M.A. Examination, 2023

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 question no. 1

1. Examine whether the following statements are True, False or Uncertain and give brief explanation for it:
   (a) The Random Walk Model represents a stationary stochastic process.
   (b) Detrending method is employed to run a regression that involves time series variables which are difference stationary.
   (c) An MA model provides forecasting information only for a limited number of periods into the future.
   (d) GARCH models are more flexible in modelling 'varying variance' of financial time series than the ARCH models.

   4 X 4 =16

Answer question no. 2 or question no. 3

2. Consider the data on personal consumption expenditure (PCE) and personal disposable income (PDI) for a country for the period 1980 -2020.
   (a) How you would examine the stationarity of these data using the Augmented Dickey Fuller (ADF) test.
   (b) In the context of these data, explain the concept of cointegration. Discuss how you would test for cointegration between the variables using the Engle–Granger approach.
   (c) Construct an 'Error Correction Model' (ECM) and show how the ECM reconciles the short run behaviour of an economic variable with its long run behaviour.

   3+2+3+4=12

3. (a) Discuss the steps involved in the Box-Jenkins (BJ) methodology for ARIMA model selection.
   (b) Explain the concept of the Impulse Response Function (IRF) in the context of VAR models.
   (c) Show that in forecasting with VAR (1), a forecast error in the first period will be carried forward in future periods.

(d) Consider the following model:

$$GDP_t = a_1 + \sum_{i=1}^{n} \alpha i Mt - i + \sum_{j=1}^{m} \beta j GDPt - j + \varepsilon_{1t}$$

$$M_t = a_2 + \sum_{i=1}^{n} \Upsilon i Mt - i + \sum_{j=1}^{m} \delta j GDPt - j + \varepsilon_{2t}$$

where ε_{1t} and ε_{2t} are uncorrelated white-noise error terms.

Explain the steps to examine GDP (Granger) causes M.

4+2+3 +3 =12

Answer question no. 4 or question no. 5

4. (a) *Panel data can be used to deal with heterogeneity among the cross-sectional units* – Explain with the help of an example.
   (b) What is the main limitation of the Constant Coefficient Model?
   (c) How do the Fixed Effect Model and the Random Effect Model deal with the limitation of the Constant Coefficient Model?
   (d) What is Within-Group Estimator (WGE) and First-Difference Estimator (FDE) in the context of panel regression?

2+2+4+4=12

5. (a) 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.
   (b) How would you estimate such a model?
   (c) How would you justify appropriateness of your specified model?

4+5+3=12