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 indiactc full marks.*
3) *Use of logarithmic tables slide rule, mollier charts, electronic pockct 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 Anneling

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]**