

ADBMS LAB EXAM VIVA QUESTION ANSWERS

1. **Database:**

A database is a structured collection of data organized in a way that allows for efficient storage, retrieval, and manipulation of data. Databases are designed to store large amounts of information in a structured format for easy access and management.

2. **DBMS (Database Management System):**

A DBMS is software that provides an interface for users and applications to interact with a database. It manages data storage, retrieval, security, and ensures data integrity. Popular DBMS systems include MySQL, PostgreSQL, Oracle, and Microsoft SQL Server.


3. **Applications of DBMS:**

- Business data management
- E-commerce websites
- Inventory management systems
- Customer relationship management (CRM)
- Human resources management systems (HRMS)
- Online banking systems
- Social media platforms
- Healthcare record management

4. **SQL (Structured Query Language):**

SQL is a domain-specific language used for managing and querying relational databases. The name SQL stands for "Structured Query Language." Example query:

sql

 Copy code

```
SELECT * FROM Customers WHERE Country='USA';
```

5. Relational Database:

A relational database is a type of database that uses a tabular structure with rows and columns to store and manage data. Data is organized into tables, and relationships between tables are established using keys.

6. SQL Languages:

- **DDL (Data Definition Language):** Used for defining and managing the structure of the database.
 - Syntax: CREATE TABLE, ALTER TABLE, DROP TABLE, etc.
- **DML (Data Manipulation Language):** Used for querying and manipulating data.
 - Syntax: SELECT, INSERT, UPDATE, DELETE, etc.
- **DCL (Data Control Language):** Used for controlling access to data.
 - Syntax: GRANT, REVOKE, etc.

7. View and Index:

- **View:** A virtual table derived from one or more tables. It presents data from the underlying tables in a specific way.
- **Index:** A database structure that improves the speed of data retrieval operations on a table.

8. Difference between Truncate and Drop:

- **Truncate:** Removes all rows from a table while keeping the table structure intact. It can't be rolled back.
- **Drop:** Deletes an entire table, including its structure. It can be rolled back if used within a transaction.

9. Different Datatypes in SQL:

Common data types include INT, VARCHAR, DATE, FLOAT, BOOLEAN, etc.

10. **Different Types of Keys and Their Uses:**

- **Primary Key:** Uniquely identifies each row in a table.
- **Foreign Key:** Establishes a link between two tables by referring to the primary key of another table.
- **Unique Key:** Ensures that values in a column are unique.
- **Composite Key:** Combines two or more columns to create a unique key.

11. **Aggregate Functions (MIN, MAX, AVG, SUM, COUNT):**

- **MIN:** Returns the minimum value in a set.
- **MAX:** Returns the maximum value in a set.
- **AVG:** Returns the average value of a set.
- **SUM:** Returns the sum of values in a set.
- **COUNT:** Returns the number of rows in a set.

12. **Date Functions:** SQL provides functions for working with date and time data, such as DATEADD, DATEDIFF, NOW, etc.

13. **Set Operations (UNION, IN, NOT IN):**

- **UNION:** Combines the results of two or more SELECT queries.
- **IN:** Tests if a value matches any value in a subquery or list.
- **NOT IN:** Tests if a value does not match any value in a subquery or list.

14. **LIKE Operator:**

- Used for pattern matching in WHERE clauses. It allows the use of wildcard characters like '%' and '_'.

15. **ORDER BY and GROUP BY:**

- **ORDER BY:** Sorts the result set based on specified columns.
- **GROUP BY:** Groups rows with similar values in specified columns.

16. Different Types of Joins:

- INNER JOIN, LEFT JOIN (or LEFT OUTER JOIN), RIGHT JOIN (or RIGHT OUTER JOIN), FULL JOIN (or FULL OUTER JOIN), CROSS JOIN.

17. PL/SQL (Procedural Language SQL):

- PL/SQL is an extension of SQL that adds procedural capabilities. It is often used for writing stored procedures, functions, and triggers in Oracle databases.

18. Use of Procedures and Functions in SQL:

- Procedures: Used for executing a sequence of SQL statements.
- Functions: Return a single value and can be used in SQL statements.

19. Trigger (Syntax and Use):

- A trigger is a database object that automatically executes when certain events (e.g., INSERT, UPDATE, DELETE) occur in a table.

20. Cursor (Syntax and Use):

- A cursor is a database object used to retrieve and manipulate data row by row, typically within stored procedures or functions.

21. Comparison between MySQL and MongoDB:

- Please provide specific notes for a detailed comparison.

22. Different Functions in MongoDB:

- MongoDB uses functions like `find`, `insert`, `update`, and `delete` for data manipulation. It also has aggregation framework functions for complex data analysis.

23. Different Data Models:

- Relational, Entity-Relationship (ER), Object-Oriented, Document-Based, Graph-Based, Key-Value, Columnar, etc.

24. **Data Independence (Physical, Logical, View):**

- Physical Independence: Changes in the physical storage structure should not affect the application.
- Logical Independence: Changes in the logical schema should not require changes to the application.
- View Independence: Changes in views (virtual tables) should not affect the underlying schema or application.

25. **ACID Properties of SQL and CAP Properties of NoSQL:**

- ACID (Atomicity, Consistency, Isolation, Durability) ensures data integrity in SQL databases.
- CAP (Consistency, Availability, Partition Tolerance) is a trade-off in NoSQL databases, meaning they prioritize two out of the three properties.

26. **Different Types of Relationships (One-to-One, One-to-Many, etc.):**

- One-to-One: Each record in one table is related to one record in another table.
- One-to-Many: Each record in one table can be related to multiple records in another table.
- Many-to-Many: Multiple records in one table can be related to multiple records in another table. Requires a junction table.