TITLE:- SQL QUERIES

THEORY:-

In this lab, we are going to create tables and insert data into it using SQL and perform various operations such as using Select, having, where, group by, order by etc. to get required data.

1.) Creating table:-

a) Employee:-

```
create table employee (
    Ssn int primary key,
    fname varchar(20),
    lname varchar(20),
    bdate date,
    address varchar(50),
    sex char,
    salary int,
    super_ssn int,
    dno int
);
```

b) Create table 'department':-

```
create table department (
    dnumber int primary key,
    dname varchar(30),
    mgr_ssn int,
    mgr_start_date date
);
```

2.) Inserting data:-

a) Into employee table:-

```
insert into employee values
    (1, "Aashis", "Limbu", "Baneshwor", "m", 45000, 5, 1),
    (2, "Barsana", "Nakarmi", "Lalitpur", "F", 50000, 5, 1),
    (3, "Avinash", "Thakur", "Janakpur", "m", 55000, 4, 1),
```

(4, "Tara", "Ghalan", "Dharan", 'm', 55000, 4, 2),
(5, "Bishnu", "Nepali", "pokhara", 'm', 50000, 4, 3),
(6, "Bibek", "Kathayat", "pokhara", 'm', 50000, 4, 3);

b) Into department table:-

insert into department values
(1, "physics", 4, '1952-12-30'),
(2, "Chemistry", 5, '1952-12-18'),
(3, "Computer", 6, '1952-12-17');

3.) Use of select and from clauses:-

a) Retrieve the ssn values for all employees.

→ select ssn from employee;

b) Run following SQL command and check the output:-

i) select ssn, dname from employee, department;
→ Gave cartesian product of two table

ii) select ssn, dname from employee, department
where dno = dnumber;
→ Gave ssn of employee and respective department name.

4.) Use of select, from and where clauses:-

a) Retrieve the name and address of all employees who work for the computer department.

→ select fname, lname, address
from employee, department
where dname = 'computer';

5.) Use of group by clause :-

a) For each department, retrieve the department number, the number of employees in the department, and their average salary.

→ Select count(*), Avg(salary)
from employee
group by dno;

6.) Use of having clause :-

a) For each department on which more than two employees work, retrieve the dno, dname and the number of employees who work on that department.

→ Select dno, dname, count(ssn) as total_emp
from employee, department
where dno = dnumber
group by dno
having total_emp > 2;

7.) Use of order by clause :-

a) Retrieve dname, lname, fname, of employees ordered by the employee's department, and within each department ordered alphabetically by employee's last name.

→ Select dname, lname, fname
from department, employee
where dno = dnumber
order by dname, lname;

```
MariaDB [lab]> create table employee (ssn int primary key, fname varchar(20),
lname varchar(20), bdate date, address varchar(50), sex char, salary int, supe
r_ssn int, dno int);
Query OK, 0 rows affected (0.043 sec)

MariaDB [lab]> create table department (dnumber int primary key, dname varchar
(30), mgr_ssn int, mgr_start_date date);
Query OK, 0 rows affected (0.045 sec)

MariaDB [lab]> show tables;
+---------------+
| Tables_in_lab |
+---------------+
| department    |
| employee      |
+---------------+
2 rows in set (0.000 sec)
```

Figure 1 create two tables employee and department

```
MariaDB [lab]> insert into employee values (1, "Aashis", "Limbu", "Baneshwor", "
M", 45000, 5, 1), (2, "Barsana", "Nakarmi", "Lalitpur", "F", 50000, 5, 1), (3, "
Avinash", "Thakur", "Janakpur", "M", 55000, 4, 1), (4, "Tasu", "Ghalan", "Dharan
", "M", 55000, 4, 2), (5, "Bishnu", "Nepali", "Pokhara", "M", 50000, 4, 3), (6,
"Bibek", "Kathayat", "Pokhara", "M", 50000, 4, 3);
Query OK, 6 rows affected (0.039 sec)
Records: 6  Duplicates: 0  Warnings: 0
```

Figure 2 insert data into employee table

```
MariaDB [lab]> insert into department values (1, 'Physics', 4, '1952-12-30'), (2
, 'Chemistry', 5, '1952-12-18'), (3, 'Computer', 6, '1952-12-17');
Query OK, 3 rows affected (0.039 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

Figure 3 insert data into department table

```
MariaDB [lab]> select ssn from employee;
+-----+
| ssn |
+-----+
|   1 |
|   2 |
|   3 |
|   4 |
|   5 |
|   6 |
+-----+
6 rows in set (0.001 sec)
```

Figure 4 select ssn of all employees

```
MariaDB [lab]> select ssn, dname from employee, department where dno=dnumber;
+-----+-----------+
| ssn | dname     |
+-----+-----------+
|   1 | Physics   |
|   2 | Physics   |
|   3 | Physics   |
|   4 | Chemistry |
|   5 | Computer  |
|   6 | Computer  |
+-----+-----------+
6 rows in set (0.001 sec)
```

Figure 5 joining two tables using foreign key

```
MariaDB [lab]> select ssn, dname from employee, department;
+-----+-----------+
| ssn | dname     |
+-----+-----------+
|   1 | Physics   |
|   1 | Chemistry |
|   1 | Computer  |
|   2 | Physics   |
|   2 | Chemistry |
|   2 | Computer  |
|   3 | Physics   |
|   3 | Chemistry |
|   3 | Computer  |
|   4 | Physics   |
|   4 | Chemistry |
|   4 | Computer  |
|   5 | Physics   |
|   5 | Chemistry |
|   5 | Computer  |
|   6 | Physics   |
|   6 | Chemistry |
|   6 | Computer  |
+-----+-----------+
18 rows in set (0.000 sec)
```

Figure 6 Cartesian product

```
MariaDB [lab]> select fname, lname, address from employee, department where dno=
dnumber and dname='computer';
+--------+----------+---------+
| fname  | lname    | address |
+--------+----------+---------+
| Bishnu | Nepali   | Pokhara |
| Bibek  | Kathayat | Pokhara |
+--------+----------+---------+
2 rows in set (0.000 sec)
```

Figure 7 using where clause to retrieve data based on a condition

```
MariaDB [lab]> select dno, count(*) as total_employees, avg(salary) as average_s
alary from employee group by dno;
+------+-----------------+----------------+
| dno  | total_employees | average_salary |
+------+-----------------+----------------+
|    1 |               3 |     50000.0000 |
|    2 |               1 |     55000.0000 |
|    3 |               2 |     50000.0000 |
+------+-----------------+----------------+
3 rows in set (0.000 sec)
```

Figure 8 using group by clause

```
MariaDB [lab]> select dno, dname, count(ssn) as total_employee from employee, de
partment where dno=dnumber group by dno having total_employee > 2;
+------+---------+----------------+
| dno  | dname   | total_employee |
+------+---------+----------------+
|    1 | Physics |              3 |
+------+---------+----------------+
1 row in set (0.001 sec)
```

Figure 9 using having clause

```
MariaDB [lab]> select dname, lname, fname from department, employee where dno=dn
umber order by dname, lname;
+-----------+----------+---------+
| dname     | lname    | fname   |
+-----------+----------+---------+
| Chemistry | Ghalan   | Tasu    |
| Computer  | Kathayat | Bibek   |
| Computer  | Nepali   | Bishnu  |
| Physics   | Limbu    | Aashis  |
| Physics   | Nakarmi  | Barsana |
| Physics   | Thakur   | Avinash |
+-----------+----------+---------+
6 rows in set (0.001 sec)
```

Figure 10 using order by clause