

Topics : Sequence & Series, Trigonometric Ratio

Type of Questions

Comprehension (no negative marking) Q.1 to Q.2	(3 marks, 3 min.)	[6, 6]
Single choice Objective (no negative marking) Q.3,4,5	(3 marks, 3 min.)	[9, 9]
Subjective Questions (no negative marking) Q.6,7	(4 marks, 5 min.)	[8, 10]

COMPREHENSION : (Q. 1 to Q. 2)

Between two numbers whose sum is $2\frac{1}{6}$, an even number of arithmetic means are inserted. If the sum of these means exceeds their number by unity, then the number of means is t , then answer the following questions.

- The value of t is
(A) 12 (B) 11 (C) 15 (D) 16
- The third term of a G.P. is the square of the first term. If the second term is 8, then the 6th term is (in terms of t)
(A) $10t - 8$ (B) $10t + 8$ (C) $8t + 10$ (D) $8t - 10$
- If $P = \frac{\sin 300^\circ \cdot \tan 330^\circ \cdot \sec 420^\circ}{\tan 135^\circ \cdot \sin 210^\circ \cdot \sec 315^\circ}$ & $Q = \frac{\sec 480^\circ \cdot \operatorname{cosec} 570^\circ \cdot \tan 330^\circ}{\sin 600^\circ \cdot \cos 660^\circ \cdot \cot 405^\circ}$,
then P & Q are respectively :
(A) 2, 16 (B) $\sqrt{2}$, $\frac{16}{3}$ (C) -2 , $\frac{3}{16}$ (D) none of these
- The product $\cot 123^\circ \cdot \cot 133^\circ \cdot \cot 137^\circ \cdot \cot 147^\circ$, when simplified is equal to :
(A) -1 (B) $\tan 37^\circ$ (C) $\cot 33^\circ$ (D) 1
- In a sequence, if the sum of the first ' n ' terms is given by $S_n = 2^{np} - 1$, where ' p ' is a fixed non zero real number the nature of the sequence, is
(A) A.P. (B) G.P. (C) H.P. (D) None of these
- If θ lies in III quadrant and $\sin \theta = -\frac{12}{13}$, find $\cos \theta$, $\tan \theta$, $\cot \theta$
- Find the sum of the series
 $1 + 2(1-x) + 3(1-x)(1-2x) + \dots + n(1-x)(1-2x)\dots(1-(n-1)x)$

Answers Key

1. (A) 2. (B) 3. (B) 4. (D) 5. (B)

6. $\cos \theta = -\frac{5}{13}$, $\tan \theta = \frac{12}{5}$, $\cot \theta = \frac{5}{12}$

7. $\Sigma T_r = -\frac{1}{x} [(1-x)(1-2x) \dots (1-nx) - 1]$