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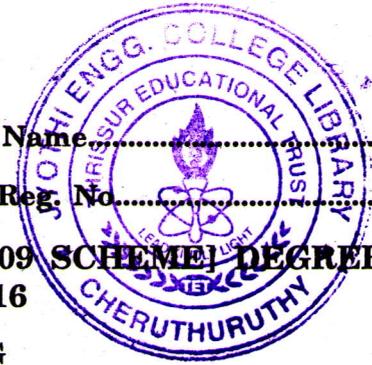
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Name

Reg. No.

SEVENTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE
EXAMINATION, NOVEMBER 2016

CS 09 706 L19—SOFT COMPUTING



Time : Three Hours

Maximum : 70 Marks

Part A

- I. (a) Mention the role of fitness function in GA and what are the requirements of GA.
(b) Define learning rate with respect to neural networks. What is its function ?
(c) What is associative memory ? Explain its types.
(d) Consider a fuzzy sets given by $M = \left\{ \frac{1}{low} + \frac{0.2}{medium} + \frac{0.5}{high} \right\}$. Find α -cut and strong α -cut of M.
(e) What are the three conceptual components of the basic structure of a fuzzy inference system?
(5 × 2 = 10 marks)

Part B

- II. (a) What is inversion ? Explain the various types of inversion.
(b) Describe the different activation functions used in ANN.
(c) Explain the Competitive learning network with an example.
(d) Explain fuzzy relations and composition techniques.
(e) Briefly explain the Darwinian principles of natural selection with respect to Evolutionary Computation
(f) Mention the advantages of Swarm Intelligence.
(4 × 5 = 20 marks)

Part C

- III. (a) Summarize the sequential procedures involved in the cross over and reproduction phase of GA with typical example.

- Or

- (b) Maximize the function $f(x) = x^2$ where $0 < x < 31$ using genetic algorithm.

- IV. (a) State and explain Perceptron Convergence Theorem.

Or

- (b) Draw the architecture and explain the algorithm of Back Propagation Network.

Turn over

V. (a) Given two fuzzy sets :

$$A = \left\{ \frac{1}{1.0} + \frac{0.75}{1.5} + \frac{0.3}{2.0} + \frac{0.15}{2.5} + \frac{0}{3.0} \right\}$$

$$B = \left\{ \frac{1}{1.0} + \frac{0.6}{1.2} + \frac{0.2}{2.0} + \frac{0.1}{2.5} + \frac{0.2}{3.0} \right\}$$

Find the following :

(a) $A \cup B$.

(b) $A \cap B$.

(c) \bar{A} .

(d) \bar{B} .

(e) $A | B$.

(f) $\overline{A \cup B}$.

(g) $\overline{A \cap B}$.

(h) $A \cup \bar{A}$.

(i) $A \cap \bar{A}$.

(j) $B \cup \bar{B}$.

(k) $B \cap \bar{B}$.

Or

(b) Draw the block diagram of a fuzzy logic control system and explain.

VI. (a) Explain the classification using support Vector-Machine.

Or

(b) Explain Harmony Search Algorithm for optimization.

(4 × 10 = 40 marks)