Chapter 8
(Absorption vs. Variables Costing Systems)

Product Costs vs. Period Costs

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a. Product Costs.

Product costs are the manufacturing costs that ***should be assigned*** to the units produced. They are reported on the balance sheet as **inventory** until they are sold.

Upon sale, product costs are transferred from the balance sheet to the income statement as "Expense" and treated as period cost, which is referred to as cost of goods sold (CGS).

b. Period Costs.

All costs that are ***not included*** in product costs are treated as period costs. Since these costs are not assigned to production, they are treated as expenses on an income statement in the period during which they are incurred. That is why they are called period costs.

Note that the terms "product cost" and "period cost" designate which financial statement (balance sheet or income statement) the costs incurred should be recognized.

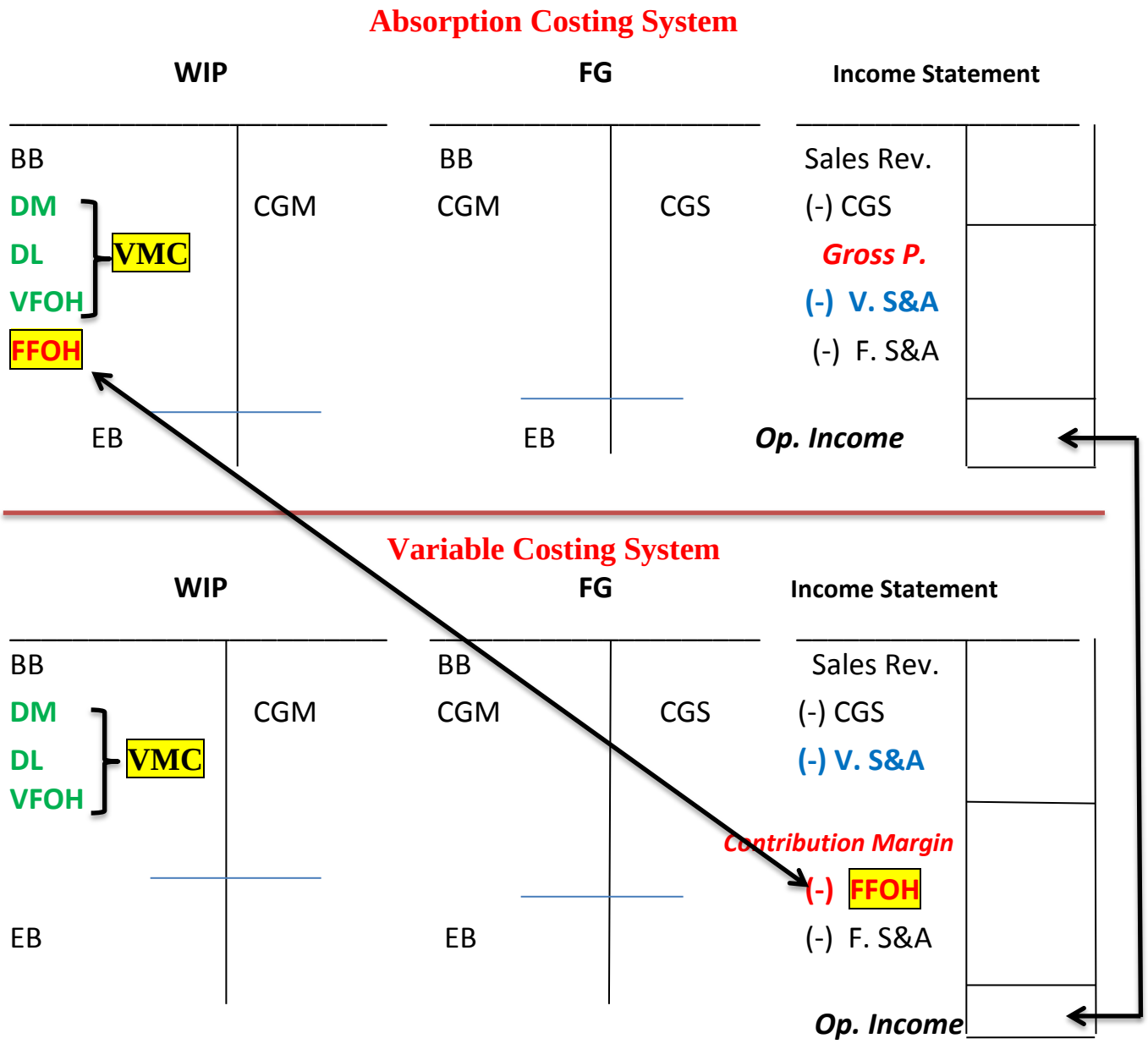
Product Costing Systems (Absorption vs. Variable systems)

Absorption (Full) Costing System

- Absorption costing system is required by GAAP for the purpose of preparing the financial statements for external users.
- Under absorption costing system **ALL** manufacturing costs (i.e., DM, DL, Variable Factory Overhead (VFOH) and **Fixed Factory Overhead** (**FFOH**)) are assigned to production in the WIP account as **product costs,** which is reported as **(CGM).** The cost CGM flow from WIP account into Finished-Goods account as inventory available for sale. Upon the sale of inventory, the product costs flow from Finished-Goods Inventory into the income statement as an Expense referred to as Cost of Goods Sold (CGS).
- All *non-product* costs incurred by a company are reported as period costs and are usually labeled S&A expenses on the income statement.

Variable Costing System

- Variable costing is required for internal reporting purpose to help managers in decision making.
- Under variable costing system **ONLY** variable manufacturing costs (i.e., DM, DL and Variable Factory Overhead (VFOH)) are assigned to production in the WIP as **product costs.**
- Fixed FOH costs are treated as period costs along with S&A expenses.


Absorption Costing System
WIP
FG
Income Statement
BB
DM
DL
VFOH
VMC
FFOH
CGM
EB
BB
CGM
CGS
EB
Sales Rev.
(-) CGS
Gross P.
(-) V. S&A
(-) F. S&A
Op. Income
Variable Costing System
WIP
FG
Income Statement
BB
DM
DL
VFOH
VMC
CGM
EB
BB
CGM
CGS
EB
Sales Rev.
(-) CGS
(-) V. S&A
Contribution Margin
(-) FFOH
(-) F. S&A
Op. Income

Comparison of Absorption Costing (AC) & variable costing (VC)

There are three cases when we compare the income under the two methods:

Production versus Sales	Total Inventory Effect	Period Expense Effect		Profit Effect
Produced > Sold	Increase	Fixed mfg. costs expensed AC	< Fixed mfg. costs expensed VC	AC > VC
Produced < Sold	Decrease	Fixed mfg. costs expensed AC	> Fixed mfg. costs expensed VC	AC < VC
Produced = Sold	No change	Fixed mfg. costs expensed AC	= Fixed mfg. costs expensed VC	AC = VC

AC = Absorption Costing System VC = Variable Costing System

Summary:

If Production = Sales	***then***	Absorption NI = Variable NI
If Production > Sales	***then***	Absorption NI > Variable NI*
If Production < Sales	***then***	Absorption NI < Variable NI**

* Net operating income will be higher under absorption costing because some of the current period FFOH will be *deferred* in inventory under absorption costing.

** Net operating income will be lower under absorption costing because the total amount of FFOH *released* to the income statement under absorption costing is higher than those charged under variable costing.

RECONCILIATION OF NET OPERATING INCOMES

Three alternative formulas to reconcile the differences between NI under the two approaches:

1. **Diff. in NI =** |#Units produced – #Units sold|* ***per unit*** Fixed FOH
2. **Diff. in NI =** |#Units [Ending Inventory] – #Units [Beg. Inventory] | * ***per unit*** Fixed FOH
3. Diff. in NI = |Fixed FOH in Ending Inventory – Fixed FOH in Beginning Inventory|

It is important to Note that while the net income under variable costing system is a function of only sales volume, the net income under absorption costing is a function of both sales volume and production volume.

Example 1: (Case 1- Production = Sales)

Harvey Company produces a single product. During 2010 (the first year of operation), the company ***produced 25,000 units*** and ***sold 25,000 units*** at $30/unit.

Following are the cost data:

Variable costs *per unit*:

Variable Manufacturing Costs **(VMC):** DM ($5) + DL($4) + VFOH($1) =	**$10**
Selling and administrative expense	$3

Fixed costs per year:

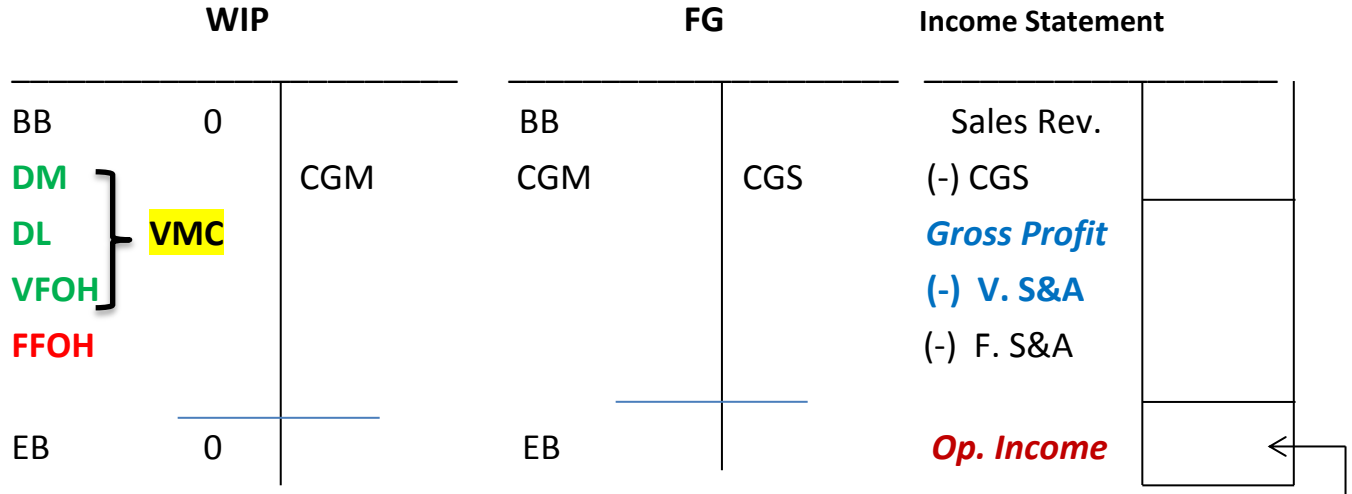
Total Fixed manufacturing overhead	$150,000
Total Fixed selling & administrative expense	$100,000

Required:

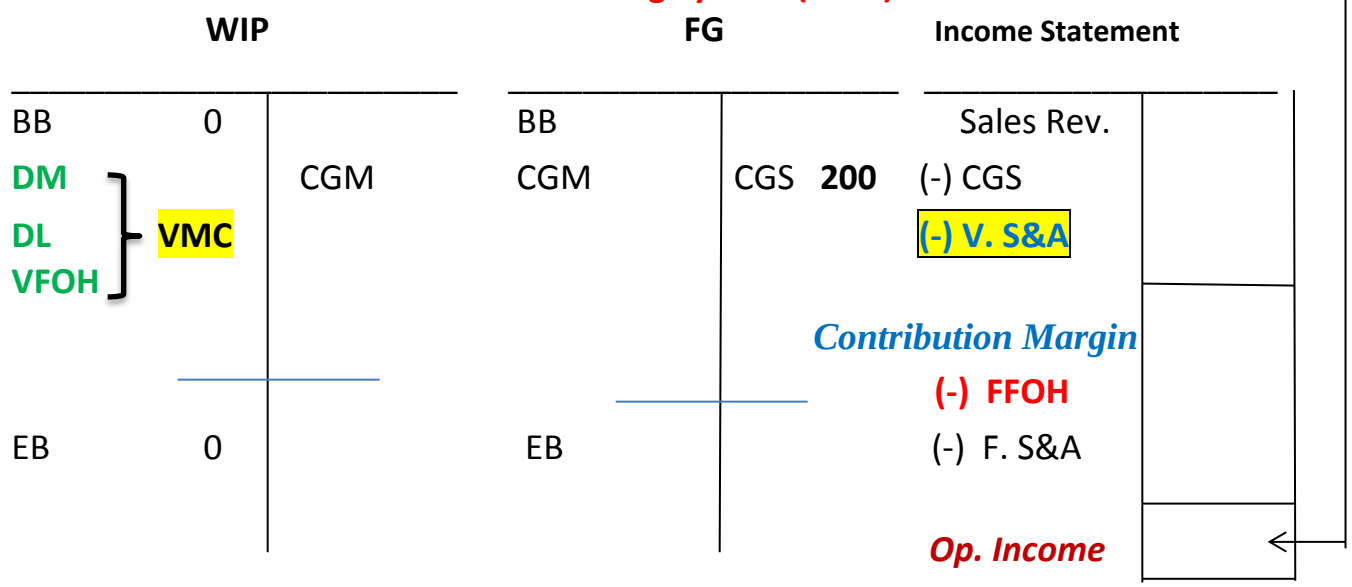
1) Prepare the income statement under Absorption Costing System for 2010.
2) Prepare the income statement under Variable Costing System for 2010

Case 1: **Production = 25,000 units & Sales = 25,000 Units**

Absorption Costing System (2010)



Variable Costing System (2010)



(Case 2- Production > Sales)

- During 2011, the company ***produced 25,000 units*** and ***sold 20,000 units*** at $30/unit.
- The cost structure remained the same as the first year.

Absorption Costing System (2011)

WIP

BB	0		
DM		CGM	
DL	VMC		
VFOH			
FFOH			
EB	0		

FG

BB		
CGM	CGS	
EB		

Income Statement

Sales Rev.	
(-) CGS	
Gross Profit	
(-) V. S&A	
(-) F. S&A	
Op. Income	

Variable Costing System (2011)

WIP

BB	0		
DM		CGM	
DL	VMC		
VFOH			
EB	0		

FG

BB		
CGM	CGS	
EB		

Income Statement

Sales Rev.	
(-) CGS	
(-) V. S&A	
Contribution Margin	
(-) FFOH	
(-) F. S&A	
Op. Income	

Reconciliation:

Reconcile the differences in net income under the two product costing systems

(Case 3- Production < Sales)

- In its third year of operations 2012, Harvey Co. started with an inventory of 5,000 units, produced 25,000 units and sold 28,000 units at $30 each.
- The cost structure remained the same as the first year.

Absorption Costing System (2012)

WIP

BB	0		
DM		CGM	
DL	VMC		
VFOH			
FFOH			
EB	0		

FG

BB		
CGM	CGS	
EB		

Income Statement

Sales Rev.	
(-) CGS	
Gross Profit	
(-) V. S&A	
(-) F. S&A	
Op. Income	

Variable Costing System (2012

WIP

BB	0		
DM		CGM	
DL	VMC		
VFOH			
EB	0		

FG

BB		
CGM	CGS	
EB		

Income Statement

Sales Rev.	
(-) CGS	
(-) V. S&A	
Contribution Margin	
(-) FFOH	
(-) F. S&A	
Op. Income	

Reconciliation:

Reconcile the differences in net income under the two product costing systems

Practice Questions

T/F

Product costs include all the manufacturing costs that are used in the production process.

Use the following information to answer the next two questions

S&F Co started its business on January 1, 2014. On December 31, 2014, the company's records show the following costs per unit:

Prime Costs	44
Variable manufacturing overhead	35
Fixed manufacturing overhead	40
Variable selling and administrative cost	17
Fixed selling and administrative cost	32

1. Calculate the **Product (Inventoriable) cost per unit** under variable costing and absorption costing?

	Variable Costing	Absorption Costing
a.	$79	$151
b.	$96	$119
c.	$96	$151
d.	$79	$119
e.	None of the above	

2. Calculate the **Period cost per unit** under variable costing and absorption costing?

	Variable Costing	Absorption Costing
a.	$89	$49
b.	$96	$119
c.	$89	$72
d.	$79	$49
e.	None of the above	

3. Rose Corporation produces a single product. Last year, the company had net operating income of $50,000 using **variable** costing. Beginning and ending inventories were 13,000 units and 18,000 units, respectively. If the fixed manufacturing overhead cost was $2.00 per unit, what would have been the net operating income using **absorption** costing?

a. $40,000
b. $50,000
c. $60,000
d. $86,000

4. For the most recent year, Atlantic Company's net income computed by the absorption costing method was $7,400, and its net income computed by the variable costing method was $10,100. The company's unit product cost was $17 under variable costing and $22 under absorption costing. What must have been the beginning inventory if the ending inventory consisted of 1,460 units?

a. 920 units
b. 1,460 units
c. 2,000 units
d. 12,700 units
e. None of the above

MCQ Answers

T/F: **F**

1. D
2. A
3. C

Explanation:

Diff. in NI = ABS |# of Units produced – #Units sold|* *per unit* Fixed FOH
Diff. in NI = ABS (13,000 units– 18,000 units) * 2 = $10,000
The fact that # of units in EB > # of units in BB implies that Production is > Sales.
Hence, Absorption NI > Variable NI
Thus, Absorption NI = 50,000 + 10,000 =60,000

4. C

Explanation:

Diff. in NI = $10,100 - $7,400 = $2700
Per unit FFOH = 22 – 17 = $5 per unit.
Diff. in NI = ABS |# of Units produced – #Units sold|* *per unit* Fixed FOH
$2700 = ABS (|# of Units produced – #Units sold) * 5
Change in the Quantity of inventory = 2700/5 = 540 units
Since Absorption NI < Variable NI; this implies that EB < BB
Thus, BB = EB + Change in Inv. During the period
= 1,460 units + 540 units = 2,000 units

Problem 1:

Boat Refit Inc. produces and sells custom parts for powerboats. The company uses a costing system based on actual costs. Selected accounting and production information for fiscal 2016 is as follows:

Net income (under absorption costing)	$ 400,000
Sales	$3,400,000
Fixed factory overhead	$ 600,000
Fixed selling and administrative costs (all costs are fixed)	$ 400,000
Net income (under variable costing)	$ 310,000
Units produced	2,000 units
Units sold	?

Boat Refit had no work in process inventory at either the beginning or the end of fiscal 2016. As well, the company did not have any finished goods inventory at the beginning of the fiscal year.

Instructions

1) Calculate the units sold in fiscal 2016.

2) Calculate the total contribution margin under variable costing.