D3AST2103 **(1 Page)** **Name.....**

Reg. No.....

THIRD SEMESTER M.Sc. DEGREE EXAMINATION, NOVEMBER 2022

STATISTICS

FMST3E11 – TIME SERIES ANALYSIS

Time: 3 Hours **Maximum Weightage: 30**

Part A: Answer any *four* questions. Each carries *two* weightage.

1. What is the difference between the autoregressive model and the moving average model?
2. Define spectral density. What is the purpose of spectral density?
3. How do you choose an AR or MA model? Explain model checking using the graphical method.
4. Explain Exponential smoothing.
5. Find the Conditional Likelihood of an ARIMA Process.
6. Explain the scope of Residual analysis in Time series
7. Define periodogram. What is bias in periodogram?

(4 × 2 = 8 weightage)

Part B: Answer any *four* questions. Each carries *three* weightage.

8. Define smoothing techniques. Explain forecasting based on smoothing.
9. Explain Holt-Winter smoothing.
10. Establish the stationarity conditions for autoregressive processes.
11. Explain Yule-Walker estimation for AR Processes.
12. How do we conduct the residual analysis and diagnostic checks in time series analysis?
13. Explain Spectral analysis of the weakly stationary process.
14. Define weakly stationary process.

(4 × 3 = 12 weightage)

Part C: Answer any *two* questions. Each carries *five* weightage.

15. Derive invertibility and stationarity conditions for both AR and MA models.
16. Describe the various approaches for residual analysis and diagnostic checks in time series analysis.
17. Explain least squares estimation for ARMA Processes.
18. Describe the ARCH and GARCH models and explain the need of nonlinear time series.

(2 × 5 = 10 weightage)