Printed Pages: 2 **Sub Code:RCS062**

Paper Id: **110261** **Roll No.** | | | | | | | | | | |

B. Tech.
(SEM VI) THEORY EXAMINATION 2018-19
NEURAL NETWORK

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 7 = 14**

a. What is the use of bias weight in artificial neuron?
b. Compare ANN with conventional computing.
c. Define Hybrid System. Explain in brief Neuro-Fuzzy-genetic algorithm Integration.
d. Consider an auto-associative network with the bipolar step function as the activation function and weights set by Hebb Rule where the main diagonal of the weight matrix is set to zero. Find the weight matrix to store the vector x= (1 1 1 1-1-1).
e. Differentiate between Delta Rule & Gradient descent rule for learning.
f. If the net input to an output neuron is 0.64, calculate its output when the activation function is binary sigmoidal.
g. How are Neural Networks related to machine learning?

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

a. Define Back Propagation algorithm. Describe how error-correction rule is applied? Describe the steps of training in BPN and changes in learning rate parameter.
b. Explain approximation properties of RBF networks and compare with multilayer perceptron.
c. Explain principal component analysis and regression in terms of data processing. How PCA is related to co-variance matrix, Eigen values & Eigen vectors.
d. What are various learning techniques used in neural networks? Give the critical information used in the learning process? Also, Explain how a momentum factor makes faster convergence of a network?
e. Explain Independent Component Analysis (ICA) technique. How does the ICA work for blind source separation problem?

SECTION C

3. Attempt any *one* part of the following: **7 x 1 = 7**

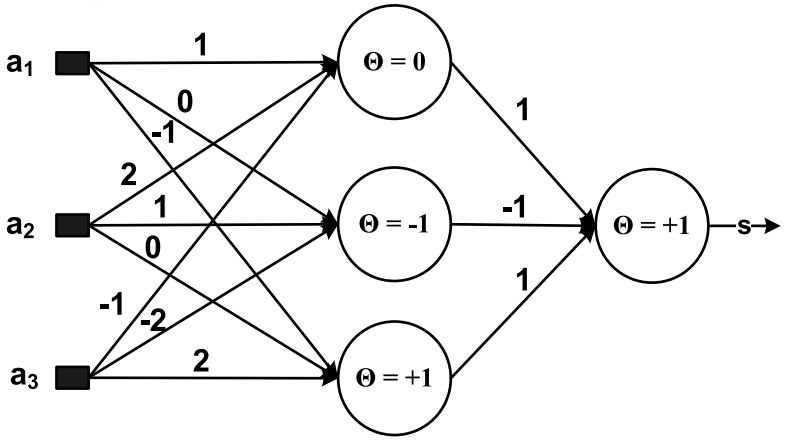
(a) What do you understand by winner-takes-all competition? Distinguish between supervised and unsupervised learning in artificial neural network.
(b) Explain briefly the terms Cell body, Axon, Synapse, dendrite and neuron with respect to a biological neural network.

Dr. Rajesh Tewari | 23-May-2019 13:30:15 | 139.5.198.30

4. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain Rosenblatt's perceptron model. Differentiate between linearly separable pattern and non-linearly separable patterns.

(b) Evaluate the output of the neural network in figure given for the inputs [1 1 1].



The above diagram is represented as feed-forward artificial neural network.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a) Draw the XOR gate using RBF networks or any other neural networks, justify its truth table.

(b) What is back propagation learning? Explain forward pass and backward pass in conjunction with back propagation learning. Shall it be called unsupervised learning? Why?

6. Attempt any *one* part of the following: 7 x 1 = 7

(a) Derive the training algorithm of Kohonen network. Also, explain how SOMs can be used for data compression.

(b) What is feature extraction? Explain any two feature extraction technique in detail.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a) Explain how we done Complexity analysis of neural network models.

(b) What do you mean by soft computing? List the various types of soft computing techniques and mention some application areas for neural network.