Different Types Of Keys in DBMS-

1. Super key
2. Candidate key
3. Primary key
4. Alternate key
5. Foreign key
6. Composite key
7. Unique key

1. Super Key-

- A super key is a set of attributes that can identify each tuple uniquely in the given relation.
- A super key is not restricted to have any specific number of attributes.
- Thus, a super key may consist of any number of attributes.

Example-

Consider the following Student schema-

Student (roll , name , sex , age , address , class , section)

Given below are the examples of super keys since each set can uniquely identify each student in the Student table-

- (roll , name , sex , age , address , class , section)
- (class , section , roll)
- (class , section , roll , sex)
- (name , address)

NOTE-

All the attributes in a super key are definitely sufficient to identify each tuple uniquely in the given relation but all of them may not be necessary.

2. Candidate Key-

A minimal super key is called as a candidate key.

OR

A set of minimal attribute(s) that can identify each tuple uniquely in the given relation is called as a candidate key.

Example-

Consider the following Student schema-

Student (roll , name , sex , age , address , class , section)

Given below are the examples of candidate keys since each set consists of minimal attributes required to identify each student uniquely in the Student table-

- (class , section , roll)
- (name , address)

NOTES-

All the attributes in a candidate key are sufficient as well as necessary to identify each tuple uniquely.

- Removing any attribute from the candidate key fails in identifying each tuple uniquely.
- The value of candidate key must always be unique.
- The value of candidate key can never be NULL.
- It is possible to have multiple candidate keys in a relation.
- Those attributes which appears in some candidate key are called as **prime attributes**.

3. Primary Key-

A primary key is a candidate key that the database designer selects while designing the database.

OR

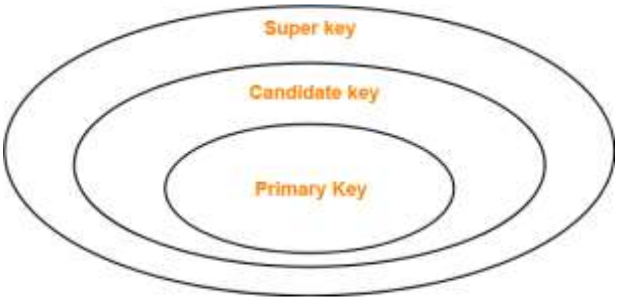
Candidate key that the database designer implements is called as a primary key.

NOTES-

The value of primary key can never be NULL.

- The value of primary key must always be unique.
- The values of primary key can never be changed i.e. no updation is possible.
- The value of primary key must be assigned when inserting a record.
- A relation is allowed to have only one primary key.

Remember-



4. Alternate Key-

Candidate keys that are left unimplemented or unused after implementing the primary key are called as alternate keys.

OR

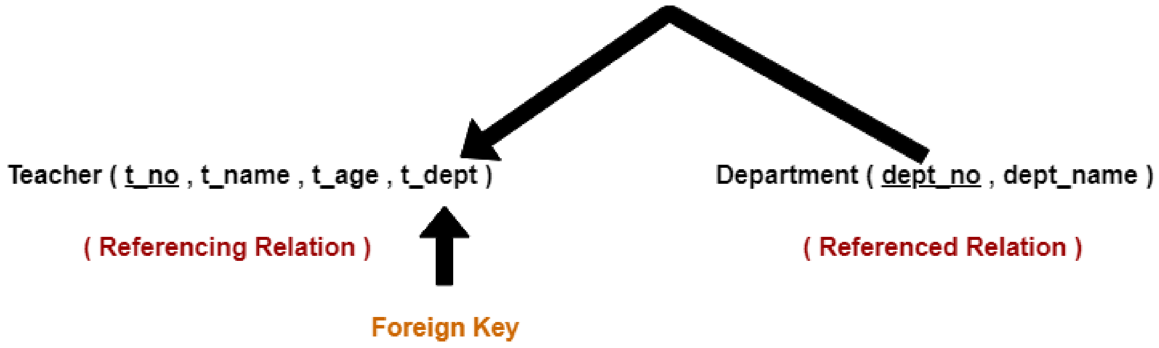
Unimplemented candidate keys are called as alternate keys.

5. Foreign Key-

- An attribute ‘X’ is called as a foreign key to some other attribute ‘Y’ when its values are dependent on the values of attribute ‘Y’.
- The attribute ‘X’ can assume only those values which are assumed by the attribute ‘Y’.
- Here, the relation in which attribute ‘Y’ is present is called as the **referenced relation**.
- The relation in which attribute ‘X’ is present is called as the **referencing relation**.
- The attribute ‘Y’ might be present in the same table or in some other table.

Example-

Consider the following two schemas-


Teacher (t_no , t_name , t_age , t_dept)
Department (dept_no , dept_name)
(Referencing Relation)
(Referenced Relation)
Foreign Key

Here, t_dept can take only those values which are present in dept_no in Department table since only those departments actually exist.

NOTES-

- Foreign key references the primary key of the table.
- Foreign key can take only those values which are present in the primary key of the referenced relation.
- Foreign key may have a name other than that of a primary key.
- Foreign key can take the NULL value.
- There is no restriction on a foreign key to be unique.
- In fact, foreign key is not unique most of the time.
- Referenced relation may also be called as the master table or primary table.
- Referencing relation may also be called as the foreign table.

6. Composite Key-

A primary key comprising of multiple attributes and not just a single attribute is called as a composite key.

7. Unique Key-

Unique key is a key with the following properties-

- It is unique for all the records of the table.
- Once assigned, its value can not be changed i.e. it is non-updatable.
- It may have a NULL value.

Example-

The best example of unique key is **Adhaar Card Numbers**.

- The Adhaar Card Number is unique for all the citizens (tuples) of India (table).
- If it gets lost and another duplicate copy is issued, then the duplicate copy always has the same number as before.
- Thus, it is non-updatable.
- Few citizens may not have got their Adhaar cards, so for them its value is NULL.