(183) SET-II

Roll No. | | | | | | | | | |

COER University

END SEMESTER EXAMINATION, EVEN SEMESTER, 2023-24

Time : 3 hour **Semester : VI** **Total Marks: 100**
Program Name: B. Tech **Branch/Specialization: AI&ML**
Course Code : SOC 316 **Course Name : Time Series Analysis and Forecasting**

Note: All questions are compulsory. No student is allowed to leave the examination hall before the completion of the time.

Q. No 1	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	What is Seasonality in Time series and how can you deal with different types of Seasonality in time series modelling?	CO 1	3
(b)	Discuss components of Time-Series Analysis & Forecasting with suitable examples.	CO 1	2
(c)	Discuss some real-world applications of Time-Series Analysis and Forecasting.	CO 1	2
(d)	Define Secular Trend. Discuss different methods for measurement of Secular Trend.	CO 1	2
(e)	How would you prepare your data before time series forecasting?	CO 1	2

Q. No 2	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	Discuss Exponential Smoothing in Time Series Forecasting. Also discuss its advantages and disadvantages.	CO 2	2
(b)	Analyze the impact of outliers in time series analysis, how can they be detected and treated?	CO 2	4
(c)	Monthly sales revenue data were collected for a company for 2023: Calculate three-months moving average & seasonal variations for the above problem.	CO 2	3
(d)	Find the trend of production by the method of a five-yearly period of moving average for the following data:	CO 2	3
(e)	The sales of a commodity in tones varied from January 2010 to December 2010 as follows: Fit a trend line by the method of semi-average.	CO 2	3

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sales $000	125	145	186	131	151	192	137	157	198	143	163	204

Year	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Production('000)	126	123	117	128	125	124	130	114	122	129	118	123

in year 2010	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sales (in tones)	280	240	270	300	280	290	210	200	230	200	230	210

Q. No 3	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	Analyze the conditions under which the Moving Average method can be recommended for trend analysis?	CO 3	4
(b)	What is Moving Average? How will you determine the period of the moving average?	CO 3	2
(c)	Following figures relates to the profits of a commercial concern for 8 years: Year: 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993 Profit (₹): 15,420, 15,470, 15,520, 21,020, 26,500, 31,950, 35,600, 34,900 Find the trend of profits by the method of three yearly moving averages.	CO 3	3
(d)	List different methods of fitting a straight line. Discuss Least Square Method of fitting a straight line with suitable example.	CO 3	2
(e)	The annual production of a commodity is given as follows : Year: 1995, 1996, 1997, 1998, 1999, 2000, 2001 Production (in tones): 155, 162, 171, 182, 158, 180, 178 Fit a straight line trend by the method of least squares.	CO 3	3

Q. No 4	Attempt Any Two Parts. Each Question Carries 10 Marks.	CO	BL
(a)	Define Non-Stationary Time Series Data. Explain behavior of a Non-Stationary Time Series Data with suitable examples.	CO 4	2
(b)	Explain different types of Non-Stationary Processes. Analyze Random Walk to predict the chances of accident of a drunk person who is walking on a road.	CO 4	4
(c)	Describe the **ARIMA** (Autoregressive Integrated Moving Average) modeling framework. How does it handle non-stationarity?	CO 4	2

Q. No 5	Attempt Any Two Parts. Each Question Carries 10 Marks.	CO	BL
(a)	You are working for an investment firm that manages portfolios for clients. Your firm is interested in understanding the historical behavior of a particular stock and making forecasts to guide investment decisions. As a financial analyst Your objective is to perform time series analysis on the stock price data of company X to 1. Identify trends, seasonality, and patterns. 2. Develop a forecasting model to predict future stock prices. 3. Evaluate the performance of the forecasting model.	CO 5	6
(b)	Discuss the application of time series analysis and forecasting in real-world domain such as Weather Forecasting.	CO 5	2
(c)	Apply time series analysis and forecasting in real-world domain such as Market Basket Analysis.	CO 5	3

----------**End of Paper**----------