BT–7/D-22   **47246**

NEURAL NETWORKS AND DEEP LEARNING

Paper–PE–CS–D411A

Time Allowed : 3 Hours]   [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

Unit–I

1. (a) Explain the orgnization of brain in detail.   8

   (b) Explain what is an artificial neural network and show how a basic ANN is constructed from a Biological neuron concept.   7

2. (a) Describe the characteristics of artifical neural networks? Explain taxonomy of neural network architecture.   8

   (b) Briefly discuss about unsupervised learning, threshold and learning rate.   7

Unit–II

3. What is back propagation? With a schematic two-layer feed forward neural network, derive its learning algorithm. Also discuss its learning difficulties and improvements.   15

4. (a) Explain the working of a Hopfield network with a neat sketch of its architecture. 8

(b) Explain adaptive resonance theory network architecture and training algorithm. 7

Unit–III

5. Why is Kohonen network called self-organizing feature map? How many layers are there in Kohonen network self-organizing map? Discuss map architecture and training algorithm. 15

6. (a) What is Boltzman machine used for? How do Boltzman machines work? Explore the different types of Boltzman machine. 8

(b) Write about electro-optical multipliers and holographic correlators. 7

Unit–IV

7. How is deep learning related to Machine learning? Explore machine learning algorithm. Discuss underfitting and overfitting challenges in Machine learning. 15

8. Write notes on the following :

(a) Convolutional networks. 8

(b) Natural language processing. 7