

VII SEMESTER B.TECH (COMPUTER SCIENCE AND ENGINEERING) MAKEUP EXAMINATION, DEC/JAN 2016

SUBJECT: NEURAL NETWORKS AND FUZZY SYSTEMS [CSE 431]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- * Answer ANY FIVE FULL questions.
- ✤ Missing data, if any, may be suitably assumed.

1A.	Explain the Biological Picture of Neuron, with diagram.	5M
1 B .	Design network using MP neurons, to realize the following logic functions, us or -1, for weights, for the following logical function. $s(a_1,a_2,a_3) = a_1a_3 + a_2a_3 + \bar{a}_1\bar{a}_3$	ing +1 3M
1C.	Describe the recurrent network architecture, with diagram.	2M
2A.	Give a Comparative study for the learning laws, with all mathematical equatio	ns. 5M
2B.	What is XOR problem. Explain with a neat circuit diagram.	2M
2C.	Explain the Single Layer Perceptron Algorithm.	3M
3A.	Perform Gram Schmidt Orthogonalization for $y_1=1+t$, $y_2=1-2t$, $y_3=1+t^2$, over [0]),1]. 5M
3B.	Explain the procedure for Dimension Reduction, with a proper example.	3M
3C.	Derive a Matrix Representation from Linear transformation. Explain the steps involved.	2M
4A.	State the INSTAR rule and OUTSTAR rule.	2M
4B.	Explain the differences between Banana Associator, Orange problem and Pine A problem. Choose appropriate weights.	pple 3M

4C. Perform Supervised Hebb's rule for $p1^{t}=[0.5, -0.5, 0.5, -0.5]$, $p2^{t}=[0.5, 0.5, -0.5]$ and $t1^{t}=[1,-1]$, $t2^{t}=[1,1]$.

5A. Derive Maximum weight for Hebb's rule with decay. What do you mean by associations are lost in Hebb's rule with Decay. 3M

5B.What is Mexican Hat Function. Explain with an example.

2M 5C. Perform Competitive Learning for $p1^{t}=[-0.1961, 0.9806]$, $p2^{t}=[0.1961, 0.9806]$, $p3^{t}=[0.9806, 0.1961]$, $p4^{t}=[0.9806, -0.1961]$, $p5^{t}=[-0.5812, -0.8137]$, $p6^{t}=[-0.8137, -0.5812]$, w.r.t. p2 and $_{1}w^{t} = [0.7071, -0.7071]$, $_{2}w^{t}=[0.7071, 0.7071]$ and $_{3}w^{t}=[-1.0000, 0.0000]$. 5M

6A. What are basic properties of Fuzzy sets? 2M

6B. What are basic Fuzzy Set operations? Explain with an example. 3M

6C. Suppose E indicates a set of students who have chosen subjects from different streams of Computer Science discipline, and Cardinality of E is 100, 32 study Computer Networks, 20 study Multimedia, 45 study System Software. 15 study Computer Networks and System Software, 7 study Multimedia and System Software, and 10 study Computer Networks and Multimedia. 30 do not study any subjects from either of streams. Find the number of students who study subjects belonging to all three streams. 5M