

(3 Hours)

Max. Marks: 80



- N.B.:** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **Three** questions out of remaining **Five** questions.
 (3) **Figures** to the **right** indicate **full** marks.
 (4) Assume suitable data if **necessary**.

Q.1 Answer the following:

[20]

- A) List different Functions of Selection operator? List different techniques to implement selection in Genetic Algorithms.
 B) What are defuzzification methods in fuzzy logic? Explain any one with example.
 C) Compare and contrast: ANN, Fuzzy Logic and GA.
 D) What are the different properties of fuzzy sets?

Q.2 A) The characteristics of the laundry load (inputs) include: The actual weight, fabric types and amount of dirt. The washing parameters (outputs) include: amount of detergent, washing time, agitation, water level and temperature. The cleaner laundry, conserving water, and saving detergent, electricity, time and money needs controlling the above different parameters. Give the initial stage of designing a fuzzy control for a hypothetical washing machine. [10]

Q.2 B) Write back propagation algorithm. Explain how it minimizes the error function. [10]

Q.3 A) What are the different types of artificial neural networks? Explain any two with diagram. [10]

Q.3 B) What is associative memory? Explain how the pattern is represented as a key and retrieve the values associated with that pattern. [10]

Q.4 A) Design Hebb net to implement logical AND function? Use bipolar inputs and targets. [10]

Q.4 B) What are Neuro-Fuzzy Systems? Explain different steps in Neuro Fuzzy Hybrid system. [10]

Q.5 A) What is linear separability? Explain with example why single layer perceptron is not capable of solving linearly inseparable problems. [10]

Q.5 B) Explain McCulloch Pitts neuron model with example. [10]

Q.6 Answer the following:

[20]

- A. Delta Learning Rule
 B. Binary Hopfield Network
 C. GA-Fuzzy approach
 D. Competitive Learning

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