

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET University)



B. Tech (Eighth Semester - Regular) Examinations, April - 2026
22BCDPC48011 - Time Series Analysis and Forecasting
(CSE-DS)

Time: 3 hrs

Maximum: 70 Marks

(The figures in the right hand margin indicate marks)

PART – A**(2 x 5 = 10 Marks)**Q.1. Answer **ALL** questions

- | | CO # | Blooms Level |
|--|------|--------------|
| a. List the main components of a time series. | CO1 | K1 |
| b. Define Partial Autocorrelation Function (PACF). | CO1 | K2 |
| c. Write a short note on Seasonal-Trend decomposition using Loess (STL). | CO2 | K2 |
| d. Explain the overfitting in ARIMA models. | CO3 | K1 |
| e. Define Mean Absolute Percentage Error (MAPE). | CO4 | K1 |

PART – B**(15 x 4 = 60 Marks)**Answer **ALL** the questions

- | | Marks | CO # | Blooms Level |
|--|-------|------|--------------|
| 2. a. Explain the characteristics of time series data. Discuss discrete and continuous time series with examples. | 8 | CO1 | K2 |
| b. Describe the Augmented Dickey-Fuller (ADF) test. How is it used to check stationarity? | 7 | CO1 | K3 |
| (OR) | | | |
| c. Explain how outliers can be detected in time series data during EDA with few relevant examples. | 8 | CO1 | K3 |
| d. Discuss time series plotting techniques and how they help in identifying patterns like trend and seasonality. | 7 | CO1 | K3 |
| 3.a. Describe the process of Seasonal Decomposition of Time Series (STL). | 8 | CO2 | K2 |
| b. Compare moving average methods and exponential smoothing techniques. Plot the graphs with an example. | 7 | CO2 | K4 |
| (OR) | | | |
| c. Discuss the advantages and limitations of smoothing techniques in time series analysis. | 8 | CO2 | K4 |
| d. Explain time series decomposition. Differentiate between additive and multiplicative models with examples. | 7 | CO2 | K2 |
| 4.a. Describe the ARIMA(p,d,q) model in detail. Explain each parameter clearly. | 8 | CO3 | K2 |
| b. Explain how ACF and PACF plots help in identifying AR and MA components. | 7 | CO3 | K3 |
| (OR) | | | |
| c. Explain residual analysis and its importance in validating ARIMA models. | 8 | CO3 | K3 |
| d. List the steps involved in building an ARIMA model for time series forecasting | 7 | CO3 | K3 |
| 5.a. Discuss Long Short-Term Memory (LSTM) networks and their application in time series forecasting | 8 | CO4 | K2 |
| b. Compare different forecasting models based on accuracy and performance. | 7 | CO4 | K4 |
| (OR) | | | |
| c. Explain the process of selecting the best forecasting model for a given dataset. Take a data set as an example. | 8 | CO4 | K2 |
| d. Compare ARIMA and SARIMA models with suitable examples. | 7 | CO4 | K4 |

--- End of Paper ---