

$A_1(1,1)$   
 $A_1(1,2)$

**PART-A**

5 X 2 = 10

Q1. Answer any five questions

- ✓ i) If A and B are two fuzzy sets with membership functions  $\mu_A(x) = (0.2, 0.5, 0.6, 0.1, 0.9)$   $\mu_B(x) = (0.1, 0.5, 0.2, 0.7, 0.8)$  Then the value of  $\mu_{A \cap B}$  will be
- ii) Consider two fuzzy sets:  
P=Beautiful flowers=0.3/jasmine + 0.9/rose + 1.0/lotus + 0.7/daffodil  
Q=Fragrant flowers= 1.0/jasmine + 1.0/rose + 0.5/lotus + 0.2/daffodil  
Compute fuzzy sets R  
Where  $R = X \text{OR } (P, Q)$
- ✓ iii) Consider a dataset with six objects  $a=\{1,2\}$ ,  $b=\{2,5\}$ ,  $c=\{7,4\}$ ,  $d=\{9,2\}$ ,  $e=\{6,6\}$ ,  $f=\{9,10\}$ ; There are three clusters  $C_1: \{a,b\}$ ,  $C_2: \{c, d\}$ ,  $C_3: \{e,f\}$ ; Compute highest distance among the cluster centers using single linkage
- ✓ iv) State modus tollens with the help of an example
- ✓ v) Prove that the statement  $((P + Q) \equiv (\sim P \rightarrow Q))$  is invalid
- ✓ vi) How many learnable parameters in 4-3-6-4-3 ANN?

**PART-B**

Answer any four questions

4 X 5 = 20

- ✓ 1. State the different types of intelligence with the help of examples. State the differences between Depth-Limited Search Algorithm  
Consider the following set of axioms
  - a) If it rains, Joe brings his umbrella
  - b) If Joe has an umbrella, he doesn't get wet
  - c) If it doesn't rain, Joe doesn't get wet
  - d) It is raining
 prove that Joe doesn't get wet
- ✓ 2. State fuzzy c-means algorithm with proper mathematical notations. How one can set the value of k of k-means algorithm?
- ✓ 3. Let Table 1 is an information table where "Flu" is a decision attribute. Find out the REDUCT/s and CORE.

Table-1

Patient_id	Headache	Temp	Flu
U1	Yes	Normal	No
U2	Yes	High	Yes
U3	Yes	Very High	Yes
U4	No	Normal	No
U5	No	High	No
U6	No	Very High	Yes

5. Compute  $A \cap B$ ; where  $A=\{(2,1), (3,0.5)\}$  and  $B=\{(3,0), (2,0.5)\}$  are fuzzy sets.
- ✓ 6. Consider the following dataset and we will find frequent item sets and generate association rules for them (Here TID is the transaction and I1,I2...are items). Find out the significant rule set if confidence threshold is 60% and support count is 3

TID	items
T1	I1, I2, I5
T2	I2, I4
T3	I2, I3
T4	I1, I2, I4
T5	I1, I3
T6	I2, I3
T7	I1, I3
T8	I1, I2, I3, I5
T9	I1, I2, I3

