

Q1. 21 January Shift 1

The sum of all the roots of the equation $(x - 1)^2 - 5|x - 1| + 6 = 0$, is :

- (1) 1 (2) 5 (3) 3 (4) 4

Q2. 21 January Shift 2

Let α and β be the roots of the equation $x^2 + 2ax + (3a + 10) = 0$ such that $\alpha < 1 < \beta$. Then the set of all possible values of a is :

- (1) $(-\infty, -\frac{11}{5})$ (2) $(-\infty, -2) \cup (5, \infty)$
 (3) $(-\infty, -3)$ (4) $(-\infty, -\frac{11}{5}) \cup (5, \infty)$

Q3. 22 January Shift 2

Let α, β be the roots of the quadratic equation $12x^2 - 20x + 3\lambda = 0, \lambda \in \mathbf{Z}$. If $\frac{1}{2} \leq |\beta - \alpha| \leq \frac{3}{2}$, then the sum of all possible values of λ is :

- (1) 1 (2) 6 (3) 3 (4) 4

Q4. 23 January Shift 1

A building construction work can be completed by two masons A and B together in 22.5 days. Mason A alone can complete the construction work in 24 days less than mason B alone. Then mason A alone will complete the construction work in :

- (1) 30 days (2) 36 days (3) 24 days (4) 42 days

Q5. 23 January Shift 1

If α and $\beta (\alpha < \beta)$ are the roots of the equation $(-2 + \sqrt{3})(|\sqrt{x} - 3|) + (x - 6\sqrt{x}) + (9 - 2\sqrt{3}) = 0, x \geq 0$, then $\sqrt{\frac{\beta}{\alpha}} + \sqrt{\alpha\beta}$ is equal to :

- (1) 8 (2) 11 (3) 9 (4) 10

Q6. 23 January Shift 2

The sum of all the real solutions of the equation

$\log_{(x+3)}(6x^2 + 28x + 30) = 5 - 2\log_{(6x+10)}(x^2 + 6x + 9)$ is equal to

- (1) 2 (2) 1 (3) 0 (4) 4

Q7. 24 January Shift 2

The smallest positive integral value of a , for which all the roots of $x^4 - ax^2 + 9 = 0$ are real and distinct, is equal to

- (1) 4 (2) 9 (3) 3 (4) 7

Q8. 28 January Shift 1

Let $S = \{x^3 + ax^2 + bx + c : a, b, c \in \mathbb{N} \text{ and } a, b, c \leq 20\}$ be a set of polynomials. Then the number of polynomials in S , which are divisible by $x^2 + 2$, is

(1) 10

(2) 20

(3) 6

(4) 120

Q9. 28 January Shift 1

If α, β , where $\alpha < \beta$, are the roots of the equation $\lambda x^2 - (\lambda + 3)x + 3 = 0$ such that $\frac{1}{\alpha} - \frac{1}{\beta} = \frac{1}{3}$, then the sum of all possible values of λ is

(1) 8

(2) 6

(3) 2

(4) 4

ANSWER KEYS

1. (4)

2. (1)

3. (3)

4. (1)

5. (3)

6. (3)

7. (4)

8. (1)

9. (2)