Q1. A database is a structured collection of data organized for efficient retrieval, storage, and manipulation. It can be thought of as an electronic filing system. SQL (Structured Query Language) and NoSQL (Not Only SQL) are two main categories of databases:

SQL Databases: SQL databases are relational databases that store data in tables and use structured query language (SQL) for defining and manipulating data. Examples include MySQL, PostgreSQL, SQLite, and Oracle.

NoSQL Databases: NoSQL databases are non-relational databases that can store and manipulate unstructured or semi-structured data. They offer flexibility and scalability and are often used for big data and real-time web applications. Examples include MongoDB, Cassandra, Redis, and Couchbase.

Q2. DDL stands for Data Definition Language. It is a subset of SQL used for defining and modifying the structure of database objects. The main DDL commands are:

CREATE: Used to create new database objects such as tables, indexes, views, etc.

DROP: Used to delete existing database objects.

ALTER: Used to modify the structure of existing database objects.

TRUNCATE: Used to delete all the rows from a table without deleting the table structure itself.

Example:

```
CREATE TABLE Students (
   id INT PRIMARY KEY,
   name VARCHAR(50),
   age INT
);

DROP TABLE Students;
```

```
ALTER TABLE Students
ADD COLUMN grade CHAR(1);

TRUNCATE TABLE Students;
```

Q3. DML stands for Data Manipulation Language. It is used to manipulate data within the database. The main DML commands are:

INSERT: Used to add new records into a table.

UPDATE: Used to modify existing records in a table.

DELETE: Used to remove records from a table.

Example:

```
INSERT INTO Students (id, name, age) VALUES (1, 'John', 20);

UPDATE Students SET age = 21 WHERE id = 1;

DELETE FROM Students WHERE id = 1;
```

Q4. DQL stands for Data Query Language. It is used to retrieve data from the database. The main DQL command is:

SELECT: Used to retrieve data from one or more tables based on specific criteria.
Example:

```
SELECT * FROM Students;
```

Q5.
Primary Key: A primary key is a column or a set of columns that uniquely identifies each row in a table. It ensures that no duplicate or null values are entered in the key column(s). Each table can have only one primary key.

Foreign Key: A foreign key is a column or a set of columns in a table that refers to the primary key of another table. It establishes a relationship between two tables and ensures referential integrity. It helps maintain data integrity by enforcing a link between related tables.

Q6. Here's a Python code to connect to MySQL and explain the cursor() and execute() methods:

```
import mysql.connector

# Connect to MySQL database
connection = mysql.connector.connect(
    host="localhost",
    user="username",
    password="password",
    database="mydatabase"
)

# Create a cursor object to execute SQL queries
cursor = connection.cursor()

# Execute SQL query
cursor.execute("SELECT * FROM my_table")

# Fetch the results
results = cursor.fetchall()

# Process the results
for row in results:
    print(row)

# Close cursor and connection
cursor.close()
connection.close()
```

cursor(): This method creates a cursor object, which is used to execute SQL queries and fetch results from the database.

execute(): This method is used to execute SQL queries. It takes an SQL query as an argument and executes it on the connected database.