O.P.Code: 23CS0902	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. II Year II Semester Regular & Supplementary Examinations March/April-2026

MACHINE LEARNING

(Common to CSM, CAD & CAI)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	What is the need of label encoding?	CO1	L1	2M
	b	What is meant by supervised and Unsupervised learning in ML?	CO1	L1	2M
	c	Define MAE and R2.	CO2	L1	2M
	d	List out common distance measures used in machine learning.	CO2	L1	2M
	e	What assumption does the Naive Bayes Classifier make about features?	CO3	L1	2M
	f	Extend the role of the bias–variance trade-off in decision trees.	CO3	L2	2M
	g	What does the Kernel Trick do in the context of SVM?	CO4	L1	2M
	h	Compare Linear Regression and Logistic Regression.	CO4	L2	2M
	i	Infer the uses of Matrix Factorization in clustering.	CO5	L2	2M
	j	What is a centroid in K-Means clustering?	CO5	L1	2M

PART-B

(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	a	Outline the applications of Machine Learning in various fields.	CO1	L2	5M
	b	Explain about various types of Data.	CO1	L2	5M

OR

3	a	Summarize feature engineering in Machine Learning.	CO1	L2	5M
	b	Explain concepts of learning by Rote & Induction with an example.	CO1	L2	5M

UNIT-II

4	a	Apply the steps involved in Nearest Neighbour Models to classify data points.	CO2	L3	5M
	b	Solve Hamming distance to compute the difference between two given binary and DNA	CO2	L3	5M

OR

5 A bank wants to classify customers as "Low-Risk" or "High-Risk" for loans. Classify Customer E using Manhattan Distance and Radius Distance Nearest Neighbour Algorithm. Assume suitable radius. **CO2 L3 10M**

Customer	Age	Income ($)	Credit Score	Loan Amount (Rupees)	Risk Level
A	25	30,000	700	10,000	Low
B	45	80,000	600	40,000	High
C	35	50,000	750	20,000	Low
D	55	90,000	580	50,000	High
E (New)	40	60,000	680	25,000	???

UNIT-III

6 Apply Bayes' Rule to perform classification with a suitable example. **CO3 L3 10M**

OR

7 Make use of Random Forest to train a classification model using appropriate steps. **CO3 L3**

UNIT-IV

8 Apply the Backpropagation algorithm to train an MLP, including forward pass, error calculation, and weight update steps. **CO4 L3**

OR

9 Make use of Support Vector Machines (SVMs) to classify linearly separable data, and illustrate the margin, hyperplane, and support vectors. **CO4 L3**

UNIT-V

10 Illustrate the K-Means clustering algorithm. What are the steps involved in the algorithm? **CO5 L2**

OR

11 Compare Agglomerative and Divisive clustering methods with an example. **CO5 L2**

***** END *****