Q1. 21 January Shift 1

The number of relations, defined on the set $\{a, b, c, d\}$, which are both reflexive and symmetric, is equal to:

(1) 16 (2) 1024 (3) 64 (4) 256

Q2. 21 January Shift 2

Let $A = \{x : |x^2 - 10| \leq 6\}$ and $B = \{x : |x - 2| > 1\}$. Then

(1) $A \cup B = (-\infty, 1] \cup (2, \infty)$ (2) $B - A = (-\infty, -4) \cup (-2, 1) \cup (4, \infty)$

(3) $A - B = [2, 3)$ (4) $A \cap B = [-4, -2] \cup [3, 4]$

Q3. 21 January Shift 2

Let $A = \{2, 3, 5, 7, 9\}$. Let R be the relation on A defined by $x R y$ if and only if $2x \leq 3y$. Let l be the number of elements in R, and m be the minimum number of elements required to be added in R to make it a symmetric relation. Then $l + m$ is equal to :

(1) 21 (2) 27 (3) 23 (4) 25

Q4. 22 January Shift 1

Let the relation R on the set $M = \{1, 2, 3, \ldots, 16\}$ be given by $R = \{(x, y) : 4y = 5x - 3, x, y \in M\}$. Then the minimum number of elements required to be added in R, in order to make the relation symmetric, is equal to

(1) 4 (2) 1 (3) 2 (4) 3

Q5. 22 January Shift 2

The number of elements in the relation $R = \{(x, y) : 4x^2 + y^2 < 52, x, y \in \mathbf{Z}\}$ is

(1) 77 (2) 67 (3) 86 (4) 89

Q6. 22 January Shift 2

Let S be the set of the first 11 natural numbers. Then the number of elements in $A = \{B \subseteq S : n(B) \geqslant 2$ and the product of all elements of B is even $\}$ is ____ .

Q7. 23 January Shift 1

Let $A = \{-2, -1, 0, 1, 2, 3, 4\}$. Let R be a relation on A defined by $x R y$ if and only if $2x + y \leqslant 2$. Let l be the number of elements in R. Let m and n be the minimum number of elements required to be added in R to make it reflexive and symmetric relations respectively. Then $l + m + n$ is equal to :

(1) 35 (2) 34 (3) 33 (4) 32

Q8. 23 January Shift 2

Let A $= \{0, 1, 2, \ldots, 9\}$. Let R be a relation on A defined by $(x, y) \in$ R if and only if $|x - y|$ is a multiple of 3.

Given below are two statements:

Statement I: $n(\text{R}) = 36$.

Statement II: R is an equivalence relation.

In the light of the above statements, choose the correct answer from the options given below

(1) Statement I is incorrect but Statement II is correct

(2) Statement I is correct but Statement II is incorrect

(3) Both Statement I and Statement II are incorrect

(4) Both Statement I and Statement II are correct

Q9. 24 January Shift 1

Let R be a relation defined on the set $\{1, 2, 3, 4\} \times \{1, 2, 3, 4\}$ by R $= \{((a, b), (c, d)) : 2a + 3b = 3c + 4d\}$. Then the number of elements in R is

(1) 18 (2) 6 (3) 15 (4) 12

ANSWER KEYS

1. (3)	**2.** (2)	**3.** (4)	**4.** (3)	**5.** (1)	**6.** 1979	**7.** (2)	**8.** (1)
9. (4)							