(*Knowledge for Development*)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2019/2020 ACADEMIC YEAR

FOURTH YEAR 2nd SEMESTER

MAIN EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL ECONOMICS & RESOURCE MANAGEMENT

COURSE CODE: **IAE 485**

COURSE TITLE: **ECONOMETRICS**

DATE: 12TH NOVEMBER 2020 **TIME: 2PM – 4 PM**

INSTRUCTIONS TO CANDIDATES

Answer **Question 1** and any other two (2) Questions.

QUESTION ONE

a) Distinguish the following terms as used in econometrics:

i. Spearman and Pearson correlation coefficients (3mks)

ii. Time series and panel data (3mks)

iii. Heteroscedasticity and autocorrelation (3mks)

iv. Regression and correlation analysis (4mks)

b) State the Gauss Markov theorem and illustrate the three properties of a good estimator. (4mks)

c) Derive the normal equations which are used in simple regression analysis (10mks)

d) Illustrate the advantages of adjusted R squared over the unadjusted R squared as a measure of goodness of fit. (3mks)

QUESTION TWO

The following data refers to weekly sales Y and weekly advertising expenditure X_2 and the mean weekly income of customers X_3.

Y	200	236	262	261	322	280	308	347	397	382
X_2	3	4	16	13	20	23	23	28	33	37
X_3	21	22	25	26	30	31	34	34	38	39

i) Regress Y on X_2 and X_3 and interpret the results of your regression model (10mks)

ii) Calculate the coefficient of determination and interpret your answer. What is adjusted R squared? (5mks)

iii) Create 95% confidence intervals for the slope parameters and state whether the slope parameters are significant or not. (5mks)

QUESTION THREE

There were five finalists in a pageant contest. Two judges A and B separately ranked the contestants as follows:

Contestants	V	W	X	Y	Z
Ranked by judge A	2	1	5	3	4

Ranked by Judge B	4	2	5	1	3

i. Calculate the Pearson correlation coefficient (8mks)

ii. Calculate Spearman Rank correlation coefficient (8mks)

iii. Explain why correlation analysis is not popular among econometricians (4mks)

QUESTION FOUR

a) Clearly explain the steps that constitute an econometric research methodology (10mks)

b) An ANOVA table for a certain three variable regression (Y, X_1, and X_2),and 20 observations are given as follows:

Source of variation	Sum of squares	d.f.	Mean sum of squares (MSS)
Due to regression (ESS)	300	a	b
Due to residuals (RSS)	c	d	e
Total (TSS)	400	f	F statistic = g

Find the values for a, b, c, d, e, f, and g. What can you conclude about the overall significance of the model? (10mks)

QUESTION FIVE

a) An econometrician at KALRO was performing a regression analysis, but realized that her model could be violating the OLS assumption of autocorrelation.

i. Clearly explain five causes of such econometric problem (10mks)

ii. What are the consequences of her just proceeding with her analysis? (5mks)

b) State limitations of relying on economic theories that are solved by econometrics (5mks)