

CHUKA



UNIVERSITY

SUPPLEMENTARY / SPECIAL EXAMINATIONS
FIRST YEAR EXAMINATION FOR THE AWARD OF BACHELOR DEGREE IN
ECONOMICS AND STATISTICS, ECONOMICS AND SOCIOLOGY, ECONOMICS
AND MATHEMATICS AND ECONOMICS AND HISTORY.
ECON 131: INTRODUCTION TO MATHEMATICS FOR ECONOMISTS

STREAMS:

TIME: 2

HOURS

DAY/DATE: MONDAY 16/11/2020

11.30 A.M - 1.30 P.M.

INSTRUCTIONS:

- Answer Question One And Any Other Two Questions

QUESTION ONE (30MARKS)

- a. Consider the universal set T and its subsets A, B and C below;

$$T = \{a, b, c, d, e, f\}$$

$$A = \{a, d\}$$

$$B = \{b, c, f\}$$

$$C = \{a, c, e, f\}$$

Find (5mks)

- $A \cup B$
 - $B \cup C$
 - $A \cup B \cup C$
 - $A \cap B \cap C$
- b. Evaluate the following (8mks)
- $3+2$
 -
 -
 -
- c. Expand $(X + Y)^3$ (2Marks)

d. Graph and compute the intercept of the following function (6 Marks)

i. $Y = 4 - 2x$

ii. Consumption C is a function of income Y , given by the following expression;

$$C = 7 + 0.85Y$$

iii. What is the slope of the consumption function? (1 Mark)

iv. Is the function positively or negatively sloped? (2 Marks)

v. What is the level of consumption when $Y = 1$ (2 Marks)

e. You are given the following demand and supply functions for a commodity

P

find the equilibrium price and quantity (4 Marks)

QUESTION TWO(20MKS)

a. Solve the following (4mks)

i. =

ii.

b. Solve the first two equations by factorization and the last two by completing the square

(8 Marks)

i. $8x^2 - 50 = 0$

ii. $X^2 = 20 - X$

iii. $X^2 - 2X - 8 = 0$

iv. $X^2 + \beta X = 0$

c. Find for the following equations (8 Marks)

i.

ii.

iii. ²

iv.

QUESTION THREE (20MARKS)

- a. The demand function for some product is
 $P = 16 - 0.4Q$
 Find
- i. Total revenue (TR) function (2 Marks)
 - ii. Average revenue (AR) function (2 Marks)
 - iii. Marginal revenue (MR) function (2 Marks)
- b. Find the points at which critical values for the following functions occur and determine whether the functions attain maximum or minimum at such points (6 Marks)
- i.
 - ii.
- c. The average revenue and average cost functions for a firm are given as;
- Find the level of Q and P that will maximize profits for the firm (6 Marks)
- d. Find the points of inflexion for (2 Marks)

QUESTION FOUR (20MARKS)

- a. Evaluate the following (8 Marks)
- b. Evaluate the product AB of the following pairs of matrices (4 Marks)
- c. Solve the following by Cramer's rule (4 Marks)
- i. $x_1 + 3x_2 = 3$
 $2x_1 + 4x_2 = 7$
 - ii. $3x_1 + x_2 = 6$
 $6x_1 + x_2 = 7$
- d. Highlight the elements of the input -output table (4 Marks)
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