Q1. What are the different types of database? Explain any one (open-source) database.

Ans. The different types of databases are:-

1. Hierarchical databases
2. Network database
3. Object-oriented database
4. Relational database
5. NoSQL database
6. Centralized database

→ One open source database:-

1. MySQL
   - MySQL is ~~on~~ among the most widely deployed open source databases.
   - MySQL is a relational database.
   - Like other relational databases, my SQL complies with the ACID properties, atomicity, consistency, isolation and durability.
   - Its commonly used as a web application server and to run cloud applications.

Q2. what are PDL, DML, DCL, and TCL Languages?

Ans.

1. DDL (Data Definition Language)
   - DDL statements are specially used to build and modify the structure of your tables and other database objects in the database.
   - DDL is a set of commands that are used to:-
     a. Create Database objects
     b. Alter Database objects.

2. DML (Data manipulation Language)
   - This database access language is designed only for

table data, so it only performs operations based on table data only.

- It is a set of commands used to:-

a. To add, delete, update data of table.

3. Data control language (DCL)

- It is possible to secure database table or view by restricting access for database users.
- It is a set of commands used to:-

a. Grant and revoke priviledges to/from users.

4. TCL (Transaction control Language)

- These are used to handle database transactions.
- These are used to ~~handle database transaction~~ keep track of the modifications that DML statements make.
- It also allows you to organize statements ~~make.~~
- ~~It also all~~ into logical transactions.
- TCL commands help a user manage all the transactions taking place in a database.

Q 3. What are primary key, unique key and foreign key?

Ans.

1. Primary key:

- A table in a relational database has one column or combination of some columns whose values uniquely identifies a single row in the table.
- This column or combinations of columns is called the primary key of the table.

2. Unique key:

- In case of unique key constraint, no two tuples can have equal value for same attributes.

. It prevents duplicate values from being stored in the table.

3. Foreign key:

. A value appearing in one relation (table) for a given set of attributes ~~for~~ also appears for another set of attributes in another relation (table).

. This is called foreign key.

. The foreign key constraint is specified between two tables to maintain the consistency among tuples in the two tables.

Q4. How we can make use of create statement to create multiple objects?

Ans. Making database objects using create statement:-

1. Table:-

. This database object is used to create a table in database.

→ ~~DDL~~ Syntax:

. CREATE TABLE ~~[schema]~~ table_name (
<column_name> <data_type> [(size)],
<column_name> <data_type> [(size)]);

2. View:-

. This database object is used to create a view in database.

→ Syntax:

. CREATE VIEW view-name as select column_name(s) FROM table_name WHERE condition

3. Index:-

. This database object is used to create an index in database.

→ Syntax:

. CREATE TABLE table_name (col-name1, col_name2, INDEX (col-name));

Q5. What is view? How is it helpful to users?

Ans. A view is defined as a database object that allows us to create a virtual table in the database whose contents are defined by a query or taken from one or more tables.

→ Syntax:

- CREATE VIEW view_name AS SELECT column_name(s) FROM table_name WHERE condition.
- By using a view instead of a query in an application, it is easier to make changes to the underlying table structure which is helpful to the user.

Q6. What is an index? What are the types of indexes?

Ans.
- An index can be created in a table to access data in database more quickly and efficiently.
- MySQL uses indexes to quickly search rows with specific column values as specified in query.

→ Types of indexes:-

i) Automatic
- A unique index is created automatically when you define a PRIMARY KEY or UNIQUE constraint in a CREATE TABLE statement.

ii) Manual
- Users can create non unique indexes on columns to speed up access to the rows.

→ Syntax:
- CREATE ~~Index~~ INDEX index
  ON table (column [, column]...);

Q7. What is sequence? How is it generated in MySQL?

Ans.. A sequence in MySQL is an arrangement of integers generated in the ascending order (1,2,3 and so on) on specific demand.

- Sequences are used in the databases to generate unique numbers.
- The simplest way for creating a sequence in MySQL is by defining the column as AUTO_INCREMENT during table creation, which should be a primary key column.

(a)

→ Eg:

```
CREATE TABLE insects (
    Id INT unsigned not null AUTO_INCREMENT,
    PRIMARY KEY (id),
    Name varchar (30) NOT NULL
);
```

Q8. What are the different query optimization techniques?

(m)

Ans. The different query optimization techniques include:-

1. Use indexes effectively
2. Avoid SELECT * and retrieve only necessary columns
3. Optimize JOIN operations
4. Minimize the use of subqueries
5. Avoid redundant or unnecessary data retrieval
6. Consider partitioning and sharding
7. Optimize subquery performance
8. Avoid DISTINCT in select query
9. Use WHERE instead of HAVING

Q9. How to Create synonyms in MySQL?

Ans. • A synonym is merely another name for a table or a view.

• Synonyms are usually created so a user can avoid having to qualify another users table or view to access the table or view.

• The general syntax to create a synonym is as follows:-

→ CREATE [PUBLIC|PRIVATE] SYNONYM_NAME FOR TABLE|VIEW

Q10. Which are the different commands used to modify database object?

Ans. The different commands used to modify database objects include:-

1. ALTER:-

• It is used to modify the structure of an existing database.

2. DROP:-

• It is used to delete an entire object or part of an object from the database.

3. TRUNCATE:-

• Used to delete all records from a table but does not delete the table structure.

4. RENAME:-

• Used to rename an existing database object.

Q11. List down the different operators that support MySQL.

Ans. Arithmetic operators

Operator	Description
+	ADD

-	subtract
*	multiply
/	divide
%	modulo

→ Bitwise operators

Operator	Description
&	Bitwise AND
|	Bitwise OR
^	Bit wise exclusive OR

→ Comparison operators

Operator	Description
=	Equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to
<>	Not equal to

→ Compound operators

operator	Description
+=	Add equals
-=	subtract equals
*=	multiply equals
/=	Divide equals

→ Logical operators

Operator	Description
ALL	True if all subquery ~~cond~~ values meet the condition

AND	True if all the conditions separated by AND are TRUE
IN	TRUE if the operand is equal to one of a list of expressions
NOT	Displays a record if the condition(s) is NOT TRUE.

Q12. What is the difference between ~~Dro~~ Delete, Drop and Truncate?

Ans. Drop and TRUNCATE are DDL commands while DELETE is a DML command.

- DELETE removes the specific row based on the given condition.
- TRUNCATE removes all the records from the table at once, whereas the DROP command removes the table or ~~D~~ databases and as well as the structure.