GATE | GATE CS 2019 | Question 63

Consider the following relation P(X, Y, Z), Q(X, Y, T) and R(Y, V):

P		
X	Y	Z
X1	Y1	Z1
X1	Y1	Z2
X2	Y2	Z2
X2	Y4	Z4

Q		
X	Y	T
X2	Y1	2
X1	Y2	5
X1	Y1	6
X3	Y3	1

R	
Y	V
Y1	V1
Y3	V2
Y2	V3
Y2	V2

How many tuples will be returned by the following relational algebra query?

$$\pi_X(\sigma_{P.Y = R.Y \wedge R.V = V}(P \times R)) - \pi_X(\sigma_{Q.Y = R.Y \wedge Q.T > 2}(Q \times R))$$

Note: This was Numerical Type question.

(A) 3

(B) 1

(C) 2

(D) 4

Answer: (B)

Explanation: Query-1:

$\pi_X(\sigma_{P.Y = R.Y \wedge R.V = V}(P \times R))$

It will satisfy only one row:

```
X   Y   Z   Y   V
--------------------
X2   Y2   Z2   Y2   V2
--------------------
```

Only column X will be selected.


```
X
-----
X2
-----
```

Query-2:

$\pi_X(\sigma_{Q.Y = R.Y \wedge Q.T > 2}(Q \times R))$

It will satisfy three row:

```
X   Y   T   Y   V
-------------------
X1   Y2   5   Y2   V3
X1   Y2   5   Y2   V2
X1   Y1   6   Y1   V1
-------------------
```

Only column X will be selected.

```
X
-----
X1
-----
```

Note that relational algebra return unique tuples only.

Now,

$$= \pi_X(\sigma_{(P.Y = R.Y \wedge R.V = V}(P \times R)))$$
$$= (\text{Query-1}) - (\text{Query-2})$$
$$= X2 - X1$$
$$= X2$$

So, answer is **1**.

Note that {(Query-1) – (Query-2)} will return all tuples from query-1 those are not in query-2.

Quiz of this Question

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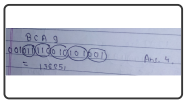

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