MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 39

Total Marks : 27

Max. Time : 27 min.

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 $\in$ R.

[.] respresents greatest integer function.

1. [p + q] is equal to

(A) 6 (B) 7 (C) 8 (D) 5

2. Number of integers which are common to both solution sets is

(A) 2 (B) 3 (C) 4 (D) None of these

3. 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)

4. 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) $-\frac{3\pi}{4}$

5. $(1+i)^{n_1} + (1+i^3)^{n_1} + (1-i^5)^{n_2} + (1-i^7)^{n_2}$ is a real number if ($n_1, n_2 \in Z$)

(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

6. Find the square root of

(i) 5 + 12 i (ii) 27 – 36 i

7. 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