PRN:		Course Code :	CST27072

Final Year B. Tech End Semester Examination Summer 2024

Soft Computing

Day and Date: 29 MAY 2024, wed Max Marks: **100**

Time : 10:30AM To 01:30PM Duration: **03** hrs

Instructions: All questions are compulsory.

			Marks	Bloom's Level	CO
Q.1		**Attempt the following**			
	a)	Explain the concept of computing systems. How do they form the backbone of modern technological infrastructure?	08	4	CO1
	b)	Explain the key characteristics of Soft computing. How do these characteristics differentiate it from traditional computing methods?	08	2	CO1
		OR			
	b)	Describe two applications of Soft computing techniques. Explain how these techniques are utilized in each application.	08	2	CO1
Q.2		**Attempt the following**			
	a)	Describe the key differences between fuzzy logic and traditional binary logic	08	2	CO2
	b)	Explain the union and intersection operations for fuzzy sets with suitable examples.	08	4	CO2
		OR			
	b)	Explain the process of converting a fuzzy set to a crisp set. Discuss any two methods used for this conversion.	08	4	CO2
Q.3		**Attempt any two from the following**			
	a)	Explain how inference mechanisms work in fuzzy logic systems. Provide an example to illustrate your explanation.	08	4	CO2
	b)	Discuss the structure and purpose of fuzzy if-then rules. Provide an example of a fuzzy if-then rule in the context of temperature control.	08	2	CO2
	c)	Describe the processes of Fuzzification and Defuzzification in a fuzzy logic system. Why are these processes important?	08	2	CO2
Q.4		**Attempt any two from the following**			
	a)	Explain the concepts of genetics and evolution. How these concepts are applied to probabilistic search techniques in genetic algorithms?	08	4	CO3
	b)	Explain the role of encoding, crossover, selection, and mutation in genetic algorithms. Provide examples to illustrate each operator.	08	4	CO3
	c)	Discuss the process of solving a single-objective optimization problem using genetic algorithms. Illustrate your answer with a step-by-step example.	08	2	CO3

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Q.5	**Attempt any Two of the following**				
	a)	Define multi-objective optimization problems (MOOPs). What are the key challenges in solving MOOPs?	09	2	CO3
	b)	Explain non-Pareto approaches to solve multi-objective optimization problems. Provide an example of such an approach	09	4	CO3
	c)	Describe two real-world applications where Multi-Objective Evolutionary Algorithms (MOEAs) have been effectively used. Explain the benefits achieved in these applications.	09	2	CO3
Q.6	**Attempt any Two of the following**				
	a)	Explain the basic concept of neural networks. How do they mimic the human brain?	09	4	CO4
	b)	Describe the steps involved in the simple implementation of an artificial neural network (ANN). Illustrate with an example	09	2	CO4
	c)	What is deep learning? How does it differ from traditional machine learning?	09	2	CO4

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