

B.TECH.
(SEM VI) THEORY EXAMINATION 2022-23
MACHINE LEARNING TECHNIQUES

Time: 3 Hours**Total Marks: 100****Note:** Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief. 2 x 10 = 20

- (a) Define classification tree and regression tree.
- (b) Discuss reason of opting unsupervised learning over supervised learning.
- (c) Discuss the features of learning problems.
- (d) Discuss the issues in machine learning.
- (e) List the issues in Decision tree learning.
- (f) Discuss the characteristics of the problems suited for decision tree learning.
- (g) Write different applications of neural networks (NN).
- (h) Define Delta Rule.
- (i) What are the types of neuron connection?
- (j) Discuss the perspective and issues in machine learning.

SECTION B

2. Attempt any three of the following: 10x3=30

- (a) Discuss Inductive Bias in Decision Tree Learning. Differentiate between two types of biases. Discuss the reason to prefer short hypotheses?
- (b) Write the algorithm for back propagation.
- (c) Write a detail note on naive bayes linear models.
- (d) Discuss the types of problems in which Artificial Neural Network can be applied.
- (e) Explain in detail the concept of evaluating hypotheses.

SECTION C

3. Attempt any one part of the following: 10x1=10

- (a) Describe the reinforcement learning in detail with suitable examples.
- (b) Discuss the learning. Write any four learning techniques and in each case give the expression for weight- updating.

4. Attempt any one part of the following: 10x1=10

- (a) Explain the process to find complexity for finite hypothesis spaces and Complexity for infinite hypothesis spaces.
- (b) Discuss the neighbors? Also discuss the reason of necessary use of nearest neighbor while classifying justify the answer with suitable example.

5. Attempt any one part of the following: 10x1=10

- (a) Discuss Bayesian learning and its impacts in machine learning?
- (b) Write a short note on following:
 - i. Hypothesis space search
 - ii. General-to-specific ordering of hypotheses

6. Attempt any *one* part of the following:

10x1=10

- (a) Explain that genetic algorithms are influenced by knowledge based techniques. Also discuss the how genetic algorithm is different from traditional algorithms.
- (b) Write a short note on the following:
 - i. EM algorithm
 - ii. Generalization

7. Attempt any *one* part of the following:

10x1=10

- (a) Explain Find -S Algorithm in detail. Also discuss the properties and complaints of Find S.
- (b) Explain the inductive biased hypothesis space, unbiased learner and the futility of bias free learning. Describe the three types of learner.

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