Certainly! Here are explanations for the SQL theory questions you provided:

1. **Difference between DBMS and RDBMS:**

- DBMS (Database Management System) is a software that manages databases. It provides an interface for interacting with the database.

- RDBMS (Relational Database Management System) is a type of DBMS that organizes data into tables with rows and columns. It enforces relationships between tables.

2. **What is a primary key:**

- A primary key is a unique identifier for a record in a table. It ensures that each record in the table can be uniquely identified and retrieved. A primary key cannot have NULL values.

3. **What is a foreign key:**

- A foreign key is a field in a table that refers to the primary key in another table. It establishes a link between the two tables, enforcing referential integrity.

4. **What are constraints? Explain their types:**

- Constraints are rules applied to columns to enforce data integrity. Types include:

  - **Primary Key Constraint**: Ensures uniqueness in a column.

  - **Foreign Key Constraint**: Enforces relationships between tables.

  - **Unique Constraint**: Ensures unique values in a column.

  - **Check Constraint**: Validates data based on a condition.

  - **Default Constraint**: Provides a default value for a column.

5. **Explain different types of SQL commands:**

- SQL commands include:

  - **DDL (Data Definition Language)**: Define and manage database structures (CREATE, ALTER, DROP).

  - **DML (Data Manipulation Language)**: Manipulate data in the database (SELECT, INSERT, UPDATE, DELETE).

  - **DCL (Data Control Language)**: Control access to data (GRANT, REVOKE).

  - **TCL (Transaction Control Language)**: Manage transactions (COMMIT, ROLLBACK).

6. **Difference between DROP, DELETE, TRUNCATE:**

   - **DROP**: Deletes a table or a database.

   - **DELETE**: Removes rows from a table based on a condition.

   - **TRUNCATE**: Removes all rows from a table but retains the structure for future use.

7. **Types of joins:**

   - **INNER JOIN**: Retrieves records with matching values in both tables.

   - **LEFT JOIN (or LEFT OUTER JOIN)**: Retrieves all records from the left table and matching records from the right table.

   - **RIGHT JOIN (or RIGHT OUTER JOIN)**: Retrieves all records from the right table and matching records from the left table.

   - **FULL JOIN (or FULL OUTER JOIN)**: Retrieves all records when there is a match in either the left or right table.

8. **Nested query vs. correlated query:**

   - **Nested Query**: A query within another query.

   - **Correlated Query**: A type of nested query where the inner query depends on the outer query.

9. **Pattern matching:**

   - Uses the LIKE operator to search for a specified pattern in a column.

   - `%` represents zero or more characters, and `_` represents a single character.

10. **Find 2nd highest salary:**

    ```sql

    SELECT MAX(salary)

    FROM employees

    WHERE salary < (SELECT MAX(salary) FROM employees);

    ```

11. **SQL vs. NoSQL vs. MySQL:**

    - SQL is a query language used for managing relational databases.

- NoSQL databases are non-relational, distributed, and designed for scalability.

- MySQL is a specific RDBMS.

12. **VARCHAR vs. VARCHAR2:**

- In some databases, VARCHAR and VARCHAR2 are used interchangeably.

- In Oracle, VARCHAR is an alias for VARCHAR2. Both are used for variable-length character strings.

14. **ACID Property:**

- ACID stands for Atomicity, Consistency, Isolation, and Durability. It ensures reliability in database transactions.

15. **Stored Procedure:**

- A stored procedure is a precompiled collection of one or more SQL statements. It can be called with a single command, enhancing code reusability and security.

16. **Triggers:**

- Triggers are sets of instructions that are automatically executed ("triggered") in response to certain events, such as INSERT, UPDATE, or DELETE operations on a table.

17. **Temporary Table:**

- A temporary table is a table that exists temporarily and stores a subset of data from another table. It is used for various purposes within a session.

18. **View:**

- A view is a virtual table based on the result of a SELECT query. It does not store the data itself but provides a way to represent it.

19. **Normalization and Denormalization:**

- **Normalization**: The process of organizing data to eliminate redundancy and dependency.

- **Denormalization**: The process of combining tables to reduce the number of joins and improve query performance.

20. **Indexing:**

- Indexing is a database feature that enhances the speed of data retrieval operations on a database table. Types include single-column and composite indexes.