackson work with any of the chains in an effort to improve results? Explain.
B. Customer-related costs are driven by events (and costs) directly traceable to clients. In this case, Tool Mart's costs as a percentage of gross margin are much higher (68%) than those of Home Barn and Fix-It Depot. This result is not surprising given that the firm creates a large number of small orders ($28,000 vs. $40,000 and $46,000) for Jackson to process. In addition, relative to the other two firms, Tool Mart relies more heavily on rush orders, which likely creates additional cost. Finally, a number of Tool Mart's orders (11.4%) eventually result in sales returns, again creating additional processing expense for Jackson. In summary, Tool Mart seems to be an outlier in relation to Home Barn and Fix-It Depot, and management should approach Tool Mart to see if the firm can change its ways of doing business.

8. In the not-too-distant future, Victor Enterprises will introduce a new printer for desktop computers. This printer is expected to compete successfully with other models that are anticipated to sell for $250. Victor's printer has several unique features, and management believes that a slightly higher selling price (10%) is justified. The company's normal profit margin is 30% of selling price.

Required:
A. What is the printer's target price, target profit, and target cost?
B. Suppose that Victor's engineers and cost accountants conclude that the present design of the printer will result in a unit cost of $210. Explain the concept of "value engineering" and be sure to note how it can assist Victor Enterprises in achieving its goals.
A. es can be made.
Chapter 7: Activity Analysis, Cost Behavior, and Cost Estimation

MULTIPLE CHOICE QUESTIONS

1. Montgomery Company has a variable selling cost. If sales volume increases, how will the total variable cost and the variable cost per unit behave?
   
<table>
<thead>
<tr>
<th>Total Variable Cost</th>
<th>Variable Cost Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase</td>
<td>Increase</td>
</tr>
<tr>
<td>B. Increase</td>
<td>Remain constant</td>
</tr>
<tr>
<td>C. Increase</td>
<td>Decrease</td>
</tr>
<tr>
<td>D. Remain constant</td>
<td>Decrease</td>
</tr>
<tr>
<td>E. Decrease</td>
<td>Increase</td>
</tr>
</tbody>
</table>

2. A review of Glandon Corporation's accounting records found that at a volume of 80,000 units, the variable and fixed cost per unit amounted to $7 and $5, respectively. On the basis of this information, what amount of total cost would Glandon anticipate at a volume of 90,000 units?
   
   A. $960,000.  
   B. $1,010,000.  
   C. $1,030,000.  
   D. $1,080,000.  
   E. Some other amount not listed above.

Use the following to answer questions 3-5:

Atlanta, Inc., which uses the high-low method to analyze cost behavior, has determined that machine hours best explain the company's utilities cost. The company's relevant range of activity varies from a low of 600 machine hours to a high of 1,100 machine hours, with the following data being available for the first six months of the year:

<table>
<thead>
<tr>
<th>Month</th>
<th>Utilities</th>
<th>Machine Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>$8,700</td>
<td>800</td>
</tr>
<tr>
<td>February</td>
<td>8,360</td>
<td>720</td>
</tr>
<tr>
<td>March</td>
<td>8,950</td>
<td>810</td>
</tr>
<tr>
<td>April</td>
<td>9,360</td>
<td>920</td>
</tr>
<tr>
<td>May</td>
<td>9,625</td>
<td>950</td>
</tr>
<tr>
<td>June</td>
<td>9,150</td>
<td>900</td>
</tr>
</tbody>
</table>

3. The variable utilities cost per machine hour is:
   
   A. $0.18.  
   B. $4.50.  
   C. $5.00.  
   D. $5.50.  
   E. an amount other than those listed above.

4. The fixed utilities cost per month is:
   
   A. $3,764.  
   B. $4,400.  
   C. $4,760.  
   D. $5,100.  
   E. an amount other than those listed above.

5. Using the high-low method, the utilities cost associated with 980 machine hours would be:
   
   A. $9,510.  
   B. $9,660.  
   C. $9,700.  
   D. $9,790.  
   E. an amount other than those listed above.
Yang Manufacturing, which uses the high-low method, makes a product called Yin. The company incurs three different cost types (A, B, and C) and has a relevant range of operation between 2,500 units and 10,000 units per month. Per-unit costs at two different activity levels for each cost type are presented below.

<table>
<thead>
<tr>
<th>Activity Level</th>
<th>Type A</th>
<th>Type B</th>
<th>Type C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000 units</td>
<td>$4</td>
<td>$9</td>
<td>$4</td>
<td>$17</td>
</tr>
<tr>
<td>7,500 units</td>
<td>$4</td>
<td>$6</td>
<td>$3</td>
<td>$13</td>
</tr>
</tbody>
</table>

6. The cost types shown above are identified by behavior as:
   - A. Fixed
   - B. Variable
   - C. Semivariable

7. If Yang produces 10,000 units, the total cost would be:
   - A. $90,000.
   - B. $100,000.
   - C. $110,000.
   - D. $125,000.
   - E. an amount other than those given above.

8. The cost formula that expresses the behavior of Yang's total costs is:
   - A. \( Y = 0 + 17X \).
   - B. \( Y = 20,000 + 13X \).
   - C. \( Y = 40,000 + 9X \).
   - D. \( Y = 45,000 + 4X \).
   - E. \( Y = 60,000 + 5X \).

9. Checkers Corporation, which uses least-squares regression analysis, has derived the following regression equation for estimates of manufacturing overhead: \( Y = 495,000 + 5.65X \). Which of the following statements is true if the primary cost driver is machine hours?
   - A. Total manufacturing overhead is represented by the variable "X."
   - B. The company anticipates $495,000 of fixed manufacturing overhead.
   - C. "X" is commonly known as the dependent variable.
   - D. "X" represents the number of machine hours.
   - E. Both "B" and "D" are true.

10. Which of the following is not an issue in the collection of data for cost estimation?
    - A. Outliers.
    - B. Missing data.
    - C. Mismatched time periods.
    - D. The effects, over time, of inflation and the learning (i.e., efficiency improvement) that takes place in repetitive tasks.
    - E. All of the above are issues in data collection.
EXERCISE

1. Consider the graphs that follow (the horizontal axis represents activity; the vertical axis represents total dollars).

   a   b   c

   d   e   f

   g   h   i

Required:
For items A-I, choose the graph that best represents the cost behavior pattern described. Note: Graphs can be used more than once.

A. Straight-line depreciation on machinery.
B. The cost of chartering a private airplane. The cost is $800 per hour for the first 6 hours of a flight; it then drops to $600 per hour.
C. The wages of table service personnel in a restaurant. The employees are part-time workers who can be called upon for as little as 4 hours at a time.
D. Weekly wages of store clerks who work 40 hours each week. One clerk is hired for every 125 sales made during the month.
E. The cost of tires used in the production of trucks.
F. Outbound shipping charges that increase at a decreasing rate as sales rise because the firm can use more efficient modes of transportation (e.g., full trailer loads, full rail cars, etc.). Gradually, however, at high levels of sales, freight costs start to increase at an increasing rate, which reflects more transactions made to customers in far-away locations.
G. Equipment leasing costs that are computed at $2 per machine hour worked. The company pays a maximum of $120,000 per month.
H. The monthly cost of a franchise fee for a fast-food restaurant. The franchisee must pay $20,000 plus 5% of gross dollar sales.
I. The cost of electricity during peak demand periods, which is based on the following schedule:

   Up to 20,000 kilowatt hours (KWH) $4,000
   Above 20,000 kilowatt hours $4,000 + $0.02 per KWH
2. Viscount Corporation has a machining capacity of 200,000 hours per year. Utilization of capacity is normally 75%; it has been as low as 40% and as high as 90%. An analysis of the accounting records revealed the following selected costs:

<table>
<thead>
<tr>
<th>Cost A:</th>
<th>At a 40% Utilization Rate</th>
<th>At a 90% Utilization Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>$440,000</td>
<td>$440,000</td>
</tr>
<tr>
<td>Per hour</td>
<td>$5.50</td>
<td>?</td>
</tr>
</tbody>
</table>

Cost B:

<table>
<thead>
<tr>
<th>Cost B:</th>
<th>At a 40% Utilization Rate</th>
<th>At a 90% Utilization Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>?</td>
<td>$1,944,000</td>
</tr>
<tr>
<td>Per hour</td>
<td>$10.80</td>
<td>$10.80</td>
</tr>
</tbody>
</table>

Cost C:

<table>
<thead>
<tr>
<th>Cost C:</th>
<th>At a 40% Utilization Rate</th>
<th>At a 90% Utilization Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>$680,000</td>
<td>$1,330,000</td>
</tr>
<tr>
<td>Per hour</td>
<td>$8.50</td>
<td>$7.39</td>
</tr>
</tbody>
</table>

Viscount uses the high-low method to analyze cost behavior.

Required:
A. Classify each of the costs as being either variable, fixed, or semivariable.
B. Calculate amounts for the two unknowns in the preceding table.
C. Calculate the total amount that Viscount would expect at a 75% utilization rate for Cost A, Cost B, and Cost C.
D. Develop an equation that Viscount can use to predict total cost for any level of hours within its range of operation.
Chapter 8: Cost-Volume-Profit Analysis

MULTIPLE CHOICE QUESTIONS

1. Which of the following would produce the largest increase in the contribution margin per unit?
   A. A 7% increase in selling price.
   B. A 15% decrease in selling price.
   C. A 14% increase in variable cost.
   D. A 17% decrease in fixed cost.
   E. A 23% increase in the number of units sold.

2. Which of the following would take place if a company were able to reduce its variable cost per unit?
   - Contribution Margin
   - Break-even Point
   A. Increase Increase
   B. Increase Decrease
   C. Decrease Increase
   D. Decrease Decrease
   E. Increase No effect

3. A recent income statement of Fox Corporation reported the following data:
   - Sales revenue $3,600,000
   - Variable costs $1,600,000
   - Fixed costs $1,000,000
   If these data are based on the sale of 10,000 units, the break-even point would be:
   A. 2,000 units.
   B. 2,778 units.
   C. 3,600 units.
   D. 5,000 units.
   E. an amount other than those given above.

4. LMS has a break-even point of 40,000 units. If the firm's sole product sells for $20 and fixed costs total $240,000, the variable cost per unit must be:
   A. $6.
   B. $8.
   C. $14.
   D. an amount that cannot be derived based on the information presented.
   E. an amount other than those in choices "A," "B," and "C" but one that can be derived based on the information presented.

5. Yellow, Inc., sells a single product for $10. Variable costs are $4 per unit and fixed costs total $120,000 at a volume level of 10,000 units. What dollar sales level would Yellow have to achieve to earn a target net profit of $240,000?
   A. $400,000.
   B. $500,000.
   C. $600,000.
   D. $750,000.
   E. $900,000.

Use the following to answer questions 6-8:

Archie sells a single product for $50. Variable costs are 60% of the selling price, and the company has fixed costs that amount to $400,000. Current sales total 16,000 units.

6. Archie:
   A. will break-even by selling 8,000 units.
   B. will break-even by selling 13,333 units.
   C. will break-even by selling 20,000 units.
   D. will break-even by selling 1,000,000 units.
   E. cannot break-even because it loses money on every unit sold.
7. Each unit that the company sells will:
   A. increase overall profitability by $20.
   B. increase overall profitability by $30.
   C. increase overall profitability by $50.
   D. increase overall profitability by some other amount.
   E. decrease overall profitability by $5.

8. In order to produce a target profit of $22,000, Archie's dollar sales must total:
   A. $8,440.
   B. $21,100.
   C. $1,000,000.
   D. $1,055,000.
   E. some other amount.

9. Dana sells a single product at $20 per unit. The firm's most recent income statement revealed unit sales of 100,000, variable costs of $800,000, and fixed costs of $400,000. If a $4 drop in selling price will boost unit sales volume by 20%, the company will experience:
   A. no change in profit because a 20% drop in sales price is balanced by a 20% increase in volume.
   B. an $80,000 drop in profitability.
   C. a $240,000 drop in profitability.
   D. a $400,000 drop in profitability.
   E. a change in profitability other than those given above.

10. The following information relates to Knight Company:
    Sales revenue $5,000,000
    Contribution margin 2,000,000
    Net income 500,000
    Knight's operating leverage factor is:
    A. 0.25.
    B. 0.40.
    C. 2.50.
    D. 4.00.
    E. 10.00.

11. The following information relates to Paterno Company:
    Sales revenue $10,000,000
    Contribution margin 4,000,000
    Net income 1,000,000
    If a manager at Paterno desired to determine the percentage impact on net income of a given percentage change in sales, the manager would multiply the percentage increase/decrease in sales revenue by:
    A. 0.25.
    B. 0.40.
    C. 2.50.
    D. 4.00.
    E. 10.00.

**EXERCISE**

1. Thompson Company is considering the development of two products: no. 65 or no. 66. Manufacturing cost information follows.

<table>
<thead>
<tr>
<th></th>
<th>No. 65</th>
<th>No. 66</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual fixed costs</td>
<td>$220,000</td>
<td>$340,000</td>
</tr>
<tr>
<td>Variable cost per unit</td>
<td>33</td>
<td>25</td>
</tr>
</tbody>
</table>

Regardless of which product is introduced, the anticipated selling price will be $50 and the company will pay a 10% sales commission on gross dollar sales. Thompson will not carry an inventory of these items. Required:
A. What is the break-even sales volume (in dollars) on product no. 66?
B. Which of the two products will be more profitable at a sales level of 25,000 units?
C. At what unit-volume level will the profit/loss on product no. 65 equal the profit/loss on product no. 66?

2. The Bruggs & Strutton Company manufactures an engine for carpet cleaners called the "Snooper." Budgeted cost and revenue data for the "Snooper" are given below, based on sales of 40,000 units.

<table>
<thead>
<tr>
<th>Sales</th>
<th>$1,600,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less: Cost of goods sold</td>
<td>1,120,000</td>
</tr>
<tr>
<td>Gross margin</td>
<td>$480,000</td>
</tr>
<tr>
<td>Less: Operating expenses</td>
<td>100,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$380,000</td>
</tr>
</tbody>
</table>

Cost of goods sold consists of $800,000 of variable costs and $320,000 of fixed costs. Operating expenses consist of $40,000 of variable costs and $60,000 of fixed costs.

Required:
A. Calculate the break-even point in units and sales dollars.
B. Calculate the safety margin.
C. Bruggs & Strutton received an order for 6,000 units at a price of $25.00. There will be no increase in fixed costs, but variable costs will be reduced by $0.54 per unit because of cheaper packaging. Determine the projected increase or decrease in profit from the order.
D. Bruggs also received an order for 2,500 units at $29 per unit. If packaging costs will not be reduced on this order and only one order ("C" or "D") can be accepted, which order is more attractive?

3. Alphabet Corporation sells three products: J, K, and L. The following information was taken from a recent budget:

<table>
<thead>
<tr>
<th></th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit sales</td>
<td>40,000</td>
<td>130,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Selling price</td>
<td>$60</td>
<td>$80</td>
<td>$75</td>
</tr>
<tr>
<td>Variable cost</td>
<td>40</td>
<td>65</td>
<td>50</td>
</tr>
</tbody>
</table>

Total fixed costs are anticipated to be $2,450,000.

Required:
A. Determine Alphabet's sales mix.
B. Determine the weighted-average contribution margin.
C. Calculate the number of units of J, K, and L that must be sold to break even.
D. If Alphabet desires to increase company profitability, should it attempt to increase or decrease the sales of product K relative to those of J and L? Briefly explain.

4. Metropolitan Enterprises is studying the addition of a new product that would have an expected selling price of $160 and expected variable cost of $100. Anticipated demand is 8,000 units.

A new salesperson must be hired because the company's current sales force is working at capacity. Two compensation plans are under consideration:

Plan 1: An annual salary of $32,000 plus a 10% commission based on gross sales dollars
Plan 2: An annual salary of $140,000 and no commission

Required:
A. What is meant by the term "operating leverage"?
B. Calculate the contribution margin and net income of the two plans at 8,000 units.
C. Compute the operating leverage factor of the two plans at 8,000 units. Which of the two plans is more highly leveraged? Why?
D. Assume that a general economic downturn occurred during year no. 2, with product demand falling from 8,000 to 6,400 units. By using the operating leverage factors, determine and show which plan would produce a larger percentage decrease in net income.
Chapter 9: Profit Planning, Activity-Based Budgeting, and e-Budgeting

MULTIPLE CHOICE QUESTIONS

1. Charleston Sporting Goods sells bicycles throughout the southeastern United States. The following data were taken from the most recent quarterly sales forecast:

<table>
<thead>
<tr>
<th>End-of-Month</th>
<th>Expected Sales</th>
<th>Target Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>1,200 units</td>
<td>200 units</td>
</tr>
<tr>
<td>May</td>
<td>1,310 units</td>
<td>280 units</td>
</tr>
<tr>
<td>June</td>
<td>1,450 units</td>
<td>375 units</td>
</tr>
</tbody>
</table>

On the basis of the information presented, how many bicycles should the company purchase in May?
A. 1,230.
B. 1,390.
C. 1,590.
D. 1,790.
E. None of the above.

2. Swanson plans to sell 10,000 units of a particular product during July, and expects sales to increase at the rate of 10% per month during the remainder of the year. The June 30 and September 30 ending inventories are anticipated to be 1,100 units and 950 units, respectively. On the basis of this information, how many units should Swanson purchase for the quarter ended September 30?
A. 31,850.
B. 32,150.
C. 32,950.
D. 33,250.
E. None of the above.

3. Tidewater plans to sell 85,000 units of product no. 794 in May, and each of these units requires three units of raw material. Pertinent data follow.

<table>
<thead>
<tr>
<th>Product No. 794</th>
<th>Raw Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual May 1 inventory</td>
<td>11,000 units</td>
</tr>
<tr>
<td>Desired May 31 inventory</td>
<td>17,000 units</td>
</tr>
</tbody>
</table>

On the basis of the information presented, how many units of raw material should Tidewater purchase for use in May production?
A. 228,000.
B. 246,000.
C. 264,000.
D. 282,000.
E. None of the above.

4. Vern's makes all sales on account, subject to the following collection pattern: 20% are collected in the month of sale; 70% are collected in the first month after sale; and 10% are collected in the second month after sale. If sales for October, November, and December were $70,000, $60,000, and $50,000, respectively, what was the budgeted receivables balance on December 31?
A. $40,000.
B. $46,000.
C. $49,000.
D. $59,000.
E. None of the above.

5. Diego makes all purchases on account, subject to the following payment pattern:
   Paid in the month of purchase: 30%
   Paid in the first month following purchase: 60%
   Paid in the second month following purchase: 10%
If purchases for January, February, and March were $200,000, $180,000, and $230,000, respectively, what were the firm's budgeted payments in March?
A. $69,000.
B. $138,000.
C. $177,000.
D. $197,000.
E. None of the above.

**EXERCISE**

1. Jacobs manufactures two products: A and B. The firm predicts a sales volume of 10,000 units for product A and ending finished-goods inventory of 2,000 units. These numbers for product B are 12,000 and 3,000, respectively. Jacobs currently has 7,000 units of A in inventory and 9,000 units of B.

   The following raw materials are required to manufacture these products:

<table>
<thead>
<tr>
<th>Required for Product</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material</td>
<td>2 pounds</td>
<td>1 pound</td>
</tr>
<tr>
<td>X</td>
<td>2 pounds</td>
<td>3 pounds</td>
</tr>
<tr>
<td>Y</td>
<td>1 pound</td>
<td>1 pound</td>
</tr>
<tr>
<td>Z</td>
<td>3 pounds</td>
<td></td>
</tr>
</tbody>
</table>

   Product A requires three hours of cutting time and two hours of finishing time; B requires one hour and three hours, respectively. The direct labor rate for cutting is $10 per hour and $18 per hour for finishing.

   Required:
   A. Prepare a production budget in units.
   B. Prepare a materials usage budget in pounds and dollars.
   C. Prepare a direct labor budget in hours and dollars for product A.

2. Tara Company has the following historical collection pattern for its credit sales:
   - 70% collected in month of sale
   - 15% collected in the first month after sale
   - 10% collected in the second month after sale
   - 4% collected in the third month after sale
   - 1% uncollectible

   Budgeted credit sales for the last six months of 20x1 follow.

<table>
<thead>
<tr>
<th>Month</th>
<th>Credit Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>$30,000</td>
</tr>
<tr>
<td>August</td>
<td>35,000</td>
</tr>
<tr>
<td>September</td>
<td>40,000</td>
</tr>
<tr>
<td>October</td>
<td>45,000</td>
</tr>
<tr>
<td>November</td>
<td>50,000</td>
</tr>
<tr>
<td>December</td>
<td>42,500</td>
</tr>
</tbody>
</table>

   Required:
   A. Calculate the estimated total cash collections during October.
   B. Calculate the estimated total cash collections during the year's fourth quarter.