CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
III–B.TECH–II–Semester End Examinations (Regular) - May- 2023
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) How overfitting is avoided in decision trees?   [2M]
   b) What are the limitations of the Find-S algorithm?   [2M]
   c) Define Variance and Standard Deviation.   [2M]
   d) What are local minima and global minima.   [2M]
   e) Define 1. Prior Probability 2. Posterior Probability.   [2M]
   f) Define 1. Regression 2. Kernel Function   [2M]
   g) What is a Horn Clause?   [2M]
   h) Define Relative Frequency.   [2M]
   i) What is Instance Space (X) and Hypothesis Space (H) in Analytical Learning.   [2M]
   j) Mention two main differences between analytical and inductive learning methods?   [2M]

PART-B   (50 Marks)

2. What are the basic design issues and approaches to machine learning?   [10M]

OR

3. Develop a decision tree to "Play Tennis or Not" from the given data.   [10M]

Day	Outlook	Temperature	Humidity	Wind	PlayTennis
D1	Sunny	Hot	High	Weak	No
D2	Sunny	Hot	High	Strong	No
D3	Overcast	Hot	High	Weak	Yes
D4	Rain	Mild	High	Weak	Yes
D5	Rain	Cool	Normal	Weak	Yes
D6	Rain	Cool	Normal	Strong	No
D7	Overcast	Cool	Normal	Strong	Yes
D8	Sunny	Mild	High	Weak	No
D9	Sunny	Cool	Normal	Weak	Yes
D10	Rain	Mild	Normal	Weak	Yes
D11	Sunny	Mild	Normal	Strong	Yes
D12	Overcast	Mild	High	Strong	Yes
D13	Overcast	Hot	Normal	Weak	Yes
D14	Rain	Mild	High	Strong	No

4. Write the algorithm for Back propagation.   [10M]

OR

5. Explain about Accuracy of Hypothesis space (H).   [10M]

6. Explain the concept of EM Algorithm.   [10M]

OR

7. Discuss the major drawbacks of K-nearest Neighbour learning Algorithm and how it can be corrected.   [10M]

8. Explain Q learning algorithm assuming deterministic rewards and actions? [10M]

OR

9. Demonstrate the process of 'Learning Sets of Rules' with a Sequential Learning [10M]
Algorithm using the "Play Tennis" example.

10. What are the key properties of PROLOG-EBG? Discuss its limitations and [10M]
capabilities.

OR

11. Explain in detail the KBANN (Knowledge Based Artificial Neural Networks) [10M]
algorithm.

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