B.TECH
(SEM III) THEORY EXAMINATION 2017-18
INTRODUCTION TO SOFT COMPUTING

Time: 3Hours   *Max. Marks: 70*

Note: Attempt all Sections. Assume missing data, if any.

SECTION A

1.   **Attempt *all* questions in brief.**   2 x 7 = 14

   a)   What do you mean by Soft Computing?
   b)   Explain Binary Encoding in Genetic Algorithm.
   c)   What is a fuzzy number?
   d)   Why do we use a Mutation in Genetic Algorithm?
   e)   What is the difference between Crisp set and Fuzzy set?
   f)   Write benefits of Genetic Algorithm.
   g)   Which Neural Network Architecture is used for on line spell checking?

SECTION B

2.   **Attempt any *three* of the following:**   7 x 3 = 21

   a)   Write various steps of the Back Propagation Algorithm.
   b)   Draw and explain the multiple perceptions with its learning algorithm.
   c)   Explain the membership function in detail.
   d)   Draw a single layer feed forward network and explain its working functions.
   e)   Define Classical Set and Fuzzy Set in detail.

SECTION C

3.   **Attempt any *one* part of the following:**   7 x 1 = 7

   a)   What is Hetro-Associative Memory? Describe in context of Neural Network
   b)   If the net input to an output neuron is 0.64, calculate its output when the activation function is
         I. Binary sigmoidal, assume $\lambda = 1$
         II. Bipolar sigmoidal, assume $\lambda = 1$

4.   **Attempt any *one* part of the following:**   7 x 1 = 7

   a)   Explain the topology and learning in Bidirectional Associative memory.
   b)   Discuss various learning techniques in detail with suitable example.

5.   **Attempt any *one* part of the following:**   7 x 1 = 7

   a)   What are the disadvantages of Fuzzy control? And what are the disadvantages of Neural Network control?
   b)   Which is the most common radial basis function? Explain that function.

6. **Attempt any *one* part of the following:**   7 x 1 = 7

   a)   Differentiate Single Layer Perception method & Multilayer Perception method.
   b)   Draw a flow chart & Genetic Algorithm and also explain its working principles.

7. **Attempt any *one* part of the following:**   7 x 1 = 7

   a)   What are the Genetic Operators? What is the role of genetic operators in Genetic Algorithm?
   b)   Explain the following terms:
        (i) Fuzzy Arithmetic
        (ii) Fuzzy relations.