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PG Even Semester (CBCS) Exam., May—2018

ECONOMICS

(4th Semester)

Course No. : ECOCC–404

(Advanced Econometrics—II)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. *(a)* Indicate whether the following statements are true, false or uncertain. Provide brief explanation in each case :

  (i) The OLS method is inappropriate for estimating an equation from a system of simultaneous equations.

  (ii) If an equation is overidentified, ILS can be used to estimate the structural parameters.

(**2**)

(b) The structure of a model with three endogenous and three exogenous variables is given below (1 indicates presence and 0 indicates absence of the variable in the equation) :

1	0	1	1	1	0
0	1	1	0	0	1
1	1	1	0	0	1

Which of the three equations is identified? (3+3)+(4+4)=14

2. *(a)* What is meant by identification? Explain why identification problem arises in a simultaneous equation system.

(b) Consider the following model :

$$y_{1t} \quad _{12}\, y_{2t} \quad _{11}\, x_{1t} \quad _{12}\, x_{2t} \quad u_{1t}$$

$$y_{2t} \quad _{21}\, y_{1t} \quad _{23}\, x_{3t} \quad u_{2t}$$

The following data are given to you :

$$(X\ X) \quad \begin{matrix} 10 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 10 \end{matrix}$$

$$X\,Y \quad \begin{matrix} 10 & 20 \\ 10 & 10 \\ 30 & 20 \end{matrix}$$

Find out the ILS estimators of the parameters of the exactly identified equation in the model. 4+10=14

(3)

UNIT—II

3. *(a)* Find the autocorrelation function (ACF) for the AR(1) model given by

$$X_t = m + \phi X_{t-1} + \varepsilon_t, \quad |\phi| < 1$$

and hence plot the ACF for $\phi = 0.70$.

(b) Verify whether the first difference of Y_t for the model $Y_t = t + u_t$ is a weakly stationary stochastic process. Here u_t is a white random noise.

(c) Verify whether the random walk (RW) model $Y_t = m + Y_{t-1} + \varepsilon_t$ (ε_t is a white noise) implies that Y_t is non-stationary. Hence also verify whether the first difference is stationary.

(d) Point out the all important properties of integrated time series. 4+3+4+3=14

4. *(a)* What is 'Granger causality'? Explain.

(b) Outline Granger causality under a structural VAR setup as developed by Toda-Yamamoto (1995). 4+10=14

UNIT—III

5. *(a)* Outline the Box-Jenkins methodology of model selection for a univariate time series. How would you use the Ljung-Box and Box-Pierce statistics under this procedure?

(4)

(b) Outline the Granger-Newbold concept of spurious regression. Explain the steps for detection of spurious regression. 9+5=14

6. *(a)* Present a stepwise procedure of testing for cointegration under Engel-Granger method.

(b) What is 'Granger representation theorem'? How is it involved in Engle-Granger test for cointegration? 9+5=14

UNIT—IV

7. *(a)* Define panel data. Discuss the usefulness of panel data.

(b) Discuss the random effects model of panel data regression with suitable examples. How does it differ from random coefficients model?

(c) Write a brief note on fixed the effects model. (2+3)+6+3=14

8. *(a)* Consider the following model :

$$y_{it} = \alpha_i + \beta x_{it} + u_{it}$$

$$i = 1, ..., N \text{ and } t = 1, ..., T$$

Show that in this case $\hat{\beta}_{OLS}$ and $\hat{\beta}_{LSDV}$ can be obtained as special cases of GLS.

(b) Write short notes on the following :

 (i) SUR model

 (ii) Hausman test   8+(3×2)=14

UNIT—V

9. (a) What do you mean by multivariate analysis?

 (b) Briefly discuss different types of multivariate technique.

 (c) Write the p.d.f. and properties of multivariate normal distribution. 3+5+6=14

10. (a) Write a short note on canonical correlations.

 (b) Suppose our problem is to study non-vegetarian food consumption by considering only two food items—meat and fish. The correlation matrix is given as under :

$$R \quad \hat{S} \quad \begin{matrix} P_1 & P_2 & x_1 & x_2 \\ 1 & 0\ 18 & 0\ 56 & 0\ 50 & p_1 \\ & 1 & 0\ 35 & 0\ 76 & p_2 \\ & & 1 & 0\ 10 & x_1 \\ & & & 1 & x_2 \end{matrix}$$

 Here p_1 price of meat, p_2 price of fish, x_1 meat consumption and x_2 fish consumption. Obtain price and consumption indices.   5+9=14

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