Department Of Information Technology
A.Y. 2023-24
Class: SE-ITA/B, Semester: III

Subject: **Structured Query Lab**

Experiment – 5: Perform complex queries using group by and nested queries on the chosen system.

1. **Aim:** To Perform complex queries using group by and nested queries on the chosen system.

2. **Objective:**
   - After performing the experiment, the students will be able to formulate and use various complex SQL queries to manipulate databases and retrieve data with help of nested, recursive and group by query.
   - Use various aggregate functions for mathematical and simple calculations
3. **Outcome:** L303.3: To Write queries in SQL to retrieve any type of information from a database.
4. **Prerequisite:** Understanding of various SQL complex queries like group by, nested and recursive queries with notations and terminologies along with sample syntax.
5. **Requirements:** PC, MySQl Workbench, Microsoft Word, Internet

6. **Pre-Experiment Exercise:**
   Brief Theory:(To be handwritten)
   Explain each of the following with 3 examples and implement the examples.
   - Group by clause
   - Nested queries
   - Aggregate functions

7. **Laboratory Exercise**
   A. Procedure:
   i) Open Mysql Command Line Client using below login credentials:
   Username: root, Password:lab306b
   ii) Use existing database created by you or
   iii) Construct your own database
   iv) Construct tables for any two to three entities from your chosen case study
   v) Insert at least 8 to 10 records for each tables
   vi) Execute below queries:

   Use **Group by** using below syntax

SELECT COUNT(CustomerID), Country FROM Customers GROUP BY Country;

Having Clause example

```
SELECT COUNT(CustomerID), Country FROM Customers
        GROUP BY Country
        HAVING COUNT(CustomerID) > 5;
```

Nested Query example

```
SELECT *     FROM CUSTOMERS     WHERE ID IN
(SELECT ID    FROM CUSTOMERS   WHERE SALARY > 4500) ;
```

Aggregate Functions:

Count Example:

```
SELECT COUNT(ProductID) FROM Products;
```

Average Example

```
SELECT AVG(Price) FROM Products;
```

SUM Example

```
SELECT SUM(Quantity)  FROM OrderDetails;
```

MAX Example

```
SELECT MAX(Price) AS LargestPrice FROM Products;
```

MIN Example

```
SELECT MIN(Price) AS LowestPrice  FROM Products;
```

vi)Write/Print output for each query

Result/Observation/Program code: Attach all queries executed code with proper output

8. Post Experimental Exercise-

A.Questions:

B. Conclusion:

C. **References:**

[1] Elmasri and Navathe, “Fundamentals of Database Systems”, 5th Edition, PEARSON Education.

[2] Korth, Silberchatz, Sudarshan, “Database System Concepts”, 6th Edition, McGraw – Hill

[3] https://www.w3schools.com/sql/sql_default.asp