

IV B.Tech I Semester Supplementary Examinations, April/May 2005
NEURAL NETWORKS
 (Common to Electronics & Communication Engineering, Computer Science
 & Engineering, Information Technology, Computer Science & Systems
 Engineering and Electronics & Telematics)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain about biological neuron with neat diagram ?
 (b) Explain in detail the properties of biological neuron.
 (c) Compare: biological neuron and Artificial neuron ?
2. Compare the similarities and differences between single layer and multi layer perceptrons and also discuss in what aspects multi layer perceptrons are advantageous over single layer perceptrons.
3. Explain the backpropagation algorithm and derive the expressions for weight update relations?
4. What are the modes of operation of a Hopfield network? Explain the algorithm for storage of information in a Hopfield network. Similarly explain the recall algorithm.
5. Explain the Kohonen's method of unsupervised learning. Discuss any example as its application.
6. (a) Explain bidirectional associative memories using suitable examples for storage algorithms.
 (b) The weight matrix W for a network with bipolar discrete binary neurons is given as

$$W = \begin{bmatrix} 0 & 1 & -1 & -1 & -3 \\ 1 & 0 & 1 & 1 & -1 \\ -1 & 1 & 0 & 3 & 1 \\ -1 & 1 & 3 & 0 & 1 \\ -3 & -1 & 1 & 1 & 0 \end{bmatrix} \Omega^{-1}$$

Knowing that the thresholds and external inputs of neurons are zero, compute the values of energy for $v = [-1 \ 1 \ 1 \ 1 \ 1]^t$ and $v = [-1 \ -1 \ 1 \ -1 \ -1]^t$

7. (a) ART network exploits in full one of the inherent advantages of neural computing technique, namely parallel processing Explain.
 (b) Describe the architecture and operation of ART2 network.
8. Explain the concept of pattern recognition and how artificial neural network is helping in the pattern recognition problems..
