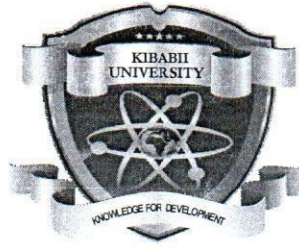


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**UNIVERSITY EXAMINATIONS  
2019/2020 ACADEMIC YEAR  
FIRST YEAR SECOND SEMESTER  
MAIN EXAMINATION  
FOR THE DEGREE OF BACHELOR OF BUSINESS  
ADMINISTRATION.**

**COURSE CODE: BCO 105**

**COURSE TITLE: BUSINESS MATHEMATICS**

**DATE: 19.11.2020**

**TIME: 2-5PM**

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**INSTRUCTIONS TO CANDIDATES**

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

TIME: 2 Hours

KIBU observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over. ►

### QUESTION ONE

- a) Using the following linear function draw a line graph  
 $y = 1.5 + 3x^2$  ( $-4 < x < 5$ ) 10 marks
- b) Work out the following
- $81 = 3^{x-2}$  2 marks
  - Two points of a line are given as  $(-3, -2)$  and  $(21, -14)$  determine the slope of the function.  
2 marks
- c) Alice saved sh.112,000 for three years at 2.5% compounded quarterly annually. How much will Alice withdraw from her bank at maturity? 5 marks
- d) Find the value of the unknowns in the pair of equations below.  
 $4x - y = 6$   
 $5x - 3y = 4$  5 marks
- e) Work out the following
- $(-2/3)^{-3}$  2 marks
  - $\text{Log}(2.73)^4$  2 marks
  - The cost in shillings,  $C(x)$ , of manufacturing  $X$  picture frames, where  $X$  is measured in thousands, is

$$C(x) = 5000 + 2000 \log(x+1).$$

Find the cost of manufacturing 19000 frames. (2 marks)

### QUESTION TWO

- a) Solve the system of three equations below using elimination.

$$X + 3y + 2z = 1$$

$$2X + y - z = 2$$

$$X + y + z = 2$$

(9 marks)

- b) Graph the inequality  $X + 4y > 4$  (5 marks)

- c) Use a matrix to solve the system

$$2x - 3y = 4$$

$$X + 5y = 2$$

(6 marks)

### QUESTION THREE

- a) Plot the graph of the quadratic function below.

$$F(x) = -2/x$$

From the graph find the three  $x$  intercepts.  $-4 \leq x \leq 4$

(10 marks)

- b) Find the present value of a debt of sh.25000 taken out over 3 years where the borrowing rate is 14.5% and the discount rate is 9.5% (5 marks).
- c) Solve  $(1/3)^x = 81$  (3 marks)

#### QUESTION FOUR

- a) The revenue of a charter bus company depends on the number of unsold seats. If revenue  $R(x)$ , is given by  
$$R(x) = 5000 + 50x - x^2,$$
Where  $X$  is the number of unsold seats, find the maximum revenue and the number of unsold seats which produce maximum revenue. (8 marks)
- b) Differentiate between a null and a universal set (4 marks)
- c) Suppose you start a kiosk business with the following plan. You buy two products for a start-credit cards and soda. You can order no more than a total of 500 cards and spend no more than sh.600.
- i) 12 cards per stack, you pay sh.24 per stack and sell at sh.3.50 per card.
- ii) 20 crates of soda, paying sh.150 per crate and selling at sh.25 per bottle.
- Using inequalities show how you can maximize profit. (8 marks)