Total No. of Questions: 6

Seat No.:

BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-V Computer Science & Business Systems : WINTER: 2025
SUBJECT: DATA MINING & ANALYTICS

Day : Tuesday
Date : 16/12/2025

W-30746-2025

Time : 02:30 PM-05:30 PM
Max. Marks : 60

NB :
1. All questions are COMPULSORY.
2. Figures to the right indicate FULL marks.
3. Draw neat labeled diagram WHEREVER necessary.

Q. 1 Define Data Mining and explain its relationship with Machine Learning, DBMS, OLAP, and Statistics. (10)

OR

Q. 1 Enumerate and briefly explain different Data Mining Techniques. (10)

Q. 2 Define data transformation. List and explain different techniques used in data cleaning. (10)

OR

Q. 2 What is data reduction? Explain data reduction strategies. (10)

Q. 3 Describe Apriori algorithm with its advantages and disadvantages. Find out frequent item sets using candidate generation. (Min support=2) (10)

Tid	Items
1	I1,I3,I4
2	I2,I3,I5
3	I1,I2,I3,I5
4	I2,I5

OR

Q. 3 Generate FP Tree for the following dataset, given minimum support=3 (10)

Transactions:

Transaction ID	Items Bought
1	S, Q
2	R, Q, T, P, S
3	S
4	P, S, T
5	R, P, Q, T
6	T, P, S, Q
7	Q, P, S
8	Q, R, U
9	U

Q. 4 Explain the following A) Descriptive and Predictive Analysis. B) Simple Linear Regression Analysis. (10)

OR

Q. 4 Discuss heuristic methods in forecasting models. Provide examples of heuristic methods and explain how they are used for making forecasts. (10)

Q. 5 Discuss iterative procedures used for nonlinear least squares (NLS) estimation. Explain the grid search, Newton-Raphson, steepest descent, and Marquardt's methods, highlighting their advantages and limitations. (10)

OR

Q. 5 Explain the role of link functions in GLMs. Provide examples of link functions such as Poisson, binomial, inverse binomial, inverse Gaussian, and Gamma, and discuss their applications. (10)

Q. 6 Define prescriptive analytics and its role in decision-making. Discuss the main components of prescriptive analytics, including mathematical optimization, network modeling, stochastic modeling, and decision and risk analysis. (10)

OR

Q. 6 Explain the process of exploratory time series analysis. What techniques are commonly used to visualize and identify patterns in time series data? (10)

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