correlated in such a model. Suggest an estimation strategy for a Koyck lagged modle. 7+(5+2)=14

8. Write short notes on any two : 7+7=14
   (a) Lagged time series models and econometric causality
   (b) Partial stock adjustment.
   (c) Adaptive expectations.

UNIT-V

9. (a) Outline the LSDV model for panel data. How would you test for the statistical superiority of the LSDV vis-a-vis the pooled estimation. Explain.
   (b) Outline the working of a random effects model by means of feasible GLS estimator.
   (4+3)+7=14

10. Write analytical notes on any two of the following: 7x2=14
   (a) Hausman test for correlated random effects
   (b) SURE model
   (c) Random effects in panel data.

★★★

PG EVEN SEMESTER EXAMINATION, 2024

ECONOMICS

4th Semester

Course No. : ECOCC - 653 (C)

(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 endegenous and exogenous variables and also between structural and reduced form equations in the context of simultaneous equation models.
   (b) In case of a two equation simple Keynesian model elaborate the concept of simultaneous equation bias. Can you estimate the bias? Explain.
   (2+2)+10=14

2. (a) Outline the 2-stage least squares method of estimation for the following model

$$C_t = \alpha + \beta y_t + u_t$$

$$Y_t = C_t + I_t$$

(symbols have their usual meaning)

(b) Check the rank and order conditions for identification of the first equation in the following system of equations.

$$Q^d = \beta_0 + \beta_1 p_t + u_1$$
$$Q^s = \alpha_0 + \alpha_1 p + \alpha_2 w + u_2$$
$$\text{and } Q^d = Q^s$$

(symbols have their usual meaning) 7+7=14

UNIT-II

3. (a) Show that an AR(1) process is a stationary stochastic process.

(b) Plot the correlogram for y_t where,

$$y_t = \alpha + 0.7\, y_{t-1} + \epsilon_t$$

(ϵ_t is a white random noise)

(c) Distinguish between trend stationary and differences stationary processes on the basis of the model,

$$y_t = \alpha + \varphi\, y_{t-1} + \gamma.t + \epsilon_t$$

(d) Outline the steps for detection of unit root by means of the Augmented Dickey-Fuller test. 4+3+3+4=14

4. (a) What is an ARMA model? Find the expressions for mean aid variance for an ARMA (1, 1) model.

(b) When are two variables said to be co-integrated? Hence define co-integrating vector and co-integrating parameter.

(c) Outline the Engle-Granger 2-step procedure for testing co-integration between two variables. 6+2+6=14

UNIT-III

5. (a) Suppose you are given quarterly data for sales of T-shirts made by 4 different makers or brands. Five years of data are given. Construct suitable models with the help of independent dummy variables to test the following hypotheses.

(i) Sales of T-shirts vary acorss seasons (quarters)

(ii) Sales of T-shirts vary across brands or makers.

(b) In an educational study you are required to examine the hours spent in reading non-fiction (y) by arts, commerce and science students in a college. Construct an appropriate independent dummy variable model such that you can test for the difference in hours of non-fiction reading across streams, where your null hypothesis is that of no difference. (4+4)+6=14

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

(a) The Logit model

(b) Structural shift testing using dummy variables

(c) Goodness of fit in limited dependent variable models.

UNIT-IV

7. (a) Explain “mean lag”, “median lag” and “impact multiplier” in case of Lagged regression.

(b) Outline the Koyck lagged model of linear regression. Verify whether the errors are serially