SQL Assignment 1

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

Ans:- RDBMS is a common type of database that stores data in tables, so it can be used in relation to other stored dataset. It is based on the relational model, straightforward method of representing data in tables.

Advantages of RDBMS over file system:-

- **No redundant data**: Redundancy removed by data normalization. No data duplication saves storage and improves access time.
- **Data Consistency and Integrity**: As we discussed earlier the root cause of data inconsistency is data redundancy, since data normalization takes care of the data redundancy, data inconsistency also been taken care of as part of it
- **Data Security**: It is easier to apply access constraints in database systems so that only authorized user is able to access the data. Each user has a different set of access thus data is secured from the issues such as identity theft, data leaks and misuse of data.
- **Privacy**: Limited access means privacy of data.
- **Easy access to data** – Database systems manages data in such a way so that the data is easily accessible with fast response times.
- **Easy recovery**: Since database systems keeps the backup of data, it is easier to do a full recovery of data in case of a failure.
- **Flexible**: Database systems are more flexible than file processing systems.

2. In a database management system, explain the ACID properties.

Ans:- In order to maintain consistency in a database, before and after transaction, certain properties has to be followed which is called as **ACID Properties**(Atomicity,Consistency,Isolation,Durability).

a. **Atomicity:-** Entire transaction takes place at once or doesn't happen at all
b. **Consistency:-** The database must be consistent before and after the transaction
c. **Isolation:-** Multiple transactions occur independently without interference.
d. **Durability:-** The changes of a successful transaction occurs even if the system failure occurs.

3. Explain the concept of normalization.

Ans:- Normalization is the process of minimizing redundancy from a relation or set of relations. Redundancy in relation may cause insertion, deletion, and update anomalies. So, it helps to minimize the redundancy in relations. Normal forms are used to eliminate or reduce redundancy in database tables.

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

Ans:- types of SQL commands :- DML, DQL, DCL, DDL and TCL

a. **DDL:-** DDL or Data Definition Language consists of SQL commands that can be used to define the database schema. It deals with description of the database schema and is used to create and modify structure of database objects . This only create, modify or delete the database structure and not the data.
   List of DDL commands:-
   CREATE,DROP,ALTER,TRUNCATE,COMMENT,RENAME.
b. **DQL:-** DQL or Data Query Language used for performing queries on the data within schema objects.purpose of DQL is to get some schema relation based on the query passed to it.
   List of DQL commands:- SELECT
c. **DML:-** DML or Data Manipulaion Language used to perform manipulation of data present in the database, which include most of the SQL commands.
   List of DML commands:- INSERT,UPDATE,DELETE,LOCK,CALL, EXPLAIN PLAN
d. **DCL:-** DCL or Data Control Language deals with the rights, permissions and controls of the Database management system.
   List of DCL Commands:- GRANT,REVOKE
e. **TCL:-** TCL or Transition Control Language deal with the transactions within the database.
   List of DCL Commands:- COMMIT,ROLLBACK,SAVEPOINT,SET TRANSACTION

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

Ans:- Primary key is that column of the table whose every row data is uniquely identified. ... Composite Key is a form of the candidate key where a set of columns will uniquely identify every row in the table

For instance:-

Consider the table given below:-

	Id	Name	Gender	City	Email	Dep_Id
▶	1	Ajay	M	Delhi	ajay@gmil.com	1
	2	vijay	M	Mumbai	vijay@gmil.com	2
	3	radhika	F	Bhopal	radhka@gmil.com	1
	4	shikha	F	Jaipur	shikha@gmil.com	2
	5	hrithik	M	Jaipur	hrithik@gmil.com	2

In this case Id is the primary key since it is unique and has non null value.
But if we consider composite key then Id and Email both together constitute Composite Key. We cannot use city and gender as composite because they are not unique value for every record.

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

Ans:-

```
CREATE TABLE Persons (
    ID int NOT NULL,
    FirstName varchar(255) NOT NULL UNIQUE,
    LastName varchar(255),
    Age int,
    City varchar(255) DEFAULT 'Mumbai',
    Primary key (ID)
);
--ID is the primary key
--City is the column with default value Mumbai
--FirstName is the column Unique constraint
Insert into Persons(ID,FirstName,LastName,Age) values (1,'sharath','dinesh',20);
Insert into Persons values (2,'Darshan','Sapariya',20,'thane');

select * from Persons
```

OUTPUT:-

	ID	FirstName	LastName	Age	City
▶	1	sharath	dinesh	20	Mumbai
	2	Darshan	Sapariya	20	thane