

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR**  
(AUTONOMOUS)

**B.Tech. II Year II Semester Regular Examinations July/August-2025**

**MACHINE LEARNING**

(Common to CSM, CAD & CAI)

**Time: 3 Hours**

**Max. Marks: 70**

**PART-A**

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

- |            |   |            |           |           |
|------------|---|------------|-----------|-----------|
| <b>1 a</b> | What are the advantages of Machine Learning?  | <b>CO1</b> | <b>L1</b> | <b>2M</b> |
| <b>b</b>   | Infer Label Dataset in ML.  | <b>CO1</b> | <b>L2</b> | <b>2M</b> |
| <b>c</b>   | List out the performance measures of Classification.  | <b>CO2</b> | <b>L1</b> | <b>2M</b> |
| <b>d</b>   | Define MAE and R2.  | <b>CO2</b> | <b>L1</b> | <b>2M</b> |
| <b>e</b>   | Outline the feature of Naive Bayes Classifier.  | <b>CO3</b> | <b>L2</b> | <b>2M</b> |
| <b>f</b>   | State one key difference between decision trees used for classification and for regression. | <b>CO3</b> | <b>L1</b> | <b>2M</b> |
| <b>g</b>   | Recall Support Vector Machines.   | <b>CO4</b> | <b>L1</b> | <b>2M</b> |
| <b>h</b>   | What is the main objective of the Perceptron Learning Algorithm?                            | <b>CO4</b> | <b>L1</b> | <b>2M</b> |
| <b>i</b>   | Interpret Soft Clustering. Give an example.   | <b>CO5</b> | <b>L2</b> | <b>2M</b> |
| <b>j</b>   | What is Matrix Factorization in clustering?   | <b>CO5</b> | <b>L1</b> | <b>2M</b> |

**PART-B**

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

**UNIT-I**

- |            |  |            |           |           |
|------------|--|------------|-----------|-----------|
| <b>2 a</b> | Outline the applications of Machine Learning.          | <b>CO1</b> | <b>L2</b> | <b>5M</b> |
| <b>b</b>   | Explain the concepts of Reinforcement Algorithm.       | <b>CO1</b> | <b>L2</b> | <b>5M</b> |
| <b>OR</b>  |  |            |           |           |
| <b>3 a</b> | Discuss about various types of Data.                   | <b>CO1</b> | <b>L2</b> | <b>5M</b> |
| <b>b</b>   | Explain about feature engineering in Machine Learning. | <b>CO1</b> | <b>L2</b> | <b>5M</b> |

**UNIT-II**

- |          |  |            |           |            |
|----------|--|------------|-----------|------------|
| <b>4</b> | 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. | <b>CO2</b> | <b>L3</b> | <b>10M</b> |
|----------|--|------------|-----------|------------|

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	

**OR**

- |          |   |            |           |            |
|----------|---|------------|-----------|------------|
| <b>5</b> | Identify the steps involved in K-Nearest Neighbors algorithm. Give Example. | <b>CO2</b> | <b>L3</b> | <b>10M</b> |
|----------|---|------------|-----------|------------|

**UNIT-III**

- |          |   |            |           |            |
|----------|---|------------|-----------|------------|
| <b>6</b> | What is the Naive Bayes Classifier? Explain the assumption of class conditional independence and how it simplifies computation. | <b>CO3</b> | <b>L2</b> | <b>10M</b> |
|----------|---|------------|-----------|------------|

**OR**

- 7 Describe the steps involved in Decision Tree is built for regression with one example. **CO3 L2 10M**

**UNIT-IV**

- 8 a Outline the steps involved in training a Perceptron classifier with a simple example. **CO5 L2 6M**  
b Summarize Kernel Trick in SVM with an example. **CO5 L2 4M**

**OR**

- 9 Explain the Backpropagation algorithm for training an MLP. Include forward pass, error calculation, and weight update steps. **CO5 L2 10M**

**UNIT-V**

- 10 What is clustering? Explain the types of clustering methods with simple examples. **CO6 L2 10M**

**OR**

- 11 Describe the steps involved in K-Means clustering algorithm. Give example. **CO6 L2 10M**

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