1128
B.E. (Computer Science and Engineering)
Seventh Semester
Elective – III
CS-705B: Neural Networks

Time allowed: 3 Hours   Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I.   Attempt the following:-

   a) List the guidelines with regard to choice of number of neurons in different layers and the choice of number of hidden layers.

   b) Explain the role of learning rate in the process of weight updation?

   c) Why bipolar representation is better than binary representation in neural network?

   d) Discuss any two applications of Radial Basis Function Network.

   e) How is topology preserving property executed in Kohenon SOM?   (5x2)

UNIT – I

II.   a) Consider a 4 input, 1 output parity detector. The output is 1 if the number of inputs is 5 even. Otherwise, it is 0. Is this problem linearly separable? Justify your answer.

   b) Compare similarities and differences between single layer and multi-layer perceptrons.   (5,5)

III. a) Define activation function. List and explain various activation functions used in modeling of artificial neuron. Also explain their suitability with respect to some sample applications.

   b) You are given the task of identifying human gestures computationally. Which neuron learning model will you use? Why?   (5,5)

IV.   a) What is back-propagation? Explain back-propagation training algorithm with the help of 6 one hidden layer feed forward network.

   b) Sketch the architecture of Boltzmann network and mention the steps for recall Procedure. What are limitations of the Boltzmann learning?   (6,4)

UNIT – II

V.   a) Train the auto-associative network for input vector [-1,1,1,1] and also test the network for the same input vector. Test the auto-associative network mistake, two missing and two mistake entries in test vector.

P.T.O.

b) Distinguish between MLP and Radial basis function. (6,4)

VI. a) What is competitive learning? How it is different from conventional learning? Explain the 5 architecture and components of Competitive Learning Neural Network with neat diagram.

b) Construct a Max net with four neurons and inhibitory weights $E = 0.25$ when given the 5 initial activations (input signals). The initial activations are $a_1(0) = 0.1$, $a_2(0) = 0.3$, $a_3(0) = 0.4$, $a_4(0) = 0.7$. (5,5)

VII. a) Write a short note on Hebbian based Principal Component Analysis.

b) Explain the architectures of popular self-organizing maps. Derive the training algorithm of Kohonen network. (5,5)

x-x-x