

Q1. What is a database? Differentiate between SQL and NoSQL databases.

Database:

A database is a structured collection of data that is organized and stored for easy access and management. It can be a physical container for data or a digital repository, and it can store various types of data like text, numbers, images, etc.

SQL vs NoSQL:

SQL (Structured Query Language):

Relational databases. Table-based structure. Predefined schema. Support for ACID properties (Atomicity, Consistency, Isolation, Durability). Examples: MySQL, PostgreSQL, SQLite, SQL Server, Oracle.

NoSQL (Not Only SQL):

Non-relational databases. Document-oriented, key-value pairs, graph databases, etc. Dynamic schema. Scalable and flexible. Examples: MongoDB, Cassandra, CouchDB, Redis.

Q2. What is DDL? Explain why CREATE, DROP, ALTER, and TRUNCATE are used with an example.

DDL (Data Definition Language):

DDL is a subset of SQL dealing with the definition and structure of the database.

CREATE:

Used to create a new table, view, or other database objects.

```
In [ ]: CREATE TABLE users (  
        id INT PRIMARY KEY,  
        username VARCHAR(50) NOT NULL,  
        email VARCHAR(100)  
    );
```

DROP:

Used to delete a table or database

```
In [ ]: DROP TABLE users;
```

ALTER:

Used to modify the structure of an existing table.

ALTER TABLE users ADD COLUMN age INT;

TRUNCATE:

Used to remove all records from a table, but the table structure remains.

```
In [ ]: TRUNCATE TABLE users;
```

Q3. What is DML? Explain INSERT, UPDATE, and DELETE with an example.

DML (Data Manipulation Language):

DML deals with the manipulation of data stored in the database.

INSERT:

Used to insert new records into a table.

```
In [ ]: INSERT INTO users (id, username, email) VALUES (1, 'john_doe', 'john@example.com');
```

UPDATE:

Used to modify existing records in a table.

DELETE:

Used to delete records from a table.

```
In [ ]: DELETE FROM users WHERE id = 1;
```

Q4. What is DQL? Explain SELECT with an example.

DQL (Data Query Language):

DQL is used to retrieve information from the database.

SELECT:

Used to retrieve data from one or more tables.

```
In [ ]: SELECT * FROM users WHERE age > 21;
```

```
In [ ]: Q5. Explain Primary Key and Foreign Key.
```

Primary Key:

A primary key is a field in a table that uniquely identifies each record in that table. It must contain unique values, and it cannot have NULL values.

```
In [ ]: CREATE TABLE students (  
        student_id INT PRIMARY KEY,  
        student_name VARCHAR(50),  
        age INT  
    );
```

Foreign Key:

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

```
In [ ]: CREATE TABLE orders (  
        order_id INT PRIMARY KEY,  
        product_name VARCHAR(50),  
        customer_id INT,  
        FOREIGN KEY (customer_id) REFERENCES customers(customer_id)  
    );
```

```
In [ ]: Q6. Write a python code to connect MySQL to python. Explain the cursor() and exe
```

```
In [ ]: import mysql.connector  
  
# Connect to MySQL  
mydb = mysql.connector.connect(  
    host="your_host",  
    user="your_username",  
    password="your_password",  
    database="your_database"  
)
```

```
# Create a cursor
mycursor = mydb.cursor()

# Execute SQL query
mycursor.execute("SELECT * FROM your_table")

# Fetch the result
result = mycursor.fetchall()

# Iterate and print the result
for row in result:
    print(row)

# Close the cursor and connection
mycursor.close()
mydb.close()
```

In []: Q7. Give the order of execution of SQL clauses **in** an SQL query.

The order of execution of SQL clauses in an SQL query is as follows:

SELECT: Specifies the columns to be retrieved.

FROM: Specifies the table or tables from which to retrieve the data.

WHERE: Filters the rows based on a specified condition.

GROUP BY: Groups the result set by one or more columns.

HAVING: Applies a filter to the grouped rows.

ORDER BY: Sorts the result set by one or more columns.

LIMIT/OFFSET: Limits the number of rows returned or skips a specified number of rows.