No. of Printed Pages : **1**

21CSC4E4BL

Sl. No.

M.Sc. IV Semester Degree Examination, October - 2023

COMPUTER SCIENCE

Soft Computing

(NEP)

Time : 3 Hours Maximum Marks : 70

Note : *Answer* ***any five*** *questions. Q.No.* ***1*** *is* ***compulsory****.*

1. (a) What is supervised learning ? Compare supervised and unsupervised learning. **7**
(b) Describe McCulloch and Pitts neuron model. **7**

2. (a) What is associative memory ? Explain auto-associative memory. **7**
(b) What is backpropagation ? What is need of hidden layers ? **7**

3. (a) What is approximate reasoning ? Explain Compositional rule of inference. **7**
(b) What is linguistic variable ? Explain fuzzy if-then-rules **7**

4. (a) Describe fitness function. **7**
(b) What is Genetic algorithm ? Explain GA steps with flowchart. **7**

5. (a) Explain neuro-fuzzy systems. **7**
(b) Describe GA in fuzzy logic controller design. **7**

6. (a) Explain the algorithm steps involved to solve any one of the optimization problem using Hopfield Neural Network. **7**
(b) Consider two fuzzy sets A and B. **7**

$$A = \left\{\frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5}\right\} \quad B = \left\{\frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5}\right\}$$

(i) $A \cup B$
(ii) $A \cap B$
(iii) Component of fuzzy set A
(iv) Difference (A/B)
(v) Algebraic sum of given fuzzy sets

7. (a) Explain following operator : **7**
(i) Selection operator
(ii) Matrix crossover
(b) What is Hybrid system ? List classification of Hybrid system. **7**

8. Write short notes :
(a) Stability analysis of NN interconnected systems **5**
(b) Adaline and Madaline networks **5**
(c) Mutation operator **4**

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