

**BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)**  
**B. Tech. Sem - V Computer Science & Engineering AI & ML : SUMMER : 2025**  
**SUBJECT: MACHINE LEARNING**

Day : Tuesday  
Date : 13/05/2025

S-23958-2025

Time : 10:00 AM-01:00 PM  
Max. Marks : 60

**N.B.**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Assume suitable data **WHEREVER** necessary.
- 4) Draw neat labeled diagrams **WHEREVER** necessary.

**Q.1** Compare structured, semi-structured and unstructured data. (10)

**OR**

**Q.1** Describe the various steps involved in developing a machine learning algorithm. (10)

**Q.2** A clinical trial gave the following data for BMI and Cholesterol level for 10 patients. (10)  
Predict the likely value of cholesterol level for someone who has a BMI of 27.

BMI	Cholesterol
17	140
21	189
24	210
28	240
14	130
16	100
19	135
22	166
15	130
18	170

**OR**

**Q.2** Consider following table for binary classification. Calculate the root of the decision tree (10)  
using Gini index

Sr. No.	Customer Income	Gender	Car Type	Class
1	High	M	Family	C1
2	High	M	Sports	C1
3	High	M	Family	C2
4	Low	M	Family	C2
5	Low	F	Family	C2
6	Low	F	Sports	C1
7	Low	F	Sports	C2
8	High	M	Family	C1
9	High	F	Family	C2
10	High	F	Family	C2
11	High	F	Sports	C2
12	Low	M	Sports	C2
13	Low	F	Family	C2
14	Low	M	Sports	C1

**Q.3** Explain Cross-Validation technique in details with its type. (10)

**OR**

**Q.3** Explain in details about Random Forest Technique. (10)

PTO

Q.4 Enlist and explain in details about Multi-Class Classification Techniques. (10)  
OR (10)

Q.4 What is Support Vector Regression (SVR)? Explain in details. (10)

Q.5 With suitable example explain the steps involved in the K-means algorithm. (10)  
OR

Q.5 Two clusters have the following data points. Calculate their intra cluster distance also calculate total inertia of the data point assignment. (10)

Q.6 Describe the major types of dimensional reduction techniques. (10)

Height	Weight	Assigned Cluster
185	72	2
170	56	1
168	60	1
179	68	2
182	72	2
188	77	2
180	71	2
180	70	2
183	84	2
180	88	2
180	67	2
177	76	2

OR

Q.6 Carry out SVD on

$$\begin{bmatrix} 1 & 1 \\ 7 & 7 \end{bmatrix}$$

(10)

\*\*\*\*\*