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**CONCORDIA UNIVERSITY**

**Course:** Managerial Accounting,  
**No.:** Comm. 305 & Acco. 240 Sections All  
**Examination:** Final  
**Date:** June 18, 2009  
**No. of Pages:** 7 including the cover page  
**Material Allowed:** Non-programmable calculators and dictionaries  
**Special Instructions:** Return the exam questions with your answers.

**Student Name:** \_\_\_\_\_

**Student Id. No.:** \_\_\_\_\_

**Section:** \_\_\_\_\_

**Instructor:** \_\_\_\_\_

## PROBLEM I 15 MARKS

Steel Shop Co. manufactures three types of computer desks. The income statement for the three products and the whole company is shown below:

	Product A	Product B	Product C	Total
Sales	\$50,000	\$60,000	\$65,000	\$175,000
Variable costs	25,000	40,000	60,000	125,000
Fixed costs	16,000	12,000	8,000	36,000
Total costs	41,000	52,000	68,000	161,000
Operating income	\$ 9,000	\$ 8,000	\$ (3,000)	\$ 14,000

The company produces 1,000 units of each product. The company's capacity is 9,000 labour hours. The labour for each product is four hours for Product A, three hours for Product B, and two hours for Product C. Fixed costs are allocated based on labour hours.

### **Instructions**

- (a) If the current production levels are maintained, should the company eliminate Product C? Explain your reasoning. 3 marks
- (b) If the company can sell unlimited quantities of any of the three products, which product should be produced? 4 marks
- (c) Suppose the company can sell unlimited quantities of any of the three products. If a customer wanted to purchase 500 units of Product C, what would the minimum sale price per unit be for this order? 4 marks
- (d) The company has a contract that requires it to supply 500 units of each product to a customer. The total market demand for a single product is limited to 1,500 units. How many units of each product should the company manufacture to maximize its total contribution margin? 4 marks

## PROBLEM II 15 MARKS

Tecko manufactures an electronic component for a high-end computer. The company currently sells 50,000 units a year at a price of \$180 per unit. These units are produced using a machine that was purchased five years ago at a cost of \$1.2 million. It currently has a book value of \$600,000; however, due to its specialized nature, it has a market value today of only \$70,000. The machine, which is expected to last another five years, will have no salvage value. The costs to produce an electronic component are as follows:

Direct materials	\$ 15.00
Direct labour (4 hours × \$30.00/hour)	120.00
Variable overhead (4 hours × \$2.40/hour)	9.60
Total variable costs per unit	<u>\$144.60</u>

The company expects the following changes for next year:

\*The unit selling price will increase by 10 percent.

\*Direct labour rates will increase by 15 percent.

\*Sales are expected to increase to 52,000 units (within the capacity of present facilities) and remain at that level.

Management is currently considering the replacement of the company's old machine with a new one that would cost \$2.5 million and produce 52,000 units per year for five years. The new machine is expected to last five years and to have a salvage value of \$107,375 (straight-line amortization is used). By using the new machine, management expects to cut direct labour hours to 3.5 hours per unit, but the company will have to hire an operator for the machine at \$90,000 per year.

### **Instructions**

- (a) Determine whether or not the company should purchase the new machine. 7 marks
- (b) How many units would the company have to sell to earn annual profits of \$268,950 (after taxes) if it were to purchase the new machine? The company tax rate is 40%. 4 marks
- (c) Assuming that sales revenue under the new machine increases by 25%, use the degree of operating leverage to calculate the increase in net income. 4 marks

### PROBLEM III 20 MARKS

Andrew was hired in January 2005 to manage the home products division of Advanced Techno. As part of his employment contract, he was told that he would get an extra a bonus of 5% of the amount by which the division's profits exceeds the previous year's profits.

Soon after coming on board, Andrew met with his plant managers and explained that he wanted the plants to be run at full capacity. Previously, the plant had employed just-in-time inventory practices and had consequently produced units only as they were needed. Andrew stated that under the previous management the company had missed out on too many sales opportunities because it did not have enough inventories on hand. Because the previous management had employed just-in-time inventory practices, when Andrew came on board there was virtually no beginning inventory. The selling price and variable cost per unit remained the same from 2007 to 2008. Additional information follows:

	2007	2008
Units produced	20,000	25,000
Units sold	20,000	20,000
Selling price per unit	\$270	\$270
<b>Variable costs per unit</b>		
Direct materials	\$80	\$80
Direct labour	40	40
Variable overhead	35	35
Variable Selling expenses	30	30
Fixed manufacturing overhead (total)	\$1,000,000	\$1,000,000
Fixed selling and administrative expenses (total)	\$300,000	\$300,000

#### ***Instructions***

- (a) Calculate Andrew's 2008 bonus based on the net income in 2008 using the absorption-costing method. (Hint prepare income statement for 2007 and 2008) (10 marks).
- (b) Recalculate Andrew's 2008 bonus under variable-costing method (10 marks).

## PROBLEM IV 15 MARKS

Doc's Auto Body has budgeted the costs of the following repair time and parts activities for 2009:

	<u>Repair Time Activity</u>	<u>Parts Activity</u>
Shop employees' wages and benefits	\$111,000	\$ 0
Parts manager's salary and benefits	0	26,600
Office employee's salary and benefits	21,000	12,000
Cost of parts used	0	200,000
Overhead (supplies, amortization, advertising, utilities)	<u>24,600</u>	<u>15,000</u>
Total budgeted costs	<b>\$156,600</b>	<b>\$253,600</b>

Doc's budgets 6,000 hours of repair time in 2009. A profit margin of \$7 per labour hour will be added to the hourly rate for repairs, and a 50% profit markup will be added to the cost of parts used.

On January 10, 2009, Doc's is asked to submit a price quotation for the repair of a 2007 Chevrolet Blazer that was damaged in a head-on collision. Doc's Auto estimates that this repair will consume 61 hours of labour and \$4,200 in parts.

### ***Instructions***

- (a)** Calculate the labour rate to be charged to customers by Doc's Auto Body for 2009.  
3 Marks
- (b)** Calculate the parts mark-up percentage to be added to the cost of parts used by Doc's Auto Body for 2009. (Round to three decimal places.) 6 Marks
- (c)** Prepare a time and parts price quotation for the repair of the 2007 Chevrolet Blazer.  
6 Marks

## PROBLEM V 15 MARKS

O & Y Inc. is preparing its annual budgets for the year ending December 31, 2008. Accounting assistants provide the following data:

	<u>Product LN 35</u>	<u>Product LN 40</u>
Sales budget:		
Expected volume in units	350,000	180,000
Unit selling price	\$20.00	\$30.00
Production budget:		
Desired ending finished goods units	30,000	25,000
Beginning finished goods units	20,000	15,000
Direct materials budget:		
Direct materials per unit (kilograms)	2	3
Desired kilograms of ending direct materials	50,000	20,000
Beginning kilograms of direct materials	40,000	10,000
Cost per kilogram	\$2.00	\$3.00
Direct labour budget:		
Direct labour time per unit (hours)	0.5	0.75
Direct labour rate per hour	\$10.00	\$10.00
Budgeted income statement:		
Total unit cost	\$10.00	\$20.00

An accounting assistant has prepared the detailed manufacturing overhead budget and the selling and administrative expenses budget. The latter shows selling expenses of \$560,000 for product LN 35 and \$440,000 for product LN 40, and administrative expenses of \$420,000 for product LN 35 and \$380,000 for product LN 40. Income taxes are expected to be 30%.

### ***Instructions***

Prepare the following budgets for the year. Show data for each product. Quarterly budgets should not be prepared.

- (a) Production 5 Marks
- (b) Direct materials 6 marks
- (c) Direct labour 4 Marks

## PROBLEM VI 20 MARKS

Montreal Manufacturing Company uses a standard cost system in accounting for the cost of its main product. The following standards have been established for the direct manufacturing costs per unit:

Direct materials (1 kg at \$5/kg) \$5.00 per unit

Direct labour (2 hrs. at \$4/hr.) \$8.00 per unit

Budgeted overhead for the month of April (based on expected activity of 4,000 direct labour hours) is as follows:

Variable overhead	\$19,000
Fixed overhead	<u>8,000</u>
Total overhead	\$27,000

Overhead is applied based on labour hours. The average activity per month is 5,000 direct labour hours. The company calculates overhead rates based on average activity. Results for the month of April are as follows:

Units produced	2,100
Direct materials used (2,500 kg)	\$11,000
Direct labour (4,320 hrs.)	18,144
Variable overhead	21,410
Fixed overhead	<u>8,125</u>
Total costs	\$58,679

There was no beginning or ending work in process inventory.

### ***Instructions***

Calculate the following: 4 Marks Each

- (a) Direct materials price, usage, and budget variances
- (b) Labour price, usage, and budget variances
- (c) Variable overhead spending, quantity, and budget variances
- (d) Fixed overhead spending and volume variances
- (e) The overhead controllable variance

### PROBLEM I 15 MARKS

(a)	A	B	C	Total
Sales	\$50,000	\$60,000	\$65,000	\$175,000
Variable costs	25,000	40,000	60,000	125,000
CM	\$25,000	\$20,000	\$ 5,000	\$ 50,000

Product C should not be eliminated because it is contributing \$5,000 towards fixed costs and profit. **3 PTS**

(b)	A <b>1 PT</b>	B <b>1 PT</b>	C <b>1 PT</b>
Total CM	\$25,000	\$20,000	\$5,000
Units produced	1,000	1,000	1,000
CM per unit	\$25.00	\$20.00	\$5.00
DLH per product	4	3	2
CM per DLH	\$6.25	\$6.67	\$2.50

The company should produce product B because it has the highest contribution margin per constrained resource (direct labour hours). **1 PT**

- (c) If the company could sell unlimited quantities of any of the three products, they would only sell Product B, as this product has the highest CM per DLH. To produce C they would have to cut down on production of B.

Opportunity cost of producing C:

500 units x 2 hours per unit = 1,000 DLH required **1 PT**

1,000 hours taken away from B: 1,000 x \$6.67 = \$6,670 **1 PT**

\$6,670 ÷ 500 units = \$13.34 per unit

The minimum selling price would be the variable costs per unit plus opportunity cost =  $(\$60,000 \div 1,000) + \$13.34 = \$73.34$  **2 PTS**



(d)	<u>A</u>	<u>B</u>	<u>C</u>
CM per DLH	\$6.25	\$6.67	\$2.50
Production sequence	(2)	(1)	(3)
DLH per unit	4	3	2
Hours available		9,000	
First produce 500 units of each			
500 x (4 + 3 + 2)		(4,500)	
Hours remaining		4,500	
Produce 1,000 units of B		(3,000)	
Hours left for A		1,500	
Produce 375 units of A		(1,500)	
Hours remaining		-	

They should produce 875 units of A (500 + 375); **1.5 PTS**  
1,500 units of B (500 + 1,000); **1.5 PTS**  
and 500 units of C. **1 PT**

## PROBLEM II 15 MARKS

(a)	Next Year Old Machine	Next Year New Machine
Selling price per unit	\$198.00	\$198.00 (10% increase)
Variable costs:		
Direct materials	15.00	15.00
Direct labour	138.00	120.75 (4 hrs x \$34.50)
Variable overhead	9.60	8.40 (3.5 hrs x \$2.40)
Total variable costs:	<u>\$162.60</u>	<u>\$ 144.15</u>
	<b>1.5 PTS</b>	<b>1.5 PTS</b>
CM per unit	<u>\$ 35.40</u>	<u>\$ 53.85</u>
Units to be produced	52,000	52,000
Total annual CM	<u>\$1,840,800</u>	<u>\$2,800,200</u>

	Keep Old Machine	Buy New Machine
Total CM earned (5 yrs) <b>.5PT</b>	\$9,204,000	\$14,001,000 <b>.5PT</b>
New machine <b>.5PT</b>		(2,500,000)
Salvage of old machine <b>.5PT</b>		70,000
Salvage of new machine <b>.5PT</b>		107,375
New operator <b>.5PT</b>		(450,000)
Net gain	<u>\$9,204,000</u>	<u>\$11,228,375</u>

The company should purchase the new machine.

They will increase their profits by \$2,024,375 over 5 years. **1 PT**

Or

VC for the old machine \$162.60 – VC for the new machine \$144.15 =  
Net saving in the operating cost per unit \$18.45 **2PTS**

for 52,000 units for 5 years = \$4,797,000 – cash flow out [(2,500,000) +  
(450,000)] + salvage value for the old and the new [\$70,000 + \$107,375] =  
They will increase their profits by \$2,024,375 over 5 years. **5PTS**

- (b) How many units would the company have to sell to earn annual profits of \$268,950 (after taxes) if it were to purchase the new machine? The company tax rate is 40%.

Net income before tax = \$268,950 / .6 = \$448,250 **1PT**

Cost of the operator <b>.5PT</b>	90,000
Amortization (\$2,500,000 - \$107,375) ÷ 5 years <b>1.5PTS</b>	<u>478,525</u>
Total new fixed costs	<u><u>\$568,525</u></u>

Sales in units to target income = (\$568,525 + \$448,250) / CM \$53.85 = 18,882 units **1PT**

- (c) Assuming that sales revenue under the new machine increases by 25%, use the degree of operating leverage to calculate the increase in net income.

Total annual CM	\$2,800,200
Total annual fixed costs	<u>\$568,525</u>
Net income	<u>\$2,231,675</u> <b>2PTS</b>

The degree of operating leverage = \$2,800,200 / \$2,231,675 = 1.2547525 **1PT**

The increase in net income = 1.2547525 X .25 X \$2,231,675 = \$700,050 **1PT**

### PROBLEM III 20 PTS

(a)	Per unit manufacturing costs:	<u>2007</u>	<u>2008</u>
	Direct material	\$ 80.00	\$80.00
	Direct labour	40.00	40.00
	Variable manufacturing overhead	<u>35.00</u>	<u>35.00</u>
	Total variable unit cost	155.00	155.00
	Plus: fixed manufacturing overhead		
	(\$1,000,000 ÷ 20,000 units)	<u>50.00</u>	
	Plus: fixed manufacturing overhead		
	(\$1,000,000 ÷ 25,000 units)		<u>40.00</u>
		<b>1.5 PTS</b>	<b>1.5 PTS</b>
		<u>\$205.00 S</u>	<u>195.00</u>

#### Cost of goods sold: 2007

Beginning finished goods inventory	\$ -
Plus: cost of goods manufactured	
(20,000 x \$205)	<u>4,100,000</u>
Cost of goods available for sale	4,100,000
Less: ending inventory	
	<u>0</u>
Cost of goods sold	<u>\$4,100,000</u>

#### Cost of goods sold: 2008

Beginning finished goods inventory	\$ 0
Plus: cost of goods manufactured	
(25,000 x \$195.00)	<u>\$4,875,000</u>
Cost of goods available for sale	4,875,000
Less: ending inventory	
[(25,000 - 20,000) x 195.00]	<u>975,000</u>
Cost of goods sold	<u>\$3,900,000</u>

**HOME PRODUCTS DIVISION OF ADVANCED TECHNO.**

**Absorption Costing Income Statement**

**for the years ended December 31**

	<u>2007</u>	<u>2008</u>
Sales in units	<u>20,000</u>	<u>20,000</u>
Sales (\$270 per unit) <b>1PT EACH</b>	\$5,400,000	\$5,400,000
Cost of goods sold: <b>1PTS EACH</b>	<u>4,100,000</u>	<u>3,900,000</u>
Gross Profit	1,300,000	1,500,000
Less: selling and administrative expenses [F\$300,000+ V 20,000 X \$30] <b>1PT EACH</b>	<u>900,000</u>	<u>900,000</u>
Net income	\$ <u>400,000</u>	\$ <u>600,000</u>

- (a) The division's net income increased by \$200,000 (\$600,000 – \$400,000).  
Thus Scott's bonus would be 5% X \$200,000 = \$10,000. **1PT**

(b) **HOME PRODUCTS DIVISION OF ADVANCED TECHNO.**

**Variable Costing Income Statement**

**for the years ended December 31**

	<u>2007</u>	<u>2008</u>
Sales in units	<u>20,000</u>	<u>20,000</u>
Sales (\$270 per unit)	\$5,400,000	\$5,400,000
Variable costs:		
Cost of goods sold (\$155)	3,100,000	3,100,000
Selling (\$30)	<u>600,000</u>	<u>600,000</u>
Total variable costs	<u>3,700,000</u>	<u>3,700,000</u>
Contribution margin <b>2.5 PTS EACH</b>	1,700,000	1,700,000
Less: Fixed costs		
Manufacturing overhead	1,000,000	1,000,000
Selling	<u>300,000</u>	<u>300,000</u>
Total fixed costs <b>1PT EACH</b>	<u>1,300,000</u>	<u>1,300,000</u>
Net Income	\$ <u>400,000</u>	\$ <u>400,000</u>

**In 2007 the number of units produced and sold was equal. When this occurs variable costing and absorption costing provide the same results. Thus, in 2007 net income under variable costing would have been \$400,000. In 2008 units produced exceeded units sold by 5,000 units. However, net income under variable costing is not impacted by the number of units produced. Since the number of units sold did not change from 2007 to 2008, and the selling price, variable cost per unit, and total fixed costs didn't change, the division's net income in 2008 would equal its 2007 income of \$400,000.**

**In part (b) it was determined that the division's net income would have been \$400,000 in 2008 under variable costing. Since this is the same as 2007 net income, Scott would not receive a bonus. 3 PTS**

# PROBLEM IV 15 MARKS

## (a) Computation of time charge rate

	<u>Total Cost</u>	÷	<u>Total Hours</u>	=	<u>Per Hour Charge</u>
Hourly labour rate for repairs:					
Total charges <b>2 PTS</b>	\$156,600	÷	6,000	=	\$26.10
Profit margin <b>1 PT</b>					<u>7.00</u>
Rate charged per hour of labour					<u>\$33.10</u>

## (b) Computation of material loading charge

	<u>Material Loading Charges</u>	÷	<u>Total Invoice Cost, Parts and Materials</u>	=	<u>Material Loading Percentage</u>
Total material charges	\$253,600				
Less: invoice cost	<u>200,000</u>				
Material loading charge <b>3 PTS</b>	<u>\$53,600</u>	÷	\$200,000	=	26.8%
Profit margin <b>2 PTS</b>					<u>50.0%</u>
Material loading percentage <b>1 PT</b>					<u>76.8%</u>

## (c) Price quotation for time and material

### Doc's AUTO BODY SHOP Time and Material Price Quotation January 10, 2008

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Job: 2007 Chevrolet Blazer

Labour charges: 61 hours @ \$33.10 <b>2 PTS</b>		\$2,019.10
Material charges:		
Cost of parts and materials <b>1 PT</b>	\$4,200.00	
Material loading charge (76.8% X \$4,200) <b>2PTS</b>	<u>3,225.60</u>	<u>7,425.60</u>
Total price of labour and material		<b>1 PT</b> <u>\$9,444.70</u>

**PROBLEM V 15 MARKS**

(a)

**O & Y INC.  
Production Budget  
For the Year Ending December 31, 2005**

	<u>LN 35</u>	<u>LN 40</u>	<u>Total</u>
Expected unit sales .....	350,000	180,000	
Add: Desired ending finished goods units .....	<u>30,000</u>	<u>25,000</u>	
Total required units .....	380,000	205,000	
Less: Beginning finished goods units .....	<u>20,000</u>	<u>15,000</u>	
Required production units.....	<b>2.5 PTS</b>	<b>2.5 PTS</b>	
	<u>360,000</u>	<u>190,000</u>	<u>550,000</u>

(b)

**O & Y INC.  
Direct Materials Budget  
For the Year Ending December 31, 2005**

	<u>LN 35</u>	<u>LN 40</u>	<u>Total</u>
Units to be produced .....	360,000	190,000	
Direct materials per unit.....	<u>X 2</u>	<u>X 3</u>	
Total kilograms needed for production .....	720,000	570,000	
Add: Desired ending direct materials (kilograms).....	<u>50,000</u>	<u>20,000</u>	
Total materials required .....	770,000	590,000	
Less: Beginning direct materials (kilograms).....	<u>40,000</u>	<u>10,000</u>	
Direct materials purchases .....	730,000	580,000	
Cost per kilogram .....	<u>X \$2</u>	<u>X \$3</u>	
Total cost of direct materials purchases .....	<b>3 PTS</b>	<b>3 PTS</b>	
	<u>\$1,460,000</u>	<u>\$1,740,000</u>	<u>\$3,200,000</u>



(c)

**O & Y INC.**  
**Direct Labour Budget**  
**For the Year Ending December 31, 2005**

	<u>LN 35</u>	<u>LN 40</u>	<u>Total</u>
Units to be produced .....	360,000	190,000	
Direct labour time (hours) per unit	<u>X .5</u>	<u>X .75</u>	
Total required direct labour hours .....	180,000	142,500	
Direct labour cost per hour .....	<u>X \$10</u>	<u>X \$10</u>	
Total direct labour cost .....	<u>\$1,800,000</u>	<u>\$1,425,000</u>	<u>\$3,225,000</u>
	<b>2 PTS</b>	<b>2 PTS</b>	

## PROBLEM VI 20 PTS

- (a) Direct materials price variance =  $AQ \times (AP - SP)$   
AP =  $\$11,000 \div 2,500 = \$4.40$  per kg  
Price variance =  $2,500 \times (\$4.40 - \$5.00) = \$1,500F$  **1.5 PTS**
- Direct materials usage variance =  $SP \times (AQ - SQ)$   
SQ =  $2,100 \times 1 \text{ kg} = 2,100 \text{ kg}$   
Usage variance =  $\$5.00 \times (2,500 - 2,100) = \$2,000U$  **1.5 PTS**
- Material Budget variance =  $\$1,500F + \$2,000U = \$500U$ , OR  
=  $(2,500 \times \$4.40) - (2,100 \times \$5.00)$  **1 PT**
- (b) Labour rate variance =  $AH \times (AR - SR)$   
AR =  $\$18,144 \div 4,320 = \$4.20$  per hour  
Rate variance =  $4,320 \times (\$4.20 - \$4.00) = \$864U$  **1.5 PTS**
- Labour efficiency variance =  $SR \times (AH - SH)$   
SH =  $2,100 \times 2 \text{ hours per unit} = 4,200$   
Efficiency variance =  $\$4.00 \times (4,320 - 4,200) = \$480U$  **1.5 PTS**
- Labour budget variance =  $\$864U + \$480U = \$1,344U$  **1 PT**
- (c) Variable spending variance = actual overhead – (AQ x SR)  
VOH rate =  $\$19,000 \div 4,000 = \$4.75$  per hour  
Spending variance =  $\$21,410 - (4,320 \times \$4.75) = \$890U$  **1.5 PTS**
- Variable efficiency variance =  $SR \times (AH - SH)$   
=  $\$4.75 \times (4,320 - 4,200) = \$570U$  **1.5 PTS**
- Total variable budget variance =  $\$890U + \$570U = \$1,460U$  **1 PT**
- (d) Fixed overhead spending variance = actual – budget  
=  $\$8,125 - \$8,000 = \$125U$  **1.5 PTS**
- Fixed overhead volume variance = Budget – (SH x SR)  
SR =  $\$8,000 \div 5,000 = \$1.60$   
=  $\$8,000 - (4,200 \times \$1.60) = \$1,280U$  **2.5 PTS**

- (e) The overhead controllable variance =  
Total variable budget variance + Fixed overhead spending variance  
= \$890U + \$570U = \$1,460U + \$125U = \$1,585U **4 PTS = 1 PT FOR EACH #**