GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VII EXAMINATION – WINTER 2025

Subject Code: 3172009   **Date:01-12-2025**

Subject Name: Soft Computing

Time: 10:30 AM TO 01:00 PM   **Total Marks:70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Explain Importance of Soft Computing.	**03**
	(b)	Explain main component of soft computing.	**04**
	(c)	Explain architecture and application of fuzzy-neural system. Give advantages and disadvantages of the same.	**07**
Q.2	**(a)**	Differentiate hard computing and soft computing.	**03**
	(b)	Enlist and explain properties of fuzzy sets.	**04**
	(c)	Explain all methods of De-fuzzification.	**07**
		OR	
	(c)	Write short note on GA operators.	**07**
Q.3	**(a)**	Compare biological neuron with artificial neuron.	**03**
	(b)	Design mamdani fuzzy logic controller.	**04**
	(c)	List and Explain techniques of Supervised Learning Network.	**07**
		OR	
Q.3	**(a)**	State the merits and demerits of Kohonen Self-organizing feature maps.	**03**
	(b)	Explain McCulloch-Pitts Neuron model.	**04**
	(c)	List and explain techniques of Unsupervised Learning Network.	**07**
Q.4	**(a)**	Explain membership functions and its features	**03**
	(b)	Explain Hebb network neuron model.	**04**
	(c)	Explain the basic membership functions of fuzzy sets with a suitable example.	**07**
		OR	
Q.4	**(a)**	Enlist various types of learning methods in neural network.	**03**
	(b)	Explain genetic algorithm operator: Mutation.	**04**
	(c)	What are the evolution steps of genetic algorithm? Draw flow chart. Explain selection methods applied to genetic algorithm	**07**
Q.5	**(a)**	Compare Fuzzy Logic and Crisp Logic	**03**
	(b)	Explain term Reproduction in Genetic Algorithm.	**04**
	(c)	Distinguish between supervised and unsupervised learning network.	**07**
		OR	
Q.5	**(a)**	What is learning vector quantization.	**03**
	(b)	Write a short note on hybrid intelligent system.	**04**
	(c)	Explain any application of Genetic algorithm for single objective optimization problem.	**07**

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