

Roll No.

Total Pages : 3

BT-7/M-23

47246

NEURAL NETWORKS AND DEEP LEARNING

Paper-PE-CS-D411A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *five* questions in all, selecting atleast *one* question from each Unit-I to Unit-IV. All questions carry equal marks.

UNIT-I

1. Show the mapping and structural view point of Artificial Neural Network (ANN). Distinguish between Biological neural network and artificial neural networks. (15)
2. Distinguish between Supervisory Learning and Unsupervisory Learning in Artificial Neural Network (ANN). Give a brief idea of neural network taxonomy and terminologies. (15)

UNIT-II

3. (a) Explain step by step procedure of Single Discrete Perception Training Algorithm (SDPTA).
- (b) With suitable diagram explain the concept of back propagation. Derive update equations for weight elements of multi-layer feed forward neural network. (7+8=15)

4. (a) A Hopfield network made up of 5 neurons, which is required to store the following three fundamental memories.

$$E_1 = \{+1, +1, +1, +1, +1\}^T$$

$$E_2 = \{+1, -1, -1, +1, -1\}^T$$

$$E_3 = \{-1, +1, -1, +1, +1\}^T$$

Evaluate the 5-by-5 synaptic weight matrix of the network.

- (b) Write a detailed note on adaptive resonance theory networks architecture and training algorithms.

(7+8=15)

UNIT-III

5. (a) Consider a Kohonen network with two cluster units and five input units. The weight vectors for the cluster units are $w_1 = [0.1, 0.3, 0.5, 0.7, 0.9]$ and $w_2 = [0.9, 0.7, 0.5, 0.3, 0.1]$. Use the square of the Euclidean distance to find the winning cluster unit for the input pattern.

- (b) Write a note on learning vector quantization architecture and training algorithm.

(7+8=15)

6. (a) What is Boltzmann Machine? Mention the two different architectures of Boltzmann Machine. Discuss briefly the working concepts of Boltzmann Machine.

- (b) Why do we use optical networks? How does an optical neural network works? Discuss.

(7+8=15)

UNIT-IV

7. (a) What is the need and importance of machine learning? Discuss under-fitting and over-fitting challenges in machine learning.
- (b) Draw and explain the architecture of convolutional network. (7+8=15)
8. (a) What are the different machine learning types? Explore its potential applications in speech recognition.
- (b) Write a note on deep forward networks. (7+8=15)

