R18

Code No: 155BZ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, March - 2024

MACHINE LEARNING

(Computer Science and Engineering – Artificial Intelligence and Machine Learning)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) List out the issues in Machine Learning. [2]
b) Define Well-Posed problem learning problem. Give an example. [3]
c) What are Sample Error and True Error? [2]
d) List out 3 characteristics of the problems for which ANN learning technique is suitable. [3]
e) What is Minimum Description Length Principle? [2]
f) Write the remarks on k-NEAREST NEIGHBOR Algorithm. [3]
g) What are First-Order rules? [2]
h) Discuss about Resolution Rule for automated deduction. [3]
i) What is the primary goal of Analytical Learning? [2]
j) Write the differences between FOIL and FOCL. [3]

PART – B

(50 Marks)

2.a) Write about Find-S algorithm.
b) Consider the following data set having the data about which particular seeds are poisonous. Find out the Maximally Specific Hypothesis using Find-S algorithm. [4+6]

Example	Color	Toughness	Fungus	Appearance	Poisonous
1.	GREEN	HARD	NO	WRINKLED	YES
2.	GREEN	HARD	YES	SMOOTH	NO
3.	BROWN	SOFT	NO	WRINKLED	NO
4.	ORANGE	HARD	NO	WRINKLED	YES
5.	GREEN	SOFT	YES	SMOOTH	YES
6.	GREEN	HARD	YES	WRINKLED	YES
7.	ORANGE	HARD	NO	WRINKLED	YES

OR

3.a) Write the steps in building Decision Tree using Information Gain.
b) What are the hyper parameters of decision tree? [7+3]

4.a) How do Artificial Neural Networks work? Explain
b) Write the advantages of Artificial Neural Networks. [6+4]

OR

5.a) Write the procedure for comparing two learning methods.
b) Explain Estimators, Bias, and Variance. [5+5]

6.a) Explain Naïve Bayes algorithm with an example.
b) Write about Gibbs Algorithm. [6+4]

OR

7.a) What is Learning with Radial Basis Functions? Explain.
b) Explain Locally Weighted Linear Regression. [5+5]

8.a) Define Genetic Algorithms. Explain the basic components of a typical Genetic Algorithm.
b) What is the hypothesis space in the context of Genetic Algorithms? [5+5]

OR

9.a) Describe the Q-learning algorithm and its key components.
b) Define dynamic programming and its relevance to reinforcement learning. [7+3]

10. Explain EBNN algorithm in detail. [10]

OR

11.a) What is Explanation-Based Learning (EBL) and how does it contribute to Analytical Learning?
b) Discuss the relationship between EBL and the extraction of general knowledge. [6+4]

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