

Topics : Sequence & Series, Trigonometric Ratio & Trigonometric Equations

Type of Questions

M.M., Min.

Single choice Objective (no negative marking) Q.1,2

(3 marks, 3 min.)

[6, 6]

Multiple choice objective (no negative marking) Q.3

(5 marks, 4 min.)

[5, 4]

Subjective Questions (no negative marking) Q.4,5,6,7

(4 marks, 5 min.)

[16, 20]

- If $abcd = 1$, where a, b, c, d are positive reals, then the minimum value of $a^2 + b^2 + c^2 + d^2 + ab + ac + ad + bc + bd + cd$ is
 (A) 6 (B) 10 (C) 12 (D) 20
- The A.M of the nine numbers in the given set $\{9, 99, 999, \dots, 999999999\}$ is a 9 - digit number N , all whose digits are distinct then, the number N does not contain the digit.
 (A) 0 (B) 2 (C) 5 (D) 9
- If the first & the $(2n + 1)^{\text{th}}$ terms of an A.P., a G.P. & an H.P. of positive terms are same and their $(n + 1)^{\text{th}}$ terms are a, b & c respectively, then:
 (A) $a = b = c$ (B) $a \geq b \geq c$ (C) $a + c = 2b$ (D) $ac = b^2$.
- If $\sin \theta + \sin^2 \theta = 1$, then prove that $\cos^2 \theta + \cos^4 \theta = 1$
- Prove that : $\frac{1 - \sin \theta}{1 + \sin \theta} = (\sec \theta - \tan \theta)^2$
- Find θ lying in the interval $[0, 2\pi]$ satisfying the following equations :
 (i) $\sin \theta = \frac{1}{2}$ (ii) $\cos \theta = \frac{\sqrt{3}}{2}$ (iii) $\tan \theta = \sqrt{3}$
 (iv) $\sin \theta = -\frac{1}{\sqrt{2}}$ (v) $\cos \theta = -\frac{1}{2}$ (vi) $\tan \theta = -\frac{1}{\sqrt{3}}$
- Find the sum to 'n' terms and the sum to infinite terms of the series

$$\frac{3}{1^2} + \frac{5}{1^2 + 2^2} + \frac{7}{1^2 + 2^2 + 3^2} + \frac{9}{1^2 + 2^2 + 3^2 + 4^2} + \dots \text{upto } n \text{ terms}$$

Answers Key

1. (B) 2. (A) 3. (B) (D) 6. (i) $\frac{\pi}{6}, \frac{5\pi}{6}$

(ii) $\frac{\pi}{6}, \frac{11\pi}{6}$ (iii) $\frac{\pi}{3}, \frac{4\pi}{3}$ (iv) $\frac{5\pi}{4}, \frac{7\pi}{4}$ (v) $\frac{2\pi}{3}, \frac{4\pi}{3}$

(vi) $\frac{5\pi}{6}, \frac{11\pi}{6}$ 7. $S_n = \frac{6n}{n+1}, S_\infty = 6$