CS & DA

Database Management System

DPP: 2

Query Languages

Q1 Consider the following employee table Employees (EmpID, EmpName, Sal, DeptID, ManagerID), assume that EmpID is primary key of relation. Which of the following SELECT statements is/are invalid?
(A) SELECT ManagerID, DeptID FROM employees;
(B) SELECT ManagerID, DISTINCT DeptID FROM employees;
(C) SELECT DISTINCT ManagerID, DISTINCT DeptID FROM employees;
(D) SELECT DISTINCT ManagerID, DeptID FROM employees;

Q2 Consider the following product relation Products (PID, PName, Cost)
Assume that PID is a primary key of relation. Which SELECT statement should we used to limit the display of product information to the product having cost less than 50?
(A) SELECT PID, PName FROM Products WHERE Cost < 50;
(B) SELECT PID, PName FROM Products Having Cost < 50;
(C) SELECT PID, PName FROM Products WHERE PID IN
    (SELECT PID FROM Products WHERE Cost < 50);
(D) SELECT PID, PName FROM Products GROUP BY PID Having Cost < 50;

Q3 The Employees table contains these columns
empID   NUMBERS (4)
LastName   VARCHAR (25)
JobID   VARCHAR (10)
Suppose that, you want to search for string that contains 'Negi' in the LastName. Which SQL statement will be used?
(A) SELECT empID, LastName, JobID FROM
    employees WHERE LastName LIKE '%Negi%';
(B) SELECT empID, lastName, JobID FROM employees WHERE LastName = 'Negi_%';
(C) SELECT empID, lastName, JobID FROM employees WHERE LastName LIKE 'Negi';
(D) None of these

Q4 Consider a relation A(P,Q) currently has tuples {(1, 2), (1, 3), (3, 4)} and relation B(Q, R) currently has tuples {(2, 5), (4, 6), (7, 8)}. The number of tuples in the result of the below SQL query is _____.
SELECT * FROM A NATURAL OUTER JOIN B;

Q5 Consider the following instance of database table Supply and following SQL query:
 SELECT Counter_no
 FROM Supply
 GROUP BY Counter_no , Part
 HAVING MAX(cost) ≥ 2

 Supply

Counter_No	Part	Cost
1	P1	2
1	P2	1
1	P3	3
2	P1	4
2	P3	3
3	P3	1

Number of tuples returned by the above SQL query is_____.

Q6 Consider following two queries Q1 and Q2 executed on the given instances of tables.

Q1: SELECT Sid, Sname
     FROM Salesman AS S
     WHERE (SELECT COUNT(*)
     FROM Customer AS C
     WHERE S.Sid= C.Sid) > 1

Q2: SELECT DISTINCT S.Sid, S.Sname
     FROM Salesman AS S, Customer AS C
     where S.Sid = C.Sid
     group by (S.Sid, S.Sname)
     Having count(S.Sid) > 1;

Salesman

Sid	Sname	City
1	Vishal	Ujjain
2	Venkat	Hyderabad
3	Abhishek	Hyderabad
4	Satya	Hyderabad
5	Rohit	Lucknow
6	Mili	Delhi

Customer

Cid	Cname	Sid
1	Akshay	3
2	Mohit	1
3	Ram	2
4	Soham	3
5	Reema	3
6	James	2

Let 'X' is the number of tuples produced by Q1 and 'Y' is the number of tuples produced by Q2. The value of X+Y is_____.

Q7 Consider following two queries Q1 and Q2 executed on the given instance of Sell table. Let X is the number of tuples produced by Q1 and Y is the number of tuples produced by Q2.

Q1: SELECT S.cost FROM Sell S WHERE NOT EXISTS
     (SELECT * FROM Sell WHERE cost > S. cost)

Q2: SELECT MAX(cost) FROM Sell
     Value of |X-Y| is_____.

Sell

Counter_no	Drink_name	Cost
1	Pepsi	2
2	Pepsi	1
1	Kinley	3
2	Cola	4
3	Cola	4
3	Pepsi	4

Q8 Consider the relational schema orders(Cid,date,amount) and following SQL query:

   SELECT Cid, date, MAX(amount)
   FROM orders
   GROUP BY Cid, date
   HAVING MAX(amount) > 2000;

Output produced by above query for an arbitrary 'orders' table will always contain

(A) Exactly one tuple from the table

(B) At least one tuple from the table

(C) No tuple from the table

(D) None of the above

Q9 Consider a relation schema Student(Sid, Sname, Marks) and following two queries.

   Q1: SELECT S.Marks FROM Student S WHERE NOT EXISTS

        (SELECT * FROM Student WHERE Marks > S.Marks)

   Q2: SELECT MAX(Marks) FROM Student

(A) Q1 and Q2 always produces the same answer

(B) Q1 and Q2 always produces the different answer

(C) Q1 and Q2 may produce same answer

(D) None of the above

Q10 Consider a database schema EMP(EID, ENAME, SALARY, DEPTNO) and database table contains exactly 20 rows where salary is not allowed to be NULL.

   Consider the following SQL query 'Q'

   Q: SELECT ENAME, DEPTNO FROM EMP
       WHERE SALARY < ANY (SELECT SALARY
   FROM EMP WHERE DEPTNO = 20)

   Let 'X' is the minimum number of rows that can

be returned by query Q for some random 20 rows in table EMP, and 'Y' is the maximum number of rows that can be returned by query Q for some other random 20 rows in table EMP. Value of X+Y is_____.

Q11 Consider the following Relational schemas
Salesman (salesman_id, name, city) and
Customer (customer_id , c_name , city , salesman_id)
What output is produced by following SQL query:
SELECT name
FROM Salesman
WHERE salesman_id IN
(SELECT DISTINCT a.salesman_id
FROM Customer a
WHERE NOT EXISTS
(SELECT *
FROM Customer b
WHERE
(a.salesman_id = b.salesman_id
AND
a.customer_id <> b.customer_id)));
(A) Name of salesman with no customers
(B) Names of salesman with exactly one customer
(C) Names of salesman with more than one customers
(D) Names of salesman with at most one customer

Q12 Consider the following relation store (store_id, owner_name,ncountry).
Which of the following SQL statement lists the number of stores in each country along with country name?
(A) Select count (store_id), country from store group By country
(B) Select count (store_id), country from store group by (store_id, country)
(C) Select count (store_id, country) from store group by (country)
(D) Select count (store_id, country) from store group by (store_id, country)

Q13 Consider the following relation:

Agents

aid	name	city	rating
1	Ram	Bhopal	5
2	John	Ujjain	7
3	Geeta	Indore	3
4	Mohan	Bhopal	4
5	Shyam	Ujjain	2
6	Sita	Indore	3

Select count (*)
From Agents
Group by City
Having (Rating > 4)
Number of tuples produced by given SQL query is _____.

Q14 Consider two relation schema R(A, B) and S(C, B), and following two queries:
Q1: SELECT A FROM R
WHERE B ≥ ALL (SELECT B FROM S WHERE C=1)
Q2: SELECT A FROM R
WHERE B ≥ ANY (SELECT B FROM S WHERE C=1)
Which of the following option is correct?
(A) Both the queries always produces same answer
(B) Tuples produced by query Q1 is always a subset of tuples produced by Q2
(C) Tuples produced by query Q2 is always a subset of tuples produced by Q1
(D) None of the above

Q15 Consider The following relational schema:
EMP(Eid, Ename)
Work_in(Eid, Did)
DEPT(Did, Dname)
If we want to retrieve the Eids of the the employees working for both finance and HR department then which of the following is true?
(A) (Select distinct W.Eid from Work_in W, DEPT D

Where W.Did=D.Did AND D.Dname = 'finance') Intersect
(Select distinct W.Eid from Work_in W, DEPT D
Where W.Did=D.Did AND D.Dname = 'HR')

(B) Select distinct W.Eid from Work_in W, DEPT D

Where W.Did=D.Did AND D.Dname = 'finance'
AND D.Dname = 'HR'

(C) Both (A) and (B)

(D) None of the above

Answer Key

Q1	(B, C)		Q9	(C)
Q2	(A, C, D)		Q10	19~19
Q3	(A)		Q11	(B)
Q4	4~4		Q12	(A)
Q5	4~4		Q13	2~2
Q6	4~4		Q14	(D)
Q7	2~2		Q15	(A)
Q8	(D)			

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Hints & Solutions

Q1 **Text Solution:**

Option B & C are having invalid SELECT statement, because we cannot apply DISTINCT keyword on separate attributes, instead DISTINCT keyword is applied on an entire tuple.

Q2 **Text Solution:**

The HAVING clause is used for filtering aggregate results (e.g., GROUP BY queries). Since there is no aggregation in option B, this query is invalid.

Q3 **Text Solution:**

A) The '%Negi%' pattern ensures that 'Negi' can appear anywhere in LastName, making it a substring match.
B) The = operator does not support wildcard matching.
C) The LIKE operator is used for pattern matching, but without wildcards (% or _), it behaves the same as =. This query will only match LastName exactly equal to 'Negi', not if 'Negi' is a substring.

Q4 **Text Solution:**

The output of the query is as follows:

P	Q	R
1	2	5
1	3	NULL
3	4	6
NULL	7	8

Q5 **Text Solution:**

The output will be as follows:

Counter_No
1
1
2
2

Q6 **Text Solution:**

Both the queries essentially does the same check but in a different way. The queries selects Sid and Sname from the Salesman table, but only for those salesmen who are referenced in the Customer table more than once.

The output of both queries is as follows:

Sid	Sname
2	Venkat
3	Abhishek

Hence, X = Y = 2.

Q7 **Text Solution:**

Q1: This query selects the cost values from the Sell table where no other row has a greater cost.

The output of Q1 is as follows:

Cost
4
4
4

$\therefore$ X = 3

Q2: This query returns the maximum cost in the Sell table i.e., a single value 4.

$\therefore$ Y = 1

Q8 **Text Solution:**

Since the query groups by Cid and date, each

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(Cid, date) pair will have exactly one tuple in the result. Thus, the number of tuples in the output depends on the specific amount values in each row.

Since the number of tuples returned depends on the data, none of the first three options are universally true.

Q9   Text Solution:

Q1 selects the Marks of students whose marks are not exceeded by any other student, meaning it returns the highest marks in the table.

Q2 directly retrieves the maximum marks from the table using MAX(Marks).

Both queries will return the same value in cases where there is a single student with the highest marks. However, if multiple students have the same highest marks, Q1 will return multiple tuples, whereas Q2 will return a single value.

Thus, Q1 and Q2 may produce the same answer but not always.

Q10   Text Solution:

The given query selects ENAME and DEPTNO from the EMP table where the SALARY is less than at least one (ANY) salary in department 20.

If no employee exists in department 20, the subquery returns an empty set, and SALARY < ANY (empty set) is false for all rows.

In this case, Q returns 0 rows (i.e., X = 0).

If all employees belong to department 20, then the subquery contains all salaries from EMP.

This results in selecting all employees except the highest-paid one, making Y = 19.

Q11   Text Solution:

The query selects salesmen who have exactly one customer.

If a salesman has more than one customer, the NOT EXISTS condition fails.

If a salesman has zero customers, their salesman_id won't appear in the Customer table, so they won't be selected.

Q12   Text Solution:

B) This groups by both store_id and country, meaning each unique store (since store_id is unique) forms a separate group. The result would not aggregate all stores per country, but instead count 1 for each store.

C) COUNT(store_id, country) is invalid syntax. The COUNT() function takes only one column (or *).

D) Again, COUNT(store_id, country) is invalid syntax.

Q13   Text Solution:

Grouping the data by City:

City	Ratings in Group
Bhopal	5, 4
Ujjain	7, 2
Indore	3, 3

The HAVING condition (Rating > 4) means that the aggregated Rating for a city must be greater than 4. Thus, Bhopal and Ujjain satisfy the condition, so the number of tuples produced is 2.

Q14   Text Solution:

Q1 (ALL) requires B in R to be greater than or equal to the maximum B value in S.

Q2 (ANY) requires B in R to be greater than or equal to at least the minimum B value in S.

This means that Q1's result is generally a subset of Q2's result, because satisfying "greater than or equal to the max value" is stricter than "greater than or equal to any value".

But it may be the case that there is no tuple with C=1, in that case all tuples will be selected by Q1 but none will be selected by Q2. So Q1 may not be subset of Q2 because in that case output of Q2 will be empty.

Q15   Text Solution:

The condition D.Dname = 'finance' AND D.Dname = 'HR' can never be true because a single row in the DEPT table cannot have both names at the same time.

Thus, the query in option B will always return 0 rows.