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(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3018 Roll No. | | | | | | | | | | |

B.Tech.

SEVENTH SEMESTER EXAMINATION, 2006-07

ARTIFICIAL NEURAL NETWORKS

Time : 3 Hours *Total Marks : 100*

Note : *(i) Attempt ALL questions.*

(ii) All questions carry equal marks.

(iii) In case of numerical problems assume data wherever not provided.

(iv) Be precise in your answer.

1. Attempt *any two* parts of the following : **(10x2=20)**

EL003

(a) Explain briefly the operation of a biological neural network. Compare the performance of a computer and that of a biological neural network in terms of speed of processing, size and complexity, storage, fault tolerance and control mechanism.

(b) Draw the McCulloch-Pitts (MP) neuron model. Write the main differences between MP and perceptron model.
Find the output of network shown in figure 1.

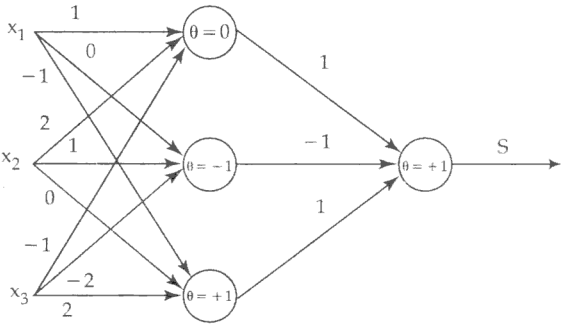

Fig. 1

(c) Explain the following :
(i) Associative memory
(ii) Graph algorithms

2. Attempt ***any two*** parts of the following : **(10x2=20)**

(a) Draw the architecture of MLP network. Derive the expressions used to update weights in back propagation algorithm for MLP network.

(b) Explain self organizing network and write the algorithm.

(c) Explain how a pattern classification problem leads to a radial basis function network. What decides the basis functions in a pattern classification problem ?

3. Attempt ***any four*** parts of the following : **(5x4=20)**

(a) What are some extensions of the ART concepts ?

(b) What are partially recurrent neural networks ?

(c) Write K-means algorithm.

(d) What is perceptron learning for pattern classification ?

(e) Explain the hybrid learning with example.

(f) Write note on time delay neural networks.

4. Attempt *any two* parts of the following : **(10x2=20)**

(a) A neural network detects the level of a liquid in a cylindrical container 10cm high. The main function of the network is to maintain the level of the liquid in a cylinder by opening and closing two valves, one at the top that supplies liquid and the other at the bottom that removes liquid from the container. The neural network detects the liquid levels at high points 0, 2, 4, 6, 8 and 10 cm. Obviously, for intermediate levels (e.g., between 2 and 4 cm), the controlling action is not accurate. It has been decided to to incorporate fuzzy logic concepts to better control the level at the intermediate levels. Discuss how this can be done.

(b) Write note on 'Fuzzy Rule Generation'.

(c) Explain the following :

(i) Defuzzification of Fuzzy Logic.

(ii) Fuzzy Neural Net.

5. Write short note on *any two* of the following : **(10x2=20)**

(a) Image Compression using ANN

(b) Time Series Prediction using ANN

(c) Visual Processing Networks

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