M.A. Examination, 2022
Semester-IV
Economics
Course: OP-14 (Optional)
(Advanced Econometrics-II)

Time: 3 Hours

Full marks: 40

Questions are of value as indicated in the margin

Answer any **four** questions:

1. (a) Define the following terms -
   (i) Weak stationarity
   (ii) Strict stationarity
   (iii) Difference Stationary Process
   (iv) Trend Stationary Process

   (c) Can you apply detrending method to run a regression that involves time series variables which are difference stationary?
   (d) Explain how you would examine stationarity of time series data using the Augmented Dickey-Fuller test.

   $$4+2+4 =10$$

2. (a) What is meant by the 'spurious regression' problem? When does such a problem arise?
   (b) What is meant by 'cointegration'? Explain the steps in Engle-Granger test of cointegration between two time series variables.
   (c) Explain how the Error Correction Mechanism reconciles the short run behavior of an economic variable with its long run behavior.
   $$2+5+3 = 10$$

3. (a) Discuss the steps involved in Box-Jenkins methodology for ARIMA model selection.
   (b) Consider the following AR(2) model
   $$Y_t = \mu + \phi_1 Y_{t-1} + \phi_2 Y_{t-2} + u_t$$
   Show that this process has infinite memory.

   $$5 + 5 =10$$

4. (a) Define a Vector Autoregressive (VAR) Model.
   (b) Construct a VAR (1) with two time series variables y_{1t} and y_{2t}. How do you forecast the values of y_{1t} and y_{2t}?
   (c) What is meant by the ARCH effect?

(d) Show that the GARCH models are more flexible in modeling 'varying variance' of financial time series than the ARCH models.

$$1+4+1+4 = 10$$

5. (a) Define panel data.

(b) Suppose you are interested to examine interstate variations in the degree of casualization of the Indian workforce. From past literature on the subject, you learnt that degree of casualization is related to unemployment rate, incidence of poverty and degree of urbanization. Suppose you compile data on these variables for 15 major states of India at three points of time. Specify an appropriate panel regression model for this research problem.

(c) How would you justify appropriateness of your specified model?

$$2+ 5 + 3 =10$$

6. Write short notes: (a) Granger Causality Test; (b) One way and two way Fixed Effects Model

$$5+5=10$$