BCA   (Sem.–5)

SOFT COMPUTING

Subject Code : BTEC-909D-18
M.Code : 93169
Date of Examination : 19-12-22

Time : 3 Hrs.   **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.**

SECTION-A

1. **Write briefly :**

   a) Define Fuzzy Cartesian product.

   b) Differentiate Non-crisp set and Crisp set?

   c) Define Cross Over Rate.

   d) Define swarm intelligence.

   e) What is SOM Network?

   f) Distinguish between Supervised learning and Unsupervised learning?

   g) What is ant based routing?

   h) What is the importance of hybrid GA's?

   i) Draw the sketch for artificial neuron.

   j) Write some advantages of Genetic Algorithm over conventional algorithms?

SECTION-B

2. a. What are the types of soft computing? Write the advantages and disadvantages of each type.

    b. Write training algorithm for Perception. Also, implement AND function using-perception networks for bipolar inputs and targets.

3. a. Define fuzzy logic and consider two fuzzy sets A and B

$$A = \frac{0.2}{1} + \frac{0.3}{2} + \frac{0.4}{3} + \frac{0.5}{4} \qquad\qquad B = \frac{0.1}{1} + \frac{0.2}{2} + \frac{0.2}{3} + \frac{1}{4}$$

    Perform union, intersection, complement and Algebraic sum.

    b. Explain in detail the applications of neural networks in character recognition.

4. What is particle swarm optimization? Explain the algorithm in detail.

5. Differentiate between

    a) Particle Swarm optimization and Binary vector optimization.

    b) Genetic Neuro Hybrid Systems and Genetic Fuzzy Hybrid Systems.

6. a) Discuss in detail the various selection techniques used in Genetic Algorithms and highlight the application areas where these techniques are applied.

    b) What is (are) the stopping criteria used while executing GA? How GA is useful for solving non-linear optimization problems? Explain.

7. **Explain briefly:**

    a) Rule based structure identification

    b) Data clustering algorithms

    c) Flock of birds algorithm

    d) Regression Trees.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.