

Topics : Fundamentals of Mathematics, Complex Numbers, Logarithm

Type of Questions

M.M., Min.

Comprehension (no negative marking) Q.1 to Q.3

(3 marks, 3 min.)

[9, 9]

Multiple choice objective (no negative marking) Q.4,5

(5 marks, 4 min.)

[10, 8]

Subjective Questions (no negative marking) Q.6,7

(4 marks, 5 min.)

[8, 10]

COMPREHENSION (Q.No. 1 to 3) :

Set of all the solutions of the inequality $\sqrt{x^2 - 6x + 5} \geq x - 4$ is $(-\infty, p] \cup [q, \infty)$.

Set of all the solutions of the inequality $\left(\frac{1}{3}\right)^{x^2 - 6x - 7} > 1$ is (a, b) , where $p, q, a, b \in \mathbb{R}$.

$[.]$ represents greatest integer function.

- $[p + q]$ is equal to
(A) 6 (B) 7 (C) 8 (D) 5
- Number of integers which are common to both solution sets is
(A) 2 (B) 3 (C) 4 (D) None of these
- If k denotes the number of divisors of $3(p + 2q + a + b)$ then set of all the solutions of $[x] = k$ is -
(A) [4, 5) (B) [6, 7) (C) [7, 8) (D) [8, 9)
- If $z = \sqrt{20i - 21} + \sqrt{21 + 20i}$, then the principle value of $\arg z$ can be :
(A) $\frac{\pi}{4}$ (B) $\frac{3\pi}{4}$ (C) $-\frac{\pi}{4}$ (D) $-\frac{3\pi}{4}$
- $(1+i)^{n_1} + (1+i^3)^{n_1} + (1-i^5)^{n_2} + (1-i^7)^{n_2}$ is a real number if $(n_1, n_2 \in \mathbb{Z})$
(A) $n_1 = n_2 + 1$ (B) $n_1 + 1 = n_2$
(C) $n_1 = n_2$ (D) n_1, n_2 are any two positive integers
- Find the square root of
(i) $5 + 12i$ (ii) $27 - 36i$
- Simplify : $\sqrt[3]{5^{\frac{1}{\log_7 5}} + \frac{1}{\sqrt{-\log_{10}(0.1)}}}$.

Answers Key

1. (A) 2. (B) 3. (D) 4. (A) (B)(C)(D)
5. (A)(B)(C)(D)
6. (i) $3 + 2i, -3 - 2i$ (ii) $-6 + 3i, 6 - 3i$ 7. 2