Total number of printed pages–4

53 (CS 513) NECP

2019

NEURAL COMPUTING

Paper : CS 513

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(a)* Describe various components of an Artificial Neural Network. 10

   (b) What is Back Propagation Network? Describe. 10

2. *(a)* What is Hopfield net ? Define. Describe Bidirectional Associative Memory (BAM) structure. 5+10=15

   (b) What is Simulated annealing? Describe. 5

Contd.

3. *(a)* What is Counter propagation Network? Draw the architecture of a Counterpropagation Network. Discuss the Building Blocks of a Counterpropagation Network. 2+4+4=10

(b) How the counterpropagation Network can be used to classify images into categories? Discuss with an example. 10

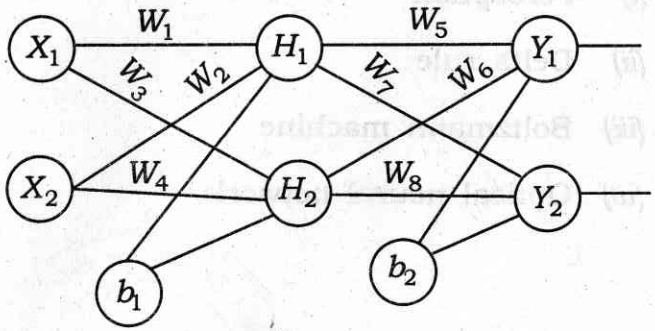
4. *(a)* What is Kohonen Self-Organizing Map? Draw the Architecture of the Kohonen self-organizing map. Mention *two* applications of Kohonen self organizing map. 2+5+3=10

(b) What is Neo-cognitron? Why is it designed? Discuss its architecture. 2+2+6=10

5. *(a)* Why Adaptive Resonance theory nets are designed? Discuss Basic Architecture and Basic Operation of Adaptive Resonance theory nets. 2+4+4=10

(b) Draw and discuss the architecture of ART1 and ART2. 5+5=10

6. Consider the following net : 20



$X_1 = 0.05$ $b_1 = 0.35$

$X_2 = 0.10$ $b_2 = 0.60$

Initial weights :

$W_1 = 0.15$ $W_3 = 0.25$ $W_5 = 0.40$ $W_7 = 0.50$

$W_2 = 0.20$ $W_4 = 0.30$ $W_6 = 0.45$ $W_8 = 0.55$

Target Values :

$T_1 = 0.01$, $T_2 = 0.99$

Learning rate : 0.5

Using Forward Propagation and Backward Propagation of Error update the values of W_1, W_2, W_3 and W_4. (any missing data maybe suitably considered).

7. Write short notes on : 5×4=20

(i) Perception

(ii) Delta rule

(iii) Boltzmann machine

(iv) Optical neural network.