BT-7/D-23   **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 different learning mechanisms used in Artificial Neural Networks with the help of necessary diagrams. Illustrate the different steps involved in the training algorithm of Perceptron.   7

    (b) How is the training algorithm performed in back-propagation neural networks? With graphical representations, explain the activation functions used in Artificial Neural Networks.   8

2. (a) With the help of an example, state the role of bias in determining the net output of an Artificial Neural Network.   7

(b) What are the Applications of Artificial Neural Networks? Where can we apply pattern classification method? Explain the Evaluation of Artificial Neural Networks. 8

UNIT–II

3. (a) What do you mean by Backpropagation network architecture and Training Algorithms ? Justify with Example and diagram. 7

(b) How is different Adaptive resonance theory networks architecture from perceptron network architecture ? Justify with suitable example. 8

4. (a) What are the stages involved in training a neural net using Back propagation algorithm ? Explain. Compare auto associative net and Hopfield net. 7

(b) Write Short notes on the following: 2×4=8

(i) Hebb Network Theory

(ii) Counter Propagation Network Architecture

(iii) Training Algorithms

(iv) Unsupervised Neural Network.

UNIT–III

5. (a) Explain the architectures of popular self-organizing maps. Derive the training algorithm of Kohonen network. Also explain how SOMs can be used for data compression? 7

(b) Explain the Boltzman machine cognition network in Neural Network. Justify with example. 8

6. (a) What do you mean by Neocognitron network? Justify with Architecture and Algorithm. 7

(b) Write short notes on the following :

(i) Elctro-optical Multipliers

(ii) Holographic Correlators. 8

UNIT–IV

7. (a) Explain the working of Deep Learning forward Networks. Discuss the Components of CNN-Model. 7

(b) Explain Adaptive Learning rate related to Convolutional Neural Networks (CNN). Discuss the different steps involved in Natural Language Processing (NLP). 8

8. (a) Discuss any four regularization techniques in Deep Learning. 7

(b) What is the Goal of the Support Vector Machine (SVM)? How to compute the Margin ? 8