DATABASE TECHNOLOGIES

1) **What is a database?**

- The database is a collection of interrelated data which is used to
  - Insert
  - Update
  - Delete
  - Retrieve the data efficiently

- It is also used to organize the data in the form of a table, schema, and view

  Example - College database

2) **What is DBMS?**
   - The database management system is software that is used to manage the database. For example, MySQL, Oracle, etc are a very popular commercial database which is used in different applications.
   - DBMS provides an interface to perform various operations like
     - database creation,
     - storing data,
     - updating data
     - creating a table in the database, and a lot more.
   - It provides protection and security to the database

3) **Characteristics of DBMS?**

- It is used to provide security of data.
- It can reduce the complex relationship between data.
- DBMS contains automatic backup and recovery procedures

4) **Advantages of DBMS?**
    - Data sharing
    - Data independence
    - Maintenance of integrity
    - Reduction of data redundancy
5) **Database users?**
    - Application programmers
    - Sophisticated users
    - End users
    - Database Administrator(DBA)
6) **What is a data model?**
    - The data model is a way of explaining the logical layout of data and the relationships
7) **Types of data model?**
    - Hierarchical
    - Network
    - Relationship
8) **What is a Hierarchical data model?**
    - In a hierarchical data model, the data is represented by the tree structure
    - It can not handle many to many relations
    - It has some inconsistency in
        - Insert
        - Delete
        - Update operations

9) Network data model?

- In the network data model, the data is represented by records and pointers
- It can handle many to many relations
- Insert, update, delete operations are possible
- Design is very complex

10) Relational data model?

- In the relational data model, the data kept in table or relations
- It is more flexible and easy to use
- Almost any item of the data can be accessed more quickly than other models

11) What is RDBMS?

- RDBMS is a system software
- It is used to create, update the relational database
- RDBMS uses SQL to access the database
- MySql, Oracle is the product of RDBMS

12) What is SQL?

- **SQL** is a computer language that is used to accessing and manipulating the database system
- SQL statements are used to retrieve data and update data in the database
- SQL is not a case sensitive

13) Components of SQL?

- DDL
- DML
- TCL
- DCL

14) What is DDL?

- DDL stands for Data Definition language
- It defines the structure of database objects
    - CREATE
    - ALTER
    - TRUNCATE
    - DROP
    - RENAME

15) What is DML?

- DML stands for Data manipulation language
        - INSERT
        - UPDATE
        - DELETE
        - SELECT

16) What is TCL?

- TCL stands for the Transaction control language
        - Commit
        - Rollback

17) What is Commit in SQL?

- Commit statement comes under TCL
- It is used to permanently save the changes in transactions in the table/database

18) What is a rollback in SQL?

- Rollback comes under the TCL
- It is used to undo the transaction that has been not saved in a database

19) What is DCL?

- DCL stands for Data control language
  - Grant
  - Revoke comes under DCL

20) What is Grant?

- Grant is used to providing any user access to the database

21) What is Revoke?

- Revoke is used to take back permission from any users

22) What is a constraint?

- Constraints are the rules that are implemented in the column of the table
- Constraints are used to control the types of data that can go in the table

23) Types of constraints?

- Primary key
- Foreign key
- Not null
- Unique
- check

24) What is a primary key constraint?

- The two-column joined together can be created by the primary key
- A table can have only one primary key but it can have n number of other constraints
- primary key does not accept duplicate values and null values

25) What is a Unique key?

- Unique key does not accept duplicate values but allowed null values

26) What is Not null?

- Unique key does not accept null values but allowed duplicate values

27) What is the check key?

- Check constraint is used to enable the condition to check the value

28) What is a foreign key?

- A foreign key is used to create a link between two tables
- The reference table is called the parent table
- Table with foreign key is called the child table
- The primary key or unique key column of the parent table can be created as the foreign key in the child table

29) What is CASCADE?

- It is used to delete the row from the parent table and also delete the matching row in the child table

30) What is SET NULL?

- It is used to delete the row from the parent table and sets the foreign key column in the child table to null

31) What is RESTRICT?

- It rejects the delete or update operation for the parent table
- This is the default option

32) DELETE in SQL?

- Delete all rows or specific rows from the table
- It can be reverted
- Rows that are referred to in the child table can not be removed

33) TRUNCATE in SQL?

- Remove all rows from the table
- It can not be reverted

34) DISTINCT in SQL?

- **DISTINCT** keyword in the select clause is used to eliminate the duplicate rows

35) WHERE in SQL?

- It is used to restrict the rows returned by using the where clause
- The where clause follows the “From” clause

36) LIKE in SQL?

- To select rows that match a character pattern by using the LIKE condition
- % denotes zero to many characters
- _ denotes one character

37) JOIN in SQL?

- A JOIN clause is used to combine rows from two or more tables, based on the related column between them

38) Types of JOIN?

- Inner join
- Left outer join
- Right outer join
- Full outer join
- Self-join

39) INNER JOIN?

- The inner join keywords select the rows that have matching values in both tables

40) LEFT JOIN?

- Left join returns all the records from the left table and returns matching records from the right table

41) RIGHT JOIN?

- Right join keyword returns all rows from the right table and the matching records from the left table

42) FULL OUTER JOIN?

- A full outer join returns all the matching records from both tables

43) SELF JOIN?

- Self-join is a regular join but the table joined with itself

44) BETWEEN in SQL?

- Between operator used to selects the values from the given range
- The values can be number, text, dates

45) GROUP BY in SQL?

- Group by statements groups the rows that have the same values into summary rows like " find the number of customers in each country"
- The group by statement used with aggregate functions
  - count()
  - avg()
  - max()
  - min()
  - sum() to group the results

46) HAVING in SQL?

- In the aggregate function, we can not use where keyword.
- Having clause can be used in aggregate functions

47) View in SQL?

- The view is a virtual table based on the result-set
- It contains rows and columns just like a real table
- We can add a SQL statement and functions to a view
- The view is created with the CREATE VIEW statement

48) What is normalization?

- Normalization is the process of organizing the data in the database.
- Normalization is used to minimize the redundancy from a relation or set of relations. It is also used to eliminate undesirable characteristics like Insertion, Update, and Deletion Anomalies.
- Normalization divides the larger table into the smaller table and links them using relationships.
- The normal form is used to reduce redundancy from the database table.

49) Type of normalization?

- There are 4 types of normalization
  - 1NF
  - 2NF
  - 3NF
  - BCNF

50) What are ACID properties?

- Atomicity
- Consistency
- Isolation
- Durability

51) What is subquery?

- A subquery is a query within another query. The outer query is known as the main query, and the inner query is known as a subquery.

52) What is a candidate key?

- A candidate key is a subset of the super key which contains no redundant attributes
- A candidate key identifies the rows or columns uniquely
- A table can have one or more candidate key