Registration No. :

Total number of printed pages – 2

Seventh Semester Examination – 2013

PRINCIPLES OF SOFT COMPUTING

BRANCH : IT

QUESTION CODE : C-252

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory and any **five** from the rest.*
The figures in the right-hand margin indicate marks.

1. Answer the following questions :   2 ×10

    (a) What is soft computing and how does it differ from hard computing ?

    (b) What are the characteristics of ANN ?

    (c) What are the types of neural network ?

    (d) What is Squash Function ?

    (e) What do you mean by gradient descent learning method ?

    (f) What is perceptron ?

    (g) A 4-input neuron has weights 1, 2, 3, 4. The transfer function is linear with constant probability being equal to 2. The inputs are 4, 10, 5 and 20 respectively. What is the output ?

    (h) What are the different selection mechanisms in GA ?

    (i) What is MOM defuzzification technique ?

    (j) What is Roulette-Wheel Selection ?

2. (a) Explain the neural network architecture with suitable example.   5

    (b) Describe the different types of learning methods in neural network.   5

3. (a) What is Madaline network ? Explain with diagram a Madaline network to solve the XOR problem.   5

    (b) Compare and contrast between MLP and RBFN with example.   5

P.T.O.

4. (a) Write the step by step procedure of Back Propagation algorithm.   5

    (b) What is Kosko's BAM ? Explain the working of Kosko's BAM considering
         N = 3, with pattern pairs given by,

         A1 = (100001) B1 = (11000)

         A2 = (011000) B2 = (10100)

         A3 = (001011) B3 = (01110)   5

5. (a) What is crisp set ? Explain the operations on crisp set.   5

    (b) Define predicate logic. Interpret the following predicate logic formulae :   5

         (i) $\forall x\, P(x)$

         (ii) $\exists x\, P(x)$, where the domain D = (1, 2) and

               <u>P(1)</u>   <u>P(2)</u>

               True   False

6. (a) Explain genetic operators and fitness function in respect of evolutionary
         computing.   5

    (b) Discuss single site cross-over in genetic modelling.   5

7. (a) What is a hybrid system ? Explain, in detail, sequential hybrid system and
         auxiliary hybrid system.   5

    (b) Explain Genetic algorithm based Back Propagation network with example.

                                                                             5

8. Explain the following terms in brief :   2.5 × 4

    (a) Adaptive Resonance Theory

    (b) Defuzzification methods

    (c) Perceptron

    (d) Soft Computing Tools.