(6 Pages) **Reg. No. :** .....

Code No. : 6395 **Sub. Code : PCSM 32**

M.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2021

Third Semester

COMPUTER SCIENCE — CORE

SOFT COMPUTING

(For those who joined in July 2017 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answers :

1. Which controls the amount of weight adjustment at each step of training

   (a) Bias

   (b) Threshold

   (c) Learning rate

   (d) Vigilance parameter

2. If $f(x)$ is defined as $f(x) = \begin{cases} 1 \text{ if } x > \theta \\ x \text{ if } 0 \le x \le 1 \\ 0 \text{ if } x < \theta \end{cases}$, then it is

(a) Binary step function

(b) Bipolar step function

(c) Linear function

(d) Ramp function

3. The three states of each unit in F2 layer in ART network are

(a) Active, inactive, inhibited

(b) Active inactive, prohibited

(c) Active, control, inhibited

(d) Active, dead, prohibited

4. The Adaline network is trained using ————

(a) Hebb rule (b) Linear rule

(c) Gradient rule (d) Delta rule

5. ———— is the process of transforming a crisp set to fuzzy set.

(a) Intuition (b) Rank ordering

(c) Fuzzification (d) Defuzzification

6. Which one is not a fuzzy set operation?

(a) Union (b) Involution

(c) Intersection (d) Complement

7. ———— is a composition operation.

(a) Max_Product (b) Max_add

(c) Min_product (d) Min_add

8. An interval closed at left end and opened at right end is represented as

(a) $[a_1, a_2] = \{x \mid a_1 \leq x \leq a_2\}$

(b) $[a_1, a_2) = \{x \mid a_1 \leq x < a_2\}$

(c) $(a_1, a_2] = \{x \mid a_1 < x \leq a_2\}$

(d) $(a_1, a_2) = \{x \mid a_1 < x < a_2\}$

9. The set of all possible alleles present in a particular form is a ————

(a) alleles (b) genome

(c) genepool (d) locus

10. Proportionate based selection selects individuals based on their ————

(a) Population size (b) Fitness value

(c) Rank (d) Alleles

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 250 words.

11. (a) Explain training algorithm of hebb network.

Or

(b) Discuss any five activation functions.

12 (a) Explain how to train pattern association with hebbrule.

Or

(b) Write a short note on Hamming network.

13. (a) State and explain properties of fuzzy sets.

Or

(b) Briefly explain any five defuzzification methods.

14. (a) Explain the various mathematical operations performed on intervals.

Or

(b) Write the steps in multiobjective decision making.

15. (a) Write short notes on selection operation.

Or

(b) How the behaviour of GA is formulated with schema theorem?

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 600 words.

16. (a) What are the basic types of neuron connection architecture? Explain in detail.

Or

(b) Give training and testing algorithm for back propagation network.

17. (a) Give an account on discrete hopfield network.

Or

(b) With neat architecture explain training algorithm of ART network.

18. (a) State and explain the operations and properties of classical relation.

Or

(b) Discuss Lambda cuts for fuzzy sets and fuzzy relations.

19. (a) Explain the methods of fuzzy inference systems.

Or

(b) Explain the architecture and operations of fuzzy logic control system.

20. (a) Give an account on crossover and mutation operations.

Or

(b) Explain adaptive genetic algorithms in detail.

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