Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MCTA - 201

M.E./M.Tech., II Semester

Examination, June 2016

Soft Computing

Time : Three Hours

Maximum Marks : 70

Note : i) Total number of questions eight.
ii) Attempt any five questions.

1. a) What is Neural Networks? Briefly describe any five learning methods of Neural Networks. 7
   b) Explain Biological model of artificial neuron. Compare ANN with human brain. 7

2. a) Describe back propagation learning techniques. Discuss learning rule for the hyperbolic tangent activation function with necessary derivations. 7
   b) Explain the following: 7
      i) Supervised and unsupervised learning
      ii) Kohen's self organizing networks 7

3. a) Discuss various operations of fuzzy sets and fuzzy preposition with example. 7
   b) The task is to recognize English alphabetical characters (F, E, X, Y, I,T) is an image processing system. Define two fuzzy sets I and F
      I = {(F, 0.4), (E, 0.3), (X, 0.1), (Y, 0.1), (I,0.9), (T, 0.8)}
      F = {(F, 0.99), (E, 0.8), (X, 0.1), (Y, 0.2), (I, 0.5), T(0.5)}
      Find the following:
      i) $I \cup F$
      ii) $I - F$
      iii) $F \cup F^c$ 7

4. a) Let X = {a, b, c, d} Y = {1, 2, 3, 4} and
      A = {(a, 0), (b, 0.8), (C, 0.6), (d, 1)}
      B = {(1, 0.2), (2, 1), (3, 0.8), (4, 0)}
      C = {(1,0), (2, 0.4), (3, 1), (4, 0.8)}
      Determine the implication relations:
      i) If X is A then Y is B.
      ii) If X is A then Y is B Else Y is C. 10
   b) Discuss in brief the centroid method and COS method of Defuzzification. 4

5. a) Given two relations R and S be defined on the sets {1, 3, 5} * {1, 3, 5} where
      R:{(x,y)/y = x+2}, S:{(x,y)/x< = y}
      R = {(1, 3), (3, 5)}, S = {(1, 3), (1, 5), (3, 5)}
      Represent relation matrices and find the composition ROS. 7
   b) What is fuzzy ART MAP? Draw and explain its architecture. Also explain its working. 7

6. a) What is Genetic algorithm? How it is different from traditional algorithm? 7
   b) Write GA term of the following biological terms: 7
      i) Substring ii) Gene
      iii) Generation iv) Population
      v) Chromosome

7. a) Give classification of optimization techniques. 7
   b) What are reproduction crossover and mutation operators in GA? Explain. 7

8. Write short notes on the following (any four): 14
   i) AI search algorithm
   ii) Evolutionary computations
   iii) Semantic network
   iv) Overview of MATLAB
   v) Soft computing v/s Hard computing

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