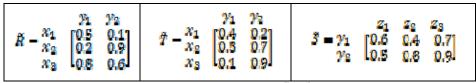
Seat No.:	Enrolment No.

## **GUJARAT TECHNOLOGICAL UNIVERSITY**

## **SEMESTER- 2 EXAMINATION - WINTER 2012**

Subject code: 640009 Subject Name: Soft Computing (SC) Time:10:30 – 13:00 Instructions:							Date: 11/01/2013				
							Total Marks: 7				
msı	1. 2.	Attempt all qu Make suitable Figures to the	assum	ptions v			ry.				
Q.1	(a)	<ul> <li>Answer the following questions:</li> <li>(i) What is artificial neural network? What are its characteristics?</li> <li>(ii) Define and differentiate weight and bias in neural network.</li> <li>(iii) Differentiate fuzzy logic and crisp logic? Define max-min composition in fuzzy.</li> </ul>								02 02 03	
	(b)	·							02 02		
		(iii) Explain bit	t-wise o	perator	s in GA					03	
Q.2	(a)	(i) List commonly used activation functions in neural network. 03							03 04		
	(b)	vectors $(1, -1, 1, -1)$ and $(1, 1, 1, -1)$ belong to class (target value $+1$ ); vectors $(-1, -1, 1, 1)$ and $(1, 1, -1, -1)$ do not belong to class (target value $-1$ ).							07		
	<b>(b)</b>	OR Explain the architecture of Back-propagation network with learning. 0								07	
Q.3	(a)	Explain training algorithm in Perceptron network with its architecture and 0' flowchart.								07	
	<b>(b)</b>	Construct a Maxnet with four neurons and inhibitory weight $Q = 0.25$ , given the								07	
		initial activations (input signals) as follows: $a_1(0) = 0.1$ $a_2(0) = 0.3$ $a_3(0) = 0.4$ $a_4(0) = 0.7$ OR									
Q.3								pattern given	07		
		oelow.	*	*	*	*	*	*			
			+	*	+	*	+	+			
			*	*	*	*	*	*			
				"I"			"C"				
			Target	Value:	(1, -1)	Targe	t Value:	(-1, 1)			
	<b>(b)</b>	State various ner diagram, explai applications.								07	
Q.4	(a)	Let $X = \{x_1, x_2, x_3\}$ $X \times Y$ and $\tilde{S}$ be a						l let 檱 be	e a relation on	07	

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Obtain  $\mathbb{A} \cup \mathbb{T}$ ,  $\mathbb{A} \cap \mathbb{T}$  and max-min composition  $\mathbb{A} \circ \mathbb{I}$  of two fuzzy relations.

**(b)** Explain fuzzy propositions and connectives with example.

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- **Q.4** (a) What is the need of defuzzification? Explain various defuzzification methods **07** with example.
- Q.4 (b) Explain the basic architecture of FLC and write steps involved in designing FLC.
- Q.5 (a) Why encoding is performed in genetic algorithm? Explain various encoding 07 methods with example.
  - (b) Explain Deletion and duplication, Deletion and Regeneration, Segregation 07 and Cross-over with Inversion operators with example in genetic modeling.

OR

- Q.5 (a) What is the need for cross-over operator in genetic modeling? Explain two-site, multi-site and uniform cross-over with example.
  - (b) State various reproduction methods used in genetic algorithm. Explain why or roulette-wheel selection method is modified in rank selection.

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