

CHAPTER

3

Relational Model &
Relational Algebra

Syllabus

Introduction to Relational Model, Relational Model Constraints and Relational Database Schemas, Concept of Keys: Primary Key, Secondary key, Foreign Key, Mapping the ER and EER Model to the Relational Model, Introduction to Relational Algebra, Relational Algebra expressions for Unary Relational Operations,

- Set Theory operations,
- Binary Relational operation

Relational Algebra Queries

Self-learning Topics: Map the ER model designed in module II to relational schema.

3.1	Introduction to Relational Model	3-3
3.1.1	Characteristics of Relational Database	3-3
3.1.2	Advantages of Relational Model	3-4
3.1.3	Basic Concepts of Relational Model	3-4
3.2	Codd's Rules	3-6
3.3	Relational Model Constraints	3-8
UQ. 3.3.1	Explain different integrity constraints. MU - Dec. 16, 10 Marks	3-8
3.3.1	Domain Integrity Constraints	3-9
3.3.1(A)	Not Null	3-9
3.3.1(B)	Unique	3-9
3.3.1(C)	Default	3-10
3.3.1(D)	Check	3-10
3.3.2	Concept of Keys : Primary Key, Secondary Key, Foreign Key / Entity Integrity Constraints	3-10
UQ. 3.3.3	Explain following terms : (i) Primary key MU - May 16, 2 Marks	3-10
3.3.3	Referential Integrity Constraint	3-11
3.3.3(A)	Foreign Key	3-11
3.3.3(B)	Difference between Primary Key Constraint and Foreign Key Constraint	3-12
3.3.3(C)	On Delete Cascade	3-12
3.3.4	Enterprise Constraints	3-13
3.4	Relational Database Schemas	3-13
3.5	Mapping the ER and EER Model to Relational Model	3-14
UQ. 3.5.1	Explain the algorithm to map ER and EER model to relational model in detail. MU - May 17, 10 Marks	3-14



3.6	Introduction to Relational Algebra.....	3
UQ. 3.6.1	Discuss fundamental operations in relational algebra. MU - May 17, 10 Marks	3
UQ. 3.6.2	Explain different types of operators in relational algebra. MU - Dec. 17, 10 Marks	3
UQ. 3.6.3	Explain different types of relational algebra operations. MU - May 18, 10 Marks	3
UQ. 3.6.4	Explain illustrate relational algebra with example. MU - Dec. 18, 10 Marks	3
UQ. 3.6.5	Discuss the basic operations that can perform using relational algebra. MU - May 19, 10 Marks	3
UQ. 3.6.6	Explain different types of operations in relational algebra. MU - Dec. 19, 10 Marks	3
3.6.1	Relational Algebra Expressions for Unary Relational Operations.....	3
3.6.1(A)	Selection (σ).....	3
3.6.1(B)	Projection (Π).....	3
3.6.1(C)	Renaming.....	3
3.6.2	Set Theory Operations.....	3
3.6.2(A)	Union Operation (\cup).....	3
3.6.2(B)	Intersection(\cap).....	3
3.6.2(C)	Difference ($-$).....	3
3.6.2(D)	Cross Product / Cartesian Product.....	3
3.6.3	Binary Relational Operations	3
3.6.3(A)	Join.....	3
UQ. 3.6.12	Explain Join Operations in relational algebra. MU - Dec. 17, 5 Marks	3
3.6.3(B)	Division (\div).....	3
3.6.4	Operators, Grouping and Ungrouping.....	3
3.6.5	Relational Comparison.....	3
3.6.6	Relational Algebra Queries.....	3
3.7	Map the ER model designed in module II to relational schema.....	3
□	Chapter Ends.....	3