MATHEMATICS

DPP
DAILY PRACTICE PROBLEMS

DPP No. 12

Total Marks : 26

Max. Time : 25 min.

Topics : Inverse Trigonometric Function, Set & Relation, Fundamentals of Mathematics, Matrices & Determinants, Quadratic Equation, Trigonometric Ratio

Type of Questions		M.M., Min.
Comprehension (no negative marking) Q.1 to Q.3	(3 marks, 3 min.)	[9, 9]
Single choice Objective (no negative marking) Q. 4, 5, 6, 7	(3 marks, 3 min.)	[12, 12]
Multiple choice objective (no negative marking) Q.8	(5 marks, 4 min.)	[5, 4]

COMPREHENSION (FOR Q.NO. 1 TO 3) :

A polynomial P(x) of third degree vanish when x = 1 & x = – 2. This polynomial have the values 4 & 28 when x = – 1 and x = 2 respectively.

1. One of the factor of P(x) is
   (A) x + 1   (B) x – 2   (C) 3x + 1   (D) none of these

2. If the polynomial P(x) is divided by (x + 3), then remainder is
   (A) – 32   (B) 100   (C) 32   (D) 0

3. If i = $\sqrt{-1}$, then P(i) is
   (A) rational   (B) purely imaginary   (C) imaginary   (D) irrational

4. If n(A) = 110, n(B) = 300, n(A – B) = 50, then n(A $\cup$ B) equals
   (1) 350   (B) 410   (C) 160   (D) 460

5. The sum of

   $\cot^{-1}\left(\dfrac{7}{4}\right) + \cot^{-1}\left(\dfrac{19}{4}\right) + \cot^{-1}\left(\dfrac{39}{4}\right) + \cot^{-1}\left(\dfrac{67}{4}\right)$ ....∞ is equal to

   (A) $\tan^{-1} 4$ (B) $\tan^{-1} 3$ (C) $\tan^{-1} 2$ (D) None of these

6. If A = $\begin{bmatrix} 1 & \tan x \\ -\tan x & 1 \end{bmatrix}$, then $A^T A^{-1}$ =

   (A) $\begin{bmatrix} \cos 2x & -\sin 2x \\ \sin 2x & \cos 2x \end{bmatrix}$ (B) $\begin{bmatrix} -\cos 2x & \sin 2x \\ -\sin 2x & \cos 2x \end{bmatrix}$

   (C) $\begin{bmatrix} \sin 2x & \cos 2x \\ \cos 2x & \sin 2x \end{bmatrix}$ (D) None of these

7. Let $\cos(\alpha + \beta) = \dfrac{4}{5}$ and $\sin(\alpha - \beta) = \dfrac{5}{13}$, where $0 \le \alpha, \beta \le \dfrac{\pi}{4}$. Then $\tan 2\alpha$ =

   (A) $\dfrac{56}{33}$ (B) $\dfrac{19}{12}$ (C) $\dfrac{20}{7}$ (D) $\dfrac{25}{16}$

8. If the cubic polynomials $x^3 + ax^2 + 11x + 6$ and $x^3 + bx^2 + 14x + 8$ may have a common factor of the form $x^2 + px + q$, then
   (A) a + p = b + q   (B) ap < bq   (C) pq divides ab   (D) p + q divides a + b.

Answers Key

1.	(C)	**2.**	(A)	**3.**	(C)	**4.**	(1)
5.	(C)	**6.**	(A)	**7.**	(A)	**8.**	(A)