CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

**THIRD YEAR EXAMINATION FOR THE AWARD OF DEGREE
OF BACHELOR OF SCIENCE IN AGRICULTURAL ECONOMICS**

AGEC 313: ECONOMETRICS

STREAMS: BSC (AGEC)   **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 15/04/2020   **11.30 A.M. – 1.30 P.M.**

INSTRUCTIONS:
- **Answer question ONE and any other TWO questions**
- **Do not write on the question paper**

QUESTION ONE

(a)   What is econometrics?   [2 marks]

(b)   Explain with examples different four types of data   [4 marks]

(c)   A researcher wanted to investigate the effects of income (Y) on transaction demand for cash balances (M) for hypothetical economy using the following data;

M	21	24	26	27	28	29	30	33	34	37
Y	80	95	103	110	114	117	120	134	139	150

(i)   Specify the model to be estimated   [2 marks]

(ii)   (a)   Estimate the model

         (b)   Calculate coefficient of determination   [15 marks]

(iii)   Interpret your results in (b) above   [2 marks]

QUESTION TWO

Suppose the following equation describes the relationship between the average number of classes missed during a semester (*missed*) and the distance from school (*distance* measured in kilometers)

Missed = 3 + 0.2 distance

(i)   Sketch this line, being sure to label the axes. How do you interpret the intercept in this equation?   [5 marks]

(ii)   What is the average number of classes missed for someone who lives five kilometers away?   [4 marks]

(iii)   What is the difference in the average number of classes missed for someone who lives 10 kilometers away and someone who lives 20 kilometers?   [6 marks]

QUESTION THREE

The following table contains monthly housing expenditure (in KES) for 10 families

Family	Monthly expenditure (KES)
1	300
2	440
3	350
4	1100
5	640
6	480
7	450
8	700
9	670
10	530

(i)   Find the average monthly housing expenditure   [3 marks]

(ii)   Find the median housing expenditure   [3 marks]

(iii)   If monthly housing expenditure were measured in '000' KES rather than in KES, what would be the average and media expenditures?   [4 marks]

(iv)   Suppose that family numbers 8 increases its monthly housing expenditure to KES 900, but the expenditure of all other families remain the same. Compute the average and median housing expenditures.   [5 marks]

QUESTION FOUR

(i)   A researcher found out that dropping some variables or seeking for more information in order to address the problem of multicollinearity were not viable options. Please advise the researcher of feasible alternatives for curing multicollinearity   [6 marks]

(ii)   Using appropriate examples and illustrations distinguish
(a) Heteroscedasticity from autocorrelation   [3 marks]
(b) Coefficient of determination from correlation coefficient   [3 marks]
(c) Stochastic from deterministic models   [3 marks]

QUESTION FIVE

(a)   A researcher has data for 50 countries on N, the average number of newspapers purchased per adults in one year, G, GDP per capita, measured in US $, and fits the following regression (RSS = residual sum of squares)

$N = 25.0 + 0.020 G$ $R^2 = 0.006$, $RSS = 4000.0$

The researcher realizes that the GDP has been underestimated by $100 in every country and that N should have been regressed on G*, where G* = G + 100. Explain with mathematical proofs, how the following components of the output would have differed.
(i)   The coefficient of GDP
(ii)   The intercept
(iii)   RSS
(iv) R^2 [10 marks]

(b)   Food security and poverty are major policy problems in many developing countries. Discuss using relevant examples the steps you would follow to apply econometric methods in solving such problems.   [5 marks]