APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY
08 PALAKKAD CLUSTER

7221(A)-17Dec-1 (Pages: 3) Name .....

Reg. No: .....

THIRD SEMESTER M.TECH. DEGREE EXAMINATION DECEMBER 2017

Branch: Electrical Engineering **Specialization: Power Electronics**

08EE 7221(A) SOFT COMPUTING TECHNIQUES

Time:3 hours **Max.marks: 60**

Answer all six questions. Part 'a' of each question is compulsory.

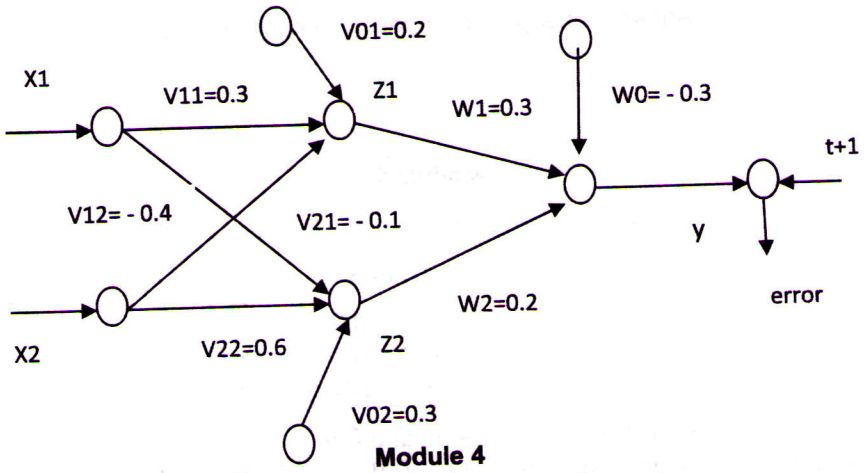
Answer either part 'b' or part 'c' of each questions

Q.no.	Module 1	Marks
1.a	Explain the features of membership function?	3
	Answer b or c	
b	For the fuzzy relation R , $R = \begin{bmatrix} 0.2 & 0.5 & 0.7 & 1 & 0.9 \\ 0.3 & 0.5 & 0.7 & 1 & 0.8 \\ 0.4 & 0.6 & 0.8 & 0.9 & 0.4 \end{bmatrix}$ Find the λ cut relation for λ = 0.2,0.4,0.7and 0.9	6
c	An athletic race was conducted. The following membership function are defined based the speed of athletes $\underset{\sim}{Low} = \{\frac{0}{100} + \frac{0.1}{200} + \frac{0.3}{300}\}$ $\underset{\sim}{Medium} = \{\frac{0.5}{100} + \frac{0.57}{200} + \frac{0.6}{300}\}$ $\underset{\sim}{High} = \{\frac{0.8}{100} + \frac{0.9}{200} + \frac{0}{300}\}$ Find the Following (i) $\underset{\sim}{R} = \underset{\sim}{Low} \; X \; \underset{\sim}{Medium}$ (ii) $\underset{\sim}{S} = \underset{\sim}{Medium} \; X \; \underset{\sim}{High}$ (iii) $\underset{\sim}{T} = \underset{\sim}{R} \; o \; \underset{\sim}{S}$ using Max-Mini Composition (iv) $\underset{\sim}{T} = \underset{\sim}{R} \; o \; \underset{\sim}{S}$ using Max-Product Composition	6

Q.no.	Module 2	Marks
2.a	Draw a simple artificial neuron and discuss the calculation of net input ?	3
	Answer b or c	
b	Implement XOR function using Mc-Culloch-Pitts neuron (consider binary Data) ?	6
c	Define network architecture and give its classifications?	6

P.T.O

Q.no.		Module 3	Marks
3.a	Explain the learning methods using in ANN ?		3
		Answer b or c	
b	Implement AND function using Perceptron network for bipolar inputs and targets ?		6
c	Find the new weight, using back-propagation network for the network shown in fig. The network is presented with the input pattern [1, -1] and the target output is +1. Use a learning rate of $\alpha = 0.3$ and bipolar sigmoidal activation function		



Q.no.		Module 4	Marks
4.a	Explain the selection methods using in genetic algorithm?		3
		Answer b or c	
b	Explain the convergence methods in genetic algorithm?		6
c	Using GA approach maximize the function $f(x) = X^2 (9X+5)$, using five bit(binary integer). Number of population is 6 for 2 generation. Use Roulette Wheel selection and Single point cross over. For mutation use flipping Method?		6

Q.no.		Module 5	Marks
5.a	State the limitation of neural network and fuzzy system when operated individually?		4
		Answer b or c	
b	What is the classification of neuro-fuzzy hybrid system? Explain in detail any one of the neuro-fuzzy hybrid system		8
c	Explain in detail the concepts of fuzzy genetic hybrid system?		8

P.T.O

Q.no.	Module 6	Marks
6.a	Explain the Properties of Genetic Neuro-Hybrid System?	4
	Answer b or c	
b	Explain the applications of neuro-fuzzy hybrid system?	8
c	Explain the Genetic Algorithm based Back Propagation Network (BPN)	8