

NEURAL NETWORK AND EXPERT SYSTEMS
(2008 Pattern) (Elective - IV) (Semester - II) (414451)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

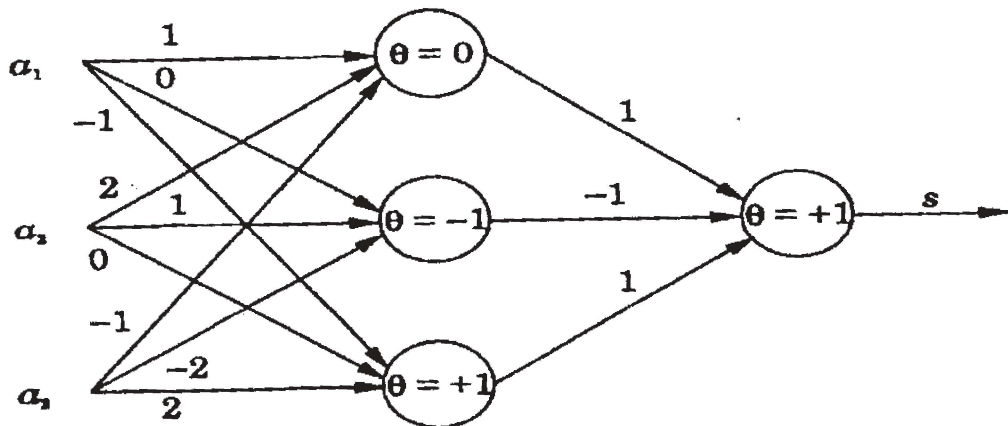
- 1) Answers to the two sections should be written in separate answer- books.
- 2) Figures to the right side indicate full marks.
- 3) Assume suitable data, if necessary.

SECTION - I

- Q1)** a) Explain McCulloch-Pitts Model of neurons. Represent NAND and NOR gate using MP neurons. [7]
- b) Explain with examples, differences between the following pattern recognition tasks: [9]
- i) Association vs classification
 - ii) Classification vs mapping
 - iii) Classification vs clustering

OR

- Q2)** a) What is activation function? State its types. Explain Sigmoid function in detail. [8]
- b) What is MP Neuron Model? Give the output of the following network for the input $[1 \ 1 \ 1]^T$. [8]



P.T.O.

- Q3)** a) Explain following learning laws in detail. [9]
i) Hebb's law
ii) Perceptron learning law
b) Explain and compare supervised and unsupervised learning in detail. [7]

OR

- Q4)** a) Distinguish between linearly separable and linearly inseparable problems. Why a single layer of perceptron cannot be used to solve linearly inseparable problems. [8]
b) What are feed forward neural networks? Explain pattern classification and regression using Multi-layer feed forward neural networks. [8]

- Q5)** a) Explain construction of optimal hyperplane for linearly separable pattern with respect to support vector machine. [9]
b) What are radial basis function networks? How it is used to perform complex pattern classification task? [9]

OR

- Q6)** a) Explain radial basis function networks in the form of layered structure. [9]
b) Write a short note on optimal hyperplane for non separable patterns. [9]

SECTION - II

- Q7)** a) Explain Hopfield network algorithm to store and recall a set of bipolar patterns. [8]
b) Explain Boltzman machine architecture together with the Boltzman learning law. [9]

OR

- Q8)** a) What is SOFM? Draw and explain its architecture. How training is done in SOFM? [9]
b) Write a short note on "Recurrent Neural Networks". [8]

- Q9)** a) Explain the rule based architecture of expert system. [8]
b) What are the advantages in keeping knowledge base separate from control module in knowledge based system? [8]

OR

- Q10)** a) Explain with neat diagram blackboard system architecture and its components. [8]
b) What is uncertainty? Explain two approaches that deal with uncertainty problem. [8]

- Q11)** a) What is PROLOG? Explain how knowledge is represented in PROLOG? [9]
b) Write a short note on ELIZA. [8]

OR

- Q12)** a) List programming languages for AI problems. Comment on language constructs in LISP. [9]
b) Write a short note on MYCIN. [8]

