MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 31

Total Marks : 27

Max. Time : 28 min.

Topics : Trigonometric Ratio & Identities, Sequence & Series

Type of Questions		**M.M., Min.**
Single choice Objective (no negative marking) Q.1,2,3,4,5	**(3 marks, 3 min.)**	**[15, 15]**
Subjective Questions (no negative marking) Q.6	**(4 marks, 5 min.)**	**[4, 5]**
Match the Following (no negative marking) Q.7	**(8 marks, 8 min.)**	**[8, 8]**

1. The value of $\cos^2 73^\circ + \cos^2 47^\circ - \sin^2 43^\circ + \sin^2 107^\circ$ is equal to :

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

2. The expression $4\cos^4 x - 2\cos 2x - \frac{1}{2}\cos 4x$ when simplified reduces to :

(A) 2/3 (B) 3/2 (C) $-2/3$ (D) $-3/2$

3. If $x \in R$, the numbers $2^{1+x} + 2^{1-x}$, $\frac{b}{2}$, $36^x + 36^{-x}$ form an A.P., then b must lie in the interval

(A) $[12, \infty)$ (B) $[6, \infty)$ (C) $(-\infty, 6]$ (D) [6, 12]

4. If $f(r) = 1 + \frac{1}{2} + \frac{1}{3} + \ldots\ldots \frac{1}{r}$ and $f(0) = 0$, then $\sum_{r=1}^{n} (2r+1) f(r)$

(A) $(n+1) f(n+1) - \frac{(n^2+3n+2)}{2}$ (B) $n f(n+1) - \frac{(n^2+3n+2)}{2}$

(C) $(n+1)^2 f(n+1) - \frac{(n^2+3n+2)}{2}$ (D) $(n+1)^2 f(n) - \frac{(n^2+3n+2)}{2}$

5. Value of $\cos^4 \frac{\pi}{8} + \cos^4 \frac{3\pi}{8} + \cos^4 \frac{5\pi}{8} + \cos^4 \frac{7\pi}{8}$ is

(A) $\frac{1}{2}$ (B) $\frac{3}{2}$ (C) 1 (D) 0

6. Suppose α, β, γ and δ are the interior angles of pentagon, hexagon, decoagon and dodecogon respectively, find the values of $|\cos\alpha + \sec\beta + \cos\gamma + \text{cosec}\,\delta|$.
Assume that all polygons are regular.

7. **Match the column**

Column – I		**Column – II**	
(A)	If $x = \sin\theta\lvert\sin\theta\rvert$ and $y = \cos\theta\lvert\cos\theta\rvert$ and $\frac{99\pi}{2} < \theta < 50\pi$, then $y - x$ is equal to	(p)	–1
(B)	If $\frac{\cos(\alpha-\beta)}{\cos(\alpha+\beta)} + \frac{\cos(\gamma+\delta)}{\cos(\gamma-\delta)} = 0$, then $(\tan\alpha.\tan\beta.\tan\gamma.\tan\delta)$ has the value equal to	(q)	0
(C)	If A lies in the third quadrant and $3\tan A - 4 = 0$, then $5\sin 2A + 3\sin A + 4\cos A$ is equal to	(r)	1
(D)	If $\sum_{i=1}^{n} \cos\theta_i = n$, then $\sum_{i=1}^{n} \sin\theta_i$ is equal to	(s)	2

Answers Key

1. (A) **2.** (B) **3.** (B) **4.** (C) **5.** (B) **6.** $\frac{\sqrt{5}}{2}$

7. (A) $\rightarrow$(r) (B)$\rightarrow$(p) (C)$\rightarrow$(q) (D)$\rightarrow$(q)