BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO2025)

CLASS: BTECH **SEMESTER : V/ADD**
BRANCH: CSE **SESSION : MO/25**

SUBJECT: CS347 SOFT COMPUTING

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Let the following fuzzy sets: A = {(x1, 0.3), (x2, 0.7), (x3, 1), x4, 0.9 } B = { (x1, 0.5), (x2, 0.3), (x3, 0), (x4, 0.9). Calculate the Hamming distance d (A, B).	[2]	CO2	2
Q.1(b)	Explain with example fuzzy concentration, Dilation and contrast Intensification.	[3]	CO1	3
Q.2(a)	Consider the fuzzy set A described on universe of discourse X = { 5,10,20,30,40,50 } Written as A= { 1.0/5 + 1.0/10 + 0.8/20 + 0.5/30 + 0.2/40 + 1.0/50 } Find the fuzzy set B on the same universe, which is defined as membership function $\mu_B(x) = 1 / (1+ x)^2$	[2]	CO1	3
Q.2(b)	Consider the universe of discourse U = {1, 2, 3, 4}. The primary linguistic terms are 'True' and 'False' which is mapped onto U. The fuzzy set True is given as {(1, 1), (0.8, 2), (06, 3), (0.4, 4), (0.2, 5)}. Find the linguistic modified fuzzy set for: (i) Not very True (ii) Not Very True and Not Very False (iii) Extremely True	[3]	CO1	3
Q.3(a)	What is the characteristic of if the fuzzy relation is symmetric, asymmetric and anti-symmetric?	[2]	CO1	1
Q.3(b)	Let the following fuzzy sets: A = { (x1, 0.4), (x2, 0.8), (x3, 0.7) } , B = { (y1, 1), (y2, 0.4)} A' = { (x1, 0.6), (x2, 0.9), (x3, 0.3) } Find the value of the following composition, if R = (A X B) B' = A' o R (x, y)	[3]	CO1	3
Q.4(a)	Let fuzzy set Old: Old = {(30, 0), (40, 0.5), (50, 0.6), (60, 0.8), (70, 0.9), (80, 0.9) } Then calculate the Crisp value of Old using Mean Of Maxima (MOM) method.	[2]	CO2	2
Q.4(b)	Sketch the working principal of Fuzzy Inference System.	[3]	CO2	1
Q.5(a)	Draw the basic structure of Genetic Algorithm?	[2]	CO3	1
Q.5(b)	Consider the parents: P1: A B C D E F G H I J P2: Z Y X W V U T S R Q What are the Off Spring (OS1) and Off Spring (OS2) if the cross over operator are: (i) Single site cross over at site location 3. (ii) Double site cross over at location 4 and 8. (iii) Uniform cross over using mask CM = 1 0 1 1 0 0 0 1 0 1 (OS1: if CM=1, then select from P1 gene else select P2 gene OS2: if CM=1, then select from P2 gene else select P1 gene)	[3]	CO3	3

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