

Subject Code: 24CS21RC05

R-24

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GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN

(Autonomous)

(Affiliated to Andhra University, Visakhapatnam)

M.Tech. - II Semester Regular Examinations, August – 2026

[Computer Science & Engineering (Data Science)]

MACHINE LEARNING

1. All questions carry equal marks
2. Must answer all parts of the question at one place

Time: 3Hrs.

Max Marks: 70

UNIT-I

1. a. Explain the relationship between Artificial Intelligence, Machine Learning, and Deep Learning. Give suitable examples to show how they are related. [7M]
b. What are the major benefits of Machine Learning systems? [7M]
- OR
2. a. Explain the three main types of Machine Learning? [7M]
b. Differentiate between batch learning and online learning [7M]

UNIT-II

3. a. What is regularization in Machine Learning? [7M]
b. Explain the k-Nearest Neighbours classification algorithm. [7M]
- OR
4. a. Compare k-NN and Naïve Bayes classification algorithms. [7M]
b. Explain accuracy, precision, recall, F1-score, and confusion matrix with suitable examples. [7M]

UNIT-III

5. a. Explain the basic concept of a separating hyperplane, support vectors, and the objective of SVM classification. [7M]
b. Compare LDA, linear SVM, nonlinear SVM, and SVM regression. [7M]
- OR
6. a. How does a linear SVM separate data belonging to two different classes? [7M]
b. Describe basic principle, working process of LDA and how it can be used for classification. [7M]

UNIT-IV

7. a. Describe how Random Forests are constructed using decision trees and discuss its advantages over a single decision tree. [7M]
b. Discuss the major strengths and weaknesses of the Decision Tree approach [7M]
- OR
8. a. Explain boosting and stacking techniques in Ensemble Learning. [7M]
b. Explain the steps involved in constructing a decision tree using ID3 and describe how the best attribute is selected for splitting. [7M]

UNIT-V

9. a. Discuss feature selection and feature extraction with suitable examples. [7M]
b. Differentiate between Incremental PCA, Randomized PCA, and Kernel PCA. [7M]
- OR
10. a. Explain how Artificial Neural Networks can be used to solve classification problems [7M]
b. Explain the basic steps involved in PCA. [7M]