ACCT2121
Ch7 Solutions to selected Exercises 12th edition

Exercise 7-1 (15 minutes)

1. Under absorption costing, all manufacturing costs (variable and fixed) are included in product costs.

Direct materials	R120
Direct labor	140
Variable manufacturing overhead	50
Fixed manufacturing overhead (R600,000 ÷ 10,000 units)	60
Unit product cost	R370

2. Under variable costing, only the variable manufacturing costs are included in product costs.

Direct materials	R120
Direct labor	140
Variable manufacturing overhead	50
Unit product cost	R310

Note that selling and administrative expenses are not treated as product costs under either absorption or variable costing; that is, they are not included in the costs that are inventoried. These expenses are always treated as period costs and are charged against the current period's revenue.

Exercise 7-3 (20 minutes)

1.

	Year 1	*Year 2*	*Year 3*
Beginning inventories (units)	180	150	160
Ending inventories (units)	150	160	200
Change in inventories (units)	(30)	10	40
Variable costing net operating income	$292,400	$269,200	$251,800
Add: Fixed manufacturing overhead cost deferred in inventory under absorption costing (10 units × $450 per unit; 40 units × $450 per unit)		4,500	18,000
Deduct: Fixed manufacturing overhead cost released from inventory under absorption costing (30 units × $450 per unit)	13,500		
Absorption costing net operating income	$278,900	$273,700	$269,800

2. Because absorption costing net operating income was greater than variable costing net operating income in Year 4, inventories must have increased during the year and hence fixed manufacturing overhead was deferred in inventories. The amount of the deferral is just the difference between the two net operating incomes or $27,000 = $267,200 – $240,200.

Exercise 7-5 (30 minutes)

1. Under variable costing, only the variable manufacturing costs are included in product costs.

Direct materials	$ 60
Direct labor	30
Variable manufacturing overhead	10
Unit product cost	$100

Note that selling and administrative expenses are not treated as product costs; that is, they are not included in the costs that are inventoried. These expenses are always treated as period costs and are charged against the current period's revenue.

2. The variable costing income statement appears below:

Sales		$1,800,000
Variable expenses:		
Variable cost of goods sold:		
Beginning inventory	$ 0	
Add variable manufacturing costs (10,000 units × $100 per unit)	1,000,000	
Goods available for sale	1,000,000	
Less ending inventory (1,000 units × $100 per unit)	100,000	
Variable cost of goods sold*	900,000	
Variable selling and administrative (9,000 units × $20 per unit)	180,000	1,080,000
Contribution margin		720,000
Fixed expenses:		
Fixed manufacturing overhead	300,000	
Fixed selling and administrative	450,000	750,000
Net operating loss		$ (30,000)

* The variable cost of goods sold could be computed more simply as: 9,000 units sold × $100 per unit = $900,000.

3. The break-even point in units sold can be computed using the contribution margin per unit as follows:

Selling price per unit	$200
Variable cost per unit	120
Contribution margin per unit	$ 80

$$\text{Break-even unit sales} = \frac{\text{Fixed expenses}}{\text{Unit contribution margin}}$$

$$= \frac{\$750{,}000}{\$80 \text{ per unit}}$$

$$= 9{,}375 \text{ units}$$

Exercise 7-6 (20 minutes)

1. Under absorption costing, all manufacturing costs (variable and fixed) are included in product costs.

Direct materials	$ 60
Direct labor	30
Variable manufacturing overhead	10
Fixed manufacturing overhead ($300,000 ÷ 10,000 units)	30
Unit product cost	$130

2. The absorption costing income statement appears below:

Sales (9,000 units × $200 per unit)		$1,800,000
Cost of goods sold:		
Beginning inventory	$ 0	
Add cost of goods manufactured (10,000 units × $130 per unit)	1,300,000	
Goods available for sale	1,300,000	
Less ending inventory (1,000 units × $130 per unit)	130,000	1,170,000
Gross margin		630,000
Selling and administrative expenses:		
Variable selling and administrative (9,000 units × $20 per unit)	180,000	
Fixed selling and administrative	450,000	630,000
Net operating income		$ 0

Note: The company apparently has exactly zero net operating income even though its sales are below the break-even point computed in Exercise 7-5. This occurs because $30,000 of fixed manufacturing overhead has been deferred in inventory and does not appear on the income statement prepared using absorption costing.

Exercise 7-7 (30 minutes)

1. a. The unit product cost under absorption costing would be:

Direct materials	$18
Direct labor	7
Variable manufacturing overhead	2
Total variable manufacturing costs	27
Fixed manufacturing overhead ($160,000 ÷ 20,000 units)	8
Unit product cost	$35

b. The absorption costing income statement:

Sales (16,000 units × $50 per unit)		$800,000
Cost of goods sold:		
Beginning inventory	$ 0	
Add cost of goods manufactured (20,000 units × $35 per unit)	700,000	
Goods available for sale	700,000	
Less ending inventory (4,000 units × $35 per unit)	140,000	560,000
Gross margin		240,000
Selling and administrative expenses		190,000 *
Net operating income		$ 50,000

*(16,000 units × $5 per unit) + $110,000 = $190,000.

2. a. The unit product cost under variable costing would be:

Direct materials	$18
Direct labor	7
Variable manufacturing overhead	2
Unit product cost	$27

b. The variable costing income statement:

Sales (16,000 units × $50 per unit)		$800,000
Less variable expenses:		
Variable cost of goods sold:		
Beginning inventory	$ 0	
Add variable manufacturing costs (20,000 units × $27 per unit)	540,000	
Goods available for sale	540,000	
Less ending inventory (4,000 units × $27 per unit)	108,000	

Variable cost of goods sold	432,000 *	
Variable selling expense (16,000 units × \$5 per unit)	80,000	512,000
Contribution margin		288,000
Less fixed expenses:		
Fixed manufacturing overhead	160,000	
Fixed selling and administrative	110,000	270,000
Net operating income		\$ 18,000

* The variable cost of goods sold could be computed more simply as: 16,000 units × \$27 per unit = \$432,000.

Exercise 7-9 (20 minutes)

1.

Sales (40,000 units × \$33.75 per unit)		\$1,350,000
Variable expenses:		
Variable cost of goods sold (40,000 units × \$16 per unit*)	\$640,000	
Variable selling and administrative expenses (40,000 units × \$3 per unit)	120,000	760,000
Contribution margin		590,000
Fixed expenses:		
Fixed manufacturing overhead	250,000	
Fixed selling and administrative expenses	300,000	550,000
Net operating income		\$ 40,000

* Direct materials	\$10
Direct labor	4
Variable manufacturing overhead	2
Total variable manufacturing cost	\$16

2. The difference in net operating income can be explained by the \$50,000 in fixed manufacturing overhead deferred in inventory under the absorption costing method:

Variable costing net operating income	\$40,000
Add: Fixed manufacturing overhead cost deferred in inventory under absorption costing: 10,000 units × \$5 per unit in fixed manufacturing overhead cost	50,000
Absorption costing net operating income	\$90,000

Problem 7-11 (45 minutes)

1. a. The unit product cost under absorption costing:

Direct materials	$15
Direct labor	7
Variable manufacturing overhead	2
Fixed manufacturing overhead (640,000 ÷ 40,000 units)	16
Unit product cost	$40

b. The absorption costing income statement follows:

Sales (35,000 units × $60 per unit)		$2,100,000
Cost of goods sold:		
Beginning inventory	$ 0	
Add cost of goods manufactured (40,000 units × $40 per unit)	1,600,000	
Goods available for sale	1,600,000	
Less ending inventory (5,000 units × $40 per unit)	200,000	1,400,000
Gross margin		700,000
Selling and administrative expenses*		630,000
Net operating income		$ 70,000

*(35,000 units × $2 per unit) + $560,000 = $630,000.

2. a. The unit product cost under variable costing:

Direct materials	$15
Direct labor	7
Variable manufacturing overhead	2
Unit product cost	$24

b. The variable costing income statement follows:

Sales (35,000 units × $60 per unit)		$2,100,000
Variable expenses:		
Variable cost of goods sold:		
Beginning inventory	$ 0	
Add variable manufacturing costs (40,000 units × $24 per unit)	960,000	
Goods available for sale	960,000	
Less ending inventory (5,000 units × $24 per unit)	120,000	
Variable cost of goods sold	840,000	

Variable selling expense (35,000 units × $2 per unit)	70,000	910,000
Contribution margin		1,190,000
Fixed expenses:		
Fixed manufacturing overhead	640,000	
Fixed selling and administrative expense	560,000	1,200,000
Net operating loss		$ (10,000)

3. The difference in the ending inventory relates to a difference in the handling of fixed manufacturing overhead costs. Under variable costing, these costs have been expensed in full as period costs. Under absorption costing, these costs have been added to units of product at the rate of $16 per unit ($640,000 ÷ 40,000 units produced = $16 per unit). Thus, under absorption costing a portion of the $640,000 fixed manufacturing overhead cost of the month has been added to the inventory account rather than expensed on the income statement:

Added to the ending inventory (5,000 units × $16 per unit)	$ 80,000
Expensed as part of cost of goods sold (35,000 units × $16 per unit)	560,000
Total fixed manufacturing overhead cost for the month	$640,000

Because $80,000 of fixed manufacturing overhead cost has been deferred in inventory under absorption costing, the net operating income reported under that costing method is $80,000 higher than the net operating income under variable costing, as shown in parts (1) and (2) above.