CBCS SCHEME

USN | | | | | | | | | | |

BAI613D

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
Time Series Analysis

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2 M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	**M**	**L**	**C**
Q.1	**a.**	Explain the five important practical problems encountered in Time Series Analysis.	10	L2	CO1
	b.	List and explain the "Auto correlation properties of a stationary model".	10	L2	CO1
		OR			
Q.2	**a.**	Determine the fourier coefficients (α_i and β_I) amplitude (C_i), frequencies (f_i) for the month of January based on the below given table that records the temperature of every month.	10	L3	CO1

Month	Temp (°C)
January	3.4
February	4.5
March	4.3
April	8.7
May	13.3
June	13.8
July	16.1
August	15.5
September	14.1
October	8.9
November	7.4
December	3.6

	b.	Explain Autoregressive and Moving average processes for a linear stationary model.	10	L2	CO1
		Module – 2			
Q.3	**a.**	Why Auto Regressive Integrated Moving Average (ARIMA) is needed for homogeneous non stationary data.	10	L1	CO2
	b.	Explain Integrated making average process for 1^{st} order and 2^{nd} order difference MA process.	10	L2	CO2
		OR			
Q.4	**a.**	Explain the three basic forms of forecasts with respect to Minimum Mean Square Error (MMSE).	10	L2	CO2
	b.	Explain the application of filtering and smoothing techniques while rewriting the ARIMA to state – space form.	10	L2	CO2
		Module – 3			
Q.5	**a.**	Explain the techniques adopted for Model identification.	10	L2	CO3
	b.	Explain the need of Model Multiplicity.	10	L2	CO3
		OR			
Q.6	**a.**	Explain likelihood function and its different forms.	10	L2	CO3
	b.	Explain the estimations using Baye's theorem.	10	L2	CO3

Module – 4					
Q.7	**a.**	What are the methods adopted to check the stochastic model	**10**	**L3**	**CO4**
	b.	Explain the impact of overfitting while diagnoising the model.	**10**	**L3**	**CO4**
OR					
Q.8	**a.**	Explain some aspects for more general seasonal ARIMA models.	**10**	**L3**	**CO4**
	b.	Explain model building, estimation and forecasting procedures for regression models.	**10**	**L3**	**CO4**
Module – 5					
Q.9	**a.**	State the difference between Vector Auto regressive models and Vector Moving Average Models.	**10**	**L2**	**CO5**
	b.	Explain the estimation and model checking for VARMA model.	**10**	**L2**	**CO5**
OR					
Q.10	**a.**	Explain the methodologies adopted in forecasting for Vector Auto regressive Moving Average Processes. (VARMA)	**10**	**L3**	**CO5**
	b.	Explain non stationary and cointegration of co Multivariate time service mode.	**10**	**L3**	**CO5**

* * * * *