1.What is SQL?

SQL Stands for Structured Query Language is a Standard Programming Langauge used to Communicate with Relational databases.It allows users to Create,Update,Retrieve and Delete data and manage database Security and Integrity.

2.What is a database?

A database is an Organized Collection of data stored electronically,typically structured in tables with rows and columns.It is managed by database management system (DBMS).

3. What are the main types of SQL commands?

SQL commands are broadly classified into FOUR:

DDL(Data Definition Langauge): CREATE,ALTER,DROP,TRUNCATE.

DML(Data Manipulation Language): SELECT,INSERT,UPDATE, DELETE.

DCL(Data Control Langauge): GRANT,REVOKE.

TCL(Trasaction control Langauage): COMMIT,ROLLBACK,SAVEPOINT.

4. What is the difference between CHAR and VARCHAR2 data types?

CHAR: Fixed-length storage.If the defined length is not fully used,it is padded with spaces.

VARCHAR2: Variable-length storage.Only the actual data is stored,Saving space when full length is not needed.

5. What is a primary key?

A Primary key is a unique identifier for each record in a table.It ensures that no two rows have same value in the primary key column and it does not allow null values.

6. What is a foreign key?

A foreign key is a column in one table refers to primary key in another table.it establishes and enforces a relationship between the two table,ensuring data integrity.

7.What is the purpose of the DEFAULT constraint?

The Default constraint assigns a defualt value to a column when no value is provided during an insert operation.

8. What is a query in SQL?

A Query is a sql statement used to retrieve,update data in database. The most common type of Query is “Select” which fetches data from one or more tables bases on specified condition.

9. What are the different operators available in SQL?

- Arithmetic Operators: +, -, *, /, %
- Comparison Operators: =, !=, <>, >, <, >=, <=
- Logical Operators: AND, OR, NOT
- Set Operators: UNION, INTERSECT, EXCEPT
- Special Operators: BETWEEN, IN, LIKE, IS NULL

10.What us a View in SQL?

A view is virtual table created by a select query. It does not store data itself, but presents data from one or more table in structured way. Views simplify complex queries, improve readability, and enhance security by restricting access to specific rows or columns.

11.What is the purpose of Unique constraint?

The Unique Constraint ensures that all values in a column are distinct.This prevents duplicate values and help maintain data integrity.

12.What are the different types of joins in SQL?

INNER JOIN: Returns rows that have matching values in both tables.

LEFT JOIN: Returns all rows from the left table,and matching rows from right table.

RIGHT JOIN: Returns all rows from right table, and matching rows from left table.

FULL JOIN: Returns all rows when there is match in either table.

CROSS JOIN: Produces the cartesian product of two tables.

13. What is the difference between INNER JOIN and OUTER JOIN?

INNER JOIN: Returns only rows where there is match in both tables.

OUTER JOIN: Returns all rows from one table(left,right, or full) and the matching rows from the other table.if there is not match, NULL values are returned for non-matching sides.

14. What is the purpose of the GROUP BY clause?

The group by clause is used to arrange identical data into groups .It is typically used with aggregrate functions such as (COUNT,SUM,AVG) to perfrom calculations on each group rather than entire dataset.

15. What are aggregate functions in SQL?

Aggregate functions perform calculations on a set of values and return a single value. Common aggregate functions include:

- COUNT(): Returns the number of rows.
- SUM(): Returns the total sum of values.
- AVG(): Returns the average of values.
- MIN(): Returns the smallest value.
- MAX(): Returns the largest value.

16. What is a subquery?

A subquery is a query nested within another query. It is often used in the where clause to filter data based on the result of another query making it easier to handle complex conditions.

17.What is the difference between the WHERE and HAVING clauses?

WHERE: Filters rows before any grouping takes place.

HAVING: Filters grouped data after the group by clause has been applied.

In Short, Where applies to individual rows, while having applies to groups.

18.What is the difference between DELETE and TRUNCATE commands?

DELETE: Removes rows one at time and records each deletion in transaction log,allowing rollback. It can have a Where clause.

TRUNCATE:Removes all rows at once.it cannot have where clause and is faster than DELETE for large data sets.