Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3160619 Date:20-05-2024

Subject Name:Soft Computing Techniques

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)**	What do you understand by soft computing? Explain its characteristics.	**03**
	(b)	What is fuzzy logic? How is it different from binary logic?	**04**
	(c)	Write a detailed note on applications of soft computing	**07**
Q.2	**(a)**	Write a short note on fuzzy expert systems.	**03**
	(b)	Enlist and explain the properties of fuzzy sets	**04**
	(c)	Explain Defuzzification. Classify the different methods of defuzzification process.	**07**
		OR	
	(c)	Explain fuzzy inference. Describe the types of procedures used in fuzzy inference.	**07**
Q.3	**(a)**	Sketch the flowchart of Genetic algorithm	**03**
	(b)	Explain Mamdani's and Zadeh's interpretation of fuzzy rule.	**04**
	(c)	Write a note on: (i) Tournament selection (ii) Chromosomes	**07**
		OR	
Q.3	**(a)**	Explain the major components of Genetic Algorithm.	**03**
	(b)	Explain bit-wise operation in genetic algorithm.	**04**
	(c)	Define crossover? Explain different types of crossover techniques.	**07**
Q.4	**(a)**	Write a short note on character recognition using ANN.	**03**
	(b)	Define Encoding in Genetic algorithm. Describe the different encoding methods.	**04**
	(c)	Explain the working of a Back propagation neural network with a neat architecture.	**07**
		OR	
Q.4	**(a)**	Differentiate between supervised learning and unsupervised learning.	**03**
	(b)	Explain Hebbian learning with its flowchart.	**04**
	(c)	Define perceptron. Explain the learning rule of perceptron.	**07**

Q.5	**(a)**	Write the advantages of Genetic fuzzy hybrids.	**03**
	(b)	Elaborate Adaline network. Also discuss the applications of the Adaline network	**04**
	(c)	What is a neuro-fuzzy system? In which areas neuro fuzzy systems are useful?	**07**

OR

Q.5	**(a)**	Write the characteristics of Neuro genetic hybrids.	**03**
	(b)	List few applications of hybrid Fuzzy genetic algorithm systems.	**04**
	(c)	With suitable block diagram, explain the principle involved in a liquid level controller using neuro fuzzy technique.	**07**

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