Total No of Questions: [12] *SEAT NO. :* [ ]

[Total No. of Pages : *02*]

B.E. 2008 (Neural Networks)(410450)
(Elective - III) (Semester - II)

Time: 3 Hours *Max. Marks : 100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6 from Section I and Q7 or Q8, Q9 or Q10, Q11 or Q12 from Section II.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right side indicate full marks.***
5) ***Use of Calculator is allowed.***
6) ***Assume Suitable data if necessary***

SECTION I

Q1) a) Explain with example the task of pattern analysis as Classification and Clustering. Give examples of ANNs used for the same. [8]

b) Draw a McCulloch Pitts Neuron model. Define the firing rule and explain how it performs the basic logic operations for NOR Gate. [8]

OR

Q2) a) What is weight vector in ANN training? How it is described in following learning laws: (i) Hebb's Law and (ii) Delta Learning Law [8]

b) What is Linear Separability? Illustrate with example. [8]

Q3) a) Draw a 3-layer FeedForward Neural Network. Explain the Back propagation training algorithm in detail. [10]

b) State the significance of Learning Rate, Momentum term and activation function in Back propagation training [8]

OR

Q4) a) What is linearly Non-separable classification problem? Can single Perceptron solve such problem? Discuss ADALINE computing model of a neuron [10]

b) What is the use of learning rules in ANN? Discuss any Two learning laws. [8]

Q5) a) How associative memory models classified? With diagram explain the working of Bi-directional Associative Memory Network. [8]

b) What is meant by simulated annealing? What is annealing schedule? [8]

OR

Q6) a) Explain the architecture of Boltzmann machine. [8]

b) What is meant by stochastic update of a neuron? Explain the concept of equilibrium in stochastic neural networks. [8]

SECTION II

Q7) a) Draw and explain the architecture of RBFN (Radial Basis function) Network. How it act as classifier? [8]

b) What is the objective of pattern storage network? Explain the meaning of activation state and energy landscape of a feedback network. [8]

OR

Q8) a) Describe Boltzmann learning law. Explain limitation of Boltzmann learning. [8]

b) Discuss the Hopfield Network training algorithm to store and recall a set of bipolar patterns. [8]

Q9) a) What is plasticity-stability dilemma problem? Explain the ART Training algorithm used for pattern clustering. [10]

b) What is vector quantization? How it is used for pattern clustering? [8]

OR

Q10) a) How the self-organizing network is trained? Illustrate the Kohonen's learning with suitable example. [10]

b) Discuss the architecture of Recurrent Neural Network. [8]

Q11) a) With example, explain the following terms w.r.t. pattern recognition system – [8]

(i) Preprocessing (ii) Feature Extraction (ii) Training

b) How an optimization problem is formulated for a solution using a neural network model? Explain with example. [8]

OR

Q12) a) Explain with architecture and algorithms the use of ANN in character recognition [8]

b) Discuss in brief auto-association and hetero-association process used for neural processing [8]