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.**

Total 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) What is tree pruning ? Explain with example.
(f) Explain the terms Bagging and Boosting.
(g) Explain the term Unsupervised learning. List types of unsupervised learning. **(7x4)**

2. (a) Discuss any four examples of machine learning applications.
(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. **(6+4+8)**

3. (a) How does bias play an important role in classification ? Write the importance of inductive bias in classification.
(b) How can the accuracy of learned hypothesis be measured ?
(c) Briefly mention the application domain, where Artificial Neural Network can be used. **(6+6+6)**

4. (a) What is significance of maximum margin linear separators in support vector machine ?
(b) What are horn clauses ? Convert following sentences in First Order Predicate logic.
(i) Everyone is loyal to someone
(ii) All men are mortal
(c) Why is regression required in Classification Techniques ?
(d) Differentiate : Unsupervised Learning and Supervised Learning. **(6+4+4+4)**

5. (a) Explain basic Decision Tree algorithm.
(b) Define Machine learning with examples.
(c) List and explain issues in Decision tree learning. **(7+4+7)**

6. (a) What is PROLOG ? Explain structure of PROLOG program with example.

(b) What is the difference between predicate and propositional logic ?

(c) How inductive classification is different from normal classification ? Write simple steps of Candidate Elimination Algorithm. **(7+3+8)**

7. (a) What is Perceptrons ? Describe the various activation functions that are employed in Neural Network. Compare their merits and demerits.

(b) Draw the architecture of Multilayer Perceptrons. Briefly mention the execution steps of Neural Network Learning.

(c) Why is it required to generate a rule ? Briefly describe the Bayes Learning. **(7+8+3)**

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