

		SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
		DEPARTMENT OF MATHEMATICS
		18MAB302T-DISCRETE MATHEMATICS FOR ENGINEERS
		UNIT 1-SET THEORY & RELATIONS
Sl.No.	TUTORIAL SHEET 1-QUESTIONS-PART(A)	
1	Simplify the following using set theoretical laws: $(A \cap B) \cup (A \cap B \cap \bar{C} \cap D) \cup (\bar{A} \cap B)$	
2	Write the dual of $(A \cap B) \cup (A \cap \bar{C}) \cup (\bar{A} \cap B)$	
3	a)Give an example of arelation which is neither reflexive nor irreflexive? b)Can any relation which is irreflexive and symmetric be transitive?Justify?	
4	Let $X=\{1,2,3,4\}$ and $R=\{(x,y)/x>y\}$ Draw the graph of R and also find its matrix.	
5	Give a relation which is both partial order relation and equivalence relation on a set.	
Part – B		
6	If A and B are any two sets prove analytically,a) $A \cap (B - C) = (A \cap B) - (A \cap C)$ b) $A \times (B \cap C) = (A \times B) \cap (A \times C)$	
7	If R is a relation on Z defined by aRb iff a) $3a+b$ is a multiple of 4 b) $2a+3b=5n,n$ is an integer. Prove the above relations are equivalence relations.	
8	Let $R=\{(1,2), (3,4), (2,2)\}$,and $S=\{(4,2), (2,5), (3,1),(1,3)\}$ be relations on $\{1,2,3,4\}$. Find $R \circ S, S \circ R, (R \circ S) \circ R, R \circ (S \circ R), R \circ R, S \circ S, R \circ R \circ R$.	
9	If the relation R on the set $X=\{1,2,3, \dots, 7\}$ defined by aRb iff $a \equiv b \pmod{3}$.Find the pairs in R,find the partition induced by the equivalence relation R on X.	
10	For the poset $\{3,5,9,15,24,45\}$ a)find the maximal and minimal elements. b)the greatest and the least elements. c)the upper bounds and LUB of $\{3,5\}$ d)the lower bounds and GLB of $\{15,45\}$.	
11	For the relation $R=\{(1,1),(1,2),(1,3),(2,1),(2,2),(2,3),(3,1),(3,3),(4,4)\}$ defined on $X=\{1,2,3,4\}$,find the transitive closure of R using Warshall's algorithm.	
12	For the relation $R=\{(1,3),(1,4),(2,1),(2,3),(2,4),(3,4)\}$ defined on $X=\{1,2,3,4\}$ find the properties of the relation R.	