Tutorial Sheet 6

Question 1: Consider the SQL query below:

select deptId, count (*)

from emp

where gender = "female" and salary > (select avg(salary)from emp)

group by deptId;

What will be the output of the above query?

Question 2: Suppose ORACLE relation R (A, B) currently has tuples {(1, 2), (1, 3), (3, 4)} and relation S (B, C) currently has {(2, 5), (4, 6), (7, 8)}. Consider the following two SQL queries SQ_1 and SQ_2:

SQ_1: Select * From R Full Join S On R.B = S.B;

SQ_2: Select * From R Inner Join S On R.B = S.B.

Calculate the numbers of tuples in the result of the SQL query SQ_1 and the SQL query SQ_2.

Question 3: STUDENT (Name, Gender, Marks, DEPT Name) is a relation that stores STUDENT information at a university. Consider the SQL Query below.

SELECT DEPT Name

from STUDENT

where Gender = 'M'> GROUP BY DEPT_Name having avg(Marks)>SELECT avg (Marks) from STUDENT.

What will be the output of the query?

Question 4: Consider the following tables.

Write an SQL query to find the third highest salary in a table?"

Table: Employee

EmpId	EmpName	MangaerId	DeptId	Salary	DOB
11	Ram	0	1	40000	01/01/1991
12	Murali	0	2	35000	21/02/1987
13	Tarang	1	1	30000	25/08/1989
15	Lisa	2	2	42000	31/05/1992
27	Fatima	2	1	39000	17/04/1990

Table: Department

DeptId	DeptName
1	IT
2	Admin

Question 5: The employee information in a company is stored in the relation

Employee (<u>name</u>, sex, salary, deptName)

Write an SQL query to find the names of departments where the average salary of male employees is higher than the overall average salary in the company?

Question 6: Consider the tables A, B and C. How many tuples does the result of the following SQL query contains?

Table A:

Id	Name	Age
12	Arun	60
15	Shreya	24
99	Rohit	11

Table B:

Id	Name	Age
15	Shreya	24
25	Hari	40
98	Rohit	20
99	Rohit	11

Table C:

Id	Phone	Area
10	2200	02
99	2100	01

SELECT A.id

FROM A

WHERE A.age > ALL (SELECT B.age

      FROM B WHERE B. name = \"arun\")

Question 7: The relation scheme given below is used to store information about the employees of a company, where empId is the key and deptId indicates the department to which the employee is assigned. Each employee is assigned to exactly one department.

emp(<u>empId</u>, name, gender, salary, deptId)

Write an SQL query to find the number of female employees in each department whose salary is higher than the average salary of all employees in the company.

Question 8: Consider the following relational schema:

 employee(<u>empId</u>, empName, empDept)

 customer(<u>custId</u>, custName, salesRepId, rating)

salesRepId is a foreign key referring to empId of the employee relation. Assume that each employee makes a sale to at least one customer. Write an SQL query to return the names of all employees whose customers all have a 'GOOD' rating

Question 9: Consider the following relation schema pertaining to a students database:

Student (<u>rollno</u>, name, address)

Enroll (<u>rollno, courseno</u>, coursename)

where the primary keys are shown underlined. The number of tuples in the Student and Enroll tables are 120 and 8 respectively. What are the maximum and minimum number of tuples that can be present in (Student * Enroll), where '*' denotes natural join ?

Question 10: Consider the following relational schema:

Suppliers(<u>sid:integer</u>, sname:string, city:string, street:string)

Parts(<u>pid:integer</u>, pname:string, color:string)

Catalog(<u>sid:integer, pid:integer</u>, cost:real)

Consider the following relational query on the above database:

SELECT S.sname

  FROM Suppliers S

    WHERE S.sid NOT IN (SELECT C.sid

         FROM Catalog C

         WHERE C.pid NOT IN (SELECT P.pid

            FROM Parts P

            WHERE P.color<> 'blue'))

Assume that relations corresponding to the above schema are not empty. What will be the output of the above query?

Question 11: The STUDENT information in a university stored in the relation STUDENT (Name, SEX, Marks, DEPT_Name)

Consider the following SQL Query

SELECT DEPT_Name from STUDENT where SEX = 'M' group by DEPT_Name having avg (Marks)>SELECT avg (Marks) from STUDENT.

What will the above query returns.

Question 12: Consider the set of relations given below and the SQL query that follows

Students : (Roll number, Name, Date of birth)

Courses: (Course number, Course name, instructor)

Grades: (Roll number, Course number, Grade)

SELECT DISTINCT Name

FROM Students, Courses, Grades

WHERE Students.Roll_number = Grades.Roll_number

What will the above query returns.

Question 13: The relation book (title,price) contains the titles and prices of different books. Assuming that no two books have the same price, what does the following SQL query list?

select title from book as B where (select count (*) from book as T where T.price>B.price)<5

Question 14: Consider the following ORACLE relations : One (x, y) = {<2, 5>, <1, 6>, <1, 6>, <1, 6>, <4, 8>, <4, 8>} Two (x, y) = {<2, 55>, <1, 1>, <4, 4>, <1, 6>, <4, 8>, <4, 8>, <9, 9>, <1, 6>} Consider the following two SQL queries SQ1 and SQ2 :

SQ1 : SELECT * FROM One)

    EXCEPT

  (SELECT * FROM Two);

SQ2 : SELECT * FROM One)

   EXCEPT ALL

  (SELECT * FROM Two);

For each of the SQL queries, what is the cardinality (number of rows) of the result obtained when applied to the instances above?

- A) 2 and 1 respectively
- B) 1 and 2 respectively
- C) 2 and 2 respectively
- D) 1 and 1 respectively

Question 15: Consider the following database table named water schemes:

Calculate the number of tuples returned by the following SQL query.

scheme_no	district_name	capacity
	water_schemes	
1	Ajmer	20
1	Bikaner	10
2	Bikaner	10
3	Bikaner	20
1	Churu	10
2	Churu	20
1	Dungargarh	10

```sql
with total(name, capacity) as

  select district_name, sum(capacity)

  from water_schemes

  group by district_name

with total_avg(capacity) as

  select avg(capacity)

  from total

select name

  from total, total_avg

  where total.capacity >= total_avg.capacity
```