

Total No. of Questions : 12]

SEAT No. :

P808

[Total No. of Pages : 3

[4659] - 221

**B.E. (IT) (Semester - II)**

**B : NEURAL NETWORKS & EXPERT SYSTEMS (ELECTIVE - IV)**  
**(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates :*

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of logarithmic tables slide rule, mollier charts, electronic pocket calculator and steam tables is allowed.*
- 4) *Assume suitable data, if necessary.*

- Q1)** a) Describe some attractive features of the biological neural network that make it superior to the most sophisticated Artificial Intelligence computer system for pattern recognition tasks. [9]
- b) Compare the performance of a computer and that of a biological neural network. [9]

OR

- Q2)** a) Define topology of ANN. Explain the basic structures which form building blocks for more complex neural network architectures. [9]
- b) Explain the Electrical Model of Neural Network with its three basic elements: synapse, adder and activation function. [9]
- Q3)** a) Explain the three classes of network architectures: Single layer feed forward network, Multi layer feed forward network and recurrent network [8]
- b) What are the main differences among the three models of artificial neuron, namely, McCulloch-Pitts, perceptron and adaline [8]

**P.T.O.**

OR

- Q4)** a) A neuron receives input from other neurons whose activity levels are -2,-10,3 and -2. The respective synaptic weights of neuron j are 0.8,0.2,-1.0 and- 0.9. Calculate the output of neuron j for the following two situations: [8]
- i) The neuron is linear
  - ii) Activation function is sigmoid
- b) What are the types of signals in Back propagation algorithm. Explain the Forward Pass of back propagation training algorithm in detail [8]
- Q5)** a) Draw and explain the architecture of Radial Basis Function (RBF) Networks. [8]
- b) Comment on solving XOR problem using RBF. [8]

OR

- Q6)** a) Explain Radial basis function network for Function Approximation [8]
- b) Compare RBF and MLP [8]
- Q7)** a) Encode three dimensional vectors {110,001} into a Hopfield CAM and completely analyze the state pace. [10]
- b) Define and explain [8]
- i) Feedback Neural Network
  - ii) Recurrent Neural Network

OR

- Q8)** a) Explain architecture of a Boltzmann Machine. Illustrate it with suitable diagram [9]
- b) What do you understand by following: [9]
- i) Stochastic Approach
  - ii) Thermal Equilibrium
  - iii) Simulated Annealing

- Q9)** a) Identify and describe an application area for an expert system within University Area [8]  
b) Explain features and capabilities of expert system building tools [8]

OR

- Q10)** a) What is decision tree architecture? Explain with neat diagram. [9]  
b) Explain with neat diagram knowledge acquisition process. [7]

- Q11)** a) Explain how DENDRAL determine molecular structure of an unknown compound. Write prominent features of DENDRAL. [8]  
b) What do you mean by knowledge engineering? Explain various stages of knowledge acquisition. [8]

OR

- Q12)** a) Give a short note on expert tool EMYCIN [8]  
b) Explain how MYCIN helps diagnoses infectious blood diseases and recommend therapy for patients. [8]

