SRM UNIVERSITY DELHI-NCR, SONEPAT

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Registration No.: 1151921 0005

MST-I(APRIL-2022)

B. Tech. (CSE) VI Semester

Subject Code: CS 3030

Subject Name: Neural Networks & Fuzzy Logic

Duration: 90 min

Max. Marks: 50

Note: Question Paper consists of two parts (Part-A and Part-B).

All Questions are compulsory in Part-A.

Answer any THREE Questions from Part-B

PART A:(10*2)

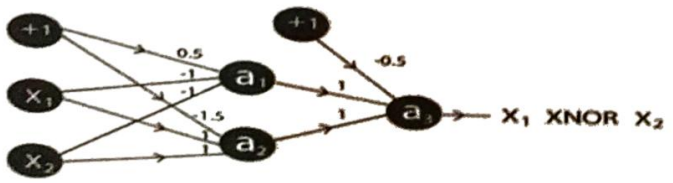
1. Define a neural network.
2. Differentiate between supervised and unsupervised learning with examples?
3. What are the different types of perceptron?
4. What is the role of activation functions in a neural network?
5. What is bias?
6. Differentiate between biological and artificial neuron.
7. Give the mathematical model of artificial neuron.
8. Differentiate between linear and non-linear activation functions with examples.
9. Explain the dying ReLU problem.
10. Define error function?

PART B:(10*3)

(Attempt any three)

11. Explain the following: a) Delta Learning rule. b) ReLU Activation Function
12. What do you mean by ADALINE? Explain its architecture in detail with its training algorithm.
13. Explain the perceptron training algorithm for single and multiple output.
14. a) For a XNOR function as given in the figure below, activation function of each node is given by:

$f(x) = 1$ *if* $x > 0$ *else* 0. Consider $X1 = 0$ and $X2 = 1$, what will be the output for the above neural network?



b) What are the advantages and disadvantages of Artificial Neural Network?

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Registration No.: | | | | | | | | | | |

MST-II(MAY-2022)
B. Tech. (CSE) VI Semester (SECTION- B and E)

Subject Code: CS 3030
Subject Name: Neural Networks & Fuzzy Logic

Duration: 90 min
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Note: Question Paper consists of two parts (Part-A and Part-B).
All Questions are compulsory in Part-A.
Answer any THREE Questions from Part-B

PART A:(10*2)

1. What is the principle of fuzzy logic?
2. For analysis of storage capacity what are the conditions imposed on hopfield model?
   a) symmetry of weights
   b) asynchronous update
   c) symmetry of weights and asynchronous update
   d) none of the mentioned
3. What BAM is required?
4. The room temperature is hot and here the term "hot", can it be represented by a crisp set? If no, why?
5. The values of the set membership is represented by _____.
   a. Discrete Set
   b. Degree of truth
   c. Probabilities
   d. Both Degree of truth & Probabilities
6. Describe fuzzy relation.
7. State the difference between discrete and continuous network.
8. Why LMS is better than Hebbian?
9. List any three properties of classical sets.
10. If the weight matrix stores the given patterns, then the network becomes?
    a) autoassoiative memory
    b) heteroassociative memory
    c) multidirectional assocative memory
    d) temporal associative memory

PART B:(10*3)

11. Draw the block diagram of fuzzy logic. And, explain the basic concepts of fuzzy logic control in detail.
12. Write the short note on:
    a. Hopfield networks
    b. Bidirectional Associative Memory
13. Find YA using max-min function:

$$A = \begin{bmatrix} 0.3 & 1 & 0.8 & 0.2 & 0 & 1 \\ 0.2 & 0 & 1 & 0.7 & 0.6 & 0.4 \\ 0.5 & 0.3 & 0.2 & 1 & 0 & 0.2 \\ 0.9 & 0.7 & 1 & 0.3 & 0.1 & 0.9 \\ 0.1 & 0.8 & 0 & 0.8 & 1 & 0.7 \\ 0.2 & 1 & 1 & 0.6 & 0 & 0.4 \end{bmatrix}$$

$$Y = (0.8, 0.1, 0.7, 0, 0.9, 1).$$

14. What do you mean by associative memory? Also, explain its paradigms in detail with the testing and training algorithm.