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Roll No. .....

CS–801

B. E. (Eighth Semester) EXAMINATION, June, 2010

(Computer Science & Engg. Branch)

NEURAL NETWORKS

(CS–801)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt any *five* questions. All questions carry equal marks. Make suitable assumptions wherever necessary.

1. (a) Differentiate between biological neuron and artificial neuron on the basis of structure and function of a single neuron.

   (b) Explain the algorithm for ADALINE and MADALINE network.

2. (a) Given a two input neuron with the following parameters : $b = 1 \cdot 2$, $W = [3 \;\; 2]$ and $P = [-5 \;\; 6]^T$. Calculate the neuron output for the following transfer function :

   (i) A symmetrical hard limit transfer function.

   (ii) A saturating linear transfer function.

   (iii) A hyperbolic tangent sigmoid transfer function.

   (b) State and explain Hebb's learning rule.

P. T. O.

3. (a) Prove that using the linear activation function with multilayer perception will make it behave like single layer perception.

   (b) Distinguish between linearly separable and linearly inseparable problems giving *two* examples of each. Why a single layer of perception cannot be used to solve linear inseparable problem ?

4. (a) What are the limitations of error back propagation algorithm ? Define its characteristics and applications.

   (b) Explain counterpropagation network. How counter. propagation works in normal and training mode ?

5. (a) Explain how Boltzmann machine can be used to overcome the problems associated with hopfield nets ? Describe *one* application of Boltzmann machine.

   (b) Draw the schematic diagram of adaptive resonance theory network and explain its architecture.

6. (a) What do you mean by generalized network ? How training is done for such networks ?

   (b) Explain any *one* training method, either Boltzmann training or Cauchy training.

7. (a) Define Optical Neural Network and give its advantages and disadvantages.

   (b) Explain the working and application of Kohonen's self organizing feature map.

8. Write short notes on any *three* of the following :

   (i) NETTALK

   (ii) Specific heat methods

   (iii) Neocognitron

   (iv) Two-dimensional pattern recognition