Group A : Assignment No. 2 & 3

Aim : Design and Develop SQL DDL statements which demonstrate use of SQL objects such as Table, View, Index, Sequence, Synonym.
Design at least 10 SQL queries for suitable database application using SQL DML statements
Insert, Select, Update, Delete with operators, functions and set operator.

Questions

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

Ans We can create tables and views using the CREATE statement.

eg —
```
create table department
(dept-name varchar(20),
 building varchar(15),
 budget numeric(12,2),
 primary key (dept-name));

create view faculty as
select ID, name, dept-name
from instructor;
```

2. What is a view? How it can be helpful to user?

Ans. A view is a virtual table. It is a data object that does not contain any data. Contents of the view are resultant of a base table. They are operated just like base table but they don't contain any data of their own. The difference between a view and a table is that views are definitions built on top of other tables (or views). If data is changed in the underlying table, the same change is reflected in the view.
Views can be helpful to user in following ways —

i) Security —
Each user can be given permission to access the database only through a small set of views that contain the specific data the user is authorized to see, thus restricting the user's access to stored data.

ii) Query Simplicity —
A view can draw data from several different tables and present it as a single table, turning multi-table queries into single-table queries against the view.

iii) Structural Simplicity —
Views can give user a "personalized" view of database structure, presenting database as a set of virtual tables that make sense for that user.

iv) Consistency —
A view can present a consistent, unchanged image of the structure of the database even if the underlying source tables are split, restructured or renamed.

v) Data Integrity —
If data is accessed and entered through a view, the DBMS can automatically check the data to ensure that it meets the specified integrity constraints.

3. What is an Index? What are the types of indexes?

Ans. A database Index is a data structure that improves the speed of operations in a table. Indexes can be created using one or more columns. Practically, indexes are also type of tables which keep primary key or index field and a pointer to reach record into the actual table.
The basic syntax to create index is
CREATE INDEX index_name ON table_name(col_name);

Different types of indexes are -

i) Single-column indices -
A single-column index is created based on only one table column.

ii) Unique indices -
Unique indices are used not only for performance, but also for data integrity. A unique index does not allow any duplicate values to be inserted into the table. The basic syntax is as follows

```
CREATE UNIQUE INDEX index_name ON
    table_name (column_name);
```

iii) Composite indices -
A composite index is an index on two or more columns of a table. Its basic syntax is as follows

```
CREATE INDEX index_name ON table_name
    (column1, column2,..);
```

4. What is Sequence? How is it generated in MySQL?

Ans. Sequence is a set of integers 1, 2, 3, ... that are generated and supported by some database systems to produce unique values on demand.

A sequence is a userdefined schema bound object that generates a sequence of numeric values. Sequences are frequently used in many databases because many applications require each row in a table to contain a unique value and sequences provides an easy way to generate them.
A sequence in MySQL is generated by setting the AUTO-INCREMENT attribute to a column which is typically a primary key column.

eg— CREATE TABLE employees
(emp-id INT(4) AUTO-INCREMENT,
name varchar(50),
primary key(emp-id));

5. How to create synonyms in MySQL?

Ans. Synonyms can be created in MySQL using the create_synonym_db() procedure. Given a schema name, this procedure creates a synonym schema containing views that refer to all the tables and views in the original schema. This can be used for example to create a shorter name by which to refer to a schema with a long name (such as info rather than INFORMATION_SCHEMA)

Parameters

- in_db_name VARCHAR(64) – The name of the schema for which to create the synonym

- in_synonym VARCHAR(64) – The name to use for the synonym schema. This schema must not already exist.

6. Which different commands are used to modify database object?

Ans. The different commands used to modify database objects are

i) ALTER

MySQL provides ALTER command that helps us incorporate the changes to already existing database design. The alter command is used to modify an existing database table, view or other database objects that might need to change during the life cycle of a database.

ii) DROP

The drop command is used to delete a database from mysql server; delete an object like table, column from a database.

iii) RENAME

The rename command is used to change the

name of an existing database object like table, column from a database. Renaming a table does not make it to lose any data contained within it.

7. List down the different operators supported by MySQL.

Ans. MySQL uses some standard SQL operators and some non-standard operators. They can be used to write expressions which involve constant values, variables, values contained in fields and/or other expressions.

i) Comparison Operators
Equality (=)
IS and NULL-safe Comparison
IS and BOOLEAN comparison
Greater than >
Less than <
BETWEEN
IN

ii) Logical Operators
NOT
AND
OR
XOR

iii) Arithmetic Operators
+, −, /, *

iv) TEXT Operators
LIKE
SOUNDS LIKE
REGEXP

v) Bitwise Operators.

8. What is the difference between Delete, Drop and Truncate?

Ans. The DELETE command is used to remove some or all rows from a table.

TRUNCATE removes all rows from a table.

The DROP command removes a table from the database.

DROP and TRUNCATE ~~an~~ are DDL commands whereas DELETE is a DML command.

9. List down different MySQL functions.

Ans i) MSQL String functions

ASCII - returns the number code that represents the specific character.

CHAR_LENGTH — returns length of specified string

CONCAT — concatenates two or more expressions

CONCAT_WS — contatenates two or more expressions and adds a separator between them.

LCASE — converts a string to lower case

REVERSE — rereverses a string

UCASE — converts a string to upper case.

SUBSTRING — ~~extr~~ extracts a substring from a string.

ii) MySQL Numeric Functions

ABS — returns absolute value of a number

AVG — returns average value of an expression

SIN, COS, TAN — trigonometric functions.

LN — returns natural logarithm of a number.

COUNT — returns the number of records in a select query

MAX – returns maximum value

MIN – returns minimum value.

POWER – returns m raised to n^{th} power.

SQRT – returns square root of a number.

iii) MySQL Date Functions

CURDATE – returns the current date.

CURTIME – returns the current time.

DATEDIFF – returns difference in days between two date values.

10. Explain in detail column level constraints.

Ans. A CONTRAINT clause is an optional part of CREATE TABLE statement or ALTER TABLE. A constraint is a rule to which data must conform. Column level constraints refer to a single column in the table. Column level constraints include NOT NULL, PRIMARY KEY UNIQUE, FOREIGN KEY.