MATHEMATICS

DPP
DAILY PRACTICE PROBLEMS

DPP No. 6

Total Marks : 31

Max. Time : 30 min.

Topics : Inverse Trigonometric Function, Fundamentals of Mathematics, Quadratic Equation

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

1. If $\sin^{-1}\left(a - \dfrac{a^2}{3} + \dfrac{a^3}{9} + ...\right) + \cos^{-1}(1 + b + b^2 + ...) = \pi/2$, then the value of 'a' and 'b' may be

(A) a = –3 & b = 1   (B) a = 1 & b = –1/3   (C) a = 6 & $b = \dfrac{1}{2}$ (D) none of these

2. If sum of the roots of the quadratic equation, $a x^2 + b x + c = 0$ is 12, then the sum of the roots of the equation, $a (x + 1)^2 + b (x + 1) + c = 0$ is :

(A) 9   (B) 10   (C) 12   (D) 14

3. In the quadratic equation $x^2 + (p + iq)x + 3i = 0$, p & q are real . If the sum of the squares of the roots is 8 then :

(A) p = 3, q = – 1   (B) p = 3, q = 1   (C) p = – 3, q = – 1   (D) p = – 3, q = 1

4. If $\cos^{-1}\left(\dfrac{n}{2\pi}\right) > \dfrac{2\pi}{3}$, then the minimum and maximum values, of integer n are respectively

(A) – 6 and – 3   (B) – 6 and – 4   (C) 3 and 6   (D) 4 and 6

5. Solve for x, if $[\cos^{-1}x] = [\sin^{-1}x]$ (where [.] represents greatest integral part function).

(A) [–1 , cos 1)   (B) (cos 1 , sin 1)   (C) [– 1, sin 1)   (D) [sin1, 1]

6. Spot in which step there is error

If $f(x) = \sin^{-1}x + \cos^{-1}x + \tan^{-1}x$, so $f(x) = \dfrac{\pi}{2} + \tan^{-1}x$ Since $-\dfrac{\pi}{2} < \tan^{-1}x < \dfrac{\pi}{2}$

$\Rightarrow$ $0 < \tan^{-1}x + \dfrac{\pi}{2} < \pi$ $\Rightarrow$ $0 < f(x) < \pi$

7. Find the set of all values of 'a' for which the equation, $(1+a)\left(\dfrac{x^2}{x^2 + 1}\right)^2 - 3a\dfrac{x^2}{x^2 + 1} + 4a = 0$ have real roots.

8. **Match the following**

Column - I		Column - II	
(A)	The minimum value of f(x) = |x – 4| + |x – 6| + |x – 2| is	(p)	1
(B)	The total number of solution/solutions of |x| = |cosx| is/are	(q)	2
(C)	The total number of real roots of equation $\sqrt{x} + \sqrt{x - \sqrt{1 - x}} = 1$ is	(r)	3
(D)	Number of distinct normal form (3, 2) to the parabola $y^2 = 4x$ is	(s)	4
		(t)	0

Answers Key

1. (B)   **2.** (B)   **3.** (B)(C)   **4.** (B)

5. (B)   **6.** Domain [–1, 1]

7. $-\dfrac{1}{2} < a \le 0$

8. (A) → (s), (B) → (q), (C) → (p), (D) → (p)