No. of Printed Pages : **2**

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) Explain Bayes' theorem.

(b) Explain Delta Rule of ANN.

(c) Why prolog is declarative language ?

(d) What is Artificial Intelligence (AI) ? List any four applications of AI.

(e) Differentiate between supervised and unsupervised learning.

(f) What is the use of kernel function in SVM ?

(g) What is Machine Learning ? List any three applications of Machine Learning. **(7x4)**

2. (a) Explain the difference between Bagging and Boosting. When these algorithms are useful ?

(b) Define terms in the context of Neural Networks : learning rate, epoch, batch size, and iterations.

(c) What is slack variable in SVM ? Explain its importance. **(7+4+7)**

3. (a) How statistical hypothesis can be tested ? Explain with an example.

(b) Explain Naive Bayes learning algorithm in brief.

(c) Define horn clauses. Which are the rules for converting sentences in First Order Predicate logic ? **(6+5+7)**

4. (a) What is the role of bias in classification ? Explain inductive bias in classification.

(b) How is Markov net used to represent dependencies ? Explain with example.

(c) Explain methods of cross-validation in classification. **(6+6+6)**

5. (a) Explain the types of learning in Machine Learning.

(b) Explain how cut and fail predicates are used in PROLOG to change the execution of program. **(8+10)**

6. (a) What is the importance of inverse resolution in Rule Learning ?

(b) What is overfitting and underfitting in Machine Learning ?

(c) Explain Back propagation learning of an ANN. **(6+4+8)**

7. (a) Write a short note on recurrent networks.

(b) Write the steps to translate decision trees into rules.

(c) Discuss various activation functions of Artificial Neural Network. **(7+7+4)**

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