KISII UNIVERSITY
UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF THE DIPLOMA IN AGRICULTURAL AND APPLIED ECONOMICS
SECOND SEMESTER, 2023/2024
(JANUARY-APRIL, 2024)

AGEC 0103: MATHEMATICS FOR ECONOMIST II

STREAM: Y1 S2 **TIME: 3 HOURS**

DAY: FRIDAY, 9:00 – 12:00 P.M. **DATE: 19/04/2024**

INSTRUCTIONS

1. ***Do not write anything on this question paper.***
2. ***Question ONE Is Compulsory and Any Other TWO Questions.***

QUESTION ONE

(a). Using the rule of differentiation and integration, work out:

i. $Y = x^3 - 2x^4 + 16$ (3marks)

ii. $3/x^2 = y$ (3marks)

iii. $\int x^6 dx$ (3marks)

iv. $\int(3x^2-x+2)dx$ (3marks

(b) With examples, discuss the three types of logarithms (9marks)

(c) (I) differentiate between endogenous and exogenous variables (4marks)

(ii) Obtain an inverse of the following matrix (5marks)

22	13
7	4

QUESTION TWO

i. Discuss in details the practical use of differentiation. (8marks)

ii. Determine the coordinates and the nature of any turning points on the curve represented by the following function: (12marks)

$Y=x^3-7.5x^2+18x+16$

QUESTION THREE

i. Differentiate between marginal revenue (MR) and marginal cost (MC) (4 marks)

ii. If the total cost function is $TC = 5Q^2 +7Q+20$, find the marginal function and evaluate in at Q= 6 and Q=9 (6 marks)

iii. A food processing plant has a particular problem with delivery and processing of perishable goods. All deliveries must be processed in a single day and although there are a number of processing machines available, they are very expensive to run. A resercher has developed the function $Y= 12x -2a -ax^2$ to describe the profit Y in '00'. Given the number of machines used x, and the number of deliveries(a) in a day;

a). Show that the system is uneconomical if 4 deliveries are made in one day (a=40) (4 marks)

b). If three deliveries are made in one day, find the number ofprocessing machines that should be used in order to maximize profit. (4 marks)

c). What is the maximum profit in b above. (2 marks)

QUESTION FOUR

a). with examples distinguish between function and equation. (4 marks)

b). Discuss in details types of equation. (10 marks)

c). solve the following equation;

i. $3x + y = 15$ (3 marks)

$x + 1/3\ y = 2$

ii. $4x-3y =18.5$ (3 marks)

$4y =7x-35.5$