



R22 Regulation

Subject code: 4P6FC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, November 2025

SOFT COMPUTING

(IT)

Maximum Marks: 60

Date: 13.11.2025

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)	List out two components of soft computing.	1M	CO1	1
b)	Name one technique used in soft computing to handle uncertainty	1M	CO1	1
c)	What is the range of the membership function in fuzzy sets?	1M	CO2	1
d)	How are fuzzy rules used in fuzzy systems?	1M	CO2	1
e)	Define defuzzification.	1M	CO3	1
f)	What is velocity in PSO?	1M	CO3	1
g)	List out the role of the crossover operator.	1M	CO4	1
h)	What is meant by "convergence" in GA?	1M	CO4	1
i)	Name the two main types of approximations in Rough Sets.	1M	CO5	1
j)	Which technique is based on natural evolution: GA or Fuzzy Logic?	1M	CO5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) Explain the main components of soft computing. b) Write a short note on Evolutionary Computing. Explain its working with an example.	5M 5M	CO1	2 2
OR				
3	a) Discuss any five applications of soft computing techniques in real-world systems. b) What are the characteristics of soft computing? Explain any five.	5M 5M	CO1	6 2
4	a) Write short notes on Fuzzy Relations and give an example. b) Explain any five applications of fuzzy logic in real-world systems.	5M 5M	CO2	2 3
OR				
5	a) Compare and contrast classical set theory and fuzzy set theory. b) Explain the structure and working of a Fuzzy Rule-Based System.	5M 5M	CO2	4 2
6	a) Discuss the role of membership functions in fuzzy decision making. Illustrate with examples. b) Compare PSO with Genetic Algorithms (GA) in terms of operators and performance.	5M 5M	CO3	6 3

	OR			
7	a) Write a short note on linguistic variables and fuzzy if-then rules. b) Illustrate with an example how a PSO algorithm finds the optimum solution in a search space.	5M 5M	CO3	1 3
8	Explain different types of crossover techniques used in Genetic Algorithms.	10M	CO4	2
	OR			
9	Discuss the use of Genetic Algorithms in machine learning or neural network training.	10M	CO4	6
10	Explain the concept of Rough Set Theory. Discuss the role of lower and upper approximations with examples.	10M	CO5	2
	OR			
11	Discuss real-world applications where integrated soft computing techniques have improved system performance. Provide examples.	10M	CO5	6