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| | **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) (3 Marks)** |
| **1** | Simplify the following using set theoretical laws:<br>$(A \cap B) \cup [B \cap (C \cap D) \cup (C \cap \bar{D})]$ |
| **2** | Write the dual of $A = (\bar{B} \cap A) \cap (A \cap B)$ |
| **3** | Determine whether the relation R on the set of all integers is reflexive, symmetric and or transitive, where aRb if and only if $ab \geq 0$ |
| **4** | Let R is the relation on A={1, 2, 3}such that (a, b) $\in R$ if and only if a+b is even, find the relational matrix $M_R$ and $R^2$ |
| **5** | Define partial order relation and give an example. |
| | **PART – B (6 Marks)** |
| **6** | If A and B are any two sets prove analytically, a) A×(B∩C)=(A×B) ∩(A×C)<br>b) A∩(B-C)=(A∩B)-(A∩C) |
| **7** | If R is a relation on the set of positive integers such that $(a, b) \in R$ if and only if ab is a perfect square<br>Prove the above relation is an equivalence relation. |
| **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}.<br>Find R◦S,S◦R, (R◦S)◦R, R◦(S◦R), R◦R,S◦S ,R◦R◦R. |
| **9** | Let R be the following equivalence relation on the set A={1,2,3,4,5,6} . $R =$ {(1,1), (1,5), (2,2), (2,3), (2,6), (3,2), (3,3), (3,6), (4,4), (5,1), (5,5), (6,2), (6,3), (6,6)}<br>Find the partition of A induced by R i.e., find the equivalence classes of R. |
| **10** | For the poset {3,5,9,15,24,45}<br>a)find the maximal and minimal elements.<br>b)the greatest and the least elements.<br>c)the upper bounds and LUB of {3,5}<br>d)the lower bounds and GLB of {15,45}. |