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 stores data in the form of a collection of tables and relations can be defined between the common fields of these tables.
Modern database management system like MySQL, Oracle, IBM, DB2 are based on RDBMS.

Advantages of DBMS over a File system:
1. Data redundancy and inconsistency
2. Data sharing: Data can be share easily.
3. Data concurrency: Multiple user can use the data at same time.
4. Data searching: Require small query to retrieve data from the database.
5. Data integrity: DBMS maintains data integrity by enforcing user-defined constraints on data by itself.
6. Data security: DBMS has specialized features that help provide shielding to its data over files.
7. Backup: It creates a backup subsystem to restore the data if required.
8. Interfaces: It provides different multiple user interfaces like graphical user interface and application program interface.
9. Easy Maintenance: It is easily maintainable due to its centralized nature.

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

Ans. ACID is an acronym that refers to the set of 4 key properties that define a transaction: Atomicity, Consistency, Isolation, and Durability.
If a database operation has these ACID properties, it can be called an ACID transaction, and data storage systems that apply these operations are called transactional systems.

3. **Explain the concept of normalization.**

Ans. It is the process of organizing the data in a database. It helps in removing the duplicate values in the database. Normalization divides the large table into smaller tables and links them using relationships.

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

Ans.

DQL statements are used for performing queries on the data within schema objects. The purpose of DQL commands is to get the schema relation based on the query passed to it. SELECT is an example of DQL.

DDL is short name of Data Definition Language, which deals with database schemas and descriptions, of how the data should reside in the database.
Example -create table, alter, drop, comment, rename

DML is short name of Data Manipulation Language which deals with data manipulation and includes most common SQL statements such SELECT, INSERT, UPDATE, DELETE, etc., and it is used to store, modify, retrieve, delete and update data in a database.

DCL is short name of Data Control Language which includes commands such as GRANT and mostly concerned with rights, permissions and other controls of the database system.

    GRANT - allow users access privileges to the database

    REVOKE - withdraw users access privileges given by using the GRANT command

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

Ans. A primary key and a composite key might do the same things, the primary key will consist of one column, where the composite key will consist of two or more columns.

CREATE TABLE students

(rollNumber INT,

name VARCHAR(30),

class VARCHAR(30),

section VARCHAR(1),

mobile VARCHAR(10),

PRIMARY KEY (rollNumber, mobile));

In this example, we have made the composite key as the combination of two columns i.e. rollNumber and mobile because all the rows of the table student can be uniquely identified by this composite key.

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

Create Database IntroSQL;

Use IntroSQL;

create TABLE students (

Id int not null,

Primary key (ID),

Name varchar(50),

Class int default 10

);