**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?

Relational database management system (RDBMS) is a collection of programs and capabilities that enable IT teams and others to create, update, administer and otherwise interact with a relational database.

Advantages of RDBMS-

1. Limited access means privacy of data.
2. Easy access to data.
3. Data can be shared easily due to centralized system.
4. It is easier to do a full recovery of data in case of a failure.

2. In a database management system, explain the ACID properties. The full form of ACID is Atomicity, Consistency, Isolation and Durability.

**Atomicity** − This property states that a transaction must be treated as an atomic unit, that is, either all of its operations are executed or none. There must be no state in a database where a transaction is left partially completed. States should be defined either before the execution of the transaction or after the execution/abortion/failure of the transaction.

**Consistency** − The database must remain in a consistent state after any transaction. No transaction should have any adverse effect on the data residing in the database. If the database was in a consistent state before the execution of a transaction, it must remain consistent after the execution of the transaction as well.

**Durability** − The database should be durable enough to hold all its latest updates even if the system fails or restarts. If a transaction updates a chunk of data in a database and commits, then the database will hold the modified data. If a transaction commits but the system fails before the data could be written on to the disk, then that data will be updated once the system springs back into action.

**Isolation** − In a database system where more than one transaction are being executed simultaneously and in parallel, the property of isolation states that all the transactions will be carried out and executed as if it is the only transaction in the system. No transaction will affect the existence of any other transaction.

1. Explain the concept of normalization.

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. Normalization is the name given to the process of simplifying the relationship among data elements in a record.

Normalization is the process of organizing data to minimize.

* Redundancy/duplication/repetition.
* Insertion, deletion, updating anomalies.

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

Relational database systems are expected to be equipped with a query language that can assist its users to query the database instances. There are two kinds of query languages − relational algebra and relational calculus.

 Types of SQL queries are

1) Data Definition Language (DDL)-Create Table, Alter Table,

Drop Table

2) Data Manipulation Language (DML) –Insert, Update, Delete

3) Data Control Language (DCL) –Grant, Revoke

4) Data Query Language (DQL)-Select

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 used to ensure data in the specific column is Unique and Not Null. A table can have only one primary key, which may consist of single or multiple fields. When multiple fields are used as a primary key, they are called a composite key.

Create Primary key :-

CREATE TABLE CUSTOMERS

(

ID INT NOT NULL,

NAME VARCHAR (20) NOT NULL,

AGE INT NOT NULL,

ADDRESS CHAR (25) ,

SALARY DECIMAL (18, 2),

PRIMARY KEY (ID)

);

 composite key is also a primary key, but the difference is that it is made by the combination of more than one column to identify the particular row in the table.

Creating table with a composite key:

CREATE TABLE student

(rollNumber INT,

name VARCHAR(30),

class VARCHAR(30),

section VARCHAR(1),

mobile VARCHAR(10),

PRIMARY KEY (rollNumber, mobile));

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

CREATE TABLE Persons (  
    ID int NOT NULL,  
    LastName varchar(255) NOT NULL,  
    FirstName varchar(255),  
    Age int,  
    PRIMARY KEY (ID)  
);