LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.A. DEGREE EXAMINATION – **ECONOMICS**

THIRDSEMESTER – APRIL 2018

16PEC3MC03- ADVANCED ECONOMETRICS

Date: 03-05-2018 Dept. No. Max. : 100 Marks
Time: 09:00-12:00

PART A

Answer any **FIVE**of the following questions:- [5x4=20 marks]

1. Define the concept of structural break using suitable diagram.
2. State the normality assumptions of the disturbance term Ui.
3. What is the employability of a Correlogram?
4. Write a note on Recursive Least Squares.
5. Differentiate Dicky Fuller and Augmented Dicky Fuller tests.
6. Point out the difference between'ARCH' and 'GARCH' models.
7. State the properties of Integrated Time series.

PART B

Answer any **FOUR** of the following questions:- [4X10=40 marks]

8. Given the model, $Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + u_i$,How can you test the equality between the two regression coefficients β_3 *and* β_4?
9. From the data for 54 standard metropolitan statistical areas (SMSA), the SIT estimated the following Logit model to explain high murder rate versus low murder rate:

$$\widehat{ln\ O_i} = 1.1387 + 0.0014P_i + 0.0561C_i - 0.4050R_i$$

SE = (0.0009) (0.0227) (0.1568)

Where, O = the odds of a high murder rate, P = 2000 population size in thousands, C = population rate from 1990 to 2000, R = reading quotient and SE are the asymptotic standard errors.

   a. How would you interpret the various coefficients?
   b. Which of the coefficients are individually statistically significant?
   c. What is the effect of a unit increase in the reading quotient on the odds of having a higher murder rate?

10. Write short notes on the following:
    a) Auto Regressive Process.
    b) Moving Average Process.
    c) Auto Regressive Moving Average Process.
    d) Auto Regressive Integrated Moving Average Process.
11. From the annual data for the years 1988 – 2007, the following regression results were obtained:

$\hat{Y}_t = -859.92 + 0.6470\ X_{2t} - 23.195\ X_{3t}$ …….. (1)

$R^2 = 0.9776.$

$\hat{Y}_t = -261.09 + 0.2452\ X_{2t}$ ……..(2)

$R^2 = 0.9388.$

Where, Y = U.S expenditure on imported goods, billions of 2002 dollars, X_2 = personal disposable income, billions of 2002 dollars, X_3 = trend variable.

True or False : The standard error of X_3 in eqn (1) is 4.2750. Show your calculations.

[Hint: Use the relationship between R^2, F and 't'].

12. Examine the employability of Tobitmodel in estimating censored samples.

13. Explain the individual and G-Logit models applied in qualitative response regressions.
14. Outline the Random Effects model.

PART C

Answer any**TWO**of the following questions:- [2X20=40 marks]

15. Given the Cobb – Douglar predicition function $Y_i = \beta_1 {X_{2i}}^{\beta_2} {X_{3i}}^{\beta_3} e^{u_i}$ which follows constant returns to scale ; How can we test whether the model satisfy some restrictions? Support your answer using suitable test procedure.
16. Using a sample of 64 countries the model for estimation is as follows :

$$\widehat{CM}_i = \beta_1 + \beta_2 PGNP_i + \beta_3 FLR_i + U_i$$

Where CM (Child Mortality rate is a function of Per- capita GNP and Female Literacy rate).
The regression results are as follows:

$$\widehat{CM}i = 263.6416 - 0.0056\, PGNP_i - 2.2316\, FLR_i \ldots\ldots\ldots\ldots\ldots (1) se = (11.5932)(0.0019)\ (0.2099)$$

$R^2 = 0.7077$

The result of extended regression model is:

$$\widehat{CM}_i = 168.3067 - 0.0055\, PGNP_i - 1.7680\, FLR_i + 12.8686\, TFR_i \ldots\ldots (2)\ se = (32.8916)(0.0018)(0.2480) \quad (?)$$

$R^2 = 0.7474$

where, TFR is Total Fertility Rate.

a. How would you interpret the co-efficient of TFR? A priori, would you expect a positive or negative relationship between CM and TFR? Justify your answer.
b. Have the coefficient values of PGNP and FLR changed between the two models and why? Which test do you use for tesing the significance and why?
c. Using appropriate statistical test, find the appropriate model of choice and why? Show the calculations.
d. Find the Standard Error of the coefficient of TFR.[Recall the relatioship between ‘t’ and ‘F’ distributions].

17. Elucidate the Chow test for testing structural break or parameter stability.
18. Discuss the possibilities of Panel data models using Least Square Dummy Variable approach.

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