MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 24

Total Marks : 27

Max. Time : 30 min.

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]

1. 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

2. The A.M of the nine numbers in the given set {9, 99, 999, ..., 9999999999} 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

3. If the first & the $(2n + 1)^{th}$ terms of an A.P., a G.P. & an H.P. of positive terms are same and their $(n + 1)^{th}$ terms are a, b & c respectively, then:

(A) $a = b = c$ (B) $a \geq b \geq c$ (C) $a + c = 2b$ (D) $ac = b^2$.

4. If $\sin\theta + \sin^2\theta = 1$, then prove that $\cos^2\theta + \cos^4\theta = 1$

5. Prove that : $\dfrac{1-\sin\theta}{1+\sin\theta} = (\sec\theta - \tan\theta)^2$

6. Find θ lying in the interval $[0, 2\pi]$ satisfying the following equations :

(i) $\sin\theta = \dfrac{1}{2}$ (ii) $\cos\theta = \dfrac{\sqrt{3}}{2}$ (iii) $\tan\theta = \sqrt{3}$

(iv) $\sin\theta = -\dfrac{1}{\sqrt{2}}$ (v) $\cos\theta = -\dfrac{1}{2}$ (vi) $\tan\theta = -\dfrac{1}{\sqrt{3}}$

7. Find the sum to 'n' terms and the sum to infinite terms of the series

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

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.** $S_n = \frac{6n}{n+1}, S_\infty = 6$