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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 [5M] given training examples.

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- [10M] Elimination algorithm.

4. Derive the Back propagation rule considering the training rule for Output Unit [10M] weights and Training Rule for Hidden Unit weights.

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 [5M] instances are points in a two-dimensional space and where the target function is discrete valued.

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]
