1. Consider the following relation schema pertaining to a students database:
Student (rollno, name, address) and Enroll (rollno, courseno, 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 *inner join* Enroll?

a. 8, 0 b. 120, 8 c. 960, 8 d. 960, 120
(a)

2. Database table by name Loan_Records is given below.

Borrower	Bank_Manager	Loan_Amount
Ramesh	Sunderajan	10000.00
Suresh	Ramgopal	5000.00
Mahesh	Sunderajan	7000.00

What is the output of the following SQL query?

```
SELECT Count(*) FROM (SELECT Borrower, Bank_Manager FROM Loan_Records) S
    INNER JOIN (SELECT Bank_Manager, Loan_Amount FROM Loan_Records) T ON
T.Bank_Manager=S.Bank_Manager;
```

a. 3 b. 9 c. 5 d. 6 (c)

3. A relational schema for a train reservation database is given below.

Table: Passenger

pid	pname	age
0	Sachin	65
1	Rahul	66
2	Sourav	67
3	Anil	69

Table : Reservation

pid	class	tid
0	AC	8200
1	AC	8201
2	SC	8201
5	AC	8203
1	SC	8204
3	AC	8202

What pids are returned by the following SQL query for the above instance of the tables?

```
SELECT pid FROM Reservation WHERE class = 'AC' AND pid = (SELECT pid FROM
Passenger WHERE age > 65 AND Passenger.pid Reservation.pid)
```

a. 1,0 b. 1, 2 c. 1, 3 d. 1, 5
(c)

4. Consider the following relational schema:
Suppliers(sid:integer, sname:string, city:string, street:string)
Parts(pid:integer, pname:string, color:string)
Catalog(sid:integer, pid:integer, 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. Which one of the following is the correct interpretation of the above query?

a. Find the names of all suppliers who have supplied a non-blue part.
b. Find the names of all suppliers who have not supplied a non-blue part.
c. Find the names of all suppliers who have supplied only blue parts.
d. Find the names of all suppliers who have not supplied only blue parts.

(a)

5. Consider the following relations:

Students

Roll No	Student Name
1	Raj
2	Rohit
3	Raj

Performance

Roll No	Course	Marks
1	Math	80
1	English	70
2	Math	75
3	English	80
2	Physics	65
3	Math	80

```
SELECT S. Student_Name, sum(P.Marks) FROM Student S, Performance P
     WHERE S.Roll_No = P.Roll_No GROUP BY S.Student_Name
```

The number of rows that will be returned by the SQL query is _____

a. 0 b. 1 c. 2 d. 3 (c)

6. Consider the following three table to store student enrollements in different courses.

Student(EnrollNo, Name), Course(CourseID, Name),
EnrollMents(EnrollNo, CourseID)

What does the following query do?

```
SELECT S.Name
FROM Student S, Course C, Enrollments E
WHERE S.EnrollNo = E.EnrollNo AND C.Name = "DBMS" AND
      E.CourseID = C.CourseID AND S.EnrollNo IN (SELECT S2.EnrollNo
         FROM Student S2, Course C2, Enrollments E2
         WHERE S2.EnrollNo = E2.EnrollNo AND E2.CourseID = C2.CourseID
          AND C2.Name = "OS")
```

a. Name of all students who are either enrolled in “DBMS” or “OS” courses.
b. Name of all students who are enrolled in “DBMS” and “OS”.
c. Name of all students who are either enrolled in “DBMS” or “OS” or both.

d. None of the above.

(b)

7. The employee information in a company is stored in the relation

Employee (name, sex, salary, deptName)

Consider the following SQL query

```
select deptName
       from Employee
       where sex = 'M'
       group by deptName
       having avg (salary) > (select avg (salary) from Employee)
```

It returns the names of the department in which

a. the average salary is more than the average salary in the company.

b. the average salary of male employees is more than the average salary of all male employees in the company.

c. the average salary of male employees is more than the average salary of employees in the same department.

d. the average salary of male employees is more than the average salary in the company. (d)

8. Given the following statements:

```
9. S1: A foreign key declaration can always
10.             be replaced by an equivalent check
11.             assertion in SQL.
12.          S2: Given the table R(a,b,c) where a and
13.             b together form the primary key, the
14.             following is a valid table definition.
15.             CREATE TABLE S (
16.                 a INTEGER,
17.                 d INTEGER,
18.                 e INTEGER,
19.                 PRIMARY KEY (d),
20.                 FOREIGN KEY (a) references R)
```

21. Which one of the following statements is CORRECT?

22. a. S1 is TRUE and S2 is FALSE.

23. b. Both S1 and S2 are TRUE.

24. c. S1 is FALSE and S2 is TRUE.

25. d. Both S1 and S2 are FALSE. (d)