PG Even Semester Exam, May 2025

Economics

4th Semester

COURSE NO. ECO-404

[Advanced Econometrics]

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. Distinguish between structural and reduced from equations . 4

   b. Demonstrate the use of Indirect least squares (ILS) for estimation of parameters of a 2 equation simple Keynesian model. 8

   c. Under what conditions can you apply ILS? Explain briefly. 2

2. What are instrumental variables (IV) and why are they required in simultaneous equation models? Elaborate the IV method of estimation of parameters of simultaneous equation models. How is IV estimation related to 2 stage least squares? 2+6+6=14

Turn over

UNIT-II

3. a. Show that an autoregressive process of order 1 is a stationary stochastic process. 7

   b. Plot the correlogram for the following model . 3

$$y_t = 2.8 + 0.7\, y_{t-1} + u_t$$

   c. Point out the key features of an ARMA (1, 1) model. 4

4. a. Elaborate the VAR based Granger causality test for testing causality. 7

   b. How is co integration and error correction used in long-run equilibrium testing? Outline the Engle-Granger 2 step method for testing co-integrating . 3+4=7

UNIT-III

5. a. What is a dummy variables trap? Illustrate the problem on the basis of an example. 3

   b. Suppose you are linearly regressing labour productivity on capital per worker for 4 size classes of farmers (marginal, small, medium and large). Frame an appropriate dummy variable model such that you can test the following hypotheses? 7

      i. Intercept does not vary across classes.

      ii. Scope coefficient does not vary across classes.

   c. Suppose you have data on personal consumption expenditure (C_i) and personal disposable income (Y_i) of same set of n households during war time and peace time. Develop an appropriate model such that you can test the hypothesis of no impact of war on the marginal propensity to consume. 4

6. a. What is a linear probability model? Elaborate with the help of an example. Show that errors in this model are heteroscedastic. 7

   b. Write a short note on any one: 7

      i. Logit model, ii. Goodness of fit in Logit model.

UNIT-IV

7. a. Elaborate a polynomial lag model with expressions of median and mean lags. 7

   b. What is a Koyck transformation? Show why errors under Koyck transformation are serially correlated. Suggest an estimation strategy for a Koyck lag model. 5+2=7

8. Write short notes on the following: 7x2=14

   a. Partial stock adjustment model

   b. Adaptive expectations

UNIT-V

9. a. Elaborate an LSDV model to fixed effects in panel data linear models. Explain the date stacking process using appropriate methods. 7

   b. What are Random Effects and why is called an error components model? Suggest an appropriate test for random effects. 7

10. Write short notes on any two of the following: 7x2=14

   a. SURE model
   b. Hausman Test
   c. Within & Between estimation

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