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22MAP423N

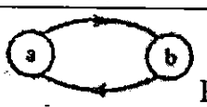
PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2025
(Fourth Semester)
Branch – **MATHEMATICS**

FUZZY SET THEORY

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Question No.	Question	K Level	CO
1	A_i is symmetric with respect to x = 2,$\forall x \in R$ a is _____ a)$Ai\ (2 + x) = Ai\ (2 - x)$ b) $Ai\ (2 + x) < Ai\ (2 - x)$ c) $Ai\ (2 + x) > Ai\ (2 - x)$ d)) $Ai\ (2 + x) \neq Ai\ (2 - x)$	K1	CO1
2	(A ∪B)(x) = _____ a) min[A(x), B(x)] b) max[A(x), B(x)] c) min[A(x)] d)) min[B(x)]	K1	CO1
3	$R^{-1}(y,x) =$ a) $R(x,y)$ b)(x,y) c) $R(y,x)$ d) (y,x)	K2	CO2
4	 Relation represents a) Reflexivity b) Symmetry c) Transitivity d) nontransitivity	K1	CO2
5	If A, B are fuzzy set in X then Fuzziness fails is_____ a)$A \cup A^C = X$ b) $A \cup B = B \cup A$ c) $A \cap B = B \cap A$ d)) $A \leq B$	K2	CO3
6	A --------is not always a fuzzy measure a) Sugeno 's measure b) possibility measure c) fuzzy measures d) entropy	K1	CO3
7	Which of the following is NOT a type of uncertainty handled by fuzzy logic? a) Linguistic uncertainty b) Random uncertainty c) Measurement uncertainty d) Probabilistic uncertainty	K2	CO4
8	The degree of membership in a fuzzy set ranges between: a) 0 and 10 b) -1 and 1 c) 0 and 1 d) Any real number	K1	CO4
9	The -------in a fuzzy environment can therefore be viewed as the intersection of fuzzy constraints and fuzzy objective function(s) a) fully symmetric b) former c) latter d) decision	K2	CO5
10	Essentially smaller than or equal to $\lesssim$ $\gtrsim$ a) ~ b) ≤ c) ≦ d) ~	K1	CO5

Cont...

SECTION - B (35 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Question No.	Question	K Level	CO
11.a.	Explain fuzzy union operations.	K3	CO1
	(OR)		
11.b.	Describe about Algebraic operation of fuzzy sets.	K4	CO1
12.a.	Describe about crisp relation and fuzzy relation.	K1	CO2
	(OR)		
12.b.	Explain about fuzzy equivalence relations.	K6	CO2
13.a.	Explain probability measure with example.	K1	CO3
	(OR)		
13.b.	Explain about relationship among classes of fuzzy measure.	K5	CO3
14.a.	Clarify Probability of a Fuzzy Event as a Fuzzy Set.	K4	CO4
	(OR)		
14.b.	Explain about measures of uncertainty.	K4	CO4
15.a.	Explain about Fuzzy Linear Programming.	K1	CO5
	(OR)		
15.b.	Explain Fuzzy dynamic programming with crisp state transformation function.	K1	CO5

SECTION -C (30 Marks)

Answer **ANY THREE** questions
ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Question No.	Question	K Level	CO
16	Describe briefly about types of fuzzy sets.	K2	CO1
17	Explain in detail about Binary relations on a single set.	K3	CO2
18	Describe about possibility and necessity of measure.	K4	CO3
19	Clarify about Type of Available Information.	K6	CO4
20	Explain about Multi Objective Decision Making (MODM).	K5	CO5

Z-Z-Z END