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 $ar^2 = \frac{1}{8}$ then answer the following :

1. The sum of their common ratio is

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

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

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

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

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

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

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

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

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

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 $\frac{\alpha}{\beta}, \frac{\beta}{\alpha}$ 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