

EXAM REVIEW

ACCOUNTING 102 - UNIT II - CHAPTERS 4, 5, & 6

STUDY SUGGESTIONS

Review your class notes, homework exercises and problems.

Review **Summary, Review Problem and Glossary** at the end of each chapter.

Use your **Study Guide**, especially Multiple Choice and True & False questions

Review the resource materials and practice quizzes and exams available on the

Textbook Website:

http://highered.mcgraw-hill.com/sites/0073048836/information_center_view0/

Additional review materials are available online at sites such as:

<http://www.cliffsnotes.com/WileyCDA/Section/id-305261.html>

Chapter 4 – Systems Design: Process Costing

- Understand the differences and similarities between job order and process costing.
- Understand how product costs flow through the inventory accounts and into cost of goods sold.
- Understand that each production department has a unique Production Report and separate work-in-process inventory account.
- Know the journal entries required in a Process Cost system.
- Understand the concept of "Equivalent Units" and how to calculate equivalent units
- Know how to prepare a Production Report consisting of:
 - Quantity Schedule
 - Equivalent Units
 - Cost per Equivalent Unit
 - Cost Reconciliation

Chapter 5 - Cost Behavior: Analysis And Use

- Understand the differences between fixed costs and variable costs
- Explain the relationship between variable cost and the activity base.
- Distinguish between true variable costs and step variable costs.
- Distinguish between committed and discretionary fixed costs.
- Explain how the relevant range affects the behavior of variable and fixed costs.
- Explain mixed costs and how to analyze them using high-low method and scatter-graph methods.
- Prepare an income statement using the contribution approach.

Chapter 6 - Cost-Volume-Profit Relationships

- CVP analysis is based on the interactions among the following five elements:
 - Price or revenue of products
 - Volume or level of activity
 - Per units variable costs
 - Total fixed costs.
 - Mix of products sold (CVP analysis requires an assumption about sales mix)
- Contribution Margin:
 - Understand the difference between gross margin and contribution margin
 - Understand the relationship among:
 - Revenue, variable cost and contribution margin per unit
 - Total revenue, variable cost, contribution margin and fixed costs
 - Level of activity / number of units sold
 - Contribution Margin is the remaining amount of sales dollars available to cover fixed expenses and profit.
 - Contribution Margin in Dollars = Sales Revenue - Variable Expenses.
 - Contribution Margin per unit = Selling Price per unit – Variable Expense per unit
 - Contribution Margin Ratio = Contribution Margin / Sales

Break-Even Point:

- At the Break-even Point:
 - Profit or operating income equals 0.
 - Total revenue equals total costs.
 - Total contribution margin equals fixed expenses.
- The break-even point is measured in sales dollars and/or units sold. It may be calculated using either the Equation Method or the Contribution Margin Method:

Equation Method :

In Units Sold: $\text{sales } \$/\text{unit} \times \text{units sold} = \text{variable expenses } \$/\text{unit} \times \text{units sold} + \text{fixed expenses} + \text{profit of } 0$

In Sales Dollars: $\text{sales } \% = \text{variable expenses } \% + \text{fixed expenses} + \text{profit of } 0$

Contribution Margin Method:

In Units Sold: $\frac{(\text{Fixed Expenses} + \text{Profit of } 0)}{\text{Contribution Margin per unit}}$

In Sales Dollars: $\frac{\text{Fixed expenses} + \text{Profit of } 0}{\text{Contribution Margin ratio}}$

- Understand and calculate the break-even point in sales dollars and units sold for both single-product and multi-product companies. Sales mix, the relative combination in which a company's products are sold, is assumed to be constant for these companies.
- Understand target profit and be able to calculate the sales dollars and units sold necessary to achieve a target profit. Use the break-even formulas above, substituting the target profit for the break-even profit of 0.
- Understand how the revenue function, cost functions and break-even point shift when revenue and/or cost assumptions are changed
- Understand and calculate the margin of safety. Margin of Safety is the excess of budgeted or actual sales over the break-even volume of sales.

$$\text{Margin of safety in dollars} = \text{Total sales} - \text{Break-even sales}$$

$$\text{Margin of safety percentage} = \text{Margin of safety in dollars} / \text{Total sales}$$
- Understand and calculate leverage and explain how leverage changes when sales increase or decrease. Operating Leverage is a way to measure, at a given level of sales, how a percentage change in sales volume will affect profits.

$$\text{Degree of operating leverage} = \text{Contribution margin} / \text{Net income}$$

SAMPLE PROBLEMS

Problem 1 - Production Report

The Rodman Paint Company manufactures products that go through two departments, mixing and filling. The company uses the weighted average method to compute unit costs. The following information is from the mixing department for the month of May.

	<u>Gallons</u>	<u>Amount Completed</u>	
		<u>Materials</u>	<u>Conversion</u>
Work in process, May 1	70,000	5/7	3/7
Started into production	460,000		
Completed and transferred	450,000		
Work in process, May 31	80,000	3/4	5/8

Costs in the beginning work in process inventory and costs added during May were:

	<u>Materials</u>	<u>Conversion</u>
Work in process, May 1	\$35,000	\$17,000
Costs added during May	391,000	282,000

Required: Prepare a production report for the mixing department for May.

Problem 2 - Multiple Choice Questions

1. Lap Company uses the weighted-average method in its process costing system. The beginning inventory in a particular department consisted of 80,000 units, 100% complete with respect to materials and 25% complete with respect to conversion costs. The total dollar value of this inventory was \$226,000. During the month, 150,000 units were transferred out of the department. The costs per equivalent unit of production for the month were \$2.00 for materials and \$3.50 for conversion costs. The value of the units completed and transferred out of the department was:
 - a. \$681,000
 - b. \$765,000
 - c. \$821,000
 - d. \$825,000

Questions 2-4 refer to the following:

Yoder Company uses the weighted-average method in its process costing system. The following data pertain to operations in the first processing department for a recent month:

Work in Process, beginning	
Units in process:	40,000
Stage of completion with respect to materials	70%
Stage of completion with respect to conversion	60%
Costs in the beginning inventory:	
Material cost	\$8,600
Conversion cost	\$4,800
Units started into production during the month	750,000
Units completed and transferred out during the month	?
Costs added to production during the month:	
Materials cost	\$223,000
Conversion cost	\$149,000
Work in process, ending	
Units in process	30,000
Stage of completion with respect to materials	40%
Stage of completion with respect to conversion	30%

2. How many units were completed and transferred to the next department during the month?
 - a. 750,000 units
 - b. 790,000 units
 - c. 760,000 units
 - d. 740,000 units
3. What was the cost per equivalent unit of production for materials during the month?
 - a. \$0.30
 - b. \$0.25
 - c. \$0.20
 - d. \$0.15
4. How much cost, in total, was assigned to the ending work in process inventory?
 - a. \$2,600
 - b. \$4,300
 - c. \$15,000
 - d. \$5,400

Problem 3 – High-Low Method and Contribution Income Statement

The Belfour Company is a manufacturer of a single product Belfour's income statements for the last two years are given below:

	This Year	Last Year
Units sold	300,000	240,000
Sales revenue	\$1,500,000	\$1,200,000
Less: Cost of goods sold	800,000	740,000
Gross margin	700,000	460,000
Less: Operating expenses	450,000	420,000
Net Income	250,000	40,000

The company's cost of goods sold and operating expenses are mixed costs.

- Required:
- (a) Using the high-low method, separate the cost of goods sold and operating expenses into their variable and fixed elements. Show the formula used.
 - (b) Prepare a contribution-format income statement for this year.
 - (c) Calculate the anticipated net income if units sold is 280,000.

Problem 4 - Multiple Choice Questions

1. When the activity level is expected to decline within the relevant range, what effects would be anticipated with respect to each of the following?

Fixed costs per unit	Variable costs per unit
a. Increase	Increase
b. Increase	No change
c. No change	No change
d. No change	Increase

2. Utility costs at Service, Inc. are a mixture of fixed and variable components. Records indicate that utility costs are an average of \$0.40 per hour at an activity level of 9,000 machine hours and \$0.25 per hour at an activity level of 18,000 machine hours. What is the expected total utility cost if the company works 13,000 machine hours?
 - a. \$4,225
 - b. \$5,200
 - c. \$4,000
 - d. \$3,250
3. Clerical costs in the billing department of Craig Company are a mixture of variable and fixed components. Records indicate that average unit processing costs are \$0.50 per account processed at an activity level of 32,000 accounts. When only 22,000 accounts are processed, the total cost of processing is \$12,500. Given these data, at a budgeted level of 25,000 accounts:
 - a. Processing costs are expected to total \$8,750
 - b. Fixed processing costs are expected to be \$10,400
 - c. The variable processing costs are expected to be \$0.35 per account processed
 - d. Processing costs are expected to total \$14,975

Questions 4-7 refer to the following:

University Store, Inc.'s first quarter income statement is presented below:

University Store, Inc.
Income Statement
For the Quarter Ended March 31, 2003

Sales		\$800,000
Cost of Goods Sold		<u>560,000</u>
Gross Margin		240,000
Less: Operating Expenses:		
Selling Expenses	\$100,000	
Administrative Expenses	<u>110,000</u>	<u>210,000</u>
Net Income		\$ 30,000

On average, a book sells for \$40.00. Variable selling expenses are \$3.00 per book; the remaining selling expenses are fixed. The variable administrative expenses are 5% of sales; the remainder of the administrative expenses are fixed.

4. The contribution margin for the University Store for the first quarter is:
 - a. \$660,000
 - b. \$700,000
 - c. \$180,000
 - d. \$140,000
5. The net income computed using the contribution approach for the first quarter is:
 - a. \$ 30,000
 - b. \$180,000
 - c. \$140,000
 - d. \$ 0
6. The cost formula for operating expenses with "X" equal to the number of books sold is:
 - a. $Y = \$105,000 + \$3X$
 - b. $Y = \$105,000 + \$5X$
 - c. $Y = \$110,000 + \$5X$
 - d. $Y = \$110,000 + \$33X$
7. If 25,000 books are sold during the second quarter, the company's expected contribution margin would be:
 - a. \$875,000
 - b. \$300,000
 - c. \$175,000
 - d. \$ 65,000

Problem 5 - CVP Relationships

The Berman Company manufactures and sells a single product . The company's sales and expenses for last month were:

	<u>Total</u>	<u>Per Unit</u>	<u>Percentage</u>
Sales	\$500,000	\$25	100%
Less: Variable expenses	<u>200,000</u>	<u>10</u>	40%
Contribution margin	300,000	15	60%
Less: Fixed expenses	<u>270,000</u>		
Net income	\$ 30,000		

Required:

1. Calculate the monthly break-even point in units sold and in sales dollars.
 - a. using the equation method
 - b. using the contribution margin method
 - c. verify your answer by preparing a contribution income statement
2. Without any computations, what is the contribution margin at the break-even point?
3. How many units would have to be sold each month to earn a minimum target net income of \$60,000?

Verify your answer by preparing a contribution income statement at the target level of sales.

4. Refer to the original data above. Compute the company's margin of safety in both dollars and percentage.
5. Refer to the original data above.
 - a. What is the company's Contribution Margin Ratio?
 - b. If monthly sales increase by \$25,000 and there is no change in fixed expenses, by how much would you expect net income to increase?
6. Refer to the original data above. If the company were able to reduce its variable expenses by \$1 per unit,
 - a. what would be the new monthly break-even point in units and sales dollars?
 - b. verify your answer by preparing a contribution income statement.
7. Compute the company's degree of operating leverage. If sales increase by 10% how much should net income increase?

Problem 6 - Multiple Choice Questions

1. Barnes Corporation expected to sell 150,000 games during the month of November. The following budgeted data are based on that level of sales:

Revenue (150,000 games)	\$2,400,000
Variable Expenses	1,425,000
Fixed manufacturing overhead expenses	250,000
Fixed selling & administrative expenses	<u>500,000</u>
Net Income	225,000

Barnes' actual sales during November were 180,000 games. What should the actual net income during November have been?

- a. \$450,000
 - b. \$270,000
 - c. \$420,000
 - d. \$510,000
2. DARTH Company sells three products. Sales and contribution margin ratios for the three products follow:

	Product		
	<u>X</u>	<u>Y</u>	<u>Z</u>
Sales in dollars	\$20,000	\$40,000	\$100,000
Contribution margin ratio	45%	40%	15%

The contribution margin ratio for the company as a whole would be:

- a. 25%
 - b. 75%
 - c. 33.3%
 - d. it is impossible to determine from the data given
3. The following information pertains to Nova Co.'s cost-volume-profit relationships:

Breakeven point in units sold	1,000
Variable costs per unit	\$500
Total fixed costs	\$150,000

How much will be contributed to net income by the 1,001st unit sold?

- a. \$650
- b. \$500
- c. \$150
- d. \$0

4. Given the following data:

Selling price per unit	\$2.00
Variable production cost per unit	\$0.30
Fixed production cost	\$3,000
Sales commission per unit	\$0.20
Fixed selling expenses	\$1,500

The breakeven point in dollars is:

- a. \$6,000
- b. \$4,500
- c. \$2,647
- d. \$4,000

Questions 5-7 refer to the following:

Pricher Corporation's income statement for last year appears below:

Sales		\$2,000,000
Cost of goods sold:		
Direct materials	\$500,000	
Direct labor (variable)	150,000	
Variable manufacturing overhead	50,000	
Fixed manufacturing overhead	<u>600,000</u>	<u>1,300,000</u>
Gross Profit		700,000
Selling and administrative expenses		
Variable	100,000	
Fixed	300,000	<u>400,000</u>
Operating Income		300,000

5. The breakeven point last year was:

- a. \$1,500,000
- b. \$2,571,429
- c. \$1,250,000
- d. \$ 900,000

6. The degree of operating leverage last year was:

- a. 0.33
- b. 2.33
- c. 4.00
- d. 3.33

7. If fixed selling and administrative expenses increase by \$60,000 and sales remain at the \$2,000,000 level, what is the margin of safety in sales dollars:
- a. \$300,000
 - b. \$200,000
 - c. \$500,000
 - d. \$400,000

SOLUTIONS TO SAMPLE PROBLEMS

Problem 1

(a) Quantity Schedule and Equivalent Units

Quantity Schedule

Units to be accounted for:

Work in process, May	170,000
Started into production	460,000
Total units to be accounted for	530,000

Equivalent Units

Units accounted for as follows:

		<u>Materials</u>	<u>Conversion</u>
Transferred to filling	450,000	450,000	450,000
Work in process, May 31	<u>80,000</u>	<u>60,000</u>	<u>50,000</u>
Total units accounted for	530,000	510,000	500,000

(b) Total and Unit Costs

Total		Materials	Conversion	Whole Unit
Work in process, May 1	\$52,000	\$ 35,000		\$ 17,000
Costs added during the month	<u>673,000</u>	<u>391,000</u>	<u>282,000</u>	
Total Cost	\$725,000	\$426,000	\$299,000	
Equivalent units (from above)		510,000	500,000	
Unit cost	\$ 0.835	\$ 0.598		\$1.433

(c) Cost Reconciliation

Equivalent Units (EU)

	Costs	Materials	Conversion
Costs accounted for as follows:			
Transferred to filling:			
450,000 units x \$1.433 each	\$645,000	450,000	450,000
Work in process, May 31,			
Materials at \$0.835 per EU	50,100	60,000	
Conversion at \$0.598 per EU	<u>29,900</u>		50,000
Total work in process, May 31	<u>80,000</u>		
Total costs accounted for	\$725,000		

4. D	Cost of Ending WIP	
	DM: 12,000 * .3 =	3,600
	CV: 9,000 * .2 =	<u>1,800</u>
	Total	5,400

Problem 3

(a) Cost of goods sold:

	Cost	Activity
High level of activity	\$800,000	300,000
Low level of activity	<u>740,000</u>	<u>240,000</u>
Change	\$ 60,000	60,000 units sold

Variable rate: $\text{Change in cost} / \text{change in activity}$
 $\$60,000 / 60,000 \text{ units} = \1.00 per unit

Fixed Cost element = Total cost - variable cost element
 $\$800,000 - (300,000 \text{ units} \times \$1) = \$500,000$

Equation: $Y = 500,000 + 1X$

(a) Operating expenses

	Cost	Activity
High level of activity	\$450,000	300,000
Low level of activity	<u>420,000</u>	<u>240,000</u>
Change	\$ 30,000	60,000 units sold

Variable rate: $\$30,000 / 60,000 \text{ units} = \0.50 per unit

Fixed cost: $\$450,000 - (300,000 \text{ units} \times \$0.50) = \$300,000$

Equation: $Y = 300,000 + .5X$

(b) The company's income statement for this year using the contribution format.

Sales Revenue	\$1,500,000	
Less: Variable expenses		
Cost of goods sold	300,000	
Operating expenses	<u>150,000</u>	<u>450,000</u>
Contribution margin		1,050,000
Less: Fixed expenses:		
Cost of goods sold	500,000	
Operating expenses	<u>300,000</u>	<u>800,000</u>
Net income		\$ 250,000

(c) The company's anticipated income if units sold is 280,000.

Sales Revenue (280,000 * 5)	\$1,400,000
Less: Variable expenses	
Cost of goods sold 280,000	
Operating Expenses	<u>140,000</u>
Contribution Margin	980,000
Less: Fixed Expenses:	
Cost of goods sold 500,000	
Operating expenses	<u>300,000</u>
Net Income	\$180,000

Problem 4

1. B

2. C	Cost	Activity
.25 * 18,000 =	\$4,500	18,000
.40 * 9,000 =	<u>3,600</u>	<u>9,000</u>
Change	900	9,000

$$\$900/9,000 = .10 \text{ variable cost per unit}$$

$$\$4,500 = (.10 * 18,000) + \text{Fixed Cost}$$

$$\$4,500 = 1,800 + \text{Fixed Cost}$$

$$\$2,700 = \text{Fixed Cost}$$

$$\text{At 13,000 machine hours: Total Cost} = (.10 * 13,000) + \$2,700$$

$$\text{Total Cost} = \$4,000$$

3. C

	Cost	Activity
	\$16,000	32,000
	<u>12,500</u>	<u>22,000</u>
Change	\$ 3,500	10,000

$$\$3,500/10,000 = \$.35 \text{ variable cost per unit}$$

$$\$16,000 = (.35 * 32,000) + \text{Fixed Cost}$$

$$\$16,000 = 11,200 + \text{Fixed Cost}$$

$$\$4,800 = \text{Fixed Cost}$$

$$\text{At 25,000 accounts: Total Cost} = (.35 * 25,000) + \$4,800$$

$$\text{Total Cost} = \$13,550$$

4. D Sale		800,000
-Var. Exp.:		
COGS	560,000	
Var. Selling	60,000	
Var. Adm.	<u>40,000</u>	<u>660,000</u>
CM		140,000

5. A

6. D Variable Costs:		
COGS	\$28.00	(\$800,000 sales / \$40 unit sales price)
Var. Selling	3.00	
Var. Adm.	2.00	(5% of sales of \$800,000)/20,000 units
Var. Cost per unit	\$33.00	
Fixed Costs:		
Fixed Selling	\$40,000	(100,000 – (\$3 * 20,000))
Fixed Adm.	<u>70,000</u>	[110,000 – (5% * Sales of 800,00)]
Total Fixed	110,000	
Cost Formula:	$Y = 33X + 110,000$	

7. C Sales (25,000 * \$40)	1,000,000
Var Exp. (25,000 * 33)	<u>825,000</u>
CM	175,000

Problem 5

1. Monthly break-even point in units and sales dollars:

(a) using equation method:

$$X = .40X + 270,000$$

$$.6X = 270,000;$$

$$X = 270,000 / .6;$$

$$X = \$450,000;$$

$$450,000 / 25 = 18,000 \text{ units}$$

(b) using contribution margin method:

$$270,000 / 15 = 18,000 \text{ units}$$

$$18,000 \text{ units} \times \$25 = \$450,000$$

(c) proof:

Sales	\$450,000
Less: Variable expenses	<u>180,000</u>
Contribution margin	270,000
Less: Fixed expenses	<u>270,000</u>
Net income	\$ 0

2. The contribution margin is \$270,000, equal to the fixed expenses

3. Target level of sales:

$$270,000 + 60,000 = 330,000$$

$$330,000 / 15 = 22,000 \text{ units}$$

$$22,000 \text{ units} \times \$25 = \$550,000$$

Proof:

Sales	\$550,000
Less: Variable expenses	<u>220,00</u>
Contribution margin	330,000
Less: Fixed expenses	<u>270,000</u>
Net income	\$ 60,000

4. Margin of safety:

$$\$500,000 - \$450,000 = \$50,000$$

$$\$50,000 / \$500,000 = .10 \text{ or } 10\%$$

5. (a) Contribution margin ratio is 60% ($300,000 / 500,000 = .60$ or 60%)

(b) Net income should increase by \$15,000 (60% of \$25,000)

6. New contribution margin is \$16 per unit

$$\text{New break-even point is } \$270,000 / \$16 = 16,875 \text{ units}$$

$$16,875 \text{ units} \times 25 = \$421,875$$

Proof:

Sales	\$ 421,875
Less: Variable expenses	<u>151,875</u>
Contribution margin	270,000
Less: Fixed expenses	<u>270,000</u>
Net income	\$ 0

7. Degree of operating leverage is 10; ($\$300,000 / \$30,000 = 10$)

Net income should increase by 100%; ($10 \times 10\% = 100\%$)

Proof: Compare original data with income statement in solution 3 above.

Sales increased 10% and net income increased 100%, from \$30,000 to \$60,000

Problem 6

1. C Selling Price per unit: $2,400,000/150,000 = \$16$
 Variable Expense per unit: $1,425,000/150,000 = \$9.50$

Sales (180,000 * 16)	2,880,000	
Less: Variable Expenses (180,000 * 9.50)	<u>1,710,000</u>	
Contribution Margin	1,170,000	
Less: Fixed MOH	250,000	
Fixed Selling & Adm.	<u>500,000</u>	<u>750,000</u>
Net Income		420,000

2. A		X	Y	Z	Total
	Sales	20,000	40,000	100,000	160,000
	Var. Exp.	<u>11,000</u>	<u>24,000</u>	<u>85,000</u>	<u>120,000</u>
	CM	9,000	16,000	15,000	40,000

$$\frac{\text{CM } 40,000}{\text{Sales } 160,000} = 25\%$$

3. C Break-even point: Sales = Total Costs
 Sales = Var. Costs (\$500/unit * 1000 units) + Fixed Costs (150,000)
 Sales = \$650,000 at break-even point
 Selling Price Per Unit = \$650,000/1,000 units = \$650
 Contribution Margin per unit = \$650 (selling price) - \$500 (var. exp.) = \$150

4. A CM% = (Sales – Var. Exp.) / Sales
 = (2.00 - .50)/2 (Var. prod., .30 + Var. selling .2 = .50)
 CM% = 75%

$$\text{Fixed Cost} = 4,500 (3,000 + 1,500)$$

$$\text{Break-even sales} = \text{Fixed cost}/\text{CM\%} = 4,500/.75 = \$6,000$$

5. A Sales		2,000,000
Less: Var. MFG	700,000	
Var. Selling & Adm.	<u>100,000</u>	<u>800,000</u>
Contribution Margin		1,200,000
Less: Fixed MFG	600,000	
Fixed Selling & Adm.	<u>300,000</u>	<u>900,000</u>
Net Income		300,000

Revised September, 2007

Break-even point:

Fixed Cost = 900,000

CM % = .6 (1,200,000/2,000,000)

Break-even sales = 900,000/.6 = \$1,500,000

6. C
$$\frac{\text{Contribution Margin}}{\text{Net Income}} = \frac{1,200,000}{300,000} = 4$$

7. D New Break-even Point:

Fixed Cost = 960,000

CM% = .6

Break-even sales = 960,000/.6 = \$1,600,000

Margin of Safety = Sales – BE Sales
= \$2,000,000 – \$1,600,000
= \$400,000