CHUKA UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF DIPLOMA IN BUSINESS MANAGEMENT

DIBM 0121: BUSINESS MATHEMATICS I

STREAMS: DIP. BUSINESS MANAGEMENT **TIME: 2 HOURS**

DAY/DATE: TUESDAY 06/08/2019 **2.30 P.M. – 4.30 P.M.**

INSTRUCTIONS:

- **Answer question ONE and any other TWO**

1. (a) Discuss the importance of business mathematics in the management of Kenyan business enterprises. (10 marks)

(b) 1000 primary school children were interviewed for the activities they like doing in their leisure time. The following results were produced;

500 children like playing football
200 children like riding bicycles
350 like swimming
140 children like playing football and riding bicycles
150 children like playing football and swimming
70 children like swimming and riding bicycles
290 children are not involved in any of the activities

(i) Present the above information on a venn diagram. (4 marks)

(ii) Determine the number of children who like all the three activities. (2 marks)

(iii) Determine the number of children who like exactly one of the three activities. (2 marks)

(iv) Determine the number of children who like at least two activities. (2 marks)

(c) Explain the following terms as used in business mathematics

(i) Universal set (2 marks)

(ii) Null set (2 marks)

(iii) Break even point (2 marks)

(d) A linear demand function passes through points A (2, 6) and B (10, 4). Find the slope of the function and hence its equation. (4 marks)

QUESTION TWO

(a) The cost in Ksh '00' incurred in feeding x students in a school is given by $C(x)$. Given that $\frac{\Delta C}{\Delta x} = 2x - 50$ and $c = 300$ when $x = 30$

Determine

(i) The fixed production cost of feeding the students. (4 marks)

(ii) The value of x which minimize the total cost of feeding the students. (3 marks)

(iii) Determine the minimum cost. (3 marks)

(b) Given $A = (2, 18, 5, 4)$ $B = (2, 18, 7, 6, 10)$
$C = (4, 5, 6)$ $\cup = 1,2,3 \ldots \ldots .10)$
Find

(i) $A \cap B \cup C$ (2 marks)
(ii) $(A \cup B)^C$ (2 marks)
(iii) $A^C \cap B$ (2 marks)
(iv) $C - A$ (2 marks)

Hence find the number of elements in each. (2 marks)

QUESTION THREE

(a) Distinguish between the following terms

(i) Fixed cost (2 marks)
(ii) Variable cost (2 marks)

(b) A company produces product x and sells it at a price of sh 100 each. The cost incurred in producing and selling the product is sh 400,000. In addition there is sh 20 incurred for each unit produced and sold.

(i) Determine the total revenue function if y units were sold

(ii) The total cost function for y units

(iii) Profit function if y units were produced and sold

(iv) The break-even quantity

(v) Break even point (10 marks)

(c) The monthly demand of milk is given by $P = 400\ e^{-0.003x}$ where P is the price and x is the number of packets of milk. How many units will be demanded when price is Sh. 50. (6 marks)

QUESTION FOUR

(a) (i) Find the coefficient of x^6 in the expansion $(1 + \frac{1}{2}x)^{10}$ (3 marks)

(ii) Use the first four terms to estimate the value of (1.005) (3 marks)

(b) Briefly explain the following terms

(i) Marginal cost (2 marks)

(ii) Marginal Revenue (2 marks)

(c) Given the demand function $p = 150 - 0.5x$ and total cost function $TC = 10x + 0.08x^2$, determine the output level of profit maximization. (7 marks)

Find the profit made if 2000 units are sold. (3 marks)
