



PARUL UNIVERSITY - FACULTY OF ENGINEERING & TECHNOLOGY

Department of Applied Science & Humanities

3rd Semester B. Tech (CSE, IT)

Discrete Mathematics (203191202)

Tutorial-1 Sets, Relation and Function

Q.1.	List the ordered pairs in the relation R from $A = \{0, 1, 2, 3, 4\}$ to $B = \{0, 1, 2, 3\}$, where $(a, b) \in R$ if and only if (a) $\gcd(a, b) = 1$ (b) $\text{lcm}(a, b) = 2$.
Q.2.	Determine whether the relation R on the set of all real numbers is reflexive, symmetric, antisymmetric, and/or transitive, where $(x, y) \in R$ if and only if (a) (b) (c) is a rational number.
Q.3.	Let R and S be relations on a set A represented by the matrices M_R and M_S . Find the matrices representing the following relations. (a) (b) (c) (d) (e)
Q.4.	Write the relation represented by the following digraph and also write the matrix representing this relation. <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <p>(a)</p> </div> <div style="text-align: center;"> <p>(b)</p> </div> <div style="text-align: center;"> <p>(c)</p> </div> </div>
Q.5.	Write the relation represented by the following matrices and also draw the corresponding digraph. (a) (b) (c)
Q.6.	Check if the relations given by the following are reflexive, symmetric, antisymmetric, and/or transitive: (a) (b) <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <p>(c)</p> </div> </div>
Q.7.	Consider the following database.

Flights.				
<i>Airline</i>	<i>Flight_number</i>	<i>Gate</i>	<i>Destination</i>	<i>Departure_time</i>
Nadir	122	34	Detroit	08:10
Acme	221	22	Denver	08:17
Acme	122	33	Anchorage	08:22
Acme	323	34	Honolulu	08:30
Nadir	199	13	Detroit	08:47
Acme	222	22	Denver	09:10
Nadir	322	34	Detroit	09:44

- What will be the result when one applies the selection operator σ_C , where C is the condition to the database?
- Display the table produced by applying the projection $\pi_{A,B}$.
- Display the table produced by applying the projection $\pi_{A,C,D}$.