# AFRICA UNIVERSITY

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*(A United Methodist-Related Institution)*

## "Investing in Africa's Future"

# FACULTY OF MANAGEMENT AND ADMINISTRATION

**COURSE TITLE:  MAC 301 Management Accounting (Conventional)**

**SEMESTER 1:      Final Examination November 2013**

**LECTURER:            Mr S.N. Chuchu**

**TIME:                      3 HOURS**

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## 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

Capricorn Limited manufactures two products, A and B. The selling prices and production costs per unit are as follows:

|  | Product A | Product B |
|---|---|---|
|  | $ | $ |
| Selling price per unit | 14 | 11 |
| Direct material per unit | 1 | 3 |
| Direct labour per unit ($3 per hour) | 6 | 3 |
| Variable overhead per unit | 1 | 1 |

**Additional information:**
1. During December 2013, the available direct labour will be limited to 8 000 hours.
2. The sales demand in December 2013 is expected to be as follows:

|  | Units |
|---|---|
| Product A | 3 000 |
| Product B | 5 000 |

3. Operating costs for December 2013 are expected to be as follows:

|  | $ |
|---|---|
| Direct labour | 24 000 |
| Variable overhead | 6 500 |
| Fixed cost | 20 000 |
| Total operating costs | 50 500 |

**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) Gemini Limited manufactures one product, C. The product contains three types of sweeteners: honey, sugar and syrup. The standard material usage and cost per unit for Product C is as follows:

|  |  | $ |
|---|---|---|
| Honey | 20 grams @ $0.020 per gram | 0.40 |
| Sugar | 15 grams @ $0.030 per gram | 0.45 |
| Syrup | 10 grams @ $0.025 per gram | 0.25 |
|  |  | 1.10 |

For the quarter ended 30 September 2013, Gemini Limited produced 101 000 units of Product C using 2 200 kg of honey, 1 400 kg of sugar and 1 050 kg of syrup.
**Note:** 1 kilogram (kg) = 1 000 grams.

**Required:**
Calculate the following material variances:
|  |  |  |
|---|---|---|
| (i) | Total material usage variance | **[4 marks]** |
| (ii) | Total material mix variance | **[4 marks]** |
| (iii) | Total material yield variance | **[4 marks]** |

(b) Taurus Limited manufactures hi-tech products for the fitness market. The firm is currently considering a new type of fitness monitor. It would take one year to develop the product and sales would commence at the beginning of the second year. The product is expected to have a life-cycle of two years, before it is replaced with a technologically superior product. The following cost estimates have been made:

|  | Year 1 | Year 2 | Year 3 |
|---|---|---|---|
| Units to be manufactured and sold |  | 100 000 | 200 000 |
|  | $ | $ | $ |
| Research and development costs | 160 000 |  |  |
| Product design costs | 800 000 |  |  |
| Marketing costs | 1 200 000 | 1 000 000 | 1 750 000 |
| Manufacturing costs: |  |  |  |
| Variable cost per unit |  | 40 | 42 |
| Fixed production costs |  | 650 000 | 1 290 000 |
| Distribution costs: |  |  |  |
| Variable cost per unit |  | 4 | 4.50 |
| Fixed distribution costs |  | 120 000 | 120 000 |
| Selling costs: |  |  |  |
| Variable cost per unit |  | 3 | 3.20 |
| Fixed selling costs |  | 180 000 | 180 000 |
| Administrative costs | 200 000 | 900 000 | 1 500 000 |

**Required:**
Calculate the life-cycle cost per unit of the product. **[8 marks]**

## Question 3

(a) Libra Limited manufactures three products, X, Y and Z. The selling price and variable cost per unit for the products and total fixed costs per period are as follows:

|  | Product X | Product Y | Product Z | Total |
|---|---|---|---|---|
|  | $ | $ | $ | $ |
| Selling price per unit | 135.00 | 165.00 | 220.00 |  |
| Variable cost per unit | 73.50 | 58.90 | 146.20 |  |
| Total fixed cost per period |  |  |  | 950 000 |

An analysis of past trading patterns indicates that products X, Y and Z are sold in the ratio 3:4:5, respectively.

**Required:**
Determine the break-even point in units                                    **[10 marks]**

(b) Gamma Limited, is a manufacturer of three products, P, Q and R. The statement of profit or loss for the period ended 30 June 2013 is as follows:

|  | Product P | Product Q | Product R | Total |
|---|---|---|---|---|
|  | $ | $ | $ | $ |
| Sales | 50 000 | 40 000 | 60 000 | 150 000 |
| Variable cost | (30 000) | (25 000) | (35 000) | (90 000) |
| Contribution margin | 20 000 | 15 000 | 25 000 | 60 000 |
| Fixed costs | (17 000) | (18 000) | (20 000) | (55 000) |
| Profit/(loss) | 3 000 | (3 000) | 5 000 | 5 000 |

Management is concerned about the poor performance of Product Q. Of the total fixed costs of Product Q, $5 000 are direct fixed costs.

Gamma Limited is considering replacing Product Q with Product S, which will use the facilities being currently used by Product Q. The sales of Product S would be $50 000 and the product would incur variable costs amounting to $30 000 and direct fixed costs amounting to $6 000 per period. The switch from Product Q to Product S would not affect the sales of products P and R.

**Required:**
Apply relevant costing to determine whether Product Q should be replaced with Product S.                                    **10 marks]**

**Question 4**

(a) Beta Limited manufactures two products, M and N. Both products pass through two production departments, Mixing and Shaping. There is unlimited demand for Product M, but the demand for Product N 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:

Machine hours required per unit

|  | Mixing Hours | Shaping Hours |
|---|---|---|
| Product M | 0.06 | 0.04 |
| Product N | 0.08 | 0.12 |

**Selling price and variable cost** per unit

|  | Product M | Product N |
|---|---|---|
|  | $ | $ |
| 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]**

(b) Delta Limited is considering expanding its operations into Zambia, or Malawi or Namibia. The firm can at this time only expand into one country.

If the firm expands into Zambia, there is a probability of 0.3 that its contribution margin will increase by $200 000, or 0.7 that it will increase by $800 000.

If the firm expands into Malawi, there is a probability of 0.4 that its contribution margin will increase by $100 000, or 0.6 that it will increase by $1 000 000.

If the firm expands into Namibia, there is a probability of 0.6 that its contribution margin will decrease by $1 000 000, or 0.4 that it will increase by $2 500 000.

**Required:**
Use a decision tree to determine whether the company should expand and, if so, where.
                                                        **[10 marks]**

**Question 5**

Scorpio Limited is considering three alternative courses of action, A, B and C. The profit or loss from each alternative depends on which one of four economic conditions, 1, 2, 3 and 4, will apply. The possible profits and losses are given in the following pay-off table, with losses shown in brackets:

| Economic condition | Action A | Action B | Action C |
|---|---|---|---|
|  | $ | $ | $ |
| 1 | 70 000 | 60 000 | 70 000 |
| 2 | (10 000) | 20 000 | (5 000) |
| 3 | 80 000 | 0 | 50 000 |
| 4 | 60 000 | 100 000 | 115 000 |

**Required:**

Determine the action that would be selected using each of the following criteria:

  (a) the maximin criterion                                **[5 marks]**

  (b) the maximax criterion                                **[5 marks]**

  (c) the minimax regret criterion                         **[10 marks]**