MACHAKOS UNIVERSITY

University Examinations for 2022/2023 Academic Year

SCHOOL OF BUSINESS, ECONOMICS AND HOSPITALITY AND TOURISM MANAGEMENT

DEPARTMENT OF ECONOMICS

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF ECONOMICS AND FINANCE

BACHELOR OF ECONOMICS & STATISTICS

BACHELOR OF ECONOMICS

EES 404: ECONOMETRIC MODELING AND METHODS

DATE: **TIME:**

INSTRUCTIONS: Answer Question ONE and any other THREE questions
- (i)   Answer Question **ONE** and any other **TWO** questions
- (ii)   Show all your workings clearly

QUESTION ONE (COMPULSORY) (30 MARKS)

a)   Distinguish between the following terms

         i)   Descriptive and inferential statistics

                                                                           (4 marks)

         ii)   Quantitative and qualitative research

                                                                            (4 marks)

b)   Explain four areas in which econometric modeling can be applied.

                                                                            (4 marks)

c)   Suppose you have been contracted to study factors determining the sales of vegetables in the market off-campus and develop an appropriate econometric model.

         i)   Explain the steps that you would follow to develop this econometric model using a suitable economic theory   (8 marks)

         ii)   Explain four ways you can use to assess the validity of the econometric model   (4 marks)

d)   A director of education sought to find out if the mean scores in national examinations of different schools in the subcounty were statistically different. He sampled four schools in the same category and conducted Anova test on SPSS and obtained the following results

Sales

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	98.686	4	8.671	0.001	0.015
Within Groups	4672.345	95	9.183		
Total	4367.440	99			

i) State the null and alternative hypothesis for the test

(2 marks)

ii) Interpret the above Anova results

(4 marks)

QUESTION TWO (20 MARKS)

A researcher sought to determine the patterns of households' expenditures. He sampled eight families and recorded their data on monthly incomes and expenditures in thousands of Kenya Shillings as follows. The monthly incomes and savings in thousands of Kenya Shillings of eight employees in a firm are recorded as follows.

Households	A	B	C	D	E	F	G	H
Incomes	10	18	17	15	13	19	16	12
Expenditures	1	7	6	5	3	8	5	2

i) Estimate and interpret an expenditure model of the employees.

(3 marks)

ii) Calculate the residual expenditure for a monthly income of KShs 15,000

(1 mark)

iii) Evaluate the statistical significance of the model on the basis of the a suitable criterion   (4 marks)

QUESTION THREE (20 MARKS)

a) Discuss the four main types of models. Give appropriate examples in each case

(8 marks)

b)   Kenya National Bureau of Statistics collected households' data from different regions in the countries related to their consumption expenditures, income levels, family sizes, assets, level of education and gender of households' heads. Level of income and gender of the head of household

i) Explain how the relationship between income and level of education of household can be measured   (4 marks)

ii) Explain the statistical tool that can be used to determine whether the mean households' incomes are statistically different across the regions.

(4 marks)

QUESTION FOUR (20 MARKS)

a)   State four reasons for including an error term/disturbance term (u) in a stochastic economic model

(4 marks)

b)   A medical research institute conducted a study to determine factors that influenced the rate of infection (infect_rate) of COVID-19 in eight countries across the world. Several key factors were identified as independent variables namely: economic growth (gdp), level of urbanization (urban), average daily temperature (climate), general health conditions of the citizens (health), average age of population (age) and population (pop). Dummy variables (d_i) for each country were also generated. A regression analysis was conducted using STATA and the following results were generated.

a)   Write down the general econometric and the estimated regression equations

(2 marks)

b)   Discuss the regression results above in terms of the statistical significance of the estimated coefficients of the model

(8 marks)

c)   Evaluate the model on the basis of the R-squared and F-test.   (6 marks)

QUESTION FIVE (20 MARKS)

Suppose as an economics student you have been contracted to conduct a household market survey on factors influencing demand for a certain type of detergent. You are required to develop an econometric model to estimate the quantity of different phones that are likely to be bought.

a) Explain five features that the model should have

(5 marks)

b) Explain the economic theory that you would use to base you model. Describe one dependent and four independent variables you would consider for the model.

(7 marks)

c) Explain five key elements of your model

(8 marks)