**TECHNICAL UNIVERSITY OF MOMBASA**
**SCHOOL OF BUSINESS**
DEPARTMENT OF ACCOUNTING AND FINANCE
**UNIVERSITY EXAMINATION FOR:**
BTCE, BTME & BSME YEAR 2 SEMESTER 2

**BFI 4204: ECONOMICS AND ACCOUNTING FOR ENGINEERS**
**SPECIAL/SUPPLEMENTARY EXAM 2025**
**TIME:** 2 HOURS

**INSTRUCTION: ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS.**

## QUESTION 1

a) (i) The Jaramogi Robot Company's marketing manager estimates that the demand curve for the company's robots in 2008 is

$$P = 3000 - 40Q$$

Where *P* is the price of the a robot and Q is the number sold per month

Required:

1. Derive the marginal revenue curve for the firm. (2 marks)
2. At what prices is the demand for the firm's product price elasticity. (2 marks)
3. If the firm wants to maximize its sales volume, what price should it charge? (2 marks)

(ii) Harper Company is contemplating the purchase of a machine capable of performing some operation that are now performed manually. The machine will cost shs. 50,000,000 and it will last for five years. At the end of the five- year period, the machine will have a zero scrap value. Use of the machine will reduce labor costs by shs 18,000,000 per year . Harper Company requires a minimum pretax return of 20%on all investment projects. Should the machine be purchased? (4 marks)

(b) Write short notes on the following fundamental concepts in economics:

(i) Scarcity and choice (4 marks)

(ii) Opportunity cost (3 marks)

(iii) Cross-elasticity of demand (3 marks)

(c) Vipingo Ltd has drawn up the following budget for its next accounting period:

| | |
|---|---|
| Selling price per unit | Sh. 1,160 |
| Variable production cost per unit | Sh. 340 |
| Sales commission | 5% of selling price |
| Fixed production costs | Sh. 43,050,000 |
| Fixed selling and administration costs | Sh. 19,815,000 |
| Sales | 90,000 units |

Required;

(i) Determine the margin of safety in percentage of budgeted sales. (5 marks)

(ii) The marketing manager has indicated that an increase in the selling price to sh. 1,225 per unit would not affect the number of units sold, provided that the sales commission is increased to 8% of the selling price.
Determine the breakeven point (to the nearest whole number) following the above changes. (5 marks)

**(Total = 30 marks)**

**QUESTION 2**

Under a special licensing arrangement, Swinyard Corporation has an opportunity to market a new product for five-year period. The product would be purchased from the manufacturer, with Swinyard responsible for promotion and distribution costs. The licensing arranged could be renewed at the end of five-year period. After careful study, Swinyard estimated the following costs and revenue for the new product:

| | *Shs000* |
|---|---|
| Cost of equipment needed………………………………………………………….. | 60,000 |
| Working capital needed…………………………………………………………….. | 100,000 |
| Overhaul of the equipment for four years……………………………………… | 5,000 |
| Salvage value of the equipment for five years…………………………………. | 10,000 |
| | |
| Annual revenue and costs: | |
| Sales revenue ………………………………………………………………………… | 200,000 |
| Cost of goods sold…………………………………………………………………… | 125,000 |
| Out of pocket operation costs (for salaries, advertising and other direct costs)……………………………………………………………………………….. | 35,000 |

At the end of five-five year period, if Swinyard decides not to renew the licensing arrangement the working capital would be released for investment elsewhere. Swinyard uses a 14% rate. Would you recommend that the new product be introduced?

**(Total = 20 marks)**

**QUESTION 3**

The transport department of Kisii County Government operates a large fleet of vehicles. These vehicles are used by the various departments of the County. Each month a statement is prepared for the transport department comparing actual results with budget. One of the items in the transport department's monthly statement is the cost of vehicle maintenance. This maintenance is carried out by the employees of the department. To facilitate control, the transport manager has asked that future statements should show vehicle maintenance costs analyzed into fixed and variable costs.

Data for the six months from January to June inclusive are given below.

| | Vehicle maintenance Cost Sh | Vehicle running Hours |
|---|---|---|
| January | 13,600 | 2,100 |
| February | 15,800 | 2,800 |
| March | 14,500 | 2,200 |
| April | 16,200 | 3,000 |
| May | 14,900 | 2,600 |
| June | 15,000 | 2,500 |

Required;

(a) Analyze the vehicle maintenance costs into fixed and variable costs, based on the data given, utilizing the least squares regression analysis method. (13 marks)

(b) Discuss the conditions that should apply if linear regression analysis is to be used to analyze cost behaviors. (7 marks)

**(Total = 20 marks)**

**QUESTION 4**

(a) Distinguish between own-price elasticity of demand and cross-elasticity of demand. (4 marks)

(b) Discuss the factors that affect the own-price elasticity of demand. (10 marks)

(c) Discuss the usefulness of these parameters in management and economic policy decision-making. (6 marks)

**(Total = 20 marks)**

**QUESTION 5**

Ahero Co. Ltd manufactures and sells wallets. The company's contribution format income statement for the most recent year is given below:

| | **Total (sh)** | **Per Unit (sh)** | **% on Sales** |
|---|---|---|---|
| Sales (20,000 units)…………………………… | 1,200,000 | 60 | 100% |
| Less variable expenses…………………….... | 900,000 | 45 | ?% |
| Contribution margin………………………. | 300,000 | 15 | ?% |
| Less fixed expenses…………………………. | 240,000 | | |
| Net operating profit………………………… | 60,000 | | |

Management is anxious to improve the company's profit performance and has asked for an analysis of a number of items.

**Required:**

(a) Compute the company's CM ratio and variable expense ratio. (4 marks)

(b) Compute the company's break-even point in both units and sales in shillings. Use the equation method. (4 marks)

(c) Assume that sales increase by sh. 400,000 next year. If cost behavior patterns remain unchanged, by how much will the company's net operating profit increase? Use the CM ratio to determine your answer. (4 marks)

(d) Refer to the original data. Assume that next year management wants the company to earn a minimum profit of sh. 90,000. How many units will have to be sold to meet this target profit figure? (4 marks)

(e) Refer to the original data. Compute the company's margin of safety in both shilling and percentage form. (4 marks)

**(Total = 20 marks)**