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KIBABII UNIVERSITY

KNOWLEDGE FOR DEVELOPMENT

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

INSTRUCTIONS TO CANDIDATES

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

TIME: 2 Hours

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

i) $81 = 3^{x-2}$ 2 marks

ii) 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

i) $(-2/3)^{-3}$ 2 marks

ii) $\text{Log } (2.73)^4$ 2 marks

iii) 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.

$X + 3y + 2y = 1$

$2X + y - Z = 2$

$X + y + Z = 2$ (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)