

FACULTY OF INFORMATICS**M.C.A. (2 Years Course) II-Semester (CBCS) (Backlog) Examination, March/April 2024****Subject: Machine Learning****Time: 3 Hours****Max. Marks: 70**

Note: I. Answer one question from each unit. All questions carry equal marks.
 II. Missing data, if any, may be suitably assumed.

Unit – I

1. a) What is Probability? How Probability Theory is useful for Solving Machine Learning problems?
 b) What are the different ways to represent the data in Linear Algebra for ML Tasks?
(OR)
2. a) What is Optimization? Explain about Convex Optimization Algorithms.
 b) Give an account on Statistical Decision Theory for Machine Learning.

Unit – II

3. a) What is Regression? Explain about the characteristics and applications of Regression.
 b) Explain about Regularized Linear Regression Algorithms.
(OR)
4. Discuss the following
 - a) Principal Component Analysis
 - b) Partial Least Squares

Unit – III

5. a) What is Decision Tree? Discuss about different metrics used to identify the splitting attribute in Decision Tree Classification.
 b) Illustrate Linear Discriminant Analysis.
(OR)
6. Discuss about the following Classification Models
 - a) Support Vector Machine
 - b) Bayesian Classification

Unit – IV

7. a) Describe the role of Hypothesis Testing in Machine Learning.
 b) Give an account on Bagging and Boosting Techniques.
(OR)
8. a) What are the characteristics of good Clustering? Write about different types of clustering techniques.
 b) Illustrate DBSCAN Clustering Algorithm.

Unit – V

9. a) Illustrate how Expectation Maximization Algorithm Works.
 b) Write about Gaussian Mixture Model.
(OR)
10. a) Describe how Reinforcement Learning Model Works.
 b) Write a short note on Graphical Models for Machine Learning.