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

Code No. : 7923 **Sub. Code : PCSM 32**

M.Sc.(CBCS) DEGREE EXAMINATION,
NOVEMBER 2019.

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 answer:

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

   (a) Binary step function

   (b) Bipolar step function

   (c) Linear function

   (d) Ramp function

2. The Adaline network is trained using_____

   (a) Delta rule (b) Linear rule

   (c) Gradient rule (d) Hebb rule

3. The activation function used in Hopfield network is _____

   (a) Linear (b) Bi-polar

   (c) Ramp (d) Sigmoid

4. In SOM, the learning the α is updated using

   (a) $\alpha(t+1) = 0.5\alpha(t)$

   (b) $\alpha(t) = 0.5\alpha(t+1)$

   (c) $\alpha(t) = 0.25\alpha(t+1)$

   (d) $\alpha(t+1) = 0.25\alpha(t)$

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

   (a) Intuition (b) Rank ordering

   (c) Fuzzification (d) Defuzzification

6. _____ is an extension and generalization of the basic concepts of crisp sets.

   (a) classical set (b) classical relation

   (c) fuzzy set (d) fuzzy relation

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7. The data set represented as $[a1, a2) = \{x | a1 \leq x < a2\}$ is

(a) a closed interval

(b) an interval closed at left end and open at right end.

(c) an interval open at left end and closed at right end.

(d) an open interval.

8. A_____ is a variable of a higher order than a fuzzy variable and its values are taken to be fuzzy variable.

(a) Implicit variable

(b) Predicate variable

(c) Aggregate variable

(d) Linguistic variable

9. Fitness function is used to _____

(a) recombine the population's genetic material

(b) introduce new genetic structures in the population.

(c) modify the population's genetic material.

(d) determine the best individual in a population

10. _____ is the process of taking two parent solutions and producing a child from them.

(a) Crossover (b) Mutation

(c) Pruning (d) Reproduction

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 250 words

11. (a) Explain the three types of learning in detail.

Or

(b) Explain Perceptron training algorithm for single output classes.

12. (a) Write activation function and testing algorithm for Discrete Bidirectional Associative Memory

Or

(b) Explain how LVQ nets are trained.

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

Or

(b) Write short notes on Lamda-cuts for fuzzy sets.

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14. (a) Briefly Explain fuzzy proposition.

Or

(b) Write short notes on control system design.

15. (a) Explain the purpose of Messy genetic algorithm.

Or

(b) Write short notes on crossover operation.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 600 words

16. (a) Describe Multiple Adaptive Linear neurons in detail.

Or

(b) State and explain some important terminologies of ANN.

17. (a) Give an account on Auto associative memory network.

Or

(b) With neat architecture explain training algorithm used in ART 1 network.

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

Or

(b) Discuss the methods for assigning membership values to fuzzy variables.

19. (a) Explain Fuzzy arithmetic in detail.

Or

(b) Discuss the various paradigms available for fuzzy decision making.

20. (a) Explain how Travelling salesman problem is optimized using Genetic algorithm approach.

Or

(b) Give an account on Encoding and selection operation.

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