R22 Regulation *Subject code: 4P6FC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Regular Examinations, May 2025

SOFT COMPUTING

(IT)

Maximum Marks: 60 Date: 23.06.2025 Duration: 3 hours

Note:
1. **This question paper contains two parts A and B.**
2. **Part A is compulsory which carries 10 marks. Answer all questions in Part A.**
3. **Part B consists of 5 Units. Answer any one full question from each unit.**
4. **Each question carries 10 marks and may have a, b, c, d as sub questions.**

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	State one advantage of using Evolutionary Computing.	1M	CO1	2
b)	Why is flexibility important in Soft Computing?	1M	CO1	2
c)	How do fuzzy rule-based systems differ from traditional rule-based systems?	1M	CO2	2
d)	Which component of a fuzzy rule-based system performs defuzzification?	1M	CO2	1
e)	What are the two best positions used in PSO updates?	1M	CO3	1
f)	What is the meaning of "fuzzification" in decision making?	1M	CO3	2
g)	What is the purpose of the selection operator in GA?	1M	CO4	2
h)	What does mutation introduce in the genetic algorithm process?	1M	CO4	1
i)	Are rule induction methods deterministic or probabilistic in Rough Sets?	1M	CO5	1
j)	Why is hybridization of Soft Computing techniques beneficial?	1M	CO5	2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	Describe the various soft computing methods such as fuzzy logic, neural networks, and genetic algorithms. Highlight the purpose of each in problem-solving.	10M	CO1	2
	OR			
3	Evaluate the recent trends in soft computing such as deep learning, hybrid systems, or swarm intelligence. Discuss their impact on solving complex AI problems.	10M	CO1	5
4	Construct a fuzzy rule-based system to solve a decision-making problem such as loan approval or health risk prediction. Include fuzzy rules, membership functions, and inference.	10M	CO2	3
	OR			
5	Assess the effectiveness of fuzzy rule-based systems in handling vague and imprecise information. Provide case-based or domain-based examples.	10M	CO2	5

6	Explain the flow chart of particle Swam Optimization and explain the working of PSO algorithm.	10M	CO3	4
	OR			
7	Evaluate the effectiveness of fuzzy decision making in environments with incomplete or imprecise data. Use at least one domain-based example (e.g., healthcare or finance).	10M	CO3	5
8	Explain how these operators are used to evolve the population towards an optimal solution, including their properties.	10M	CO4	3
	OR			
9	Analyze the genetic algorithm cycle and explain how each step contributes to the convergence of the solution.	10M	CO4	4
10	Analize the process of rules induction in rough set.	10M	CO5	2
	OR			
11	Assess the effectiveness of integrating Soft Computing techniques like Rough Sets and Genetic Algorithms for solving a complex problem, such as medical diagnosis or credit scoring.	10M	CO5	5

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