CLASS: MCA   SEMESTER : III
BRANCH: MCA   SESSION : MO/18

SUBJECT: MCA7309 SOFT COMPUTING

TIME: 3 HOURS   FULL MARKS: 60

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a) Explain why the law of contradiction and law of excluded middle are violated in fuzzy set theory under   [6]
        the standard fuzzy set operations. What is the significance of this?
Q.1(b) Let A and B be two fuzzy set defined as   [6]
        $A = .5/x_1 + .4/x_2 + .1/x_3 + .8/x_4 + 1/x_5$
        $B = .9/x_1 + .1/x_2 + .9/x_3 + 1/x_4 + .5/x_5$
        Find (a) $A \cap B$, (b) B –A, (c) $A \cup B$ (d) S(A,B) (e) $^{.5}(A)$, (f) d(A,B)

Q.2(a) Explain the following   [6]
           (i) Fuzzy cardinality of a fuzzy set
           (ii) Plasusibility Measure
Q.2(b) Let A and B be two fuzzy numbers defined as   [6]
        $A(x) = \begin{cases} 0 & \text{for } x< -2 \text{ and } x > 4 \\ (x+2)/3 & \text{for } -2 \leq x \leq 1 \\ (4-x)/3 & \text{for } 1 \leq x \leq 4 \end{cases}$
        $B(x) = \begin{cases} 0 & \text{for } x < 1 \text{ and } x > 3 \\ (x-1) & \text{for } 1 \leq x \leq 2 \\ (3-x) & \text{for } 2 \leq x \leq 3 \end{cases}$
        Find i. MIN(A,B)(x)
              ii. MAX(A,B)(x)

Q.3(a) What are different fuzzy propositions? Illustrate with examples.   [6]
Q.3(b) What is Mean of Maxima method of defuzzification? Explain.   [6]

Q.4(a) What is encoding in Genetic Algorithm? Explain with examples.   [6]
Q.4(b) Explain the following   [6]
        1. Rank Selection
        2. Boltzman Selection

Q.5(a) Explain the utility of fitness function GA with example.   [6]
Q.5(b) What is Genetic Algorithm cycle? Elaborate the reasons for stopping condition of Genetic Algorithm   [6]
        flow.

Q.6(a) Compare and contrast biological neuron and artificial neuron.   [6]
Q.6(b) Compare feed-forward and feedback network.   [6]

Q.7(a) What is Madaline? Draw the model of Madaline network?   [6]
Q.7(b)   [6]
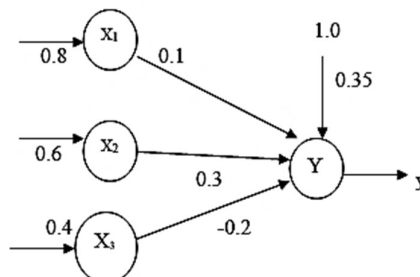
        Obtain the output of the neuron Y for the network shown in above figure using (i) binary sigmoidal
        and (ii) bipolar activation function.