Seat No.: _____ Enrolment No._____

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. A) Number of hidden layers
B) Selection of training method **07**

(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) t_1 = (1 0)

S_2 = (1 1 1 0) t_2 = (0 1)

S_3 = (0 0 1 1) t_3 = (1 0)

S_4 = (0 1 0 0) 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) t_1 = (1 0)

S_2 = (0 1 0 0) t_2 = (1 0)

S_3 = (0 0 1 1) t_3 = (0 1)

S_4 = (0 0 1 0) 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. What are its limitations?	**07**
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. 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.	**07**
	(b)	Explain with necessary example and details any one application of back propagation network.	**07**

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