Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA Integrated- SEMESTER– VII EXAMINATION – WINTER 2019

Subject Code: 4470601   **Date: 15/11/2019**
Subject Name: Machine Learning
Time: 10:30 AM TO 01:00 PM   **Total Marks: 70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions where necessary.**
3. **Figures to the right indicate full marks.**

Q-1 **(a) Select the most appropriate answer:**   **[07]**
1. **ALVINN System** has used its learned strategies to drive unassisted at ____ miles per Hour for _____ miles on public highways among other cars.
2**. LMS** error stands for: _____ error.
3. The most general hypothesis-that every day is a positive example-is represented by _____.
4. The most specific possible hypothesis- that no day is a positive example–is represented by: _____.
5. The concept or function to be learned is called the _____, which we denote by **c**.
6. One type of **ANN** system is based on a unit called _____.
7. The set of items over which the concept is defined is called _____, which we denote by **X.**

(b) Fill in the blanks: **[07]**
1. A set of hypotheses consistent with the training examples is termed as _____.
2. Any hypothesis that maximizes the probability P(D/h) is called _____.
3. **ID3** algorithm uses a statistical test for classification called _____.
4. _____ determines the kind of training experience used by a particular learning problem.
5**. BPNN** stands for _____.
6. **ANN** stands for _____.
7. In Case Based Reasoning **(CBR)**, each instance is represented by its ____ and _____.

Q-2 **(a)** Define Machine Learning and Learning Problems. What is a well-defined learning? problem? Explain it with an example.   **[07]**
(b) What is decision tree ? Explain various issues in the Decision Tree Learning.   **[07]**
`   **[OR]**
(b) What is a Version Space? How this concept is used in Candidate Elimination algorithm? Explain in detail.   **[07]**

Q-3 **(a)** What are the key elements of Machine Learning? What is an inductive learning? When should we use Inductive Learning?   **[07]**
(b) When we can consider Neural Networks? Give an examples of an application using Neural Networks.   **[07]**
                                    [OR]
Q-3 **(a)** Discuss Backpropagation algorithm in detail.   **[07]**
(b) What is Perceptron? Mention Perceptron training rules.   **[07]**

Q-4 **(a)** Write a note on Bayes Theorem.   **[07]**

(b) Differentiate the following:
    1. Gradient Descent and Stochastic Gradient Descent **[03]**
    2. Entropy and Information Gain **[04]**
[OR]

Q-4 **(a)** Discuss K-nearest Neighbor algorithm in detail. **[07]**
(b) What is Probably Approximate Correct framework (PAC)? Explain with details. **[07]**

Q-5 **(a)** Describe Sequential covering algorithm in detail. **[07]**
(b) Explain Q Learning with proper example. **[07]**
[OR]
Q-5 **(a)** Explain First Order Combined Learner (FOCL) algorithm with example. **[07]**
(b) Explain Bayseian Belief Network using an example. **[07]**

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