



# MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF COMMERCE

BMS 404: ECONOMETRIC MODELING AND METHODS

DATE: 16/8/2021

TIME: 8.30-10.30 AM

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## INSTRUCTIONS:

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

## QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Explain briefly the following concepts
  - i) Econometric modelling (5 marks)
  - ii) Model validity (5 marks)
- b) A hotel is interested in determining the factors that influence students' consumption patterns in Machakos University. As a researcher you are consulted to conduct a study and estimate an appropriate econometric model.
  - i) Explain the steps that you should follow to develop this econometric model using a suitable economic theory (7 marks)
  - ii) Explain briefly three tests you can conduct to evaluate the statistical significance of the variables used in the model (3 marks)
- c) A researcher wanted to find out the relationship between firms' monthly sales of cars ( $S$ ) and their expenditure on advertisement ( $A$ ). He sampled ten firms and obtained the following summary statistics of their monthly sales and expenditure on advertisement in thousands of Kenya Shillings as follows:  
 $\bar{A} = 519$        $\bar{S} = 300$   
 $\sum a^2 = 3,134,543$      $\sum as = 1,296,836$        $\sum s_i^2 = 539,512$ 
  - i. Estimate the sales function and interpret the results (5 marks)
  - ii. Determine the part of variation in sales which is not explained by the advertisement expenditure (5 marks)

## QUESTION TWO (20 MARKS)

The monthly incomes and savings in thousands of Kenya Shillings of eight employees in a firm are recorded as follows.

Employees	Ann	Ben	Carol	Dan	Esther	Faith	John	Nelly
Incomes	10	18	17	15	13	19	16	12
Savings	1	7	6	5	3	8	5	2

Assuming the relationship  $Y = b_0 + b_1x + e$

- a) Estimate and interpret the savings function of the employees. (8 marks)
- b) Calculate the residual savings for a monthly income of KShs 15,000 (2 marks)
- c) Evaluate the statistical significance of the model on the basis of the following criteria.
  - i. Coefficient of determination (2 marks)
  - ii. Standard error test (8 marks)

## QUESTION THREE (20 MARKS)

Discuss the following econometric problems that might arise in econometric modeling giving their possible causes, effects and possible solutions

- a) Autocorrelation (10 marks)
- b) Multicollinearity (10 marks)

## QUESTION FOUR (20 MARKS)

A research firm conducted a study to determine the influence of some variables on foreign direct investment inflows (fdi) of different countries. The variables were expressed as follows: degree of openness (open), gross domestic product (gdp), external debt (exd), inflation (inf), lending interest rate (lir), political stability (stabp) and internet use (internetuse). A regression analysis was conducted using STATA and the following results were generated.

