BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2024)

CLASS: BCA **SEMESTER : V**
BRANCH: BCA **SESSION : MO/2024**

SUBJECT: CA315 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)	Define the following fuzzy set properties: (i) Normalization (ii) core (iii) height (iv)support	[2]	1	2
Q.1(b)	Consider the Following triangular fuzzy number set and perform: A = { (-1, 1 , 3)} , B= { (1, 3 , 5)} (I) Addition, Subtraction (A-B) and Multiplication operation (II) Plot the results	[3]	1	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 $\mu_B(x) = 2 / (1+ x)^2 +1$	[2]	1	3
Q.2(b)	The capacity of an amplifier on a normalized universe say [0,100] can be described linguistically by the following fuzzy variables: Powerful= {(0,1), (0.4,10), (0.8,50), (1,100)} and weak= {(1,1), (0.9,10), (0.5,50),(0.2,80), (0,100)}. Find the belongingness of the following linguistic phrases used to describe the capacity of various amplifiers. (i) not very powerful and slightly weak, (ii) extremely powerful or not weak.	[3]	1	3
Q.3(a)	What is the characteristic of if the fuzzy relation is symmetric, asymmetric and anti-symmetric?	[2]	1	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]	1	3
Q.4(a)	Draw the block diagram of Fuzzy Inference system.	[2]	2	2
Q.4(b)	Explain with diagram: The Mamdani fuzzy reasoning rule of multiple rule with multiple antecedent.	[3]	2	2
Q.5(a)	What is basic structure of Genetic Algorithm?	[2]	3	1
Q.5(b)	Explain crossover operators used in Genetic Algorithm.	[3]	3	2

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