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12. STRUCTURED QUERY LANGUAGE

Section – A

Choose the best answer (1 Mark)

1. Which commands provide definitions for creating table structure, deleting relations, and modifying relation schemas.

    a. DDL   b. DML   c. DCL   d. DQL

2. Which command lets to change the structure of the table?

    a. SELECT   b. ORDER BY   c. MODIFY   **d. ALTER**

3. The command to delete a table is

    a. DROP   b. DELETE   c. DELETE ALL   d. ALTER TABLE

4. Queries can be generated using

    a. SELECT   b. ORDER BY   c. MODIFY   d. ALTER

5. The clause used to sort data in a database

    a. SORT BY   **b. ORDER BY**   c. GROUP BY   d. SELECT

Section-B

Answer the following questions (2 Marks)

1. Write a query that selects all students whose age is less than 18 in order wise.

Query: SELECT * FROM Student WHERE Age<=18 ORDER BY Name;

2. Differentiate Unique and Primary Key constraint.

Unique Key Constraint	Primary Key Constraint
• This constraint ensures that no two rows have the same value in the specified columns.	• This constraint declares a field as a Primary key which helps to uniquely identify a record.
• The **UNIQUE** constraint can be applied only to fields that have also been declared as **NOT NULL**.	• The primary key does not allow **NULL** values and therefore a primary key field must have the **NOT NULL** constraint.

3. Write the difference between table constraint and column constraint?

Table Constraint	Column Constraint
• Table constraints apply to a group of one or more columns.	• Column constraints apply only to individual column.

4. Which component of SQL lets insert values in tables and which lets to create a table?

Command	Description	component
Insert	Inserts data into a table	DML
Create	To create tables in the database.	DDL

5. What is the difference between SQL and MySQL?

SQL	MySQL
• **Structured Query Language** is a language used for accessing databases.	• **MySQL** is a database management system, like SQL Server, Oracle, Informix, Postgres, etc.
• **SQL** is a **DBMS**	• **MySQL** is a **RDBMS**.

Section-C

Answer the following questions   **(3 Marks)**

1. What is a constraint? Write short note on Primary key constraint.

- Constraint is a condition applicable on a field or set of fields.
- Primary constraint declares a field as a Primary key which helps to uniquely identify a record.
- It is similar to unique constraint except that only one field of a table can be set as primary key.
- The primary key does not allow **NULL** values and therefore a primary key field must have the **NOT NULL** constraint.

2. Write a SQL statement to modify the student table structure by adding a new field.

Syntax : *ALTER TABLE <table-name> ADD <column-name><data type><size>;*

To add a new column "Address" of type 'char' to the Student table, the command is used as

Statement: ALTER TABLE Student ADD Address char;

3. Write any three DDL commands.

Data Definition Language:

Create Command: To create tables in the database.

   CREATE TABLE Student (Admno integer, Name char(20), Gender char(1), Age integer);

Alter Command: Alters the structure of the database.

   ALTER TABLE Student ADD Address char;

Drop Command: Delete tables from database.

   DROP TABLE Student;

4. Write the use of Savepoint command with an example.

- The **SAVEPOINT** command is used to temporarily save a transaction so that you can rollback to the point whenever required.

Syntax: SAVEPOINT savepoint_name;

Example: SAVEPOINT A;

5. Write a SQL statement using DISTINCT keyword.

- The **DISTINCT** keyword is used along with the **SELECT** command to eliminate duplicate rows in the table.

- This helps to eliminate redundant data.

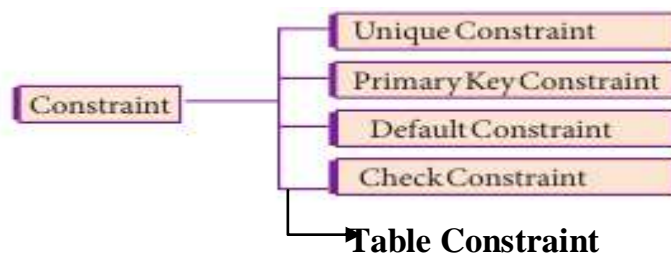- **For Example:**   SELECT DISTINCT Place FROM Student;

Section - D

Answer the following questions: **(5 Marks)**

1. Write the different types of constraints and their functions.

- Constraint is a condition applicable on a field or set of fields.
- **Type of Constraints:**

(i)Unique Constraint:

- This constraint ensures that no two rows have the same value in the specified columns.

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- For example **UNIQUE** constraint applied on Admno of student table ensures that no two students have the same admission number and the constraint can be used as:

Example:

CREATE TABLE Student

(

Admno integer NOT NULL UNIQUE, → **Unique constraint**

Name char (20) NOT NULL,

Gender char (1),

);

- The **UNIQUE** constraint can be applied only to fields that have also been declared as **NOT NULL**.

- When two constraints are applied on a single field, it is known as multiple constraints.

- In the above Multiple constraints **NOT NULL** and **UNIQUE** are applied on a single field Admno.

(ii) Primary Key Constraint:

- This constraint declares a field as a Primary key which helps to uniquely identify a record.
- It is similar to unique constraint except that only one field of a table can be set as primary key.
- The primary key does not allow **NULL** values and therefore a field declared as primary key must have the **NOT NULL** constraint.

Example:

CREATE TABLE Student

(

Admno integer NOT NULL PRIMARY KEY, → Primary Key constraint

Name char(20)NOT NULL,

Gender char(1),

Age integer,

);

(iii) DEFAULT Constraint:

- The **DEFAULT** constraint is used to assign a default value for the field.
- When no value is given for the specified field having **DEFAULT** constraint, automatically the default value will be assigned to the field.

- **Example:**

    CREATE TABLE Student

    (

    Admno integer NOT NULL PRIMARY KEY,

    Name char(20)NOT NULL,

    Gender char(1),

    Age integer DEFAULT = "17", → Default Constraint

    Place char(10));

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- In the above example the "Age" field is assigned a default value of 17, therefore when no value is entered in age by the user, it automatically assigns 17 to Age.

(iv) Check Constraint:

- This constraint helps to set a limit value placed for a field.
- When we define a check constraint on a single column, it allows only the restricted values on that field.
- **Example:**

  CREATE TABLE Student
  (
  Admno integer NOT NULL PRIMARY KEY
  Name char(20)NOT NULL,
  Gender char(1),
  Age integer (CHECK$<=$19), $\rightarrow$ Check Constraint
  Place char(10),
  );

- In the above example the check constraint is set to Age field where the value of Age must be less than or equal to 19.

(V) Table Constraint:

- When the constraint is applied to a group of fields of the table, it is known as Table constraint.
- The table constraint is normally given at the end of the table definition.
- Let us take a new table namely Student1 with the following fields Admno, Firstname, Lastname, Gender, Age, Place:
- **Example:**

  CREATE TABLE Student 1
  (
  Admno integer NOT NULL,
  Firstname char(20),
  Lastname char(20),
  Gender char(1),
  Age integer,
  Place char(10),
  PRIMARY KEY (Firstname, Lastname) $\rightarrow$ Table constraint
  );

- In the above example, the two fields, Firstname and Lastname are defined as Primary key which is a Table constraint.

2. Consider the following employee table. Write SQL commands for the qtns.(i) to (v).

EMP CODE	NAME	DESIG	PAY	ALLO WANCE
S1001	Hariharan	Supervisor	29000	12000
P1002	Shaji	Operator	10000	5500
P1003	Prasad	Operator	12000	6500
C1004	Manjima	Clerk	8000	4500
M1005	Ratheesh	Mechanic	20000	7000

(i) To display the details of all employees in descending order of pay.

SELECT * FROM employee ORDER BY DESC;

(ii) To display all employees whose allowance is between 5000 and 7000.

SELECT * FROM employee WHERE allowance BETWEEN 5000 AND 7000;

(iii) To remove the employees who are mechanic.

DELETE FROM employee WHERE desig='Mechanic';

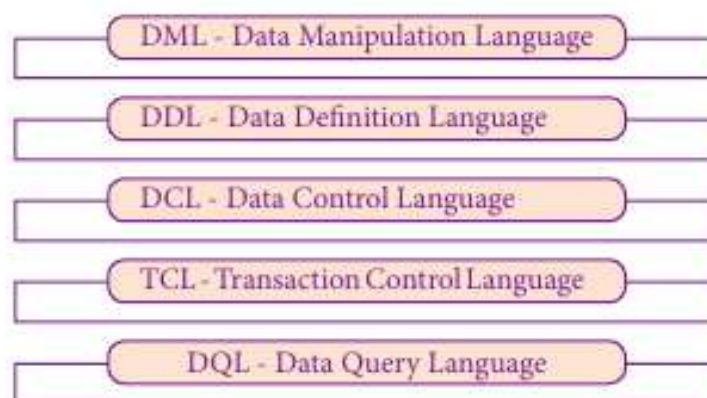**(iv) To add a new row.**

INSERT INTO employee
(empcode,name,desig,pay,allowance)VALUES(S1002,Baskaran,Supervisor,29000,12000);

(v) To display the details of all employees who are operators.

SELECT * FROM employee WHERE design='Operator';

3. What are the components of SQL? Write the commands in each.

Components of SQL:


```
DML - Data Manipulation Language
DDL - Data Definition Language
DCL - Data Control Language
TCL - Transaction Control Language
DQL - Data Query Language
```

i) DATA MANIPULATION LANGUAGE :

- **A Data Manipulation Language (DML)** is a computer programming language used for adding (inserting), removing (deleting), and modifying (updating) data in a database.

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- **By Data Manipulation we mean,**

    Insertion of new information into the database

    Retrieval of information stored in a database.

    Deletion of information from the database.

    Modification of data stored in the database.

ii) DATA DEFINITION LANGUAGE:

- The **Data Definition Language (DDL)** consist of SQL statements used to define the database structure or schema.
- It simply deals with descriptions of the database schema and is used to create and modify the structure of database objects in databases.
- The DDL provides a set of definitions to specify the storage structure and access methods used by the database system.
- **SQL commands which comes under Data Definition Language are:**

Create	To create tables in the database.
Alter	Alters the structure of the database.
Drop	Delete tables from database.
Truncate	Remove all records from a table, also release the space occupied by those records.

iii) DATA CONTROL LANGUAGE:

- A **Data Control Language (DCL)** is a programming language used to control the access of data stored in a database.
- It is used for controlling privileges in the database (Authorization).
- The privileges are required for performing all the database operations such as creating sequences, views of tables etc.

SQL commands which come under Data Control Language are:

Grant	Grants permission to one or more users to perform specific tasks.
Revoke	Withdraws the access permission given by the GRANT statement.

iv) TRANSACTIONAL CONTROL LANGUAGE:

- **Transactional control language (TCL)** commands are used to manage transactions in the database.
- These are used to manage the changes made to the data in a table by DML statements.

SQL command which come under Transfer Control Language are:

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Commit	Saves any transaction into the database permanently.
Roll back	Restores the database to last commit state.
Save point	Temporarily save a transaction so that you can rollback.

4. Construct the following SQL statements in the student table:

(i) SELECT statement using GROUP BY clause.

SELECT Gender FROM Student GROUP BY Gender;

Output:

Gender
Male
Female

SELECT Gender, count(*) FROM Student GROUP BY male;

Output:

Gender	Count(*)
Male	5
Female	3

(ii) SELECT statement using ORDER BY clause.

SELECT * FROM student WHERE Age>=18 ORDER BY Name DESC;

Output:

Admno	Name	Gender	Age	Place
105	Revathi	F	19	Chennai
106	Devika	F	19	Bangalore
103	Ayush	M	18	Delhi
101	Adarsh	M	18	Delhi
104	Abinandh	M	18	Chennai

5. Write a SQL statement to create a table for employee having any five fields and create a table constraint for the employee table.

```
CREATE TABLE employee
(
empno integer NOT NULL,
name char(20),
desig char(20),
pay integer,
allowance integer,
PRIMARY KEY (empno)
);
```

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