# Question 1

* Data definition language (DDL): Used to create and modify the structure of the database.
* Data manipulation language (DML): Used to insert, update, and delete data in the database.
* Query language: Used to retrieve data from the database.
* Database engine: Responsible for managing the storage and retrieval of data.
* Transaction manager: Ensures that transactions are executed correctly and consistently.
* Backup and recovery manager: Responsible for backing up and restoring the database.
* Security manager: Controls access to the database and ensures data confidentiality and integrity.

# Question 2

### Question A

A database schema is a blueprint of the database structure.

### Question B

It contains information about the tables, their attributes, relationships between them, and constraints.

# Question 3

### Question A

It’s because they provide a centralized and structured way of organizing and managing data.

### Question B

An OID is a unique identifier assigned to each object in the database.

### Question C

OIDs are required because they provide a way to reference objects in the database and ensure that each object can be uniquely identified.

# Question 4

### Question A

A row represents a single record in a table.

### Question B

An attribute represents a specific characteristic of a record.

# Question 5

### Question A

A primary key is a unique identifier for each record in a table.

### Question B

Duplicate primary keys are not allowed.

### Question C

Duplicate primary keys would violate the principle of uniqueness and make it impossible to identify specific records.

# Question 6

### Question A

A foreign key is a field in one table that refers to the primary key of another table.

### Question B

Foreign keys are used to establish relationships between tables.

### Question C

Duplicate foreign key values are allowed.

### Question D

Duplicate foreign key values don’t violate the principle of uniqueness but they can create data integrity issues.

# Question 7

### Question A

A class on a class diagram is represented as a table with each attribute of the class represented as a column in the table.

### Question B

A database concept that ensures that the relationships between tables remain consistent. It requires that any foreign key value in a table must match a primary key value in the related table or be null. This ensures that there are no orphaned records, where a record in one table refers to a record in another table that no longer exists.

### Question C

When a new foreign key value is created, referential integrity is enforced by ensuring that the value matches a valid primary key value in the related table. If the value does not match a valid primary key value, the database will reject the insertion and an error message will be raised.

When a row containing a primary key is deleted, referential integrity is enforced by either deleting or updating the related foreign key values in other tables.

When a primary key value is changed, referential integrity is enforced by updating the related foreign key values in other tables to match the new primary key value.

### Question D

The process of organizing a database structure to minimize data redundancy and dependency. It involves breaking up a table into smaller tables and creating relationships between them.

### Question E

Because it reduces the amount of redundant data in the database, which can lead to more efficient data retrieval and manipulation. It also reduces the likelihood of data inconsistencies and anomalies, which can occur when data is duplicated across multiple tables or when data is only partially dependent on a primary key.