

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – I • EXAMINATION – WINTER 2012****Subject code: 710423N****Date: 16-01-2013****Subject Name: Neuro Computing and Application (Elective)****Time: 02.30 pm – 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What is generalization of neural networks? Explain useful properties and capabilities offered by neural networks. **07**
- (b) Explain in brief selection of different parameters in training of Feed Forward back propagation network (FF-BPN). **07**

- Q.2** (a) Describe in brief following factors affecting the performance of artificial neural network models. **07**
- A) Number of hidden layers
B) Selection of training method
- (b) Describe different type of activation functions used for supervised training of neural network. **07**

OR

- (b) Describe in brief following factors affecting the performance of artificial neural network models. **07**
- i) Initialization of interconnecting weights
ii) Number of nodes

- Q.3** (a) A hetro associative network is given. Find the weight matrix and test the network with input vector= (0 0 1 0). Give your comments on the result. **07**

$$S_1 = (1 \ 1 \ 0 \ 0) \quad t_1 = (1 \ 0)$$

$$S_2 = (1 \ 1 \ 1 \ 0) \quad t_2 = (0 \ 1)$$

$$S_3 = (0 \ 0 \ 1 \ 1) \quad t_3 = (1 \ 0)$$

$$S_4 = (0 \ 1 \ 0 \ 0) \quad t_4 = (1 \ 0)$$

- (b) Explain simple perceptron learning algorithm with clearly mentioning all assumed parameters. **07**

OR

- Q.3** (a) Apply Hebb net to the training patterns that defines XOR function with bipolar inputs and targets. Hence show that Hebb rule can not be used to define XOR function. **07**

- (b) A hetro associative network is given. Find the weight matrix and test the network with any one of the training input vector. **07**

$$S_1 = (1 \ 1 \ 0 \ 0) \quad t_1 = (1 \ 0)$$

$$S_2 = (0 \ 1 \ 0 \ 0) \quad t_2 = (1 \ 0)$$

$$S_3 = (0 \ 0 \ 1 \ 1) \quad t_3 = (0 \ 1)$$

$$S_4 = (0 \ 0 \ 1 \ 0) \quad t_4 = (0 \ 1)$$

- Q.4 (a)** Write and explain the Widrow- Hoff rule for error correcting learning. Compare the batch mode and incremental mode of learning the neural network. **07**
- (b)** What is Associative Memory? Explain in brief working of Associative Memory (AM) with its different classes. **07**

OR

- Q.4 (a)** Draw and explain simplified model of real neuron i.e. Mcculloch –Pitts model. **07**
- What are its limitations?
- Q.4 (b)** Enlist different neural architectures of AM models. Explain “two layer models” with necessary details. **07**

- Q.5 (a)** Draw and Explain ADLINE and MADLINE networks. **07**
- (b)** Explain in brief the necessary steps for Back Propagation Learning algorithm. Clearly mentions all assumptions made. **07**

OR

- Q.5 (a)** Consider an auto associative net with the bipolar step function as the activation function and weights set by Hebb rule with main diagonal elements set to zero. **07**
- a) find the weight matrix to store vector $v_1 = (1 \ 1 \ 1 \ 1 \ -1 \ -1)$
- b) test the response of the network with the same input.
- (b)** Explain with necessary example and details any one application of back propagation network. **07**
