



Relational Database design → developed by D.E.F. Codd.

if question of Relational data, then following things to write in exam.

Roll No.	Name	Branch	Ph. No.

→ Definition of Relation

→ Basic concept of relation

Attribute

Tuple

Domain

Degree

Cardinality

Relational Key:- The basic purpose of key is to remove the redundancy (duplication) in the relation. In other words it helps to uniquely identify the record in a relation.

In order to remove the redundancy within a relation simply list all the attribute and consider only those attributes that have basic two properties :-

- 1) Uniqueness
- 2) Irreducible

UNIQUENESS:- There is no duplicacy of row in a relation.

IRREDUCIBLE:- The attribute which are used to form the key should not be further broken into sub parts.

Types of Keys.

- 1) Candidate key
- 2) Super key
- 3) Primary key
- 4) Alternate key
- 5) Foreign key
- 6) Composite key.



CANDIDATE KEY

:- A candidate key is set of one or more attribute whose combined values are unique among all the records and key cannot be further reduced.

- Candidate key is not allowed to be Null (empty).
- There can be number of candidate key in the table.
- It must satisfy properties of Keys i.e., uniqueness, Irreducible.

↓ Key		↓ Key.			Attribute
S.No	Roll No.	Name	Branch	Ph. no	
1	101	Akash	BBA	9814212345	Roll No. - unique so Cand. Key.
2	102	Aman	BBA	9814312345	Name - not C.K.
3	103	Ankit	BBA	9814212345	Branch - not C.K.
4	104	Akash	BBA	9914412368	Ph. no. - not C.K.
					S.No - C.K.

if ↓ 104 is missing then it will not be candidate Key.

SUPER KEY

:- It is a combination of attributes that can uniquely identify the database record.

- A table can have many super keys.
- Candidate keys are the special subset of super key.
- If we add another attribute to the candidate key and it satisfy the property of uniqueness it is known as super key.
- It may or may not satisfy the property of irreducible.



- Every candidate key is a super key.

Roll no — Superkey

(Roll.No, Name) — S.K.

(Roll.no, ph.no, name) — S.K.

PRIMARY KEY

- :- Primary keys are used to uniquely identify record in a relation.

- One relation can have more than one column with unique value, so select only one as primary.

- No record can have null value.

- Only one primary key allow for any relation.

If two candidate key then select one ^{as primary} and another one's alternative.

ALTERNATIVE KEY

- :- When there is more than one candidate key in the relation then one is selected as primary and another is known as Alternative key.

- Eg:- Roll No — CK → this is Primary key.

Name — x

Branch — x

Ph. No — x

S. No — C.K → this is alternative key.

COMPOSITE KEY

- :- It is a key that consists of two or more attributes that uniquely identify row or record of relation.



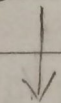
- It cannot be irreducible. (Roll no., Name) - Composite Key
- It cannot contain null value. (Roll No) - no composite key.

FOREIGN KEY

:- A foreign key is a referential constraint between two tables. A foreign key in one table points to a primary key in another table.

- It is used to create a relationship b/w two or more tables.
- The data entered in foreign key column must exist in primary key of referenced table (parent table).
- The value in a foreign key can be null.

P-ID	Name	City
1	Amar	FZR
2	Ankit	MOGA
3	Akash	FZR



P.K

Order-ID	orderNo.	P-ID
101	12345	1
102	12456	2
103	12347	2
104	12345	NULL



P.K

F.K

Person

Referenced Table or
Parent Table

Order

Referencing table or
Child table

FUNDAMENTALS OF Null

- In the relational model null means nothing.
- A null value is not like zero.



- Null value is not the empty string value.

DATA INTEGRITY (Integrity constraint)

It refers to the consistency and accuracy of the data stored in the data base.

- 1) Domain Integrity
- 2) Entity Integrity
- 3) Referential Integrity
- 4) User Define Integrity.

Domain Integrity

- It specify set of data values that is valid for column or a attribute.
- It check the domain integrity by applying data type range of possible value to the attribute.

Entity Integrity

- It is applied on the row of a relation to ensure the accuracy and consistency of a data base.
- Not to record of a relation have duplicate value in the specified column of a relation.
- The primary key column cannot contain null value.
- Entity Integrity can be ensured by setting the attribute as a primary key.

Referential Integrity

- A relationship b/w Primary key in reference table and foreign key in a referencing table is always maintained.



- This referential integrity ensures with the help of foreign key.

User Define Integrity

- The rules which are defined by the users to ensure the integrity other than domain, entity and referential integrity.

Difference between DBMS and Relational DBMS

DBMS	RDBMS.
• It is Data Base Management System. • It can store data in any format. Eg - In form of graph, table, tree, etc. • It is for single user only. • It is for smaller organisation with small amount of data. • It does not support Client server architecture. • It requires low cost hardware and software. • Eg:- MS Access, DBase, etc.	• It is the relational data Base management system. • It always store data in the format of table. • It is for the multiple user. • It is used for large organisation with large amount of data. • It supports the client server architecture. • High cost hardware and software. • Eg:- Oracle, SQL server, etc.