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 ECONOMICS AND STATISTICS

BACHELOR OF ECONOMICS AND FINANCE

BACHELOR OF ECONOMICS

BACHELOR OF COMMERCE

BACHELOR OF ARTS

SST 404: ECONOMETRICS II

DATE: 16/8/2021   **TIME: 2.00-4.00 PM**

INSTRUCTIONS:

1. Answer question ONE and any other TWO questions
2. Question ONE Carries a total of 30 marks, while all other questions carry 20 marks each
3. Being in possession of mobile phone and/or unauthorized electronic gadget constitutes an exam irregularity.
4. Being in possession of written materials, in exam room, in any form constitutes an exam irregularity.
5. Do not write on question paper

QUESTION ONE (30 MARKS)

a)   Given the following equation model;

         1. $Y_{1t} = B_{12}Y_{2t} + B_{13}Y_{3t} + \lambda_{11}X_{1t} + \lambda_{12}X_{2t} + \lambda_{13}X_{3t} + \lambda_{14}X_4 + \mu_{1t}$

         2. $Y_{2t} = B_{23}Y_{3t} + \lambda_{22}X_{2t} + \lambda_{23}X_{3t} + \lambda_{13}X_{3t} + \lambda_{24}X_4 + \mu_{2t}$

         3. $Y_{3t} = B_{31}Y_{1t} + \lambda_{31}X_{1t} + \mu_{3t}$

         4. $Y_{4t} = B_{23}Y_{3t} + \lambda_{22}X_{2t} + \lambda_{23}X_{3t} + \lambda_{24}X_4 + \mu_{2t}$

Required

     i.   Identify the endogenous and exogenous variables   (3 marks)

     ii.   Using the order condition, test the identification status of each equation**.**   (6 marks)

b) A study of the labor force participation of women was done and the resulting regression equation given as: $\widehat{D_i}$ = pr $(D_i=1) = -0.28 - 0.38M_i + 0.09S_i$

N = 30, $\widehat{R^2} = 0.32$, $\widehat{R_P^2} = 0.81$ (0.15)   (0.03)

Where: D_i=1 if the ith woman is in the labor force, and 0 otherwise,

M_i = marital status defined as M_i=1 if married, 0 otherwise,

S_i = number of years of schooling of the ith woman.

Interpret the regression results of this model: (6 marks)

c) Briefly explain differences between a stationary series and a non-stationary series. (6 marks)

d) Consider the following system of simultaneous equations:

$$C = \alpha + \beta Y + u$$

$$Y = C + I$$

Where C is aggregate consumption, Y is the level of national income, I is investment expenditure, α and β are parameters such that α>0, 0<β<1 and u is the disturbance term.

Required;

i. Obtain reduced form equations from the structural equations: (6 marks)

ii. Assuming that the reduced form equations for the above equations are given as follows:

$$C = 70 + 8I + v_{1t}$$

$$Y = 70 + 10I + v_{2t}$$

Obtain the structural coefficients α and β from the reduced form equations above. (3 marks)

QUESTION TWO (20 MARKS)

a)   Consider the following data which shows the amount of time in hours people spend watching the television as a function of their age and gender:

Hours watching TV	Gender	Age of individual
0	Male	41
180	Male	19
360	Female	54
900	Male	22
0	Male	48
360	Female	52
3600	Female	24
630	Male	60
1440	Female	28
0	Male	58
360	Female	35
4680	Female	67
630	Female	30
1440	Female	21
90	Male	32
360	Male	33
5760	Female	39
720	Female	56
2160	Female	31
90	Male	57

Required:

i.   Taking gender as D1 = 1 if individual is male, but 0 otherwise; regress hours of watching TV on gender   (10 marks)

ii.   Interpret the results of the estimated regression model   (4 marks)

b)   What are the problems associated with running regression on non-stationary series.(6 marks)

QUESTION THREE (20 MARKS)

a)   Distinguish between structural vs reduced form equations.   (4 marks)

b)   What is the difference between AR, MA, ARM A and ARIMA models in time series analysis?

                                                                                (6 marks)

c)   Explain the two remedial measures for non-stationary time series data?   (4 marks)

d)   Discuss the cons of panel data and panel data analysis?   (6 marks)

QUESTION FOUR (20 MARKS)

a)   Consider the following simultaneous equation model:

$$Y_t = C_t + I_t + G_t$$
$$C_t = \beta_0 + \beta_1 Y_t - \beta_2 T_t + e_{1t}$$
$$I_t = \alpha_0 + \alpha_1 Y_{t-1} - \alpha_2 R_t + e_{2t}$$

      Required;

      i.   Identify the endogenous and exogeneous variables   (4 marks)

      ii.   Obtain the reduced form equations for this model.   (10 marks)

b)   State the characteristics of an integrated series?   (6 marks)

QUESTION FIVE (20 MARKS)

a)   Compare and contrast between the following

      i.   Balanced and unbalanced panel   (2 marks)

      ii.   Fixed effects and random effects   (2 marks)

      iii.   Cross section data models and time series data models   (2 marks)

b)   Three series A, B and C are I (0), I (1) and I (2) respectively. Explain the meaning of these series A and series B are cointegrated. What does it mean?   (4 marks)

c)   Explain the advantages of linear probability models.   (4 marks)

d)   Distinguish between the following concepts as used in policy analysis in econometrics.

      i.   Direct effects,   (2 marks)

      ii.   Indirect effects   (2 marks)

      iii.   Total effects   (2 marks)