

2nd year

B. TECH. (MINOR) CBCS-2023
B. TECH. (MINOR) Semester-I (Sem-III Level) AI & DS : WINTER : 2024
SUBJECT: SOFT COMPUTING

Day : Thursday
Date : 19/12/2024

W-29442-2024

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Assume suitable data **WHEREVER** necessary.
- 4) Draw neat diagrams **WHEREVER** necessary.

Q.1 Compare and contrast Soft Computing with traditional computing approaches, (10) highlighting at least three key differences.

OR

Q.1 List the characteristics of Soft Computing techniques and provide examples of their (10) advantages in engineering applications.

Q.2 Explain the concept of bias and threshold in an artificial neuron and its importance (10) in determining the output.

OR

Q.2 Compare the different topologies of neural networks and discuss their importance (10) in network design.

Q.3 Explain the k-means clustering algorithm and its application in the context of (10) unsupervised learning.

OR

Q.3 Discuss Cover's Theorem and its significance in the design of Radial Basis Function (10) Networks (RBFNs).

Q.4 Differentiate between the biological concepts of parent, child, chromosome, and (10) mutation, and their counterparts in genetic algorithms.

OR

Q.4 Discuss the concept of robustness in genetic algorithms. How does it influence the (10) search for solutions?

Q.5 Compare the exploration and exploitation capabilities of Particle Swarm (10) Optimization (PSO) and Differential Evolution (DE) in terms of their search strategies.

OR

Q.5 Describe the Simulated Annealing (SA) algorithm. Explain how temperature (10) scheduling helps in avoiding local minima and improving the global search.

Q.6 Distinguish between continuous and discrete fuzzy set theory. Provide examples for (10) each.

OR

Q.6 Explain fuzzy membership functions and their importance in fuzzy set theory. (10)
