



**AFRICA
UNIVERSITY**

(A United Methodist-Related Institution)

“Investing in Africa’s Future”

**FACULTY OF MANAGEMENT AND
ADMINISTRATION**

COURSE TITLE: MAC 301 MANAGEMENT ACCOUNTING

SEMESTER 1: FINAL EXAMINATION: OCTOBER 2014 (Parallel)

LECTURER: MR S.N. CHUCHU

TIME: 3 HOURS

INSTRUCTIONS

Answer **all five (5)** questions.

Start **each** question on a new page in your answer booklet.

The marks allocated to **each** question are shown at the end of the question.

Show all your workings.

Credit will be given for logical, systematic and neat presentations.

Question 1

Scorpio Limited manufactures two products, X and Y. The selling prices and production costs per unit are as follows:

	Product X	Product Y
	\$	\$
Selling per unit	48.00	44.00
Direct material per unit	4.00	12.00
Direct labour per unit (\$12.00 per hour)	24.00	12.00
Variable overhead per unit	4.00	4.00

Additional information:

1. During October 2014, the available direct labour will be limited to 8 000 hours.
2. The sales demand in October 2014 is expected to be as follows:

	Number of Units
Product X	3 000
Product Y	5 000

3. Operating costs for October 2014 are expected to be as follows:

	\$
Direct labour	96 000
Variable overhead	26 000
Fixed overhead	<u>80 000</u>
Total operating costs	<u>202 000</u>

Required:

Determine the optimum production plan and calculate the profit that would arise from the plan applying:

- (a) the contribution margin approach **[10 marks]**
- (b) the throughput accounting approach **[10 marks]**

Question 2

(a) Libra Limited is considering three alternative courses of action, 1, 2 and 3. The profit or loss from each alternative depends on which one of four economic conditions, A, B, C or D, will apply. The possible profits and losses are given in the following pay-off table, with losses shown in brackets:

Economic condition	Action 1	Action 2	Action 3
	\$	\$	\$
A	70 000	60 000	70 000
B	(10 000)	20 000	(5 000)
C	80 000	0	50 000
D	60 000	100 000	115 000

Required:

Determine the action that would be selected using the minimax regret criterion

[10 marks]

(b) Virgo Limited manufactures two products, X and Y. Both products pass through two departments, Mixing and Shaping. There is unlimited demand for Product X, but the demand for Product Y is limited to 13 000 units per annum. The machine hours available in each department are restricted to 2 400 hours per annum. Other relevant data are as follows:

1. Machine hours required per unit

	Mixing Hours	Shaping Hours
Product X	0.06	0.04
Product Y	0.08	0.12

2. Selling price and variable cost per unit

	Product X \$	Product Y \$
Selling price per unit	1.50	2.00
Total variable cost per unit	1.30	1.70

Required:

Formulate a linear programming model and solve it algebraically

[10 marks]

Question 3

(a) Gemini Limited is considering manufacturing a new product. The estimated demand and costs are as follows:

	Year 1	Year 2	Year 3	Year 4
No. of units to be manufactured and sold	2 000	15 000	20 000	5 000
	\$	\$	\$	\$
Research and development costs	760 000	40 000	-----	-----
Marketing costs	40 000	30 000	20 000	4 000
Production cost per unit	200	180	160	180
Customer service cost per unit	20	16	16	16
				120 000

Additional information:

The marketing director believes that customers will be prepared to pay a maximum of \$200.00 per unit of the product. However, the finance director believes this will not cover all of the costs throughout the life-cycle of the product.

Required:

Calculate the product's life-cycle cost per unit and comment on the selling price per unit suggested by the marketing director **[6 marks]**

(b) Capricorn Limited produces a product by mixing three chemicals, X, Y, and Z, in the proportions: 4:3:3, respectively. Minor variations on these proportions are acceptable. The standard costs for the chemicals are as follows:

Chemical X	\$3.20 per litre
Chemical Y	\$2.50 per litre
Chemical Z	\$3.60 per litre

There is a 5% normal loss.

The output for August 2014 was 210 000 litres. The actual chemical inputs for August 2014 were:

Chemical X	70 200 litres @ \$3.30 per litre
Chemical Y	69 800 litres @ \$2.45 per litre
Chemical Z	60 200 litres @ \$3.70 per litre

Assume no stockholding.

Required:

Calculate the following direct material variances:

- (a) Total direct material usage **[4 marks]**
- (b) Total direct material mix **[5 marks]**
- (c) Total direct material yield **[5 marks]**

Question 4

(a) The following information relates to the Gamma Division of Taurus Limited:

	\$
Current investment	375 000
Controllable annual earnings before interest and tax (EBIT)	100 000
	%
Cost of borrowing	10

The division is considering a project proposal with an investment amounting to \$25 000 and which would earn a controllable annual EBIT of \$5 000.

Required:

- (i) Evaluate the project proposal using:
1. Return on investment (ROI) [3 marks]
 2. Residual income (RI) [3 marks]
- (ii) Advise the division on the action to take [2 marks]

(b) Aquarius limited has prepared the following budget for the year ending 30 June 2015:

Product	Sales in units	Selling price per unit	Variable cost per unit
		\$	\$
A	80 000	30	22.50
B	120 000	20	17.00
C	60 000	10	7.00
D	40 000	25	22.50

Budgeted fixed costs for 2015 are \$350 000.

Required:

Determine the break-even point in units. [12 marks]

Question 5

(a) The following are the budgeted and actual results of Sagittarius Limited for the period ended 30 June 2014:

	Original budget	Actual results
	\$	\$
Sales	500 000	560 000
Direct material	(50 000)	(58 000)
Labour	(100 000)	(108 000)
Other expenses	<u>(200 000)</u>	<u>(204 500)</u>
Profit	<u>150 000</u>	<u>189 500</u>

Additional information:

1. Direct material costs are variable.
2. 10% of labour costs are variable.
3. 25% of other expenses are variable.
4. All variable costs vary with the value of sales.

Required:

Prepare a control report comparing actual results with a flexible budget. [8 marks]

(b) Pisces Limited produces three products: blocks, bricks, and ordinary roofing tiles. The budgeted statement of profit or loss for the year ending 30 June 2015 is as follows:

Budgeted statement of profit or loss for the year ending 30 June 2015

	Blocks	Bricks	Ordinary tiles	Total
	\$	\$	\$	\$
Sales	30 000	48 000	9 000	87 000
Variable costs	<u>(15 000)</u>	<u>(28 800)</u>	<u>(8 400)</u>	<u>(52 200)</u>
Contribution margin	15 000	19 200	600	34 800
Direct fixed costs	<u>(6 000)</u>	<u>(5 400)</u>	<u>(3 300)</u>	<u>(14 700)</u>
Segment margin	<u>9 000</u>	<u>13 800</u>	<u>(2 700)</u>	20 100
Common fixed costs				<u>(7 500)</u>
Profit				<u>12 600</u>

Additional information:

1. Direct fixed costs include depreciation on equipment dedicated to the product lines of \$3 180 for blocks, \$2 400 for bricks and \$600 for ordinary roofing tiles.
2. The projected performance of the ordinary roofing tiles product line shows a negative segment margin. The managing director is concerned about this projected poor performance and is considering whether to replace the ordinary roofing tiles with a new product, premier roofing tiles. The premier roofing tiles product line would utilize the facilities, including equipment, currently being used by the ordinary roofing tiles product line. The direct fixed costs of the premier roofing tiles product line, excluding depreciation, would be 10% higher than those of the ordinary roofing tiles product line.
3. Many customers buy ordinary roofing tiles at the same time they purchase blocks or bricks. Some of the customers will go elsewhere if they cannot buy both products at the same location. Likewise, if ordinary roofing tiles were to be replaced with premier roofing tiles, many customers would buy premier roofing tiles at the same time they purchase blocks or bricks. However, the pattern would be different. If ordinary roofing tiles were to be replaced with premier roofing tiles, the sales of blocks would decline by 15% and the sales of bricks would increase by 20%. Furthermore, the premier roofing tiles product line would generate sales that are 20% higher than those of the ordinary roofing tiles product line. The contribution margin ratio of the premier roofing tiles product line is 10%.

Required:

Determine whether the ordinary roofing tiles product line should be replaced with the premier roofing tiles product line. Use relevant costing. **[12 marks]**