2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

IV B.TECH. II SEMESTER SUPPLEMENTARY EXAMINATIONS
NEURAL NETWORKS
(ELECTRONICS & COMPUTER ENGINEERING)

JULY -2005

TIME: 3 HOURS
MAX MARKS:80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Consider a multilayer feed forward network, all the neurons of which operate in their linear regions. Justify the statement that such a network is equivalent to a single layer feed forward network.

(b) What is the advantage of having hidden layers in an ANN? On what basis is the number of hidden layers and the number of neurons in each hidden layer selected?

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. The truncated energy function, E(v), of a certain two-neuron network is specified as
$E(v) = -\frac{1}{2}(v_1^2 + 2v_1v_2 + 4v_2^2 + v_1)$,Assuming high-gain neurons,
(a) find the weight matrix W and the bias current vector i.

(b) Determine whether single-layer feedback neural network postulates (symmetry and lack of self-feedback) are fulfilled for W and i computed in part (a).

5. Explain the architecture and training of Kohonen's self-organizing network.

6. Derive expressions for the weight updation involved in counter propagation.

7. (a) What are the advantages of ART network. Discuss about gain control in ART network.

(b) Discuss in detail about orienting subsystem in an ART network.

8. Describe how a neural network may be trained for a pattern recognition task.
Illustrate with an example