

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS

III-B.TECH-II-Semester End Examinations (Supply) - December- 2025

INTRODUCTION TO MACHINE LEARNING
(IT)

[Time: 3 Hours]

[Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(20 Marks)

1. a) Define Machine Learning. [2M]
- b) Compare Find-S and Candidate Elimination algorithms. [2M]
- c) Give diagrammatic representation of perceptron. [2M]
- d) What is meant by Multilayer Perceptron (MLP)? [2M]
- e) State Minimum Description Length principle. [2M]
- f) Where do we use instance-based learning methods? [2M]
- g) Define reinforcement learning. [2M]
- h) Which type of algorithms is called sequential covering algorithms? [2M]
- i) Define explanation-based learning. [2M]
- j) How prior knowledge is used to alter the search objective. [2M]

PART-B

(50 Marks)

- 2.a) Write FIND-S algorithm. Apply FIND-S algorithms to find best fit hypothesis for the given training examples. [5M]

Example	Sky	Air Temp	Humidity	Wind	Water	Forecast	Enjoy sport
1	sunny	warm	normal	strong	warm	same	yes
2	sunny	warm	high	strong	warm	same	yes
3	rainy	cold	high	strong	warm	change	no
4	sunny	warm	high	strong	cool	change	yes

- b) Discuss about hypothesis space search in decision tree learning. [5M]

OR

3. Describe hypothesis Space search in ID3 algorithm and contrast it with Candidate-Elimination algorithm. [10M]
4. Derive the Back propagation rule considering the training rule for Output Unit weights and Training Rule for Hidden Unit weights. [10M]

OR

- 5.a) Explain the concept of a Perceptron with a neat diagram. [5M]
- b) Discuss the general approach for deriving confidence intervals. [5M]
- 6.a) Discuss Maximum Likelihood and Least Square Error Hypothesis. [5M]
- b) Explain the EM Algorithm in detail. [5M]

OR

- 7.a) Elaborate the strategy of learning with radial basis functions. [5M]
- b) Illustrates the operation of the k-nearest neighbour algorithm for the case where the instances are points in a two-dimensional space and where the target function is discrete valued. [5M]

- 8.a) Describe the sequential covering algorithm for learning a disjunctive set of rules. [5M]
b) Write and explain the basic FOIL algorithm in detail. [5M]

OR

- 9.a) Discuss about genetic programming. [5M]
b) Explain reinforcement learning. [5M]

10. Explain Learning with perfect domain theories (PROLOG-EBG) with example. [10M]

OR

11. Discuss in detail about inductive-analytical approaches to learning. [10M]
