**ST JOSEPH’S UNIVERSITY, BENGALURU -27**

Registration Number:

Date & Session

**B.Sc (ECONOMICS)– 4th SEMESTER**

**SEMESTER EXAMINATION: APRIL 2024**

**(Examination conducted in May / June 2024)**

**ECS 4222 – Time Series Econometrics**

**(For current batch students only)**

**Time: 2 Hours Max Marks: 60**

**This paper contains 2 printed pages and 3 parts**

**PART-A Answer any ten (3 marks each) 3\*10 = 30**

1. What is autocorrelation and how can it be tested?
2. Give an example of an auto-regressive distributed lag model i.e. ADL (1,1).
3. Discuss ACF- the graphical method to test for stationarity.
4. What are the problems with a distributed lag model with several lags?
5. An ADL (1,0) model is usually estimated using a twice-lagged value of the dependent variable as an instrument for the lagged value of the dependent variable. What are the requirements for a valid instrument?
6. What conditions must be satisfied for a time series process to be stationary?
7. Examine if the Random Walk process with drift is stationary.
8. Discuss the phenomenon of spurious correlation and its causes.
9. Discuss the unit root test.
10. Explain trend-stationary and difference-stationary processes.
11. What is cointegration in time-series analysis?
12. Briefly explain the Engle Granger test of Cointegration.

**PART-B Answer any three (5 marks each) 3\*5 = 15**

1. Discuss the Error Correction Model.
2. Describe the Box-Jenkins methodology.
3. Consider an AR (1) process. Derive its expected value and state the condition under which the expected value will be independent of time?
4. Describe the Augmented Dickey-Fuller test.
5. Consider an ADL (1,0) model with autocorrelation of error terms (serial correlation). Explain the problem of using the OLS estimator.

**PART-C Answer any one (15 marks each) 15\*1 = 15**

1. Using an example of money supply (MS) and GDP affecting or being affected by the other, describe the four potential cases of Granger causality and explain how it is tested.
2. Explain the Partial Adjustment model with the dependent variable as the optimal value Y\* and one explanatory variable X (recall $Y\_{t}-Y\_{t-1}=λ[Y\_{t}^{\*}-Y\_{t-1}]$).