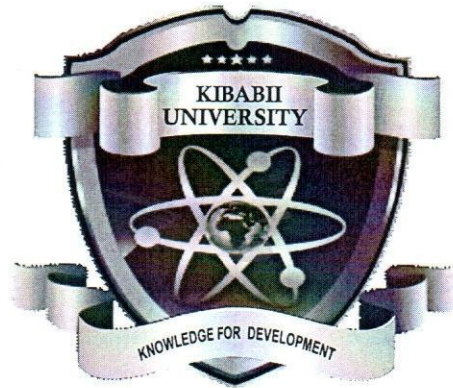(*Knowledge for Development*)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2021/2022 ACADEMIC YEAR

SECOND YEAR 2ND SEMESTER MAIN EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE INAGRICULTURAL ECONOMICS & RESOURCE MANAGEMENT

COURSE CODE: AEC 223
COURSE TITLE: ECONOMETRICS

DATE: 13TH MAY 2022   **TIME: 9 – 11 AM**

INSTRUCTIONS TO CANDIDATES

Answer Question ONE and any other two (2) Questions.

TIME: 2 Hours

This paper consists of 3 printed pages. Please Turn Over ▶

KIBU observes ZERO tolerance to examination cheating

QUESTION ONE   (30 MARKS)

(a) What is the meaning of Regression Analysis (2 Marks)

(b) Draw a schematic diagram to show the procedure one would follow when testing an economic theory and explain the steps. (10 Marks)

(c) The success of any econometric analysis ultimately depends on the availability of the appropriate data. outline reasons why data is sometime inaccurate (6Marks)

(d) State the four assumptions multiple linear regression makes about data (4 Marks)

(e) Define the statistical estimate R-squared (R^2), outlining what it measures, how it is calculated and interpreted in regression analysis (8Marks)

QUESTION TWO   (20 MARKS)

It is predicted that global warming may be reducing average rainfall in Bungoma. The table below shows rainfall data collected in Bungoma over the last 14 years.

n	Year	Amount of rainfall in ml
1	2008	40
2	2009	39
3	2010	41
4	2011	29
5	2012	32
6	2013	30
7	2014	33
8	2015	15
9	2016	10
10	2017	11
11	2018	20
12	2019	24
13	2020	10
14	2021	15

Using the data above,
(i) Develop the estimated regression equation using the least square method (10 marks)
(ii) Interpret the estimated coefficients (5 Marks)
(iii)Predict how much rainfall Bungoma is likely to receive this year (5 Marks)

QUESTION THREE

(a) Distinguish between the following econometric terms. **(12 Marks)**
    (i) Simple regression analysis and Multiple regression analysis
    (ii) Exogeneous variable and Endogenous Variable
    (iii)Time series data and cross-sectional data

(b) What are the disadvantages/limitation of linear regression Analysis **(8Marks)**

QUESTION FOUR
(20 MARKS)

From the record of Harambee farm, the quantity of maize produced increased with an increase in the quantity of fertilizer applied.

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
n	1	2	3	4	5	6	7	8	9	10
Maize Produced	40	44	46	48	52	58	60	68	74	80
Fertilizer used	6	10	12	14	16	18	22	24	26	32

Assuming all the assumptions of the Classical linear Regression model are fulfilled and the relationship is hypothesized to be $Y = b_1 + b_2X + \mu$. Calculate

(i) The coeffients b_1 and b_2 **(10 Marks)**
(ii) Standard errors of these estimator **(5 Marks)**
(iii)Establish 95% confidence intervals for b_1 and b_2 **(5 Marks)**

QUESTION FIVE
(20 MARKS)

(a) Discuss what is meant by BLUE properties in OLS estimator. **(10 marks)**

(b) Write short notes on the following violations of the assumptions of linear regression analysis

(10 Marks)

    i) Multicollinearity
    ii) Heteroscedasticity