MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 1

Total Marks : 24

Max. Time : 24 min.

Topics : Straight Line, Determinant, Fundamentals of Mathematics, Trigonometric Ratio

Type of Questions		**M.M., Min.**
Single choice Objective (no negative marking) Q. 1, 2, 3	**(3 marks, 3 min.)**	**[9, 9]**
Short Subjective Questions (no negative marking) Q.4, 5, 6, 7, 8	**(3 marks, 3 min.)**	**[15, 15]**

1. The solution set of $x \in (-\pi, \pi)$ for the inequality $\sin 2x + 1 \le \cos x + 2 \sin x$ is :

(A) $x \in [0, \pi/6]$ (B) $x \in \left[\frac{\pi}{6}, \frac{5\pi}{6}\right] \cup \{0\}$ (C) $x \in \left(-\frac{\pi}{6}, \frac{5\pi}{6}\right)$ (D) none of these

2. If the lines $x^2 + 2xy - 35y^2 - 4x + 44y - 12 = 0$ and $5x + \lambda y - 8 = 0$ are concurrent, then the value of λ is. (A) 0 (B) 1 (C) – 1 (D) 2

3. If $D = \begin{vmatrix} a^2+1 & ab & ac \\ ba & b^2+1 & bc \\ ca & cb & c^2+1 \end{vmatrix}$ then D =

(A) $1 + a^2 + b^2 + c^2$ (B) $a^2 + b^2 + c^2$ (C) $(a + b + c)^2$ (D) none

Solve the following equations and inequalities :

4. $\frac{x^2 + 4x + 4}{2x^2 - x - 1} > 0.$

5. $\frac{x^2 - 7|x| + 10}{x^2 - 6x + 9} < 0$

6. $\left|\frac{x^2 - 5x + 4}{x^2 - 4}\right| \le 1$

7. Which is greater ? $\sin(\cos 1)$ or $\cos(\sin 1)$.

8. Solve for x : $\log_2\left(\sin\frac{x}{2}\right) < -1.$

Answers Key

1. (B) **2.** (D) **3.** (A)

4. $(-\infty, -2) \cup (-2, -1/2) \cup (1, \infty)$

5. $(-5, -2) \cup (2, 3) \cup (3, 5)$ **6.** $[0, 8/5] \cup [5/2, \infty)$

7. $\cos(\sin 1)$

8. $(4n\pi, \frac{\pi}{3} + 4n\pi) \cup (\frac{5\pi}{3} + 4n\pi, 4n\pi + 2\pi)$