CHAPTER 19 SOLUTIONS

Exercise 19-15 (15 minutes)

Inventory calculations (units):

Finished-goods inventory, January 1 .................................................... 2,000 units
Add: Units produced ............................................................................... 20,000 units
Less: Units sold ....................................................................................... 21,000 units
Finished-goods inventory, December 31 .............................................. 1,000 units

EXERCISE 19-15 (CONTINUED)

1. Variable costing:

   **Inventoriable costs under variable costing:**

   - Direct material used .......................................................... $  600,000
   - Direct labor incurred ......................................................... 300,000
   - Variable manufacturing overhead ....................................... 200,000
   - Total .................................................................................. $1,100,000

   Cost per unit produced = $1,100,000/20,000 units = $55 per unit

   Ending inventory: 1,000 units × $55 per unit ............................... $55,000

2. Absorption costing:

   Predetermined fixed-overhead rate
   
   \[
   \text{Predetermined fixed-overhead rate} = \frac{\text{fixed manufacturing overhead}}{\text{planned production}} = \frac{$420,000}{20,000 \text{ units}}
   \]

   = $21 per unit
Difference in fixed overhead expensed under absorption and variable costing =

\[
\frac{\text{change in inventory in units}}{\text{fixed-overhead rate}} \times \text{predetermined rate}
\]

= (1,000 units) \times ($21 per unit)

= $21,000

Difference in reported income:

Since inventory decreased during the year, income reported under absorption costing will be $21,000 lower than income reported under variable costing.

**Exercise 19-16 (25 minutes)**

Inventory calculations (units):

Finished-goods inventory, January 1 .................................................... 0 units
Add: Units produced ............................................................................... 10,000 units
Less: Units sold ....................................................................................... 9,000 units
Finished-goods inventory, December 31 .............................................. 1,000 units

1. Variable costing:

   *Inventoriable costs under variable costing:*

   - Direct material used ............................................................... $40,000
   - Direct labor incurred .............................................................. 20,000
   - Variable manufacturing overhead ............................................ 12,000
   - Total ................................................................................ $72,000

   Cost per unit produced = $72,000/10,000 units = $7.20 per unit

   Ending inventory: 1,000 units \times $7.20 per unit ......................... $7,200

2. Absorption costing:

   Predetermined fixed-overhead rate
\[
\text{Difference in fixed overhead expensed under absorption and variable costing} = \left( \frac{\text{change in inventory}}{\text{in units}} \right) \times \left( \frac{\text{predetermined fixed-overhead rate}}{} \right)
\]

\[
= (1,000 \text{ units}) \times (2.50 \text{ per unit})
\]

\[
= 2,500
\]

Difference in reported income:
Since inventory increased during the year, income reported under absorption costing will be $2,500 higher than income reported under variable costing.

EXERCISE 19-16 (CONTINUED)

3. Throughput costing:

\textit{Inventoriable costs under throughput costing:}

\begin{align*}
\text{Direct material used} & \quad \text{.................................................................} \quad 40,000 \\
\text{Total} & \quad \text{.................................................................} \quad 40,000
\end{align*}

\[
\text{Cost per unit produced} = \frac{40,000}{10,000 \text{ units}} = 4.00 \text{ per unit}
\]

\[
\text{Ending inventory: } 1,000 \text{ units} \times 4.00 \text{ per unit} \quad \text{.........................} \quad 4,000
\]
**Exercise 19-19 (10 minutes)**

1. **Inventoriable costs under absorption costing:**

   | Direct material used | $340,000 |
   | Direct labor        | $160,000 |
   | Variable manufacturing overhead | $75,000 |
   | Fixed manufacturing overhead | $125,000 |
   | **Total**           | **$700,000** |

2. **Inventoriable costs under variable costing:**

   | Direct material used | $340,000 |
   | Direct labor        | $160,000 |
   | Variable manufacturing overhead | $75,000 |
   | **Total**           | **$575,000** |