

(6 pages)

Reg. No. : .....

Code No. : 7473

Sub. Code : ZCSM 32

M.Sc. (CBCS) EXAMINATION, NOVEMBER 2023.

Third Semester

Computer Science – Core

SOFT COMPUTING

(For those who joined in July 2021-2022 onwards )

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. \_\_\_\_\_ Describes a class of problems that involves using a model to extract relationships in data
- (a) Supervised Learning
  - (b) Unsupervised Learning
  - (c) Reinforcement Learning
  - (d) Both (b) and (c)

2. What is an Activation Value?

- (a) Weighted sum of inputs
- (b) threshold value
- (c) main input to neuron
- (d) none of the above

3. Perception networks comes under

- (a) single layer - feed-forward network
- (b) multi-layer-feed-forward network
- (c) single-layer-feed-backward n/w
- (d) single layer network

4. A network with single linear unit is called

- (a) Madaline network
- (b) Adaline Network
- (c) Hebb Network
- (d) Perception network

5. Fuzzy logic variable may have a truth value that ranges between

- (a) 0 and 1
- (b) 0.5 and 1
- (c) 0 and 9.9
- (d) 0 and 1 and 0.5 and 1

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6. A relation is said to be \_\_\_\_\_ if every vertex (node) in the graph originates a single loop

- (a) Symmetry (b) reflexivity  
(c) transitivity (d) asymmetry

7. Which of the following is associated with fuzzy logic?

- (a) Crisp set logic (b) Many-valued logic  
(c) Two-valued logic (d) Binary set logic

8. Which of the following fuzzy operators are utilized in fuzzy set theory?

- (a) AND (b) OR  
(c) NOT (d) All the above

9. The set of all the genes of a species is called \_\_\_\_\_

- (a) genome (b) DNA  
(c) akelās (d) genes

10. The same genetic information is copied to new offspring

- (a) Mitosis (b) Meiosis  
(c) DNA (d) Chromosome

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PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Define ANN? List out the advantages of Neural Network.

Or

(b) Describe Biological Neural Network.

12. (a) Write the Testing Algorithm of Perception Network.

Or

(b) Describe the Hebb rule with neat flowchart.

13. (a) Consider the following two fuzzy sets

$$A = \left\{ \frac{0.3}{X1} + \frac{0.7}{X2} + \frac{1}{X3} \right\} \text{ and } B = \left\{ \frac{0.4}{y1} + \frac{0.9}{y2} \right\}$$

Perform the Cartesian product over these given Fuzzy Sets.

Or

(b) Choose and explain any two Defuzzification methods.

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14. (a) Illustrate any five categorical Reasoning in Fuzzy Reasoning.

Or

- (b) Illustrate the Mamdani Fuzzy Inference System.
15. (a) Construct the flowchart for General Genetic Algorithm with details.

Or

- (b) Choose and Write any Five Applications of Genetic Algorithm.

PART C — ( $5 \times 8 = 40$  marks)

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

Each answer should not exceed 600 words.

16. (a) Design a Hebb net to implement Logical AND function (use bipolar inputs and targets)?

Or

- (b) Explain McCulloch-Pitts Neuron.

17. (a) Illustrate Kohonen self-organizing feature Maps.

Or

- (b) Illustrate Multiple Adaptive Linear Neuron.

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18. (a) Describe the methods of membership value assignments.

Or

- (b) What are the DeFuzzification methods? Explain.

19. (a) Construct the structure of fuzzy production system.

Or

- (b) Write Fuzzy arithmetic with example.

20. (a) Explain any two Classification of Genetic Algorithm.

Or

- (b) Explain Various operators in Genetic Algorithm.

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