BE/SEM VII / C-scheme/ Summer 2026/ 04-06-26/ Comp/ CSE

Duration: 3 Hours **[Max Marks: 80]**

N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any **three** questions out of the remaining **five**.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

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Q1 **Attempt any FOUR** **[20]**

A Explain the stages involved in developing a Machine Learning system.
B Explain Regression line, Scatter plot, Error in prediction and Best fitting line.
C Explain Bias–Variance trade-off with a suitable example.
D List and explain any four performance metrics used in Regression problems.
E Differentiate between Regression and Classification with examples.

Q2 A Explain any five applications of Machine Learning. **[10]**

B Explain Confusion Matrix. Calculate Accuracy, Precision, Recall, and F1-score for the following: **[10]**

	Predicted +	**Predicted –**
Actual +	40	8
Actual –	12	30

Q3 A Write a short note on XGBoost and explain K fold cross validation. **[10]**

B Describe Decision Trees. Explain how trees are constructed using Gini Index along with an example. **[10]**

Q4 A Explain the concept of bagging and boosting. **[10]**

B Describe DBSCAN algorithm. Apply DBSCAN on dataset {1, 2, 3.5, 4, 5, 11} with $\varepsilon = 2$ and MinPts = 4 **[10]**

Q5 A Explain the concept of Expectation Maximization Algorithm. **[10]**

B Describe PCA algorithm along with example. **[10]**

Q6 **Write a short note (Any Two)** **[20]**

A Logistics Regression
B Support Vector Machine and SVM kernel trick
C Linear Discriminant Analysis for Dimension Reduction

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