ML Unit II Assignment Questions

1. What is Artificial Neural Network? Give some of its applications

2. Compare and contrast biological neural network and artificial neural network

3. Explain perceptron model with a neat diagram. Design a perceptron for X AND Y function

4. Discuss the representational power of a perceptron

5. Differentiate between Gradient Descent and Perceptron training rule.

6. Derive the Gradient Descent Rule

7. Write the gradient descent algorithm for training perceptron unit

8. Differentiate between Gradient Descent and Stochastic Gradient Descent

9. Derive the Backpropagation algorithm for training multi-layer networks

10. Write stochastic gradient descent backpropagation algorithm for multi-layer feedforward network

11. Briefly explain the following with respect to Backpropagation
a) Convergence and Local Minima of MLP
b) Representational Power of Feedforward Networks
c) Generalization, Overfitting, and Stopping Criterion

12. Define the following terms

a. Sample error b. True error c. Random Variable d. Expected value e. Variance f. standard Deviation g. Binomial distribution h. Normal distribution

13. Suppose hypothesis h commits r = 10 errors over a sample of n = 65 independently drawn examples. What is the variance and standard deviation for number of true error rate $error_D(h)$? What is the 90% confidence interval (two-sided) for the true error rate?

14. Write the procedure to evaluate two learning algorithms