

Roll No. ....

Total Pages : 03

MCA/M-24

**24531**

MACHINE LEARNING

MCA-20-44(ii)

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory.

**1.** Answer the following questions in brief : **5×3=15**

- (a) What are the different algorithm techniques in Machine Learning ?
- (b) Explain classification in brief.
- (c) Define precision with example.
- (d) What is the difference between probability and likelihood ?
- (e) Define Logistic Regression.

**Unit I**

- 2.** (a) Discuss different types of nodes in Decision Trees. **6**
- (b) Explain the attribute selection measures used by the ID3 algorithm to construct a Decision Tree. **9**

3. Consider the following set of training examples : 15

Instance	Classification	A1	A2
1	+	T	T
2	+	T	T
3	–	T	F
4	+	F	F
5	–	F	T
6	–	F	T

- (a) What is the entropy of this collection of training examples with respect to the target function classification ? 6
- (b) What is the information gain of A2 relative to these training examples ? 9

## Unit II

4. (a) Explain, How CART can be used for Regression ? 6
- (b) How do you classify text using Bayes Theorem ? 9
3. (a) What is conditional Independence ? Explain with the help of example. 6
- (b) Explain the concept of Naïve Bayes Classifier with an example. 9

## Unit III

6. Assume that the database D is given by the table below. Follow single link technique to find clusters in D and show dendrogram also. Use Euclidean distance measure. 15

Database D	x	y
p1	0.40	0.53
p2	0.22	0.38
p3	0.35	0.32
p4	0.26	0.19
p5	0.08	0.41
p6	0.45	0.30

7. What is a cluster ? Write and explain the K-means clustering algorithm with the help of an example. 15

## Unit IV

8. Write short notes on the following : 15
- (a) Support Vector Machine
- (b) Kernel PCA.
9. (a) Explain different terms used in Reinforcement Learning. 6
- (b) Explain benefits of applying Dimensionality Reduction in detail. 9