

Roll No.

24489

B. Tech. 7th Semester (CSE)

Examination – June, 2016

NEURAL NETWORKS

Paper : CSE-407-F

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is compulsory. Attempt five questions in total selecting one question from each Section. All questions carry equal marks.

1. (a) Applications of ANN. 5 × 4
- (b) Explain role of learning factors.
- (c) Linear associator.
- (d) What do you mean by activation function and threshold function ?

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SECTION – A

2. Explain the structure of biological neuron and compare and contrast biological neurons with ANN. 20
3. Explain and compare various learning rules. 20

SECTION – B

4. Explain the discrete perceptron training algorithm for linearly separable classification. 20
5. Implement or design XOR gate as non linearly separable problem. 20

SECTION – C

6. The weight matrix W for a n/w with bipolar discrete binary neurons is given as : 20

$$\begin{bmatrix} 0 & 1 & -1 & -1 & -3 \\ 1 & 0 & 1 & 1 & 1 \\ -1 & 1 & 0 & 3 & 1 \\ -1 & 1 & 3 & 0 & 1 \\ 3 & -1 & 1 & 1 & 0 \end{bmatrix}$$

Assume threshold and external i/p of neurons are zero. Compare the values of energy for $V = [-1 \ 1 \ 1 \ 1 \ 1]^t$ and $v = [-1 \ -1 \ 1 \ -1 \ -1]^t$.

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7. Differentiate between auto association and heteroassociation. The linear associator has to associate the following pair of vectors : 20

$$s^{(1)} = [1/2 \ 1/2 \ 1/2 \ 1/2]^t \rightarrow f^{(1)} = [0 \ 1 \ 0]^t$$

$$s^{(2)} = [1/2 \ -5/6 \ 1/6 \ 1/6]^t \rightarrow f^{(2)} = [1 \ 0 \ 1]^t$$

$$s^{(3)} = [1/2 \ 1/6 \ 1/6 \ -5/6]^t \rightarrow f^{(3)} = [0 \ 0 \ 0]^t$$

- (i) Verify that vectors $s^{(1)}, s^{(2)}, s^{(3)}$ are orthonormal.
- (ii) Create partial weight matrices for each desired association.
- (iii) Compute the total weight matrix.

SECTION – D

8. Explain in detail unsupervised learning of clusters. 20
9. Write short note on : 20
 - (a) Single layer perceptron
 - (b) Clustering

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