GUJARAT TECHNOLOGICAL UNIVERSITY M. E. - SEMESTER – III • EXAMINATION – WINTER • 2013

Subj	ect (code: 730205 Date: 28-11-2013	
Time Insti	ect e: 1(ruct	0.30 am – 01.00 pm Total Marks: 70 ions:	
	1. 2. 3.	Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.	
Q.1	(a) (b)	Explain λ -cut procedure in detail. Specify the importance of λ -cut method in fuzzy logic. Explain the difference between fuzzy C-Mean algorithm and traditional C-Mean with example.	07 07
Q.2	(a) (b)	Explain backpropagation algorithm for training multilayer neural network structure with necessary derivations. Explain the working of Hopfield network. How this network can be used to solve the problem of 'Character Recognition'?	07 07
	(b)	Explain feature analysis and partitions of the feature space using fuzzy logic.	07
Q.3	(a) (b)	Explain Overlapping and Non-Negative member-ship function. Explain the working of Self Organizing Maps with suitable example. OR	07 07
Q.3	(a)	Explain the working of Kosko's basic Bidirectional associative memory. For N=2 with patterns given as, A1 = (100001) B1= (11000) A2 = (011000) B2= (10100) A3 = (001011) B3= (01110) Find the recall recall for a poicy pattern (011011)	07
	(b)	A rectangular sheet of perimeter $2L + 2h$ is to be rolled into a cylinder with height, h. Classify the cylinder as a function of the rectangular sheet as being a rod, cylinder, or disk by developing membership functions for these shapes.	07
Q.4	(a)	Describe steps of perceptron learning algorithm. What can be the suitable termination criteria for this algorithm? How can you handle non numeric input with this algorithm?	07
	(b)	Describe the architecture of Radial Basis Function Network (RBF net). Explain the steps of forward and backward calculation to train RBF net.	07
Q.4	(a)	What is swarm intelligence? How it is different from genetic algorithms? List swarm intelligence based algorithms. In which types of applications neural network is suitable, and in which types of applications swarm intelligence based algorithms are suitable?	07

- (b) Explain fuzzy tolerance and equivalence relations.
- Q.5 (a) Explain any three Properties of Fuzzy Relations with suitable example. 07
 - (b) Explain Hebbian Learning rule. Assume a network having single node three **07** inputs with initial weight vector as $[-0.5 \ 1 \ -1]^{T}$. Train this network with input vectors $[2 \ 1 \ -1]^{T}$, $[1.5 \ -0.5 \ 0]^{T}$, and $[0 \ 1 \ 0.5]^{T}$.

OR

- Q.5 (a) Differentiate auto-association and hetero association. List methods for 07 hetero association. Explain any one method in brief.
 - (b) Explain various transfer functions used in neural networks? Why sigmoid 07 type functions are of much importance for continuous type neural network?

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