

**III B.Tech II Semester Supplementary Examinations, April/May 2005**  
**NEURAL NETWORKS**  
**(Computer Science & Engineering)**

Time: 3 hours

Max Marks: 70

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. Compare the conventional and neural network computation with regard to the following tasks or performance aspects :
  - (a) Problem solving
  - (b) Knowledge acquisition
  - (c) Knowledge retrieval
  - (d) Internal data.
2. (a) Write a note on evaluation of error function derivatives  
 (b) Write a note on Least Mean Square (LMS) algorithm.
3. Explain about the generalized delta- rule and derive the weight updation for a multi layer feed forward neural network.
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. (a) What is the Kohonen layer architecture and explain its features.  
 (b) Explain the Kohonen's learning algorithm.
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. What is the function of ART network and explain its operation with relevant equations.
8. What are the applications of Kohonens networks in image processing and pattern recognition?

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