1. Q: What is a database?

A: A database is an organized collection of data that allows easy access, management, and updating of information.

2. Q: What is SQL?

A: SQL (Structured Query Language) is a standard language used to manage and manipulate relational databases.

3. Q: What is MySQL?

A: MySQL is an open-source relational database management system (RDBMS) used to store, retrieve, and manage data.

4. Q: What are tables in a database?

A: Tables are structures that store data in rows and columns, with each row representing a record and each column representing an attribute.

5. Q: What is a primary key?

A: A primary key is a unique identifier for each row in a table. It ensures that no two rows have the same value in the primary key column.

SQL Basic Queries

6. Q: What is a SELECT statement?

A: A SELECT statement is used to retrieve data from a table.

Example:

SELECT * FROM Employee;

7. Q: What is the purpose of the INSERT statement?

A: The INSERT statement is used to add new records to a table.

Example:

INSERT INTO Employee (EmpID, Name, Salary) VALUES (1, 'Alice', 50000);

8. Q: What is the difference between DELETE and TRUNCATE?

DELETE: Removes specific rows based on a condition.

TRUNCATE: Removes all rows from a table, but faster and with no rollback option.

9. Q: What is the WHERE clause used for?

A: The WHERE clause is used to filter records based on a condition.

Example:

SELECT * FROM Employee WHERE Salary > 40000;

10. Q: What is the purpose of the UPDATE statement?

A: The UPDATE statement is used to modify existing records in a table.

Example:

UPDATE Employee SET Salary = 60000 WHERE EmpID = 1;

Basic Concepts and Definitions

11. Q: What is a foreign key?

A: A foreign key is a column that creates a relationship between two tables by referencing the primary key of another table.

12. Q: What is a NULL value?

A: A NULL value represents missing or unknown data in a table cell.

13. Q: What is the difference between CHAR and VARCHAR?

CHAR: Fixed-length string (e.g., CHAR(10) always stores 10 characters).

VARCHAR: Variable-length string, storing only the characters entered.

14. Q: What is a join in SQL?

A: A join is used to combine rows from two or more tables based on a related column.

15. Q: What is a constraint in SQL?

A: A constraint is a rule applied to a table's column to enforce data integrity. Examples include PRIMARY KEY, UNIQUE, NOT NULL, FOREIGN KEY, and CHECK constraints.

Transactions and Indexes

16. Q: What is a transaction in a database?

A: A transaction is a sequence of operations performed as a single unit of work, ensuring ACID properties.

17. Q: What is an index in a database?

A: An index improves the speed of data retrieval from a table by providing a faster lookup mechanism.

18. Q: What is the difference between COMMIT and ROLLBACK?

COMMIT: Saves all changes made in a transaction permanently.

ROLLBACK: Reverts the changes made during a transaction if an error occurs.

19. Q: What is the difference between MySQL and SQL?

A: SQL is a query language, while MySQL is a database management system that implements SQL.

20. Q: What are some MySQL data types?

A: Common data types in MySQL include:

INT: Integer numbers

VARCHAR: Variable-length string

DATE: Date values

DECIMAL: Fixed-point numbers

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Q1: What is a relational database?

A relational database organizes data into tables (relations) with rows and columns, using keys to establish relationships between tables.

Q2: What is the difference between SQL and PL/SQL?

SQL is a query language used to interact with databases.

PL/SQL is a procedural extension of SQL, used for writing complex programs with control structures.

Q3: What is a JOIN in SQL?

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

Q4: What is the difference between a function and a stored procedure?

A function returns a value and is used in expressions.

A stored procedure performs actions but does not return a value directly.

Q5: What are the types of database triggers?

BEFORE/AFTER INSERT: Triggered before/after inserting data.

BEFORE/AFTER UPDATE: Triggered before/after updating data.

BEFORE/AFTER DELETE: Triggered before/after deleting data.

SQL and MySQL Questions

1. Q: What are the different types of SQL statements?

DDL (Data Definition Language): CREATE, ALTER, DROP, etc.

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

DCL (Data Control Language): GRANT, REVOKE.

TCL (Transaction Control Language): COMMIT, ROLLBACK, SAVEPOINT.

2. Q: What is the difference between WHERE and HAVING clauses?

WHERE: Filters rows before grouping.

HAVING: Filters grouped data after aggregation.

3. Q: What is normalization? Why is it important?

A: Normalization is the process of organizing data to reduce redundancy and improve data integrity. It ensures efficient storage and faster querying.

4. Q: What is the purpose of a primary key?

A: A primary key uniquely identifies each row in a table and ensures that no duplicate or NULL values are allowed.

5. Q: What is the difference between primary key and unique key?

Primary Key: Uniquely identifies a row and does not allow NULLs.

Unique Key: Ensures uniqueness but allows one NULL value.

Joins, Sub-Queries, and Views

6. Q: What are the different types of joins?

INNER JOIN: Returns matching rows from both tables.

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

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

FULL OUTER JOIN: Returns all rows from both tables with matching or non-matching records.

7. Q: What is the difference between a subquery and a join?

A: A subquery returns a result that is used by the outer query. A join combines data from multiple tables based on a related column.

8. Q: What is a view, and how is it different from a table?

A: A view is a virtual table representing a stored query result. It does not store data physically but pulls data from one or more underlying tables

Transactions, Triggers, and Indexes

9. Q: What are ACID properties in a database?

Atomicity: Ensures all operations within a transaction are completed.

Consistency: Guarantees that a transaction brings the database from one valid state to another.

Isolation: Ensures transactions do not interfere with each other.

Durability: Guarantees that committed transactions remain permanent.

10. Q: What is the purpose of a database trigger?

A: A trigger automatically executes a predefined action when specific events (INSERT, UPDATE, DELETE) occur on a table.

11. Q: What are the advantages of using an index?

Faster data retrieval.

Improves query performance.

Helps in sorting and searching.

12. Q: What is the difference between clustered and non-clustered indexes?

Clustered Index: Data is stored physically in the order of the index.

Non-Clustered Index: Stores a pointer to the data, not the data itself

PL/SQL and Stored Procedures

13. Q: What is the difference between a stored procedure and a trigger?

Stored Procedure: Manually invoked by the user or program.

Trigger: Automatically invoked based on specific events on a table.

14. Q: What are the benefits of using stored procedures?

Improves code reusability.

Encapsulates business logic.

Reduces network traffic by executing logic on the server.

15. Q: What are the different types of control structures in PL/SQL?

Conditional: IF-THEN-ELSE.

Looping: FOR, WHILE, LOOP.

Exception Handling: TRY-CATCH blocks using EXCEPTION.

16. Q: What is a cursor, and why is it used?

A: A cursor is a pointer that allows row-by-row traversal of query results. It is used when the application needs to process individual rows of a result set.

Database Connectivity

17. Q: What is the difference between JDBC and ODBC?

JDBC (Java Database Connectivity): Used to connect Java applications with databases.

ODBC (Open Database Connectivity): Provides connectivity for various programming languages (like C, C++).

18. Q: How does MySQL connect with PHP?

A: PHP uses the MySQLi or PDO extensions to connect with MySQL. A connection is established using mysqli_connect() or the PDO constructor.

19. Q: What is the purpose of database drivers in ODBC and JDBC?

A: Drivers allow programs to communicate with databases, translating API calls into database-specific commands.

20. Q: What are common errors during database connectivity, and how do you handle them?

Connection failure: Check network or authentication.

Query errors: Ensure syntax correctness.

Exception Handling: Use try-catch blocks to gracefully handle errors.