Sl. No.

CE1.2-R4 : MACHINE LEARNING

NOTE :
1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours   Total Marks: 100

1. (a) Briefly explain the goals of machine learning.
   (b) Explain the importance of Inductive Biasing using an example.
   (c) Define Ensemble learning using an example.
   (d) Explain the methods to measure the accuracy of learned hypothesis.
   (e) What is statistical hypothesis testing?
   (f) Explain the use of back-propagation for Neutral-Network training.
   (g) Differentiate between clustering and classification. Name one method of each type.   **(7x4)**

2. (a) List the differences between generative and discriminative learning.
   (b) Discuss the uses of Bayes nets and Markov nets, also explain how they represent dependency?
   (c) Explain naïve Bayes learning method using an example.   **(5+5+8)**

3. (a) Define SVM and its application in detail.
   (b) Define supervised learning and unsupervised learning using an example. Discuss its role in machine learning.
   (c) Discuss quadractive programming solution to find maximum and minimum separators.   **(6+6+6)**

4. (a) Discuss the role of neurons in machine learning and discuss the biological motivation for neurons.
   (b) Define the following networks using an example:
       (i) Multilayer network.
       (ii) Recurrent network.   **(6+[6+6])**

5. (a) Explain the steps to translate decision tree into a rule set. Provide a suitable example to support your answer.
   (b) Explain the steps of candidate elimination algorithm using an example.   **(9+9)**

6. (a) What is cross validation?Explain its necessity in machine learning?
   (b) Discuss the importance of Transfer Learning with a suitable example.
   (c) Define statistical hypothesis testing and its use in machine learning.   **(6+6+6)**

7. Write short note on **any three** of the following :
   (a) Logistic regression
   (b) Hidden Markov model
   (c) Recursive rule learning method
   (d) Factor affecting the training data for machine learning.   **(3x6)**

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