USN ☐☐☐☐☐☐☐☐☐☐

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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