D4AST2203 **(1 page)** **Name.....**
Reg.No.....

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2024
STATISTICS
FMST4E11- TIME SERIES ANALYSIS

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

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

1. Define auto covariance function and auto correlation function.
2. What is meant by simple exponential smoothing?
3. Explain stationarity of a time series and give its required conditions.
4. State the invertibility condition for a linear process.
5. Define MA(1) and MA(2) process.
6. Explain periodogram and Correlogram.
7. Derive the spectrum of ARMA(1,1) process.

(4 × 2 = 8 weightage)

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

8. Explain forecasting by methods of smoothing.
9. A shop has recorded the demand for a particular flavour candy during the first 7 days of August.

Day	1	2	3	4	5	6	7
Sales	56	64	63	56	68	59	64

Predict the sales for the 8^{th} day of August by using: a) 3 period MA; b) weighted 3 period MA with weights 0.5, 0.4 and 0.1.

10. Explain the methods for the estimation and elimination of both trend and seasonality.
11. Derive the ACF of AR(2) process.
12. Derive the auto regressive parameters in terms of Yule- Walker equations.
13. Explain the unit root test.
14. Explain the ARCH and GARCH model.

(4 × 3 = 12 weightage)

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

15. Explain Holt's two parameter exponential smoothing.
16. Explain the method of estimation of trend and seasonality using differencing.
17. Explain the tests for stationarity.
18. Explain spectral analysis of a time series. Derive the spectrum of AR(1) process.

(2 × 5 = 10 weightage)