## **MATHEMATICS**



## DPP No. 44

Total Marks: 27

Max. Time: 30 min.

Topic: Sequence & Series

Type of Questions M.M., Min.

Comprehension (no negative marking) Q.1 to Q.3 Single choice Objective (no negative marking) Q.4,5 Subjective Questions (no negative marking) Q.6,7,8

(3 marks, 3 min.) **Γ9**. 91 (3 marks, 3 min.) 6] [6,

(4 marks, 5 min.) 15] [12,

COMPREHENSION: (Q. NO. 1 TO 3)

Let  $x \in \mathbb{R}^+$  such that  $\{x\}$ , [x], x are in G.P., where [.] &  $\{.\}$  are greatest integer & fractional part functions respectively.

1 Common ratio of this G.P. is

(A) 
$$\frac{-1-\sqrt{5}}{2}$$

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

(C) 
$$\frac{1-\sqrt{5}}{4}$$

(D) 
$$\frac{1+\sqrt{5}}{2}$$

2 The value of x is

(A) 
$$\frac{-1-\sqrt{5}}{2}$$
 (B)  $\sqrt{5}$ 

(C) 
$$\frac{1+\sqrt{5}}{2}$$

(D) none of these

3 Sum to n terms of this G.P.

(A) 
$$2^n \cos^n \frac{\pi}{5} - 1$$
 (B)  $2^n \sin^n \frac{\pi}{5} - 1$  (C)  $2^n \cos^n \frac{\pi}{5}$  (D)  $2^n \sin^n \frac{\pi}{5}$ 

(B) 
$$2^n \sin^n \frac{\pi}{5} - 1$$

(C) 
$$2^{n} \cos^{n} \frac{\pi}{5}$$

(D) 
$$2^n \sin^n \frac{\pi}{5}$$

4. First, second and seventh terms of an A.P. (all the terms are distinct), whose sum is 93, are in G.P. Fourth term of this G.P. is

(D) 375

If  $\sum_{r=1}^{n} t_r = \frac{1}{12} n(n+1) (n+2)$ , then the value of  $\sum_{r=1}^{n} \frac{1}{t_r}$  is

(A) 
$$\frac{2n}{n+1}$$

(B) 
$$\frac{n}{(n+1)}$$

(C) 
$$\frac{4n}{n+1}$$

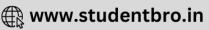
(D) 
$$\frac{3n}{n+1}$$

Find the number of terms of a G.P. in which the ratio of the sum of the first eleven terms to the sum of 6. the last eleven terms is 1/8, and the ratio of the sum of all the terms without the first nine to the sum of all the terms without the last nine is 2.

7. If 0 < r < 1 and  $m \in N$ , then prove that  $(2m + 1) r^m (1 - r) < 1 - r^{2m+1}$ 

8. The value of x + y + z is 15 if a, x, y, z, b are in AP while the value of (1/x) + (1/y) + (1/z) is 5/3 if a, x, y, z, b are in HP. Find a and b.





## Answers Key

1

(D) **2** (C) **3** (A) **4**. (D)

**5.** (C)

**6.** 38 **8.** a = 1, b = 9 or b = 1, a = 9

