



PRESIDENCY UNIVERSITY

BENGALURU

Roll No.														
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End - Term Examinations –MAY 2025

Date: 26-05-2025

Time: 01:00 pm – 04:00 pm

School: SOIS	Program: BCA (CSD)	
Course Code: CSA3070	Course Name: Time Series analysis	
Semester: IV	Max Marks: 100	Weightage: 50%

CO - Levels	CO1	CO2	CO3	CO4	
Marks	26	26	24	24	

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1.	What is the primary objective of time series analysis?	2 Marks	L1	CO1
2.	Explain the concept of trend in time series.	2 Marks	L2	CO1
3.	What is seasonality in time series data?	2 Marks	L2	CO1
4.	Explain the concept of stationary in time series.	2 Marks	L2	CO2
5.	What is the autocorrelation function (ACF)?	2 Marks	L1	CO2
6.	Define partial autocorrelation function (PACF).	2 Marks	L1	CO2
7.	Explain the condition for stationary in AR models.	2 Marks	L2	CO3
8.	What is a moving average (MA) model?	2 Marks	L1	CO3
9.	What is a GARCH model used for?	2 Marks	L1	CO4
10.	What is spectral analysis in time series?	2 Marks	L1	CO4

Part B

Answer the Questions.

Total Marks 80M

11.	a.	Explain a detailed case study applying the decomposition method to a real-world time series dataset. Include the steps involved, interpretation of components, and forecasting implications.	10 Marks	L2	CO 1
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	b.	Explain model forecast theory in time series analysis. Discuss different accuracy measures used to evaluate forecasting performance.	10 Marks	L2	CO 1
Or					
12.	a.	Discuss the concept of a stochastic process in time series analysis. How does understanding the underlying stochastic process help in modeling and forecasting?	10 Marks	L3	CO 1
	b.	Explain the approaches used for time series forecasting. Compare and contrast at least three different approaches with examples.	10 Marks	L3	CO 1
13.	a.	Explain various detrending and de-seasonalizing techniques in time series analysis. Compare their effectiveness with examples.	10 Marks	L2	CO 2
	b.	Describe different smoothing techniques used in time series analysis. Discuss simple moving averages, weighted moving averages, and exponential smoothing methods.	10 Marks	L3	CO 2
Or					
14.	a.	Explain the fundamental statistical concepts essential for time series analysis, including moments, probability distributions, and hypothesis testing relevant to time series data.	10 Marks	L2	CO 2
	b.	Provide a comprehensive introduction to time series analysis using R. Include data import, transformation, visualization.	10 Marks	L2	CO 2
15.	a.	Explain the process of forecasting using AR, MA, ARMA, and ARIMA models. Discuss point forecasts, prediction intervals, and forecast evaluation.	10 Marks	L2	CO 3
	b.	Present a detailed analysis of models for non-stationary time series. Include unit root processes, random walks, and trend-stationary processes.	10 Marks	L3	CO 3
Or					
16.	a.	Discuss parameter estimation methods for time series models, including maximum likelihood estimation and method of moments.	10 Marks	L3	CO 3
	b.	Describe the complete Box-Jenkins methodology for time series analysis. Explain each stage in detail with examples.	10 Marks	L2	CO 3
17.	a.	Provide an in-depth introduction to spectral analysis in time series. Explain the theoretical foundations, interpretation of spectra, and applications.	10 Marks	L3	CO 4
	b.	Discuss methods for estimating the spectrum of a time series. Compare parametric and non-parametric approaches with their respective advantages and limitations.	10 Marks	L3	CO 4
Or					
18.	a.	Present a detailed guide on preparing and analyzing time series models using the ITSM software. Include practical examples and interpretation of output.	10 Marks	L3	CO 4
	b.	Provide a comprehensive tutorial on using the astsa package for time series analysis in R. Include data preparation, visualization, model fitting, and diagnostics.	10 Marks	L3	CO 4