MATHEMATICS

DPP
DAILY PRACTICE PROBLEMS

DPP No. 49

Total Marks : 33

Max. Time : 33 min.

Topics : Sequence & Series, Fundamentals of Mathematics, Quadratic Equation, Straight Line

Type of Questions		M.M., Min.
Comprehension (no negative marking) Q.1 to Q.4	(3 marks, 3 min.)	[12, 12]
Single choice Objective (no negative marking) Q.5	(3 marks, 3 min.)	[3, 3]
Multiple choice objective (no negative marking) Q. 6	(5 marks, 4 min.)	[10, 8]
Subjective Questions (no negative marking) Q. 7,8	(4 marks, 5 min.)	[8, 10]

Comprehension (Q. NO. 1 TO 4)

Consider the different positive infinite geometric progression with their sums S_1 and S_2 as

$S_1 = a + ar + ar^2 + ar^3 + ... \infty$

$S_2 = b + bR + bR^2 + bR^3 + ... \infty$

If $S_1 = S_2 = 1$, ar = bR and $ar^2 = \dfrac{1}{8}$ then answer the following :

1. The sum of their common ratio is

(A) $\dfrac{1}{2}$ (B) $\dfrac{3}{4}$ (C) 1   (D) $\dfrac{3}{2}$

2. The sum of their first terms is

(A) 1   (B) 2   (C) 3   (D) none of these

3. Common ratio of first G.P. is

(A) $\dfrac{1}{2}$ (B) $\dfrac{1-\sqrt{5}}{4}$ (C) $\dfrac{\sqrt{5}-1}{4}$ (D) $\dfrac{\sqrt{5}+1}{4}$

4. Common ratio of the second G.P. is

(A) $\dfrac{3+\sqrt{5}}{4}$ (B) $\dfrac{3-\sqrt{5}}{4}$ (C) $\dfrac{1}{2}$ (D) none of these

5. If ω be a imaginary n^{th} root of unity , then $\displaystyle\sum_{r=1}^{n} (ar+b)\,\omega^{r-1}$ is equal to :

(A) $\dfrac{n(n+1)}{2}\,a$ (B) $\dfrac{nb}{1-n}$ (C) $\dfrac{na}{\omega-1}$ (D) none of these

6. The complete solution set of the inequation $x - \dfrac{2(K-1)}{K} \le \dfrac{2}{3K}(x+1)$ is given by

(A) $(-\infty, 2]$ if $K > \dfrac{2}{3}$ (B) $[2, \infty)$ if $0 < K < \dfrac{2}{3}$

(C) $(-\infty, 2]$ if $K < 0$ (D) R if $K = \dfrac{2}{3}$

7. If α, β are the roots of $x^2 + px + q = 0$ and also of $x^{2n} + p^n x^n + q^n = 0$ and if $\dfrac{\alpha}{\beta}, \dfrac{\beta}{\alpha}$ are the roots of $x^n + 1 + (x+1)^n = 0$, then prove that n must be an even integer.

8. The sides of a rhombus are parallel to y = 2x + 3 and 2y = x + 5. The diagonals of the rhombus intersect at (1, 2). If one vertex of the rhombus lies on the y-axis and possible values of the ordinates of this vertex are a & b, then find the value of (a + b).

Answers Key

1. (C)	**2.** (A)	**3.** (D)	**4.** (B)
5. (C)	**6.** (A)(B)(C)(D)	**8.** 4	