**DBMS**

DBMS is a collection of programs that facilitates users to create and maintain a database. facilities to perform several kinds of operations for either manipulation of the data in the database or the management of the database structure itself.

Redundancy control, Restriction for unauthorized access

**RDBMS**

A relational database management system (RDBMS) is a collection of programs and capabilities that to create, update, administer and otherwise interact with a relational database. RDBMS store data in the form of tables

**Primary keys**

A *primary key* is a column or a set of columns in a table whose values uniquely identify a row in the table. A relational database is designed to enforce the uniqueness of primary keys by allowing only one row with a given primary key value in a table.

**Foreign keys**

A *foreign key* is a column or a set of columns in a table whose values correspond to the values of the primary key in another table. In order to add a row with a given foreign key value, there must exist a row in the related table with the same primary key value.

**Database**

A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a database management system (DBMS). The data can then be easily accessed, managed, modified, updated, controlled, and organized.

**Constraints**

Constraints enforce limits to the data or type of data that can be inserted/updated/deleted from a table. The whole purpose of constraints is to maintain the data integrity during an update/delete/insert into a table.

**Data integrity**

The term *data integrity* refers to the accuracy and consistency of data. Maintaining data integrity means making sure the data remains intact and unchanged throughout its entire life cycle. This includes the capture of the data, storage, updates, transfers, backups, etc. Every time data is processed there’s a risk that it could get corrupted

**4 Types of Data Integrity**

* Entity integrity
* Referential integrity
* Domain integrity
* User-defined integrity

**Key Differences Between Primary key and Unique key:**

Primary key will not accept NULL values whereas Unique key can accept NULL values.

1. A table can have only one primary key whereas there can be multiple unique key on a table.

Check Constraint is used to specify a predicate that every tuple must satisfy in a given relation. It limits the values that a column can hold in a relation.

* The predicate in check constraint can hold a sub query.
* Check constraint defined on an attribute restricts the range of values for that attribute.
* If the value being added to an attribute of a tuple violates the check constraint, the check constraint evaluates to false and the corresponding update is aborted.
* Check constraint is generally specified with the CREATE TABLE command in SQL.

**ACID**

In order to maintain consistency in a database, before and after the transaction, certain properties are followed. These are called **ACID** properties.

**Atomicity**   
By this, we mean that either the entire transaction takes place at once or doesn’t happen at all. There is no midway

—**Abort**: If a transaction aborts, changes made to database are not visible.   
—**Commit**: If a transaction commits, changes made are visible.   
Atomicity is also known as the ‘All or nothing rule’.

**Consistency**   
This means that integrity constraints must be maintained so that the database is consistent before and after the transaction. It refers to the correctness of a database. The total amount before and after the transaction must be maintained.

**Isolation**

This property ensures that multiple transactions can occur concurrently without leading to the inconsistency of database state. Transactions occur independently without interference. Changes occurring in a particular transaction will not be visible to any other transaction until that particular change in that transaction is written to memory or has been committed.

**Durability:**   
This property ensures that once the transaction has completed execution, the updates and modifications to the database are stored in and written to disk and they persist even if a system failure occurs.

he **ACID** properties, in totality, provide a mechanism to ensure correctness and consistency of a database in a way such that each transaction is a group of operations that acts a single unit,

Difference between primary key and foreign key

|  |  |
| --- | --- |
| Primary Key | Foreign Key |
| A primary key is used to ensure data in the specific column is unique.  Only one primary key is allowed in a table.  It uniquely identifies a record in the relational database table.  It does not allow NULL values. | A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables.  Whereas more than one foreign key are allowed in a table.  It refers to the field in a table which is the primary key of another table.  It can also contain NULL values. |

Difference Between dbms and rdms

|  |  |
| --- | --- |
| DBMS | RDMS |
| DBMS stores data as file.  Data elements need to access individually.  Normalization is not present.  DBMS does not support distributed database.  It supports single user.  The data in a DBMS is subject to low security levels with regards to data manipulation. | RDBMS stores data in tabular form.  Multiple data elements can be accessed at the same time.  Normalization is present.  RDBMS supports distributed database.  It supports multiple users.  There exists multiple levels of data security in a RDBMS. |