

**CMR ENGINEERING COLLEGE: : HYDERABAD**  
**UGC AUTONOMOUS**  
**III-B.TECH-II-Semester End Examinations (Supply) - June- 2025**  
**MACHINE LEARNING**  
**(Common for CSE, CSM)**

[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) Interpret Handwriting recognition as Well Posed Learning Problem. [2M]
- b) Discuss the appropriate problems for decision learning. [2M]
- c) Explain role of Perceptron in ANN. [2M]
- d) Explain Confidence Interval with example. [2M]
- e) State Bayes theorem. [2M]
- f) Justify, how Case-Based Reasoning differs from Instance-Based Learning. [2M]
- g) Explain the role Fitness Function in Genetic Programming. [2M]
- h) Differentiate between Reinforcement Learning and Supervised Learning [2M]
- i) List the advantages of Explanation-Based Learning [2M]
- j) Explain the importance of Inductive Bias in Explanation Based Learning [2M]

**PART-B****(50 Marks)**

2. Demonstrate in detail various stages involved in Designing a Learning System [10M]
- OR**
3. Construct a Decision Tree for the given dataset [10M]

Age	Gaming Console	LikeGames
Young	Yes	Yes
Young	No	No
Young	Yes	Yes
Young	No	Yes
Middle	No	No
Middle	Yes	No
Middle	No	Yes
Middle	Yes	Yes
Old	Yes	Yes
Old	No	No
Old	No	Yes
Old	No	Yes

4. Define Back Propagation. Write the algorithm for Back Propagation. [10M]
- OR**
5. Explain how the Confidence Intervals derived in hypothesis evaluation? Discuss steps, mathematical principles, and provide a detailed example [10M]

6. Elaborate Maximum Likelihood And Least-Squared Error Hypotheses with example. [10M]

**OR**

7.a) Demonstrate K-Nearest Neighbor Algorithm with an example. [6M]

b) Differentiate between Lazy and Eager Learners. [4M]

8. Describe in detail how FOIL evaluates the quality of a rule. [10M]

**OR**

9.a) Elaborate Q function and algorithm for Q-learning. [5M]

b) Discuss briefly Temporal Difference Learning. [5M]

10. Discuss the role of a Domain Theory in Prolog-EBG with example. [10M]

**OR**

11. Provide an example of how altering the search objective with prior knowledge can improve learning performance [10M]

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