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, highlighting at least three key differences. **(10)**

OR

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

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

OR

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

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

OR

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

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

OR

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

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

OR

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

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

OR

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

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