MATHEMATICS

DPP
DAILY PRACTICE PROBLEMS

DPP No. 10

Total Marks : 30

Max. Time : 30 min.

Topics : Inverse Trigonometric Function, Matrices & Determinants, Function, Fundamentals of Mathematics

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

1. The number of values of k for which the linear equations
$$4x + ky + 2z = 0$$
$$kx + 4y + z = 0$$
$$2x + 2y + z = 0$$
has a non-zero solution is :
(A) 3   (B) 2   (C) 1   (D) zero

2. Total number of solution of the equation $\cos^{-1}\left(\dfrac{1-x^2}{1+x^2}\right) = \sin^{-1}x$ is/are

(A) one   (B) two   (C) three   (D) four

3. The number of 3 × 3 non-singular matrices, with four entries as 1 and all other entries as 0, is
(A) 5   (B) 6   (C) at least 7   (D) less than 4

4. If A is 4 × 4 matrix and if $\left| |A| \; adj(|A|A) \right| = |A|^n$, then n is
(A) 11   (B) 13   (C) 17   (D) 19

5. If A = $\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, then

(A) $A^{-1} = \dfrac{1}{5}(A - 4I_3)$ (B) $A^2 - 4A - 5I_3 = 0$ (C) A^2 is invertible   (D) A^3 is non invertible

6. Suppose $a_1, a_2, ...$ real numbers, with $a_1 \neq 0$. If $a_1, a_2, a_3, ...$ are in A.P. then

(A)   A = $\begin{bmatrix} a_1 & a_2 & a_3 \\ a_4 & a_5 & a_6 \\ a_5 & a_6 & a_7 \end{bmatrix}$ is singular

(B)   the system of equations $a_1x + a_2y + a_3z = 0$, $a_4x + a_5y + a_6z = 0$, $a_7x + a_8y + a_9z = 0$ has infinite number of solutions

(C)   B = $\begin{bmatrix} a_1 & ia_2 \\ ia_2 & a_1 \end{bmatrix}$ is non singular

(D)   none of these

7. Find the integral solutions of the equation [x] [y] = x + y. Show that all the non-integral solutions lie on exactly two lines. Determine these lines. Here [.] denotes greatest integer function.

8. If x + y + z = 12 and $x^2 + y^2 + z^2 = 96$ and $\dfrac{1}{x} + \dfrac{1}{y} + \dfrac{1}{z} = 36$. Find the value of $(x^3 + y^3 + z^3)$.

Answers Key

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

5. (A)(B)(C)   6. (A)(B)(C)

7. Integral solution (0, 0); (2, 2). x + y = 6, x + y = 0

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