MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN STATISTICS AND PROGAMMING

SST 300: ECONOMETRICS

DATE: 29/11/2019 **TIME: 2.00-4.00 PM**

INSTRUCTIONS: Answer Question **ONE** and any other **TWO** questions

QUESTION ONE (30 MARKS)

a) State four properties of a good econometric model. (4 marks)

b) The following data show the marks obtained by seven candidates in aptitude test and oral interview for a job.

Candidate	Ann	Ben	Carol	Dan	Emma	Felix	Jim
Aptitude test	95	85	76	68	88	71	60
Oral interview 97	82	93	67	85	80	55	

Determine the Spearman's rank order coefficient of correlation between the performances in the two interviews and interpret your results. (4 marks)

c) Highlight five reasons to justify the inclusion of random error term in an econometric model (5 marks)

d) Given the following estimated Supply function

$S = 250 + 0.6P$ $R^2 = 0.78$

Standard errors (20) (0.7) n = 80

Where S = Quantity supplied P = Price

i) Evaluate the above-estimated function on the basis of the available economic theory, Statistical criteria R^2 and T-test at 5% level of significance (9 marks)

ii) Find the 99% confidence interval for the population parameters (2 marks)

e) Discuss the three main uses of econometrics (6 marks)

QUESTION TWO (15 MARKS)

A researcher wanted to find out the relationship between households' incomes and their percentage allocation for savings. He sampled eight households and recorded their monthly incomes in thousands of dollars and percentage allocation for savings as follows:

Monthly incomes (X)	10	15	8	18	20	12	25	28
Savings (Y)	12	18	10	20	25	15	30	28

i) Form an enrollment econometric model on the basis of an economic theory(2 marks)

ii) Estimate a linear savings regression function and interpret it. (9 marks)

iii) Compute the coefficient of determination and interpret it. (2 marks)

iv) Estimate the percent allocation for savings of a household whose monthly income is 30, 000 dollars (2 marks)

QUESTION THREE (15 MARKS)

Discuss the meaning, causes, consequences and solutions for the following econometric problems

a) Autocorrelation (7 marks)

b) Multicollinearity (8 marks)

QUESTION FOUR (15 MARKS)

A researcher wanted to find out whether enrollment (E) in private schools was a function of the amount of school fees (S_F) charged per annum.

a) Formulate a linear stochastic enrollment model. Use the letters used for the variables (3 marks)

b) Explain five criteria for judging the validity of this enrolment model. (5 marks)

c) Derive the normal equations for the enrollment model and hence solve for the parameter estimates, b_0 and b_1, using ordinary least squares method. Stick to the letters used for the variables. (7 marks)

QUESTION FIVE (15 MARKS)

An Economics major student did a study to examine the impact of monthly incomes (X) on households' monthly consumption (Y). She sampled ten households and obtained the following results of monthly incomes and consumption in thousands and hundreds of Kenya shillings respectively

$\Sigma X = 605$ $\Sigma Y = 304$ $\Sigma X^2 = 38{,}475$ $\Sigma XY = 19{,}417$ $\Sigma Y^2 = 9{,}832$

a) Estimate a linear consumption function for the household

$Y = b_o + b_1 X$ (5 marks)

b) Estimate the savings function (2 marks)

c) Estimate the MPC and MPS and interpret them (4 marks)

d) Evaluate the above-estimated function on the basis of:

i) The available economic theory (2 marks)

ii) Statistical criteria R^2 (2 marks)