CBCS SCHEME

16/17SCS41

Fourth Semester M.Tech. Degree Examination, November 2020
Machine Learning Techniques

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a. Give the definition for machine learning. Illustrate the definition with checkers learning problem. **(04 Marks)**
    b. What is target function in a learning system? Explain learning of target function using board game as an example. **(06 Marks)**
    c. What is inductive learning hypothesis? What is the inductive bias in decision tree and Find-S algorithms? **(06 Marks)**

OR

2   a. Write down Find-S algorithm. Given the hypothesis H = <?, Cold, High, ?, ?, ? > determine if the hypothesis h = < Sunny, Cold, High, Strong, Warm, Same > is in H or not. **(04 Marks)**
    b. What is information gain? **(04 Marks)**
    c. Give decision free to represent the following Boolean functions:
       i) A&&¬B   ii) A V (B&&C)   iii) A XOR B   iv) (A&&B) V (C&&D) **(08 Marks)**

Module-2

3   a. What is perceptron? **(04 Marks)**
    b. Explain the perceptron delta rule. **(04 Marks)**
    c. Describe the backpropagation algorithm. **(08 Marks)**

OR

4   a. Explain genetic operators. **(04 Marks)**
    b. Describe any fitness function for selection. **(04 Marks)**
    c. Write down the prototypical genetic algorithms. **(08 Marks)**

Module-3

5   a. State Baye's theorem. **(04 Marks)**
    b. Describe Bayes concept learning. **(04 Marks)**
    c. Write the target function of Naïve Bayes classifier and explain the approximations. **(08 Marks)**

OR

6   a. What is PAC hypothesis? **(04 Marks)**
    b. Describe Mistake Bound model. **(04 Marks)**
    c. Explain Bayes Belief Network. **(08 Marks)**

Module-4

7 a. What is instance based learning? (04 Marks)
   b. Discuss curse of dimensionality. (04 Marks)
   c. Write down K-NN algorithm for classification and regression. (08 Marks)

OR

8 a. What is rule based learning? (04 Marks)
   b. Explain the algorithm to learn one rule. (06 Marks)
   c. Write down the sequential covering algorithm. (06 Marks)

Module-5

9 a. What is analytical learning? (04 Marks)
   b. Discuss learning with perfect domain theory. (04 Marks)
   c. Write down the explanation based learning algorithm PROLOG_EBG. (08 Marks)

OR

10 a. What is reinforced learning? (04 Marks)
   b. Describe policy based approach to reinforced learning. (06 Marks)
   c. Describe value based approach to reinforced learning. (06 Marks)

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