1. **What is a relational database management system (RDBMS)? What are the advantages of a database management system over a file system?**

* **RDBMS** stands for relational database management system. A relational model can be represented as a table of rows and columns. A relational database has following major components:  
  1. Table  
  2. Record or Tuple  
  3. Field or Column name or Attribute  
  4. Domain  
  5. Instance  
  6. Schema  
  7. Keys

1. **In a database management system, explain the ACID properties.**

* DBMS is the management of data that should remain integrated when any changes are done in it. It is because if the integrity of the data is affected, whole data will get disturbed and corrupted. Therefore, to maintain the integrity of the data, there are four properties described in the database management system, which are known as the **ACID** properties. The ACID properties are meant for the transaction that goes through a different group of tasks, and there we come to see the role of the ACID properties.
* **Atomicity** It means if any operation is performed on the data, either it should be performed or executed completely or should not be executed at all. It further means that the operation should not break in between or execute partially. In the case of executing operations on the transaction, the operation should be completely executed and not partially.
* **Consistency** The word ***consistency***means that the value should *remain preserved* always. In DBMS, the integrity of the data should be maintained, which means if a change in the database is made, it should remain preserved always. In the case of transactions, the integrity of the data is very essential so that the database remains consistent before and after the transaction. The data should always be correct.
* **Isolation** The term 'isolation' means separation. In DBMS, Isolation is the property of a database where no data should affect the other one and may occur concurrently. In short, the operation on one database should begin when the operation on the first database gets complete. It means if two operations are being performed on two different databases, they may not affect the value of one another. In the case of transactions, when two or more transactions occur simultaneously, the consistency should remain maintained. Any changes that occur in any particular transaction will not be seen by other transactions until the change is not committed in the memory.
* **Durability** ensures the permanency of something. In DBMS, the term durability ensures that the data after the successful execution of the operation becomes permanent in the database. The durability of the data should be so perfect that even if the system fails or leads to a crash, the database still survives. However, if gets lost, it becomes the responsibility of the recovery manager for ensuring the durability of the database. For committing the values, the COMMIT command must be used every time we make changes.

1. **Explain the concept of normalization.**

* **Normalization** is a process of organizing the data in database to avoid data redundancy, insertion anomaly, update anomaly & deletion anomaly.

1. **Explain the many types of query languages used in relational databases. DQL, DML, DCL, and DDL are some examples.**

* **Data Definition Language (DDL)**DDL is used for specifying the database schema. It is used for creating tables, schema, indexes, constraints etc. in database. Lets see the operations that we can perform on database using DDL:
* To create the database instance – **CREATE**
* To alter the structure of database – **ALTER**
* To drop database instances – **DROP**
* To delete tables in a database instance – **TRUNCATE**
* To rename database instances – **RENAME**
* To drop objects from database such as tables – **DROP**
* To Comment – **Comment**
* **Data Manipulation Language (DML)**DML is used for accessing and manipulating data in a database. The following operation on database comes under DML:
* To read records from table(s) – **SELECT**
* To insert record(s) into the table(s) – **INSERT**
* Update the data in table(s) – **UPDATE**
* Delete all the records from the table – **DELETE**
* **Data Control language (DCL)**DCL is used for granting and revoking user access on a database –
* To grant access to user – **GRANT**
* To revoke access from user – **REVOKE**
* **Transaction Control Language (TCL)**The changes in the database that we made using DML commands are either performed or rollbacked using TCL.
* To persist the changes made by DML commands in database – **COMMIT**
* To roll back the changes made to the database – **ROLLBAC**

1. **What is the difference between the main key and a composite key? Give instances of how primary key and composite are used.**

* **Primary key** is that column of the table whose every row data is uniquely identified. Every row in the table must have a primary key and no two rows can have the same primary key. Primary key value can never be null nor can be modified or updated.

**Composite Key** is a form of the candidate key where a set of columns will uniquely identify every row in the table.

An **example** would be a list of homes on a real estate market. In a well-ordered database, there should be a primary key that uniquely identifies each record.

In some cases, the homes may only be uniquely identified by a mortgage number — all other data (towns, streets, house numbers) is not unique to each record. The mortgage number would be the primary key. Suppose, however, that an MLS realtor’s listing technology assigns its own unique numbers to the records in the table.

Then, there will be two keys that developers might identify as “candidate keys”:

* The mortgage numbers.
* The MLS numbers.

One of them will qualify as the “primary key” in what some would consider an arbitrary way.

A composite key, then, would be the combination of two keys.

For example: the combination of house number and street might qualify as a composite key, given that the market listings are local. If so, then when someone searches using both the house number and the street, they should only get one single record returned.

1. **Create a table with a primary key, a column default value, and a column unique constraint in SQL**

* create table emp\_new

(

employee\_id int UNIQUE,

employee\_name varchar (50) NOT NULL,

age int,

gender varchar (1),

salary float (100)

primary key (employee\_id)

)