1. Explain a Database system?

**Software system that enables users to define, create, maintain and control access to the database**

2. Explain database?

**A database is an organized collection of structured information, or data, typically stored electronically in a computer system**

3. Define the benefits of DBMS?

* **Improved data sharing and data security. Database management systems help users share data quickly, effectively, and securely across an organization. ...**
* **Effective data integration. ...**
* **Consistent, reliable data. ...**
* **Data that complies with privacy regulations. ...**
* **Increased productivity. ...**
* **Better decision-making**.

4. Write in brief the three levels of data abstraction.

* **Physical: This is the lowest level of data abstraction. ...**
* **Logical: This level comprises the information that is actually stored in the database in the form of tables. ...**
* **View: This is the highest level of abstraction.**

5. Explain durability in DBMS?

**Durability in databases is the property that ensures transactions are saved permanently and do not accidentally disappear or get erased, even during a database crash. This is usually achieved by saving all transactions to a non-volatile storage medium.**

6. What do you mean by atomicity and aggregation?

**Atomicity: In database management, atomicity is a concept that assures the users of the incomplete transactions. It takes care of these transactions and the actions related to incomplete transactions are left undone in DBMS.**

**Aggregation: It aggregates the collected entities and their relationships.**

7. Explain a checkpoint and When does it occur?

**Checkpoint is a mechanism where all the previous logs are removed from the system and stored permanently in a storage disk. Checkpoint declares a point before which the DBMS was in consistent state, and all the transactions were committed.**

8. Define the different phases of transaction?

**Active state: This phase is divided into two states: - Initial phase: This phase is achieved when the transaction starts. - Partially Committed phase: This is achieved when the transactions final statement has been executed**.

9. What do you mean by flat file database?

**A flat file is a collection of data stored in a two-dimensional database in which similar yet discrete strings of information are stored as records in a table.**

10. Explain "transparent DBMS"?

**It is one, which keeps its Physical Structure hidden from user**.

11. Explain a query?

**A query is a request for data or information from a database table or combination of tables.**

12. What do you mean by Correlated subquery?

**A correlated subquery is a subquery that refers to a column of a table that is not in its FROM clause.**

13. How do you communicate with an RDBMS?

**You can communicate RDBMS by structural query language (SQL). The SQL is used for inserting/modifying/deleting & Retrieving data from Database. You can also use SQL for Access controls & Administration.**

14. Explain DDL (Data Definition Language)?  
**Data Definition Language(DDL) is a subset of SQL and a part of DBMS(Database Management System). DDL consist of Commands to commands like CREATE, ALTER, TRUNCATE and DROP. These commands are used to create or modify the tables in SQL.**

15. Explain VDL (View Definition Language)?

**VDL(View Definition Language): Represents user views and their mapping to the conceptual schema.**

16. Explain SDL (Storage Definition Language)?

**SDL(Storage Definition Language): Specifies the mapping between two schemas**.

17. Explain DML (Data Manipulation Language)?

**A data manipulation language (DML) is a family of computer languages including commands permitting users to manipulate data in a database. This manipulation involves inserting data into database tables, retrieving existing data, deleting data from existing tables and modifying existing data.**

18. Explain the "integrity rules"?

19. Explain Data Independence?

20. Explain a view? How it is related to data independence?

21. Explain Data Model?

22. Explain E-R model?

**An Entity–relationship model (ER model) describes the structure of a database with the help of a diagram, which is known as Entity Relationship Diagram (ER Diagram).**

23. Explain Object Oriented model?

24. Explain an Entity?

25. Explain an Entity type?

26. Explain an Entity set?

27. Explain Weak Entity set?

28. Explain an attribute?

29. Explain a Relation Schema and a Relation?

30. Explain degree of a Relation?

31. Explain Relationship?

32. Explain Relationship set?

33. Explain normalization?

**Normalization is the process of minimizing redundancy from a relation or set of relations. Redundancy in relation may cause insertion, deletion, and update anomalies. So, it helps to minimize the redundancy in relations. Normal forms are used to eliminate or reduce redundancy in database tables.**

34. Explain Functional Dependency?

35. Explain Fully Functional dependency?

36. Explain 1 NF (Normal Form)?

37. Explain 2NF?

38. Explain 3NF?

39. Explain BCNF (Boyce-Codd Normal Form)?

40. Explain 4NF?

41. Explain Domain-Key Normal Form?

42. Define partial, alternate, artificial, compound and natural key?

43. Explain indexing and define the different kinds of indexing?

44. Write in brief the four types of indexes.

**Types of Indexing in DBMS. Primary Index in DBMS. Secondary Index in DBMS. Clustering Index in DBMS.**

**A primary index is an index on a set of fields that includes the unique primary key and is guaranteed not to contain duplicates. In contrast, a secondary index is an index that is not a primary index and may have duplicates**

45. Explain system catalog or catalog relation? How is better known as?

46. Explain meant by query optimization?

47. Explain SQL and state the differences among SQL and other conventional programming Languages.

**SQL is a nonprocedural language that is designed specifically for data access operations on normalized relational database structures. The primary difference between SQL and other conventional programming languages is that SQL statements specify what data operations should be performed rather than how to perform them.**

48. Explain database Trigger?

**A database trigger is procedural code that is automatically executed in response to certain events on a particular table or view in a database**.

49. Name four applications for triggers.

* **Automatically generate derived column values.**
* **Prevent invalid transactions.**
* **Enforce complex security authorizations.**
* **Enforce referential integrity across nodes in a distributed database.**
* **Enforce complex business rules.**

50. Define stored-procedures? And Define the Benifits of using them?

**By grouping SQL statements, a stored procedure allows them to be executed with a single call. This minimizes the use of slow networks, reduces network traffic, and improves round-trip response time. OLTP applications, in particular, benefit because result set processing eliminates network bottlenecks.**

51. Define cursors give different types of cursors?

**Cursor is a Temporary Memory or Temporary Work Station. It is Allocated by Database Server at the Time of Performing DML(Data Manipulation Language) operations on Table by User. Cursors are used to store Database Tables. There are 2 types of Cursors: Implicit Cursors, and Explicit Cursors.**

52. Define data and information, and how are they related in a database?

53. Explain Enterprise Resource Planning (ERP), and what kind of a database is used in an ERP application?

54. Write an SQL SELECT statement to display all the columns of the STUDENT table but only those rows where the Grade column is greater than or equal to 90.

**SELECT \* FROM STUDENT WHERE Grade >=90;**

55. Name and briefly Write in brief the five SQL built-in functions.

**(COUNT, SUM, AVG, MAX, MIN). All these are aggregate functions that are in-built functions provided by SQL. These five functions perform calculations on the result-set and return the single value**

56. Write an SQL SELECT statement to count the number of rows in STUDENT table and display the result with the label NumStudents.

**SELECT COUNT(\*) AS NumStudents FROM STUDENT;**

57. Explain an SQL subquery?

**A Subquery or Inner query or a Nested query is a query within another SQL query and embedded within the WHERE clause. A subquery is used to return data that will be used in the main query as a condition to further restrict the data to be retrieved.**

58. Explain a foreign key, and explain it used for?

**A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables. It acts as a cross-reference between tables because it references the primary key of another table, thereby establishing a link between them.**

59. Define the steps for transforming an entity into a table?

60. Explain a surrogate key, Write in brief the ideal primary key and Write in brief how surrogate keys meet this ideal

61. Explain a cascading update?

62. Explain a SQL view? Briefly Write in brief the use of views.

63. Write in brief how to add a NOT NULL column to a table.

**ALTER the table by adding the column with NULL constraint. Fill the column with some data. ...**

64. You have two tables, EMPLOYEE and COMPUTER that are in a one-to-one relationship. The foreign key is EmpNumber in COMPUTER which references EmpNumber as the primary key of EMPLOYEE. Write in brief what must be done to convert the one-to-one EMPLOYEE-COMPUTER relationship to a one-to-many relationship where one employee can have more than one computer.

**In the one-to-one relationship, there will be a constraint on Emp Number as a foreign key in COMPUTER stating that Emp Number must be unique. To convert the relationship to a one-to-many relationship, just drop this constraint.Read more on Sarthaks.com - https://www.sarthaks.com/1196899/you-have-two-tables-employee-and-computer-that-are-in-a-one-to-one-relationship**

65. Write in brief what we mean by an ACID transaction.

**A transaction is a single logical unit of work that accesses and possibly modifies the contents of a database. Transactions access data using read and write operations. In order to maintain consistency in a database, before and after the transaction, certain properties are followed. These are called ACID properties.**

66. Write in brief what needs to happen to convert a relation to third normal form.

67. Explain denormalizations and why would someone consider doing so?

68. Compare a hierarchical and network database model?

69. Write in brief the difference among a dynamic and materialized view.

70. Briefly Write in brief the three types of SQL commands.

* **Data Definition Language (DDL) DDL changes the structure of the table like creating a table, deleting a table, altering a table, etc. ...**
* **Data Manipulation Language. DML commands are used to modify the database. ...**
* **Data Control Language. ...**
* **Transaction Control Language. ...**
* **Data Query Language.**

71. Define the steps to follow when preparing to create a table?

**The create table statement is used to create a new table. Here is the format of a simple create table statement:**

**create table "tablename" ("column1" "data type", "column2" "data type", "column3" "data type");**

72. Write in brief a join among tables

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

73. Write in brief and contrast a trigger and a procedure.

74. Briefly Write in brief an outer join.

75. Write in brief a subquery.

76. Write in brief the difference among two and three-tier architectures.

77. Write in brief a data warehouse.

**A data warehouse is a type of data management system that is designed to enable and support business intelligence (BI) activities, especially analytics.**

78. Write in brief the differences among a data warehouse and data mart.

79. Write in brief the difference among data and database administration.

80. Define some of the important security features of a DBMS?

81. Write in brief the difference among homogeneous and heterogeneous distributed database.

82. Explain a distributed database?

83. Write a query to print Second highest salary.

**SELECT MAX(SALARY) FROM Employee WHERE SALARY < (SELECT MAX(SALARY) FROM Employee);**

84. Define different types of clauses?

**SQL GROUP BY statement is used to arrange identical data into groups. The GROUP BY statement is used with the SQL SELECT statement. The GROUP BY statement follows the WHERE clause in a SELECT statement and precedes the ORDER BY clause. The GROUP BY statement is used with aggregation function.**

85. Explain inner join? Write it’s query

**Inner Join clause in SQL Server creates a new table (not physical) by combining rows that have matching values in two or more tables. This join is based on a logical relationship (or a common field) between the tables and is used to retrieve data that appears in both tables**

86. Types of joins, slowest and fastest amongst them.

* **INNER) JOIN : Returns records that have matching values in both tables.**
* **LEFT (OUTER) JOIN : Returns all records from the left table, and the matched records from the right table.**
* **RIGHT (OUTER) JOIN : Returns all records from the right table, and the matched records from the left table.**

usually **INNER JOIN** is more restrictive and returns fewer results and is therefore faster.

1-How to find duplicates in a table  
2- How to delete duplicates from a table  
3- Difference between union and union all  
4- Difference between rank,row\_number and dense\_rank  
5- Find records in a table which are not present in another table  
6- Find second highest salary employees in each department  
7- Find employees with salary more than their manager's salary  
8- Difference between inner and left join  
9- update a table and swap gender values.

**select id , extract(hour from hours) as hr from user\_log,rank() over(order by hr desc);**

**select extract(hour from timestamp) as hour, count(id) as log from Weblog group by hour order by log desc;**