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)   Define Machine Learning. Briefly mention the Goals and application of Machine Learning.
b)   Characterize the terms: Classification, Learning, Bias, and Perceptron.
c)   How does over fitting problem be resolved in Learning of Neural Network?
d)   List various kinds of learning algorithm that use for optimization problem.
e)   Briefly mention the application domain where Artificial Neural Network can be used.
f)   Differentiate: Competitive Learning and Supervised Learning.
g)   Why is back-propagation required in Neural Network training?

(7x4)

2.
a)   Draw the architecture of Multilayer Perceptrons. Briefly mention the execution steps of Neural Network Learning.
b)   How recurrent network is different from the feed forward network? Discuss briefly.
c)   Elaborate the use of Learning Rate. How does learning rate improve the Neural Network learning?
d)   Explain Back Propagation Learning Algorithm.

(5+5+4+4)

3.
a)   How neural network is related to statistical methods? How are layers counted?
b)   What is Perceptron? Describe the various activation functions that are employed and compare their merits and demerits.
c)   Define bias and variance in Neural Network?
d)   Differentiate: Generative Training vs. Discriminative Training

(6+5+3+4)

4.
a)   What is the significance of maximum margin linear separators in support vector machine?
b)   What is the requirement of cross validation in Learning? How does it improve the training?
c)   What is the difference between Bagging and Boosting? Why and when they are required?
d)   Why is it required to generate rule? Briefly describe the Bayes Theorem.

(6+4+5+3)

5.
a)   Briefly mention the steps to translate decision trees into rules.
b)   What are horn clauses? Discuss the rule for Converting sentences in First Order Predicate logic?
c)   How does inverse resolution play the important role in Rule Learning?
d)   How can the learning algorithm by statistical hypothesis testing be evaluated?

(4+6+4+4)

6.

a) How the accuracy of learned hypothesis be measured?

b) Why regression is required in Classification Techniques? Explain Logistic regression.

c) What is the importance of using parameter smoothing in Bayesian Learning?

d) How does Markov net used to represent dependencies?

(6+4+4+4)

7.

a) How does active learning play the important role with ensembles?

b) How inductive classification is different from normal classification? Write simple steps of Candidate Elimination Algorithm.

c) How does bias play an important role in classification? Write the importance of inductive bias in classification.

d) Explain the rule induction in Machine Learning.

(4+6+4+4)