Solutions for Exercises

1.1  
   a. $258,714 + 309,167 + 140,281 = $708,162 Total Manufacturing Costs
   b. $705,226 (Amount credited to the Work in Process account)
   c. $84,390 + 258,714 + 309,167 + 140,281 - 705,226
      = $87,326 Ending inventory balance

1.2  
   a. Production
   b. Procurement
   c. Selling
   d. Production
   e. Warehousing
   f. Procurement
   g. Selling
   h. Production
   i. Procurement

1.3  
   a. Direct Materials $70,420
      Direct Labor 87,953
      Manufacturing Overhead 42,230
      Manufacturing Costs for Year $200,603
      Work in Process, January 1 39,490
      Total $240,093
   b. Work in Process, December 31 35,620
      Cost of Goods Manufactured $204,473

1.4  
   a. Finished Goods, April $98,480
      Cost of Goods Manufactured 135,705
      Total Available $234,185
      Less Finished Goods, April 30 94,290
      Cost of Goods Sold $139,895
   b. Net Sales $170,920
      Less Cost of Goods Sold 139,895
      Gross Profit $31,025

Check Answers for Problems

<table>
<thead>
<tr>
<th>Problem</th>
<th>Check Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1A</td>
<td>None</td>
</tr>
</tbody>
</table>
| 1.3A    | (1) Cost of Goods Manufactured, $815,000  
          (2) Net Income, $84,000 |
| 1.4A    | (1) Cost of Goods Manufactured, $401,565  
          (2) Net Income, $141,155 |
| 1.5A    | (3) Cost of Goods Manufactured, $271,783  
          (4) Net Income, $21,230 |
Solutions for Exercises

Exercise 2.3 – Ending Balance of Materials

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Balance</td>
<td>183</td>
</tr>
<tr>
<td>Plus: Received</td>
<td>225</td>
</tr>
<tr>
<td>Less: Issued</td>
<td>(159)</td>
</tr>
<tr>
<td>Units Available</td>
<td>249 x $12.50 per unit = $3,112.50</td>
</tr>
</tbody>
</table>

Exercise 2.4 – Gross Amount of Disbursement Voucher

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase Invoice</td>
<td>$25,840</td>
</tr>
<tr>
<td>Less: Debit Memorandum</td>
<td>(1,100)</td>
</tr>
<tr>
<td>Gross Amount of Voucher</td>
<td>$24,740</td>
</tr>
</tbody>
</table>

Exercise 2.5 – Net Amount of Disbursement Vouchers

(a) | Description                        | Value  |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase Invoice</td>
<td>$25,730.00</td>
<td></td>
</tr>
<tr>
<td>Less: Debit Memorandum</td>
<td>(1,380.00)</td>
<td></td>
</tr>
<tr>
<td>Gross Amount of Voucher</td>
<td>$24,350.00</td>
<td></td>
</tr>
<tr>
<td>Less: Discount</td>
<td>(730.50) ($24,350 x .03)</td>
<td></td>
</tr>
<tr>
<td>Net Amount of Disbursement Voucher</td>
<td>$23,619.50</td>
<td></td>
</tr>
</tbody>
</table>

(b) | Description                        | Value  |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase Invoice</td>
<td>$125,703.00</td>
<td></td>
</tr>
<tr>
<td>Less: Debit Memorandum</td>
<td>(5,460.00)</td>
<td></td>
</tr>
<tr>
<td>Gross Amount of Voucher</td>
<td>$120,243.00</td>
<td></td>
</tr>
<tr>
<td>Less: Discount</td>
<td>(4,809.72) ($120,243 x .04)</td>
<td></td>
</tr>
<tr>
<td>Net Amount of Disbursement Voucher</td>
<td>$115,433.28</td>
<td></td>
</tr>
</tbody>
</table>

Check Answers for Problems

2.2A  None
2.3A  Vouchers Payable total, $343,716.24

Solutions for Exercises

3.1  Total materials requisitions $2065.19
     Total returned materials reports -119.30
     Materials costs for Job 620 $1945.89

3.2  Beginning balance (units) 7,990
     Add total purchases (units) + 9,500
     17,490
     Less issuances (units) - 6,525
     Ending balance (units) 10,965
     X $6.80 each $74,562.00

3.3  Work in Process 89,620
### Raw Material Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mfg. Overhead Control</td>
<td>9,760</td>
</tr>
<tr>
<td>Raw Materials</td>
<td>99,380</td>
</tr>
<tr>
<td>Work in Process</td>
<td>6,740</td>
</tr>
<tr>
<td>Mfg. Overhead Control</td>
<td>590</td>
</tr>
</tbody>
</table>

### Vouchers Payable Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Materials</td>
<td>1,586.20</td>
</tr>
<tr>
<td>Vouchers Payable</td>
<td>1,586.20</td>
</tr>
</tbody>
</table>

---

### Key for Questions

11. In a period of rising prices, the use of FIFO results in the highest values being assigned to the ending inventory. Consequently, the cost of goods sold will have a lower value, and the gross profit and net income will have a higher value than if LIFO were used. When LIFO is used, the inventory is assumed to contain the materials first purchased, which in a period of rising prices would be priced at the lowest cost. Consequently, when LIFO is used, the cost of goods sold reflects the higher costs and gross profit and net income will therefore be lower than under FIFO. The higher the net income, the higher the taxes paid; the lower the net income, the lower the taxes paid.

12. The FIFO method assumes that the first goods in are the first goods out, which does reflect the actual physical flow of goods in most cases. Therefore, under the FIFO method the flow of costs nearly matches the flow of materials. When the LIFO method is used, the most current cost is charged against current income. Consequently, with the LIFO method, the flow of costs seldom represents the actual flow of goods. The moving average method is an average of the balance on hand and purchases. Therefore, it acts to minimize the influence of wide fluctuations in purchase prices and does not attempt to match the actual flow of materials with the flow of costs. The inventory valuation method used does not have to match the physical flow of goods.

14. Even if a perpetual inventory system is effectively maintained, errors can occur and discrepancies can arise. Therefore, it is necessary to take a periodic physical inventory, or count of the materials on hand, and compare the actual amounts with the quantities shown on the materials ledger cards. The errors disclosed can then be corrected.

16. Probable causes of inventory shortages should be investigated. If the shortages are due to natural elements such as spoilage and evaporation, better storage techniques should be adopted. If lack of records is the problem, the company needs to strengthen its internal control procedures so that no materials are removed from (or returned to) the storeroom, nor are they returned, without proper written documentation. Also, it is important that only authorized personnel have access to removing and returning materials and that factory employees do not have free access to the storage bins in the storeroom. If the paperwork were being prepared but not processed accurately, then it would be important to identify the employees in the cost accounting department who were responsible for the inaccuracies. They would need to be retrained in the importance of accurate calculations and recordings of source documents.

17. In order to report ending inventories accurately, thus ensuring accurate income statement and balance sheet presentation, it is essential to have a clearly defined cut-off date. Use of a cut-off date ensures that all costs associated with the items in the ending inventories have been recorded. The accountant examines transactions occurring before and after the cut-off date, which is usually the last day of the accounting period.

---

### Check Answers for Problems

4.3A Inventory Valuation
Solutions for Exercises

5.3  42 x $8.00 = $336.00 regular earnings  
     2 x $4.00 =   $8.00 overtime premium  
       $344.00 gross earnings

<table>
<thead>
<tr>
<th>Gross Earnings</th>
<th>$344.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deductions</td>
<td></td>
</tr>
<tr>
<td>Social Security tax (6.2% x $344.00)</td>
<td>$21.33</td>
</tr>
<tr>
<td>Medicare (1.5% x $344.00)</td>
<td>$5.16</td>
</tr>
<tr>
<td>Federal Income tax (15% x $344.00)</td>
<td>$51.60</td>
</tr>
<tr>
<td>Total Deductions</td>
<td>78.09</td>
</tr>
<tr>
<td>Net Pay</td>
<td>$265.91</td>
</tr>
</tbody>
</table>

Solutions for Managerial Decision Case(s)

Case 1

The April overtime was needed to eliminate a backlog of ordinary orders. It should be charged to over-head in order to spread the cost over all the jobs worked on during the year. The May overtime was caused by a specific request from a customer for a rush delivery. Since the overtime can be identified with a particular job, it should be charged to direct labor and to that particular job. The overtime in June was caused by an event beyond the control of the company. This overtime should be charged to overhead.

Check Answers for Problems

5.1A    F. Miller  
    Regular Earnings, $425.50  
    Overtime Premium Earnings, $46.25  
    Gross Earnings, $ 471.75

5.2A    (1) Gross earnings, $4,394.85  
    Social Security Taxes Payable, $272.48

5.3A    Salaries and Wages Payable, $498,950.00

Solutions for Exercises

6.2    Work in Process    178,348
Check Answers for Problems

6.3A  None

7.2A  (2) Manufacturing Overhead—Stores, total costs prorated to the three production departments, $10,361

Solutions for Exercises

10.7  a.  Account Receivable  475
      Work in Process  475

b.  The sale of the scrap should be recorded on the job cost sheet as a reduction in the materials cost. The amount should be entered in the Materials column in parentheses to show the deduction of materials costs.

c.  $8,111.50

Check Answers for Problems

8.1  $196,000 = $.70 rate per unit
     280,000 units

8.4 A Allocation of service department overhead to production departments:

<table>
<thead>
<tr>
<th>Dept</th>
<th>Sq Ft</th>
<th>%</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>2,660</td>
<td>35</td>
<td>$17,101</td>
</tr>
<tr>
<td>102</td>
<td>1,900</td>
<td>25</td>
<td>$12,215</td>
</tr>
<tr>
<td>103</td>
<td>3,040</td>
<td>40</td>
<td>$19,544</td>
</tr>
<tr>
<td></td>
<td>7,600</td>
<td></td>
<td>$48,860</td>
</tr>
</tbody>
</table>

Determination of departmental overhead rates:

Dept. 101:  $75,300
           17,101
           $92,401 ÷ $154,000 = 60%

Dept. 102:  $83,800
           12,215
           $96,015 ÷ $148,860 = 64.5%

Dept. 103:  $78,518
           19,544
           $98,062 ÷ $125,239 = 78.3%

9.2A  (1) Work in Process 122, Job 4-02, $503.75 Dr.
      Work in Process 122, total $3,711.78

(2) Manufacturing Overhead—Sewing Department, -0- balance

(3) Overapplied or Underapplied Manufacturing Overhead $50, $135.72 credit balance

10.2A (4) Balances, June 30, 2006:
      Raw materials 121, $55,180 Dr.
      Work in Process 122, $47,980 Dr.
      Finished Goods 126, $62,740 Dr.
      Manufacturing Overhead Control 501, $1,557 Cr.

(5) Cost of Goods Manufactured, $186,755
(6) Net Income Before Income Taxes, $21,060

10.6A  (2) Work in Process 122, $133 Cr.
(3) Work in Process 122, $126 Dr.

Check Answers for Problems

11.2A  None

11.5A  (1) Assembly Department—Equivalent Production for August:
Labor and Overhead, 1,965 units
(2) Assembly Department—Total Costs to Be Accounted For: Unit Cost, $39.68
Completion Department—Total Costs to Be Accounted For: Unit Cost, $88.82

12.1A  Total Costs to Be Accounted For: Unit Cost $6.72

13.2A  (1) Equivalent Production for May:
Labor and Overhead, 14,275 units
Total to Be Accounted For: 14,800 units
(2) Total Costs to Be Accounted For:
Unit Cost, $96.22

Solutions for Exercises

15.4  a.  Estimated Sales Price of By-Product $18,000
Estimated Selling and Administrative Costs $3,600
Estimated Normal Net Profit $1,800 $5,400
Total Estimated Manufacturing Cost $12,600
Estimated Manufacturing Cost After Separation $4,800
Estimated Manufacturing Cost Before Separation $7,800

Check Answers for Problems

15.2A  (2b) Gain or Loss on Sale of By-Product, $32 Dr.

15.6A  (1a) Costs allocated to Tarlex $112,000
(1b) Costs allocated to Acidtin $50,400
(1c) Costs allocated to Tarlex $111,034
(3) Per Kilogram Basis: Tarlex $3,000
Relative Sales Value Basis: Acidtin $8,600
Assigned Weights Tarlex $47,800
Net Realizable Value Basis Tarlex: $3,966

Solutions for Exercises

16.6  a.  variable
b.  fixed
c.  semivariable
d.  fixed
e.  variable
16.7  

<table>
<thead>
<tr>
<th>Month</th>
<th>Labor Hours</th>
<th>Utilities Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>March (high)</td>
<td>10,400</td>
<td>$80,000</td>
</tr>
<tr>
<td>July (low)</td>
<td>6,800</td>
<td>64,700</td>
</tr>
<tr>
<td>Differences</td>
<td>3,600</td>
<td>$15,300</td>
</tr>
</tbody>
</table>

b. $15,300/3,600 labor hours = $4.25 variable cost per labor hour
10,400 hours in March × $4.25 per hour = $44,200 variable cost.
6,800 hours in July × $4.25 per hour = $28,900 variable cost.

March    July
Total Cost $80,000  $64,700
Deduct Variable Cost 44,200  28,900
Total Fixed Cost $35,800 $35,800

Check Answers for Problems

16.5A   (1) Estimated monthly fixed costs for indirect materials and supplies using high-low points method, 1,350.

Solutions for Exercises

17.6

<table>
<thead>
<tr>
<th>Hours</th>
<th>Indirect Materials</th>
<th>Salaries</th>
<th>Payroll Taxes and Fringe Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>80%</td>
<td>$.25/hr</td>
<td>158,000</td>
<td>4.40/hr</td>
</tr>
<tr>
<td>90%</td>
<td>$33,000</td>
<td>$158,000</td>
<td>40,000</td>
</tr>
<tr>
<td>100%</td>
<td>$45,000</td>
<td>$158,000</td>
<td>$251,200</td>
</tr>
<tr>
<td>110%</td>
<td>$46,500</td>
<td>$158,000</td>
<td>$277,600</td>
</tr>
<tr>
<td>120%</td>
<td>$48,000</td>
<td>$158,000</td>
<td>$304,000</td>
</tr>
<tr>
<td>Totals</td>
<td>$4.65</td>
<td>$231,000</td>
<td>$454,200</td>
</tr>
</tbody>
</table>

17.8

Big Bend Company
Selling Expenses Budget

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenses</td>
<td>Variable Rate (%) of Sales</td>
<td>Total Variable</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Office Salaries</td>
<td></td>
<td>$126,000</td>
</tr>
<tr>
<td>Adv. Expenses</td>
<td>2.00</td>
<td>$30,000</td>
</tr>
<tr>
<td>Sales Commissions</td>
<td>8.00</td>
<td>120,000</td>
</tr>
<tr>
<td>Shipping and Delivery</td>
<td>5.00</td>
<td>75,000</td>
</tr>
<tr>
<td>Delivery Costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>3.00</td>
<td>45,000</td>
</tr>
<tr>
<td>Totals</td>
<td>18.00</td>
<td>$270,000</td>
</tr>
</tbody>
</table>

Check Answers for Problems

17-3A
(1) Total Labor Budgeted, $720,000
(2) Total Budgeted Overhead at 100% of capacity, $341,970

Solutions for Exercises

18.2 Materials Quantity Variance

\[ 132,600 \text{ standard pounds} \times \$3.50 \text{ standard per pound} = \$464,100.00 \]
\[ 133,620 \text{ actual pounds} \times \$3.50 \text{ standard per pound} = \$467,670.00 \]
\[ \text{Materials Quantity Variance} = (1,020 \text{ pounds} \times \$3.50 \text{ standard per pound}) = \$3,570.00 \text{ U} \]

Materials Price Variance

\[ 133,620 \text{ actual pounds} \times \$3.50 \text{ standard per pound} = \$467,670.00 \]
\[ 133,620 \text{ actual pounds} \times \$3.45 \text{ actual per pound} = \$460,989.00 \]
\[ \text{Materials Price Variance} = (133,620 \text{ pounds} \times \$0.05 \text{ per pound}) = \$6,681.00 \text{ F} \]

18.4 a. Materials Quantity Variance

\[ 20,000 \text{ standard gallons} \times \$24.00 \text{ standard per pound} = \$480,000.00 \]
\[ 20,100 \text{ actual gallons} \times \$24.00 \text{ standard per pound} = \$482,400.00 \]
\[ \text{Materials Quantity Variance} = (100 \text{ pounds} \times \$24.00 \text{ per pound}) = \$2,400.00 \text{ U} \]
Materials Price Variance
20,100 actual pounds × $24.00 standard per pound $482,400.00
20,100 actual pounds × $23.80 actual per pound $478,380.00
Materials Price Variance (20,100 pounds × $.20 per pound) $ 4,020.00 F
b. Work in Process $480,000.00
Materials Quantity Variance 2,400.00
Raw Materials
478,380.00
Materials Price Variance 4,020.00

Check Answers for Problems
18.2A
(1) Total standard cost, $26,880
(2) Total Material B-1 price variance, $868 (U)
(3) Total price variance, $627(U)

Solutions for Exercises
19.4
a. Standard overhead per unit of product = $667,500 ÷ 30,000 units = $22.25
b. Standard overhead for production in January = 1500 × $22.25 = $33,375
c. Total overhead variance:
   Actual Costs $42,500
   Standard Cost 33,375
   Total Variance $9,125 U

   d. Budgeted hours 45,000
      Budgeted units ÷30,000
      Hours per unit Standard 1.5
      Budgeted Variable Costs $427,500
      Budgeted Hours ÷ 45,000
      Budgeted Variable cost per hr $ 9.50

      Fixed Costs Budgeted $240,000
      Budgeted units ÷ 30,000
      Fixed costs per unit budgeted $ 8

      Monthly Fixed Cost Budget $240,000 ÷ 12 = $20,000
      (1) Efficiency Variance
         Budgeted based on standard hours
         Variable costs (2,250* standard hours × $9.50 standard cost) 21,375
         *1,500 units × 1.50 std. hours
         Budget based on actual hours
         Variable costs (2,120 actual hours × $9.50 standard cost) 20,140
         Efficiency Variance $1,235 F
(2) Volume Variance
   Applied fixed Standard costs (1500 units × $8 per unit) $12,000
   Budget for fixed cost 20,000
   Volume Variance $8,000(U)

(1) Spending Variance:
   Budget for actual hours:
   Variable costs (2,120 hours × $9.50) $20,140
   Fixed Costs 20,000
   Actual Costs $42,500
   Spending Variance $40,140
   Actual Costs $42,500
   Spending Variance $2,360 U

19.8
Cost of Goods Sold 100
Overhead Spending Variance 4,850
  Overhead Volume Variance 3,800
  Overhead Efficiency Variance 1,150
To close overhead variances accounts into Cost of Goods Sold.

Check Answers for Problems
19.5A (a) Work-in-Process (standard cost), $449,600 Dr
(b) Labor Rate Variance, $2,010 Cr
(c) Manufacturing Overhead Control (Actual cost) $176,900 Cr
(d) Finished Goods, $887,250 Dr
(e) Sales $1,126,840 Cr.

Solutions for Exercises
20.1 LEWISVILLE COMPANY
Income Statement (Absorption Costing)
Year Ended December 31, 2007
Sales (10,000 @$480) $4,800,000
Cost of Sales
  Materials (10,000 × $120) $1,200,000
  Labor (10,000 × $48) 480,000
  Manufacturing Overhead (10,000 × $144) 1,440,000
Cost of Sales 3,120,000
Gross Profit $1,680,000
Selling and Administrative Expenses
  Variable (10,000 × $24) 240,000
  Fixed 600,000
  840,000
Net income $840,000
20.2
Sales price per unit $480
Variable costs per unit
  Materials $120
  Labor 48
  Manufacturing Overhead 48
  Selling and Administrative 24 240
Contribution margin per unit $240

20.3
LEWISVILLE COMPANY
Income Statement (Direct Costing)
Year Ended December 31, 2007

Sales (10,000 @$480) $4,800,000
Variable costs
  Materials $1,200,000
  Labor 480,000
  Manufacturing Overhead 480,000
  Total Variable Manufacturing Costs $2,160,000
Selling and Administrative Expenses 240,000
Contribution Margin $2,400,000

Fixed Costs
  Manufacturing $960,000
  Selling and Administrative 600,000
  Total $1,560,000
Net income $840,000

20.7
Selling Price Per Unit $372
Variable Costs
  Manufacturing $180
  Selling and Administrative 60 240
Contribution Margin $132

Fixed Costs
  Manufacturing $576,000
  Selling and Administrative 924,000
  Total $1,500,000
Break-even Point: $1,500,000 = 11,364 units (rounded)
  $132

20.8
(a) Estimated loss at a volume of $250,000 is $195,000
  Profit or (Loss) = Contribution Margin – Fixed Costs
  Contribution Margin = $250,000 Sales × .50 = $125,000
  Profit or (Loss) = $125,000 Contribution Margin- $320,000 Fixed Costs
  = $195,000 Loss

(b) Estimated profit if volume is $900,000 = $130,000
  Contribution Margin = $900,000 × .50 = $450,000
Profit = $450,000 - $320,000 = $130,000
Fixed Costs = $130,000

20.9 Sales volume necessary to earn $300,000 profit = 3,100,000.
Sales to earn profit of $300,000 = $320,000 (fixed costs) + $300,000 (profit)
= $620,000 = 3,100,000
.20 (contribution margin)

Check Answers for Problems

20-1A
(1) Net Income for Year, $64,000
(3) Net Income for Year, $14,000
(4) Difference, $50,000

Solutions for Exercises

21.3 a. If the product is discontinued, the net loss will be increased by $180,000, the amount of contribution margin now being made by the product. All allocated fixed costs will continue, even though the manufacture of the product is discontinued as shown below.

<table>
<thead>
<tr>
<th>Sales</th>
<th>$1,130,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less Variable Costs</td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>$900,000</td>
</tr>
<tr>
<td>Selling and Administrative</td>
<td>50,000</td>
</tr>
<tr>
<td>Contribution Margin</td>
<td>$180,000</td>
</tr>
</tbody>
</table>

b. Based on the information given, the company should not discontinue manufacturing the customized cabinet, because the product is now contributing $180,000 margin toward covering fixed expenses and earning a profit.

21.7 a. The company’s net income would increase by an estimated $3,250 per month: ($1.30 × 2,500 each month)

<table>
<thead>
<tr>
<th>Sales Price per Unit</th>
<th>$21.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs per unit</td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>$12.00</td>
</tr>
<tr>
<td>Labor</td>
<td>6.00</td>
</tr>
<tr>
<td>Manufacturing Overhead</td>
<td>1.00</td>
</tr>
<tr>
<td>Special packaging and Delivery</td>
<td>1.20</td>
</tr>
<tr>
<td>Estimated Contribution Margin per Unit</td>
<td>$1.30</td>
</tr>
</tbody>
</table>

b. The major consideration of this contract is potential negative reactions from other customers and the potential growth of regular sales to absorb the excess capacity. No information is given about regular sales and potential sales growth. Some businesses are reluctant to have such a large percentage of their sales made to one customer because the loss of that customer may leave a void that is difficult to replace.

21.8 a. The offer should not be accepted. The offered price is $1.88 per unit less than the variable costs (manufacturing, selling and administrative costs) related to the units sold and would contribute nothing to pay fixed costs or earn a profit.
Revenue per Unit $18.72

Variable Costs per Unit
- Materials $10.00
- Labor 6.00
- Variable Manufacturing Overhead 4.00
- Selling and Administrative Expenses .60

Excess of Variable Costs Over Revenue per Unit $1.88

b. If the price offered were 20.20, it should still be rejected. The variable costs would be increased to $21.00 by the additional $0.40 per unit increased in selling and administrative expenses, resulting in a shortfall of $0.80 per unit in recovering variable costs.

Revenue per unit $20.20
Variable Expenses ($10.00 + $6.00 + $4.00 + $1.00) 21.00
Excess of Variable Costs Over Revenue per Unit $ 80

Check Answers for Problems

Problem 21-1A

Instruction 1

<table>
<thead>
<tr>
<th>Sales</th>
<th>480,000.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable Manufacturing Costs ($360,000 - $48,000)</td>
<td>312,000.00</td>
</tr>
<tr>
<td>Variable Selling and Admin. Expenses ($200,000 - $48,000)</td>
<td>152,000.00</td>
</tr>
<tr>
<td>Total Variable Costs</td>
<td>464,000.00</td>
</tr>
<tr>
<td>Contribution Margin</td>
<td>16,000.00</td>
</tr>
</tbody>
</table>

Instruction 2

The effects of discontinuing Party-Party Jeans would be to decrease the company's profit (or increase its loss) by $16,000, the amount of the contribution margin from the Party-Party Jeans.
Instruction 1

The analysis below indicates that Product C-1 should be further processed because to do so would result in an increase of $66,000 in gross profit. Since general and administrative expenses are not affected by the decision, the net profit also would increase by $66,000. On the other hand, processing Product C-2 further would decrease gross profit (and net income) by $7,500.

<table>
<thead>
<tr>
<th></th>
<th>Present Production</th>
<th>Further Processing</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Product C-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue</td>
<td>517,500</td>
<td>1,033,500</td>
<td>516,000</td>
</tr>
<tr>
<td>Variable Costs</td>
<td>240,000</td>
<td>690,000</td>
<td>450,000</td>
</tr>
<tr>
<td>Contribution Margin</td>
<td>277,500</td>
<td>343,500</td>
<td>66,000</td>
</tr>
<tr>
<td>Fixed Costs</td>
<td>180,000</td>
<td>180,000</td>
<td>0</td>
</tr>
<tr>
<td>Gross Profit on Sales of Product C-1</td>
<td>97,500</td>
<td>163,500</td>
<td>66,000</td>
</tr>
</tbody>
</table>

| Process Product C-2  |                    |                    |            |
| Revenue              | 277,500            | 457,500            | 180,000    |
| Variable Costs       | 120,000            | 217,500            | 97,500     |
| Contribution Margin  | 157,500            | 240,000            | 82,500     |
| Fixed Costs          | 90,000             | 180,000            | 90,000     |
| Gross Profit on Sales of Product C-2 | 67,500           | 60,000             | (7,500)    |

Instruction 2

Other factors to consider in making the decision are:
- a. The key questions whether the variable cost allocation has been made on a meaningful basis. The impact of further processing on variable costs must be carefully examined to determine that the projected changes in cost are realistic and would reflect actual cost changes.
- b. Assurance that the demand and other factors relating to the products further processed are realistic.
- c. Impact on present customers for existing products if one or both products are processed further.
- d. Another assumption that warrants further investigation is that there will be no increase in general and administrative expenses. Almost invariably some of those costs are partly variable and do not remain constant when further manufacturing activity is taking place.

Solutions for Exercises

23.1   a. Accounting rate of return on beginning investment, 2.9%

Net Cash Flow Before Taxes $80,000
Annual Depreciation (.125 × $480,000) 60,000
Annual Net Income Before Taxes $20,000
Income Taxes (.3 × $20,000)  6,000
Net Income After Taxes  $14,000

Rate of return on beginning investment = \( \frac{\$14,000}{\$480,000} \) = 2.92%
b. Accounting rate of return on average investment, 5.83%
Average investment = \( \frac{\$480,000 + \$0}{2} \) = $240,000
Rate of return on average investment = \( \frac{\$14,000}{\$240,000} \) = 5.83%

23.2
a. Accounting rate of return on beginning investment, 3.49%
Net Cash Flow Before Taxes  $38,000
Annual Depreciation (.125 × $200,000)  25,000
Annual Net Income Before Taxes  $13,000
Income Taxes (.3 × $13,000)  3,900

Net Income After Taxes ($13,000 - $3,900) = $ 9,100
Rate of return on beginning investment = \( \frac{\$9,100}{\$200,000} \) = 4.55%

b. Accounting rate of return on average investment, 9.1%
Average investment = \( \frac{\$200,000 + \$0}{2} \) = $100,000
Rate of return on average investment = \( \frac{\$9,100}{\$100,000} \) = 9.1%

23.3 After-tax annual cash flow = $24,000 - .35($24,000 - $9,000 depreciation) = $18,750
Payback period = $200,000 = 10.67 years (rounded to 11 years)
$ 18,750

23.6 Total present value of the stream of cash flows, at 12% is
PV of $10,000, due one year later (10,000 × .893) = $ 8,930
PV of $12,000, due two years later (12,000 × .797) = 9,564
PV of $18,000, due three years later (18,000 × .712) = 12,816
Total present value $31,310

23.8 Present value of $12,000 per year at 16% for 10 years is 57,996 ($12,000 × 4.833).

Check Answers for Problems

23.5A (1) Total present value of future cash flows, $1,197,584