PAPER ID-311110

**Roll No:**

**BTECH**
**(SEM V) THEORY EXAMINATION 2023-24**
**APPLICATION OF SOFT COMPUTING**

**TIME: 3 HRS**                                                                 **M.MARKS: 100**

**Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.

### SECTION A

**1.     Attempt *all* questions in brief.**                                **2 x 10 = 20**

| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | Explain neuron with its structure. | 2 | 1 |
| b. | Define an artificial neural network. | 2 | 1 |
| c. | Draw diagram for multilayer perceptron model. | 2 | 2 |
| d. | Discuss the different features of single layer perceptron. | 2 | 2 |
| e. | Explain roles of crisp sets. | 2 | 3 |
| f. | Write a difference between crisp and fuzzy set. | 2 | 3 |
| g. | List basic fuzzy set operations. | 2 | 4 |
| h. | Explain fuzzy relations. | 2 | 4 |
| i. | Define genetic algorithm. | 2 | 5 |
| j. | List different types of encoding in genetic algorithm. | 2 | 5 |

### SECTION B

**2.     Attempt any *three* of the following:**                            **10 x 3 = 30**

| a. | Explain about activation function with its use in neuron model. | 10 | 1 |
|---|---|---|---|
| b. | Explain how linear separable task is defined for two dimensional spaces? Discuss XOR problem. | 10 | 2 |
| c. | Explain all fuzzy set properties. | 10 | 3 |
| d. | Verify De morgan's Law using truth table for three states. | 10 | 4 |
| e. | Explain different methods of selection in genetic algorithm in order to select a population for next generation. | 10 | 5 |

### SECTION C

**3.     Attempt any *one* part of the following:**                         **10x1=10**

| a. | Draw a single layer feed forward network and explain its working function. | 10 | 1 |
|---|---|---|---|
| b. | Explain working of recurrent network and compare with multilayer neural network. | 10 | 1 |

**4.     Attempt any *one* part of the following:**                         **10x1=10**

| a. | Explain McCulloch -Pitts model and write disadvantage of it. | 10 | 2 |
|---|---|---|---|
| b. | Draw a network for solving exclusive OR problem. | 10 | 2 |

**5.     Attempt any *one* part of the following:**                         **10x1=10**

| a. | Define the membership function and state its importance in fuzzy logic. Also discuss the features of membership functions. | 10 | 3 |
|---|---|---|---|
| b. | Explain two important inferring procedures. | 10 | 3 |

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**6.**    **Attempt any *one* part of the following:**                     **10x1=10**

| | | | |
|---|---|---|---|
| a. | Explain in brief different attributes of predicate logic | 10 | 4 |
| b. | Define fuzziness of fuzzy set and what is a fuzzy function? | 10 | 4 |

**7.**    **Attempt any *one* part of the following:**                     **10x1=10**

| | | | |
|---|---|---|---|
| a. | Discuss about the genetic operators. What are the roles of genetic operators in GA? | 10 | 5 |
| b. | Explain why mutation is done in genetic algorithm? Explain types of mutation. | 10 | 5 |