(*Knowledge for Development)*

KIBABII UNIVERSITY

UNIVERSITY EXAMINATION

2021/2022 ACADEMIC YEAR

FIRST YEAR SEMESTER TWO

MAIN EXAMINATION

FOR THE DEGREE OF

BACHELOR OF COMMERCE / BACHELOR OF BUSINESS MANAGENET AND BACHELOR OF COOPERATIVE AND ENTREPRENEURSHIP MANAGEMENT.

COURSE CODE: BCO 122/BBM 123/BCO 125

COURSE TITLE: BUSINESS MATHEMATICS

DATE:18TH MAY, 2022 **TIME:2.00PM – 4.00PM**

INSTRUCTIONS TO CANDIDATES

1. Answer Question One in Section A and Any other TWO (2) Questions in Section B

2.Question **one** carries **30**marks and each of the other two questions carry **20** marks each.

TIME: 2 Hours

KIBU observes ZERO tolerance to examination cheating

SECTION A(COMPULSORY)

QUESTION ONE

a) Differentiate between the following pairs of terms as used in business mathematics.

I) Simple interest and compound interest

II) Amortization and sinking fund (4mks)

b) If $f(x) = 4x^2 - 3x + 5$, for what values of x is $3f(x) = f(3x)$? (3mks)

c) Solve

$$x + y = 9$$
$$\frac{1}{x} + \frac{1}{y} = \frac{1}{2}$$

(3mks)

d) The total cost function C and the total revenue function R of a company are given by

$C=50 + 3x$ and $R= 30x-0.5x^2$ where x is the output. Find the output at which profit is 50 units. (4mks)

e) The demand for a certain product is 40 units when the unit price is sh 10 and 48 units when the unit price is sh 8.

i) Derive a linear demand function for the product.

ii) Compute the unit price that will correspond to demand of 16 units.(3mks)

f) Let A={2,3,4,5}, B={3,6,9} and C={5,6,7,8}. Find;

i) (AUB) n (BUC)

(2mks)

ii) A n(BUC) (2mks)

g) At what percent will sh 6,000 amount to sh 7,500 in 4 years compound interest? 3mks

h) Outline three assumptions of linear programming. 3mks

i) Solve the following equations by gauss Jordan elimination method

3x-5y=7

4x+y=17 3mks.

(Total 30marks)

QUESTION TWO

a) The compound interest on a certain sum of money for two years is ksh 920.25 and the simple interest is ksh 900. Find the sum and the rate of interest. 10mks

b) A certain sum of money invested on compound interest amounts to ksh 2,420 in 2 years and ksh 2,662 in 3 years. Find the rate of interest and the sum invested. 10mks

(Total 20marks)

QUESTION THREE

a) Write short notes under the following sub headings as used in set theory.

I) Finite set (2Marks)

II) Equality of sets (2Marks)

III) Null set (2Marks)

IV) Universal set (2Marks)

V) Complement of a set (2Marks)

b) Of the 100 boarders in a hostel, 80 drink tea, 40 drink coffee and 25 drink both tea and coffee. How many drink neither tea nor coffee? (5mks)

c) Of the 20 girls in a class, 16 play hockey, 12 play tennis and 4 play basketball. Every girl plays at least one game and two plays all the three games. How many girls play two and only two games? (5mks)

(Total 20marks)

QUESTION FOUR

a) Solve the following systems of linear equations using crammers rule

$3x+y+2z=3$

$2x-3y-z=-3$

$X+2y+z=4$ 10mks

b) Find the demand vector which is consistent with the input-output matrix

$A=\begin{pmatrix} 0.2 & 0.3 & 0.2 \\ 0.4 & 0.1 & 0.2 \\ 0.1 & 0.3 & 0.2 \end{pmatrix}$ and the output vector $X=\begin{pmatrix} 25 \\ 21 \\ 18 \end{pmatrix}$

10mks

(Total 20marks)

QUESTION FIVE

a) Jane Mbevi intends to borrow sh 600,000 from a bank. The bank has offered to lend her the money at an interest rate of 10% per annum repayable in four annual installments.

Required:

i) The annual payment necessary to amortize the loan. 6mks

ii) Loan amortization schedule for Jane mbevi. 4mks

b) Tom lent sh 10,000 to two persons in two parts. The first man borrowed at 5% simple interest and the second man borrowed at 6% simple interest per annum. If Tom receives sh 12,240 as total amount after 4 years, what sum was borrowed by each of the persons? 10mks

(Total 20marks)