(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN EXAMINATION

UNIVERSITY EXAMINATIONS
2023/2024 ACADEMIC YEAR

FOURTH YEAR FIRST SEMESTER EXAMINATIONS

FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN ECONOMICS AND BACHELOR OF SCIENCE IN ECONOMICS AND STATISTICS

COURSE CODE: ECO 404

COURSE TITLE: INTRODUCTION TO ECONOMETRICS

DATE: WEDNESDAY 13-12-2023   TIME: 3:00 -5:00

INSTRUCTIONS TO CANDIDATES

ATTEMPT QUESTION **ONE** AND ANY OTHER **TWO**

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over.

QUESTION ONE (COMPULSORY)

a) Define the following terms as used in regression; dependent variable, coefficient of determination and error term. (6 marks)

b) Discuss the various types of hypothesis testing errors and hypothesis types. (8 marks)

c) Examine any THREE econometric relationships. (6 marks)

d) The table below provides the average daily per capita expenditure on food items (Y) and average per capita total daily expenditure (X) for different income classes. Find the Spearman Rank correlation coefficient and interpret it. (10 marks)

X	11.7	7.8	6.3	13.7	15.2	18.1	24.2	30.8	52.9	50.2	54.0
Y	195	230	274	312	344	491	645	863	1175	1180	1500

QUESTION TWO

a) A foreign company which manufactures electric bulbs has assured its customers that the lifespan of the bulbs is 28 months with a standard deviation of 4 months. Recently the company embarked on a quality improvement research for their product. After the research using new technology, a sample of 70 bulbs was tested and they gave a mean lifespan of 30.2 months. Does this justify the research undertaken? Use 5% level of significance to conduct a statistical test in order to establish the truth about the above question. (10 marks)

b) Examine the procedure for hypothesis testing. (10 marks)

QUESTION THREE

a) As an analyst, discuss the processes involved in conducting an econometric analysis. (10 marks)

b) A flour processing company wanted to introduce a new brand of flour with enhanced ingredients into the market. An experiment was conducted using 5 under five years children where they were put on a diet that involved flour without ingredients for three months and their weights measured. Assuming that the change in their weights was taken in the month of January and from March, they were put on another diet lasting three months involving flour with enhanced ingredients when the change in their weights was also taken i.e. in the month of May. The change in weights for the children was recorded as in the table below.

March	10	15	12	20	16
May	7	5	12	16	18
Gender	Male	Female	Female	Male	Male

Conduct a Mann-Whitney test and based on the March results and discuss the findings to determine if there was a significant difference in the mean ranks between males and females at 5%? U-critical =2

(10 marks)

QUESTION FOUR

a) Define auto correlation and examine its consequences when conducting an analysis. (8 marks)

b) A study is conducted involving 5 children to investigate the association between age and weight. Children age and weight were taken and recorded as in Table below, measured in weeks, and birth weight, measured in grams. Fit a regression line determine if age affects the child's weight. (12 marks)

Weight	25	15	19	21	27
Age	16	23	24	15	16

QUESTION FIVE

a) Define econometrics and examine the various data types used in econometric analysis. (5 marks)

b) You are testing the null hypothesis that there is no relationship between two variables, X and Y. From your sample n=18, you determine that $\hat{b}_1 = 4.5$ and standard error for $\hat{b}_1$ is $SE_{\hat{b}_1} = 1.5$.

What is the value of the t-test statistic? (5 marks)

   i. At 5% level of significance, what is the critical value? (2 marks)

   ii. Based on your answers in (i) and (ii), what statistical decision should you make? (3 marks)

a) Construct a 95% confidence interval estimate of the population slope $\hat{b}_1$.

(5 marks)