

Mock Examination in the Bachelor of Science

Course title: Managerial Accounting

Semester: 2

Lecturers: ...

Group: ...

Examination date: ...

Aids: Dictionary; non programmable calculators like Casio fx solar, Casio fx 85 MS, Casio fx 85 GT

Please enter your student ID (matriculation number) and your group!

Student ID	Group
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Please note:

The exam consists of 7 questions of which you will have to answer **7** questions. You have **60** minutes to complete the examination. The maximum of points to be reached is **60**. Please use the enclosed answer sheet to answer your questions and add your student ID on its cover.
Always show your calculations.

We wish you all the best for your examination!

Internal use only!

Question	1	2	3	4	5	6	7	Total
Possible points:	4	4	4	4	4	20	20	60
Points achieved:								

Signature of corrector

Question 1

(4 points)

Speedy Inc., a logistics company currently applies *job costing* and uses weight (in kg) of the order as single allocation base to allocate all indirect costs. However, they recently discovered that some customers place a lot of orders (with low weight each), other customers have few orders with high weight. Handling many small orders is more expensive for Speedy than handling one large order. Hence, number of orders is also driving costs, not only the weight of the order.

Which costing system would you recommend Speedy Inc?

What would be potential consequences of the new costing approach that you suggest?

Solution:

Activity based-costing (1 point) [dual rate allocation/job costing with several allocation bases would also be an acceptable solution]

(3 points for three reasonable consequences, the following list provides examples)

- customers who order many small quantities become less profitable
- prices for those customers could be raised
- a separate charge per order could be introduced in addition to the kg-price
- customers could be convinced to bundle their demand and to make fewer orders
- service to unprofitable customers could be denied

Question 2

(4 points)

Comfort Manufacturing is a small textile manufacturer using machine-hours as the single indirect-cost rate to allocate manufacturing overhead costs to the various jobs contracted during the year. The following estimates are provided for the coming year for the company and for the Winton High School band jacket job.

	<u>Company</u>	<u>Winton High School Job</u>
Direct materials	\$40,000	\$2,000
Direct labor	\$10,000	\$400
Manufacturing overhead costs	\$45,000	
Machine-hours	100,000 mh	900 mh

For Comfort Manufacturing, what is the annual manufacturing overhead cost-allocation rate?

What are the total manufacturing costs of this job?

Solution:

$\$45,000 / 100,000 \text{ mh} = \0.45 per mh $\text{DM } \$2,000 + \text{DML } \$400 + \text{MOH } \$405 = \$2,805$

Question 3

(4 points)

The Frankfurt Äppelwoi GmbH produces alcoholic beverages. For last month, it budgeted to purchase and use 20,000 kg of apples a price of 1€ per kg. Actual purchases and usages for last month were 22,000 kg at 90 cents per kg. The company budgeted for an output of 10,000 bottles. Actual output was 11,000.

Compute the price and efficiency variance

(4 points)

Solution:

Price variance

$$\begin{aligned} &= \text{Actual input quantity} * \text{Actual price} - \text{Actual input quantity} * \text{Budgeted price} \\ &= 22,000 \text{ kg} * 0.90 \text{ €/kg} - 22,000 \text{ kg} * 1 \text{ €/kg} = -2,200 \text{ € (Favourable)} \end{aligned}$$

Efficiency variance

$$\begin{aligned} &= \text{Actual input quantity} * \text{Budgeted price} - \text{Flexible budget} \\ &= 22,000 \text{ kg} * 1 \text{ €/kg} - 22,000 \text{ €} = 0 \end{aligned}$$

Question 4

(4 points)

Mention two cost accounting choices that can increase operating income.

Solution: (e.g., 2 of the following examples)

- FIFO instead of weighted average when direct material and conversion costs have increased compared to previous period
- Increasing the completion estimation in process costing
- using absorption costing instead of variable costing when more units are produced than sold
- lower estimate of practical capacity -> less production volume variance -> higher income
- Use Sales method for byproduct, accumulate the byproduct and sell it when higher operating income is needed

Question 5

(4 points)

What are equivalent units in process costing? What are they good for?

Solution:

Equivalent units is a derived amount of output units that converts the quantity of input into the amount of completed output units that could be made with that quantity of input. Each equivalent unit is comprised of the physical quantities of direct materials or conversion costs inputs necessary to produce output of one fully completed unit.

Equivalent unit measures are necessary because all physical units are not completed to the same extent at the same time. The equivalent units help to allocate costs to units completed and Work in Progress Inventory.

Question 6

(20 points)

Smart Safety, a three year-old company, has been producing and selling a single type of bicycle helmet. Smart Safety uses standard costing. After reviewing the income statements for the first three years, Stuart Weil, president of Smart Safety, commented, "I was told by our accountants- and in fact, I have memorized-that our breakeven volume is 52,000 units. I was happy that we reached that sales goal in each of our first two years. But here's the strange thing: In our first year, we sold 52,000 units and indeed we broke even. Then in our second year we sold the same volume and had a positive operating income. I didn't complain, of course ... but here's the bad part. In our third year, we sold *20% more* helmets, but our *operating income fell by more than 80%* relative to the second year! We didn't change our selling price or cost structure over the past three years and have no price, efficiency, or spending variances ... so what's going on?!"

Absorption Costing			
	2013	2014	2015
Sales (units)	<u>52,000</u>	<u>52,000</u>	<u>62,400</u>
Revenues	\$2,236,000	\$2,236,000	\$2,683,000
Cost of goods sold			
Beginning inventory	0	0	405,600
Production	2,028,000	2,433,600	2,028,000
Available forsale	2,028,000	2,433,600	2,028,000
Deduct ending inventory	0	(405,600)	0
Adjustment for production volume variance	0	(260,000)	0
Costs of goods sold	2,028,000	1,768,000	2,433,600
Gross margin	208,000	468,000	249,600
Selling and administrative expenses (all fixed)	208,000	208,000	208,000
Operating income	<u>\$0</u>	<u>\$260,000</u>	<u>\$41,400</u>
Beginning inventory	0	0	10,400
Production (units)	52,000	62,400	52,000
Sales (units)	52,000	52,000	62,400
Ending inventory	0	10,400	0
Variable manufacturing cost per unit	\$14	\$14	\$14
Fixed manufacturing overhead costs	\$1,300,000	\$1,300,000	\$1,300,000
Fixed manuf. costs allocated per unit produced	\$25	\$25	\$25

1. What denominator level is Smart Safety using to allocate fixed manufacturing costs to the bicycle helmets? Explain your answer briefly.

Solution:

1. Smart Safety's annual fixed manufacturing costs are \$1,300,000. It allocates \$25 of fixed manufacturing costs to each unit produced. Therefore, it must be using $\$1,300,000 \div \$25 = 52,000$ units (annually) as the denominator level to allocate fixed manufacturing costs to the units produced.

We can see from Smart Safety's income statements that it disposes of any production volume variance against cost of goods sold. In 2014, 62,400 units were produced instead of the budgeted 52,000 units. This resulted in a favorable production volume variance of \$260,000 F [(62,400 – 52,000) units × \$25 per unit], which, when written off against cost of goods sold, increased gross margin by that amount. In other words, $25 \times 62,400 = 1,560,000$ allocated costs which is 260,000 more than the actual fixed costs of 1,300,000.

2. How did Smart Safety's accountants arrive at the breakeven volume of 52,000 units?

Based on 2013 data:

Selling price = $\$2,236,000 \div 52,000 = 43\$/\text{unit}$

Total fixed costs = fixed mfg. costs + fixed selling & admin. = $\$1,508,000$

$43x = \$1,508,000 + 14x$

$x = 52,000$

Alternative ways to calculate the Break Even Point:

Calculation of breakeven volume	2013	2014	2015
Selling price ($\$2,236,000 \div 52,000$; $\$2,236,000 \div 52,000$; $\$2,683,000 \div 62,400$)	\$43	\$43	\$43
Variable cost per unit (all manufacturing)	14	14	14
Contribution margin per unit	\$29	\$29	\$29
Total fixed costs (fixed mfg. costs + fixed selling & admin. costs)	\$1,508,000	\$1,508,000	\$1,508,000
Breakeven quantity = Total fixed costs \div contribution margin per unit	52,000	52,000	52,000

3. Prepare a variable costing-based income statement for each year.

3. [Hint for the corrector: Alternative ways to come to the same solution can also receive full points.]

Short version:

Variable Costing			
	2013	2014	2015
Sales (units)	52,000	52,000	62,400
Revenues	\$2,236,000	\$2,236,000	\$2,683,000
Variable cost of goods sold	\$728,000	\$728,000	\$873,600
Contribution margin	\$1,508,000	\$1,508,000	\$1,809,600
Fixed costs	\$1,508,000	\$1,508,000	\$1,508,000
Operating income	\$ 0	\$ 0	\$301,400

Alternative long version:

Variable Costing			
	2013	2014	2015
Sales (units)	52,000	52,000	62,400
Revenues	\$2,236,000	\$2,236,000	\$2,683,000
Variable cost of goods sold			
Beginning inventory $\$14 \times 0; 0; 10,400$	0	0	145,600
Variable manuf. costs $\$14 \times 52,000; 62,400; 52,000$	728,000	873,600	728,000
Deduct ending inventory $\$14 \times 0; 10,400; 0$	0	(145,600)	0
Variable cost of goods sold	728,000	728,000	873,600
Contribution margin	\$1,508,000	\$1,508,000	\$1,809,600
Fixed manufacturing costs	\$1,300,000	\$1,300,000	\$1,300,000
Fixed selling and administrative expenses	208,000	208,000	208,000
Operating income	\$ 0	\$ 0	\$301,400

Question 7

(20 points)

Use the information from Question 6.

Reconcile the operating incomes under variable costing and absorption costing for each year, and use this information to explain to Stuart Weil the positive operating income in 2014 and the drop in operating income in 2015.

Solution: [Alternative ways to come to the same solution can also receive full points. It is not required to show all components of the table below.]

Reconciliation of absorption/variable costing operating incomes			
	2013	2014	2015
(1) Absorption costing operating income	\$0	\$260,000	\$ 41,600
(2) Variable costing operating income	0	0	301,600
(3) Difference in operating incomes = (1) – (2)	\$0	\$260,000	\$(260,000)
(4) Fixed mfg. costs in ending inventory under absorption costing (ending inventory in units × \$25 per unit)	\$0	\$260,000	\$ 0
(5) Fixed mfg. costs in beginning inventory under absorption costing (beginning inventory in units × \$25 per unit)	0	0	260,000
(6) Difference = (4) – (5)	\$0	\$260,000	\$(260,000)

In the table above, row (3) shows the difference between the operating income under absorption costing and the operating income under variable costing, for each of the three years. In 2013, the difference is \$0; in 2014, absorption costing income is greater by \$260,000; and in 2015, it is less by \$260,000. Row (6) above shows the difference between the fixed costs in ending inventory and the fixed costs in beginning inventory under absorption costing; this figure is \$0 in 2013, \$260,000 in 2014, and –\$260,000 in 2015. Row (3) and row (6) explain and reconcile the operating income differences between absorption costing and variable costing.

Stuart Weil is surprised at the non-zero, positive net income (reported under absorption costing) in 2014, when sales were at the 'breakeven volume' of 52,000; further, he is concerned about the drop in operating income in 2015, when, in fact, sales increased to 62,400 units. In 2014, starting with zero inventories, 62,400 units were produced and 52,000 were sold, i.e., at the end of the year, 10,400 units remained in inventory. These 10,400 units had each absorbed \$25 of fixed costs (total of \$260,000), which would remain as assets on Smart Safety's balance sheet until they were sold. Cost

of goods sold, representing only the costs of the 52,000 units sold in 2014, was accordingly reduced by \$260,000, (in this case this equals the production volume variance, because all "overproduction" goes into the inventory), resulting in a positive operating income even though sales were at breakeven levels. The following year, in 2015, production was 52,000 units, sales were 62,400 units, i.e., all of the fixed costs that were included in 2014 ending inventory flowed through COGS in 2015. Contribution margin in 2015 was \$1,809,600 (62,400 units \times \$29), but in absorption costing, COGS also contains the allocated fixed manufacturing costs of the units sold, which were \$1,560,000 (62,400 units \times \$25), resulting in an operating income of \$41,600 = 1,809,600 – \$1,560,000 – \$208,000 (fixed sales and admin.) Hence the drop in operating income under absorption costing, even though sales were greater than the computed breakeven volume: inventory levels decreased sufficiently in 2015 to cause 2015's operating income to be lower than 2014 operating income.

Note that beginning and ending with zero inventories during the 2013–2015 period, under both costing methods, Smart Safety's total operating income was \$301,600.