**ABES Engineering College, Ghaziabad**

# B. Tech Odd Semester Make-Up Test

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| Course Code: KCS 056 | Roll No.: |
| Course Name: Application of Soft Computing | Date of Exam: |
| Maximum Marks:100 | Time: |

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**Instructions:**

1. **Attempt All sections.**
2. **If require any missing data, then choose suitably.**

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| **Q. No.** | **Question** | **Marks** | **CO** | **KL** | **PI** |
| **Attempt All Questions Total Marks: 10\*10= 100** | | | | | |
| **1a)** | **Train a heteroassociative network to store the given bipolar input s= (*s1 s2 s3 s4*) to the output vector t = (t1 t2). The bipolar vector pairs are given in table below (use outer product method) also test the network.** | **5+5** | **CO1** | K3 |  |
| **1b)** | **Discuss the activation function and its different types. State the use of activation function in Artificial Neural Network** | **5+5** | **CO1** | K2 |  |
| **2a)** | **Calculate the total error at the end of the network given below. Back propagate this error to the outer layer and calculate new value of w5, w6, w7, w8. Use Binary Sigmoidal Activation fn. Learning rate = 0.5** | **5+5** | **CO2** | K3 |  |
| **2b)** | **Why perceptron is not able to handle the tasks which are not linearly separable? Justify your answer using XOR problem.** | **5+5** | **CO2** | K2 |  |
| **3a)** | **Let U be the universe of military aircraft of interest as defined below**  **U = {a10, b52, c130, f2, f9}**  **Let A be the fuzzy set of bomber class aircraft:**  **A = {(a10, 0.3), (b52,0.4), (c130, 0.2), (f2, 0.1), (f9, 1)}**  **Let B be the fuzzy set of fighter class aircraft:**  **B = {(a10, 0.1), (b52, 0.2), (c130, 0.8), (f2, 0.7), (f9, 0)}**  **Find the following (a) AUB (b) (AՈB)c (c) (AUB)c**  **(d) Bc U A (e) Ac Ո B** | **2+2+2+2+2** | **CO3** | K2 |  |
| **3 b)** | **Let X={a,b,c,d} Y={1,2,3,4} and A={(a,0),(b,0.8),(c,0.6),(d,1)}**  **B={(1,0.2),(2,1),(3,0.8),(4,0)} C={(1,0),(2,0.4),(3,1),(4,0.8)}**  **Determine the implication relations:**  **(i) IF x is A THEN y is B ( ii) IF x is A THEN y is B ELSE Y is C.** | **5+5** | **CO3** | K2 |  |
| **4a)** | **Two fuzzy relations are given by**    **Obtain fuzzy relation T as composition between the fuzzy relations.**  **a. Max- min Composition**  **b. Max-product composition** | **5+5** | **CO4** | K3 |  |
| **4b)** | **Using the inference approach, obtain the membership values for the triangular shapes (isosceles, right-angled and other triangle) for a triangle with angles 400, 600, 800.** | **10** | **CO4** | K3 |  |
| **5a)** | **Explain Genetic algorithm with flowchart. Elaborate each and every step.** | **10** | **CO5** | K2 |  |
| **5b)** | **How can fitness functions be found for any optimization problem. Maximize the function f(x) = x2 with x in the interval [0,31) with the help of genetic algorithm.** | **10** | **CO5** | K2 |  |

CO Course Outcomes mapped with respective question

KL Bloom's knowledge Level (K1, K2, K3, K4, K5, K6)

K1- Remember, K2- Understand, K3-Apply, K4- Analyze, K5: Evaluate, K6- Create