**Q: What is SQL?**

SQL stands for Structure query language. It is invented in the year 1970 by IBM. Later in the year 1976 it was purchased by Oracle Corporation and they released in the version 2.0

Why: It is used to communicate with relational database. By using SQL we can perform CRUD operations.

**Q: What is Database?**

Database is a place where we can store the data in a systematic and organised manner.

**Data:** Data is a raw factor of an object and it will describe the properties/attributes of an object.

Properties are also known as “Attributes”.

Object is also known as “Entity”.

There are two kinds of database are available:

1. Relational Database
2. Non-Relational Database

**Q: What is DBMS?**

Database Management System is known as DBMS. It is used to maintain and manage the database.

In DBMS we are having two features:

1. Security - protect data from theft, destruction, and other types of malicious behaviour.
2. Authorization - Giving permission to user to access database, modify the data or display the information. It also controls the access given to the user.

In DBMS we are using query language to communicate with the database. In DBMS we are going to store the data in **FILE – FORMAT**.

**Dis-Adv:** In DBMS we are having two disadvantages

1. Memory Wastage
2. It will take more time to display the data. Because the compiler will search the data based upon binary values.

**Q: What is RDBMS?**

Relational Database Management System is known as RDBMS. It is used to maintain and manage the database.

Why: To overcome the disadvantages in DBMS we use RDBMS.

In RDBMS we are having two features:

1. Security
2. Authorization

In RDBMS we are storing the data in **TABLE FORMAT.**

In RDBMS we are using structured query language to communicate with the database.

In RDBMS we’ll get the data faster than the DBMS, Because the compiler will search the data based on ASCII values

**ASCII –** American Standard Code for Information Interchange

**ANSI –** American National Standard Institute

**Q: What is Table?**

The combination of rows and columns is known as Table. The table consists of:

1. Column: The vertical portion of the table is known as column. It is also called as “ATTRIBUTES”, “FIELD”, “PROPERTIES”.
2. Row: The horizontal portion of the table is known as Row. Row is also known as “PERIOD”, “TUPLE”.
3. Cell: The intersection of a row and column is known as Cell. It is the smallest part of the table.

Why: In a relational database management system, tables are the basic unit of data storage. It contains a header row at the top of the table, which gives the list of column names, followed by rows that contain data

**Q: What are Rules of E.F CODD?**

**E.F CODD:** Edger Frank Codd. He invented Relational Model.

He proposed four rules:

**Rule 1:** Whenever we are inserting the data into the cell, it must be a single value.

Reason: While updating, if there are multiple data present there will be **Data Loss**.

**Rule 2:** In RDBMS we are storing the data in multiple tables, if it is required, we can establish the relation between the table by using “**Key Attributes”**

**Rule 3:** In RDBMS, we are storing the data along with the META-DATA.

**META-DATA:** The data displaying about the data is known as Meta Data.

**Rule 4:** Whenever we are inserting the data into the table, We have to validate and verify.

To validate and verify the data we are having 2 ways:

1. By Assigning Data Types.
2. By Assigning Constraints

**Q: What are Data Types?**

It determines or specify which type of data we are going to store in the particular memory location. We are having 5 types of datatypes:

1. CHAR
2. VARCHAR
3. DATE
4. NUMBER
5. LARGE OBJECT

**1) CHAR:** This datatype accepts Alphabets, Numbers, Special Characters and Alpha Numeric. When we are using char datatype we have to enclose the character within the single quotes.

Whenever we are using the char datatype, we have to mention the size.

If we didn’t mention the size, by default it will consider as 1. The maximum size of char datatype is 2000 characters.

**2) VARCHAR:** It is same as CHAR datatype, It accepts Alphabets, Numbers, Special Characters and Alpha Numeric. When we are using char datatype we have to enclose the character within the single quotes.

Whenever we are using the char datatype, Size is mandatory. The maximum size of varchar datatype is 2000.

It follows “**Variable Length Memory Allocation**”.

**VARCHAR 2:** It is the updated version of varchar datatype. The maximum size of varchar 2 datatype is 4000 characters

Syntax: **varchar2( size );**

**NOTE:** Whenever we are using varchar datatype by default it will consider as varchar2 datatype.

**3) DATE:** It is used to store only the date in “ORACLE-FORMAT”

There are two formats:

1. DD-MON-YYYY
2. DD-MON-YY

Syntax: **date;**

**4) NUMBER:** It is used to store numeric values. Number data type is having two arguments:

1. Precision: It is used to insert the number. Range of precision is 1-38.
2. Scale: It is used to insert the decimal point to the precision value. The range of scale is 0-127.

Syntax: NUMBER ( PRECISION, SCALE );

Steps to be followed:

1. Identify the Precision, Scale.
2. Identify the greatest value.
3. Blocks will be created upon the greatest value.
4. Precision will be inserted ( Number will be inserted ).
5. Decimal point will be inserted ( Scale will be inserted ).

**5) LARGE OBJECT:** It is used to store huge amounts of data.

In Large Object we are having two types:

1. Character Large Object
2. Binary Large Object

* CHARACTER LARGE OBJECT:

It is used to store huge amount of characters up to 4GB.

Syntax: CLOB;

Ex: Social Media Applications

* BINARY LARGE OBJECT:

It is used to store huge amount of binary values upto 4GB.

Syntax: BLOB;

Ex: Photos, Videos, Audios……..

**Q: What are Constraints?**

Constraints: These are the rules used to verify the data.

We are having 5 types of constraints:

1. **Unique:** It is a constraint which cannot accept repeated or duplicate values.
2. **Not Null:** It is a constraint which cannot accept null values.
3. **Check:** It is a extra validation assigned to the column along with the condition. If the condition is satisfied it’ll accept the value other wise reject the value.
4. **Primary key:** It is a constraint used to identify the record uniquely from the table.

Characteristics of primary key:

* + It cannot accept repeated or duplicated values.
  + It cannot accept null values
  + It is a combination of unique and not null constraints.
  + One table can accept only one column as primary key
  + Primary key is optional but highly recommended

1. **Foreign key:**

It is a constraint used to establish connection/relation between the tables.

Characteristics:

* + It can accept repeated/duplicate values
  + It accepts null values
  + One table can accept more than one column as foreign key
  + If we want to make a column as a foreign key, It must be a primary key in its own table.
  + Foreign key is present in child table, but it belongs to parent table
* Foreign Key is also known as **Referential Integrity Constraint** (RFE).

**Q: What are statements in SQL?**

We are having 5 types of statements in SQL, they are:

1. Data Definition Language (DDL):

Data definition language (DDL) is a collection of SQL commands that are used to build, change, and delete database structures.

Ex: CREATE, DROP, ALTER, TRUNCATE, RENAME, COMMENT.

1. Data Manipulation Language (DML):

DML refers to SQL instructions that deal with the alteration of information stored within a database, which constitutes the majority of SQL queries.

Ex: INSERT, UPDATE, DELETE, LOCK, CALL.

1. Transaction Control Language (TCL):

A transaction is a collection of tasks that are executed as a single entity. Each transaction commences with a particular task and finishes when all of the tasks throughout the group are accomplished.

Ex: BEGIN, COMMIT, ROLLBACK, SAVEPOINT.

1. Data Control Language (DCL):

These SQL commands comprise GRANT and REVOKE, which primarily interact with the database system’s rights, permits, and other restrictions.

Ex: GRANT, REVOKE.

1. Data Query Language (DQL):

It is used to read the data from database or table. In DQL we are having 4 statements:

* + SELECT

It is used to select the data and display.

* + SELECTION

It is used to display/select the data by selecting column as well as row.

* + PROJECTION

It is used to read the data by selecting only the columns.

* + JOINS

It is used to read the data from multiple tables simultaneously

**Q: What is PROJECTION?**

It is used to display the data by selecting only the column.

Syntax: **SELECT \* / [DISTINCT] COL\_NAME / EXPRESSION [ALIAS]**

**FROM TABLE\_NAME;**

Order of Execution:

1. FROM CLAUSE:

It will move to the database and search for the table. If the table is present, it will select the table and put under the execution.

1. SELECT CLAUSE:

It will move to the table and search for the column/expression. If it is present, it will select and display.

NOTE:

1. “--” is used to give single line comment
2. “/\* COMMENTS \*/” is used to give multi-line comments.
3. “ED” or “EDIT” is used to edit the query
4. “/” is used to execute the query after editing
5. SQL is not case sensitive.

**Q: What is DISTINCT?**

It is used to remove the repeated/duplicated values from the result set. Whenever we are using DISTINCT, we have to use it as a first argument. One clause will accept only one DISTINCT and can be used in SELECT clause only.

Syntax: **SELECT DISTINCT COL\_NAME**

**FROM TABLE\_NAME;**

Q: What is Expression?

A statement which returns a result is known as expression.

Statement – The combination of operator and operands is known as statement.

Operand – These are the values/inputs we have to pass

Operator – These are used to perform specific task.

**Q: What is ALIAS?**

It is used to provide the alternate name to the column/expression. We can provide the ALIAS name in the following ways:

1. Without using alias keyword: ALIAS\_NAME
2. With using AS keyword: AS ALIAS\_NAME

Etc ..

**Q: What is SELECTION?**

It is used to select the data from both row as well as column.

Syntax: SELECT \*/COL\_NAME/EXP

FROM TABLE\_NAME

WHERE <FILTER\_CONDITION>;

(COL\_NAME = ‘VALUE’)

Order of Execution:

1. FROM
2. WHERE

where clause is used to filter the records. It’ll execute row by row.

1. SELECT

**Q: What are Operators?**