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15CS73

Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
Machine Learning

Time: 3 hrs.

Max. Marks: 80

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

Module-1

1 a. Define machine learning. Explain with specific examples. (06 Marks)
  b. How you will design a learning system? Explain with examples. (06 Marks)
  c. List and explain perspectives and issues in Machine Learning. (04 Marks)

OR

2 a. Define concept learning. Explain the task of concept learning. (06 Marks)
  b. How the concept learning can be viewed as the task of searching? Explain. (04 Marks)
  c. Explain with examples:
   i) Find-S algorithm
   ii) Candidate Elimination algorithm (06 Marks)

Module-2

3 a. Define decision tree learning. List and explain appropriate problems for decision tree learning. (06 Marks)
  b. Explain the basic decision tree learning algorithm. (05 Marks)
  c. Describe Hypothesis space search in decision tree learning. (05 Marks)

OR

4 a. Define inductive bias. Explain inductive bias in decision tree learning. (06 Marks)
  b. Give the differences between the hypothesis space search in ID3 and candidate elimination algorithm. (04 Marks)
  c. List and explain issues in decision tree learning. (06 Marks)

Module-3

5 a. Define Artificial neural networks. Explain biological learning systems. (05 Marks)
  b. Explain representations of Neural network. (05 Marks)
  c. Describe the characteristics of Back propagation algorithm. (06 Marks)

OR

6 a. Define Perceptron. Explain representational power of Perceptrons. (05 Marks)
  b. Explain gradient descent algorithm. (06 Marks)
  c. Describe derivation of the back propagation rule. (05 Marks)

Module-4

7 a. List and explain features of Bayesian learning methods. (06 Marks)
  b. Describe Brute-Force map learning algorithm. (05 Marks)
  c. Explain maximum likelihood and least-squared error hypothesis. (05 Marks)

OR

8 a. Describe maximum likelihood hypotheses for predicting probabilities. (05 Marks)
   b. Define Bayesian belief networks. Explain with an example. (06 Marks)
   c. Explain EM algorithm. (05 Marks)

Module-5

9 a. Define the following with examples:
       i) Sample error   ii) True error   iii) Mean   iv) Variance. (08 Marks)
   b. Explain central limit Theorem. (04 Marks)
   c. Explain K-Nearest neighbor algorithm. (04 Marks)

OR

10 a. Explain case-based reasoning. (06 Marks)
    b. List and explain important differences of reinforcement algorithm with other function approximation tasks. (04 Marks)
    c. Explain Q Learning Algorithm. (06 Marks)

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