



**AF-3584**

M.Sc. (Final)  
Term End Examination, 2017-18

**COMPUTER SCIENCE**

Paper - V

Soft Computing Techniques

*Time : Three Hours] [Maximum Marks : 100*  
*[Minimum Pass Marks : 36*

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**Note** : Answer **all** questions. All questions carry equal marks.

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**Unit-I**

1. (a) Define the term Soft Computing and explain the different tools of soft computing.
- (b) Differentiate Soft Computing with Hard Computing.

**OR**

( 2 )

Compute the different tools of Soft Computing according to its characteristics.

### **Unit-II**

2. (a) Draw simple single layer neural network architecture and explain its various parts.
- (b) What do you understand by linear separable problem ? Explain with suitable example.

***OR***

- (a) Differentiate supervised learning with unsupervised learning.
- (b) Write Kohonen learning algorithm in detail.

### **Unit-III**

3. (a) Explain the different operations of Fuzzy set.
- (b) Consider two Fuzzy sets as given below:

$$A = \left\{ \frac{0.2}{\text{train}} + \frac{0.5}{\text{bike}} + \frac{0.3}{\text{boat}} \right\}$$

$$B = \left\{ \frac{1}{\text{train}} + \frac{0.2}{\text{bike}} + \frac{0.4}{\text{boat}} \right\}$$

Find out the following :

- (i)  $A \cup B$
- (ii)  $A \cap B$
- (iii) Proof De Morgan's Law

***OR***

### ( 3 )

- (a) What are the various properties of Fuzzy set ?
- (b) Define Fuzzy relation. Explain the various operations of Fuzzy relation.

### **Unit-IV**

- 4. (a) Explain the various encoding methods of Genetic algorithm.
- (b) Write Pseudocode of basic genetic algorithm along with flow chart.

### **OR**

- (a) What is the role of Crossover probability and mutation probability ? Explain with suitable example.
- (b) Write short note on the application of genetic algorithm.

### **Unit-V**

- 5. (a) What do you understand by hybrid soft computing ? Write the names of atleast two hybrid soft computing models.
- (b) Write the steps of creating a neural network model using any GUI of MATLAB.

### **OR**

Draw the architecture of ANFIS and explain the purpose of each layer in detail.

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