KIBABII UNIVERSITY

DIB 102

QUANTITATIVE METHODS

SUPPLEMENTARYEXAMINATIONDEC 2017

INSTRUCTIONS: Answer All questions in the spaces provided

All workings must be clearly shown

QUESTION ONE

a).Define the following terms.   (3mks)

    i).Quantitative techniques.

    ii).Mutually exclusive events

    iii).Universal set

b).State three limitations of quantitative methods.   (3mks)

c).Solve the following equations

    i).$3x + 4 = -8$ (2mks)

    ii).$15x^2 + 16x - 15 = 0$ (3mks)

d).State and explain three advantages of linear programming.   (3mks)

e).Given that $y = 2x^3 - 4x^2 + 9x - 10$

    Find $\dfrac{dy}{dx}$ (2mks)

f). The total cost of producing and selling X units of a certain product is given by 100,000 + 150x.

find:

    i).Average cost function. (AC)   (2mks)

    ii).Marginal cost function (MC)   (2mks)

g).Evaluate $\dfrac{8!\ 5!}{3!\ 2!}$ (3mks)

h).A bag contains 7 white sweets, 9 green sweets and 4 red sweets. A sweet is drawn from the bag. What is the probability of getting?

i).A green sweet   (2mks)

ii).A white or red sweet.   (2mks)

i).State three uses of quantitative methods   (3mks)

QUESTION TWO

A).Define the following terms:

    i).Fixed cost   (1mk)

    ii).Variable cost   (1mk)

b).A manufacturer spends sh 100,000 as fixed cost. The variable cost is sh. 150 per unit of the product. The selling price per unit of the product. The selling price per unit is sh. 200 find:

    i).The total cost function   (2mks)

    ii).The revenue function   (2mks)

    iii).Profit function   (2mks)

iv) Break even point   (2mks)

QUESTION THREE

a). Determine the inverse of matrix Q given by

$$Q = \begin{bmatrix} 1 & 2 & 5 \\ 3 & 1 & 4 \\ 6 & 1 & 7 \end{bmatrix}$$ (6mks)

b). Hence solve   (4mks)

$$x + 2y + 5z = 23$$
$$3x + y + 4z = 26$$
$$6x + y + 7z = 47$$

QUESTION FOUR

a). Two sets A and Bare such that

Set A = {2, 4, 6, 8, 10, 12}
Set B = {3, 6, 9, 12, 15}

Determine:
   i). AUB   (2mks)
   ii), A∩B   (2mks)

b). In a language class, there are 15 students taking English and 20 students taking French. O f these, 10 students take both English and French.
   i). Represent this information on a Venn diagram.   (3mks)
   ii). Determine the number of students in the language. (3mks)

QUESTION FIVE

a).State and explain three assumptions of linear programming.   (6mks)

b).Define the following terms as used in probability.   (4mks)

    i).Sample space

    ii).Independent events

    iii).Equally likely events

    iv).Complement of an event.