MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 46

Total Marks : 37

Max. Time : 38 min.

Topics : Trigonometric Ratio, Quadratic Equation

Type of Questions		M.M., Min.
Single choice Objective(no negative marking) Q.1,2,3,6,9	(3 marks, 3 min.)	[15, 15]
Multiple choice objective (no negative marking) Q.5,7	(5 marks, 4 min.)	[10, 8]
Subjective Questions (no negative marking) Q.4,8,10	(4 marks, 5 min.)	[12, 15]

1. The graphs of $y = \sin x$, $y = \cos x$, $y = \tan x$ & $y = \text{cosec } x$ are drawn on the same axes from 0 to $\pi/2$. A vertical line is drawn through the point where the graphs of $y = \cos x$ & $y = \tan x$ cross, intersecting the other two graphs at the points A & B. The length of the line segment AB is

(A) 1 (B) $\frac{\sqrt{5}-1}{2}$ (C) $\sqrt{2}$ (D) $\frac{\sqrt{5}+1}{2}$

2. Let m be a positive integer, $m \geq 2$. If $\alpha_1, \alpha_2, ..., \alpha_m$ are the roots of the equation $x^m - 1 = 0$, then the equation whose roots are

$\beta_1 = \alpha_2 + \alpha_3 + ... + \alpha_m - (m-1)\alpha_1$

$\beta_2 = \alpha_1 + \alpha_3 + ...+ \alpha_m - (m-1)\alpha_2$

$\vdots$

$\beta_i = \alpha_1 + ...+ \alpha_{i-1} + \alpha_{i+1} + ... + \alpha_m - (m-1)\alpha_i$

$\vdots$

$\beta_m = \alpha_1 + ... + \alpha_{m-1} - (m-1)\alpha_m$, is

(A) $x^m + m^m = 0$ (B) $x^m - (-m)^m = 0$ (C) $x^m + (m-1)^m = 0$ (D) $x^m - (m-1)^m = 0$

3. The value of $\sum_{r=1}^{7} \tan^2\left(\frac{r\pi}{16}\right)$ is

(A) 29 (B) 33 (C) 34 (D) 35

4. Find the product of the real roots of the equation : $x^2 + 18x + 30 = 2\sqrt{x^2+18x+45}$.

5. The quadratic equation whose roots are $\sec^2\alpha$ and $\text{cosec}^2\alpha$ can be :

(A) $2x^2 - x - 1 = 0$ (B) $x^2 + 3x - 3 = 0$ (C) $x^2 - 9x + 9 = 0$ (D) $x^2 - 12x + 12 = 0$

6. The integral values of x for which $x^2 + 7x + 13$ is perfect square are

(A) – 4, 5, 2 (B) – 3, – 2 (C) – 4, – 3, – 2 (D) – 4, – 3

7. If $b^2 > 4ac$ then roots of equation $ax^4 + bx^2 + c = 0$ are all real & distinct if :

(A) $b < 0, a < 0, c > 0$ (B) $b < 0, a > 0, c > 0$ (C) $b > 0, a > 0, c > 0$ (D) $b > 0, a < 0, c < 0$

8. If α, β are the roots of the equation $x^2 - 2x + 3 = 0$ obtain the equation whose roots are $\alpha^3 - 3\alpha^2 + 5\alpha - 2$ and $\beta^3 - \beta^2 + \beta + 5$

9. If $f(x) = \frac{1-\sin 2x+\cos 2x}{2\cos 2x}$, then the value of $f(16^\circ) \cdot f(29^\circ)$ is

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) 1 (D) $\frac{3}{4}$

10. Solve the equation : $\left(4\sqrt{\cos\frac{x}{2}} - 5 - \frac{\sqrt{2}}{2}\right)^2 + \sqrt{2}\left(4\sqrt{\cos\frac{x}{2}} - 5 - \frac{\sqrt{2}}{2}\right) - \frac{\cos x}{2} = 0$

Answers Key

1.	(A)	**2.**	(B)	**3.**	(D)	**4.**	20.
5.	(C)(D)	**6.**	(D)	**7.**	(B)(D)	**8.**	$x^2 - 3x + 2 = 0$
9.	(A)	**10.**	$x = 4n\pi,\ n \in I$				