MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 11

Total Marks : 25

Max. Time : 26 min.

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

Type of Questions		**M.M., Min.**
Single choice Objective (no negative marking) Q.1 to Q. 7	**(3 marks, 3 min.)**	**[21, 21]**
Subjective Questions (no negative marking) Q. 8	**(4 marks, 5 min.)**	**[4, 5]**

1. Number of solutions of the equation

$$\tan^{-1}\left(\frac{1}{a-1}\right) = \tan^{-1}\left(\frac{1}{x}\right) + \tan^{-1}\left(\frac{1}{a^2-x+1}\right)$$

(A) one (B) Two (C) Three (D) Zero

2. Let the matrix A and B be defined as $A = \begin{bmatrix} 3 & 2 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 1 \\ 7 & 3 \end{bmatrix}$, then the value of $\text{Det.}(2A^9B^{-1})$ is

(A) 2 (B) 1 (C) – 1 (D) – 2

3. If the quadratic equations, $ax^2 + 2cx + b = 0$ and $ax^2 + 2bx + c = 0$ $(b \neq c)$ have a common root, then $a + 4b + 4c$ is equal to :

(A) -2 (B) -2 (C) 0 (D) 1

4. Number of triplets (x, y, z) satisfying $\sin^{-1}x + \cos^{-1}y + \sin^{-1}z = 2\pi$, is

(A) 0 (B) 2 (C) 1 (D) infinite

5. The matrix X for which $\begin{bmatrix} 1 & -4 \\ 3 & -2 \end{bmatrix} X = \begin{bmatrix} -16 & -6 \\ 7 & 2 \end{bmatrix}$

(A) $\begin{bmatrix} -2 & 4 \\ -3 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} -\frac{1}{5} & \frac{2}{5} \\ \frac{-3}{10} & \frac{1}{5} \end{bmatrix}$ (C) $\begin{bmatrix} 6 & 2 \\ \frac{11}{2} & 2 \end{bmatrix}$ (D) $\begin{bmatrix} -16 & -6 \\ 7 & 2 \end{bmatrix}$

6. Let R = {(3, 3), (6, 6), (9, 9), (12, 12) (6, 12), (3, 9), (3, 12), (3, 6)} be relation on the set A = {3, 6, 9, 12}. The relation is-

(A) reflexive and transitive only (B) reflexive only

(C) an equilvalence relation (D) reflexive and symmetric only

7. Let A = {1, 2}, B = {0} then which of the following is correct

(A) number of possible relations from A to B is $2^o = 1$

(B) number of void relations from A to B is not possible

(C) number of possible relations from A to B are 4

(D) number of possible relations are equal to $2^{n(A)+n(B)}$

8. Find out the values of 'a' for which any solution of the inequality, $\frac{\log_3(x^2-3x+7)}{\log_3(3x+2)} < 1$ is also a solution of the inequality, $x^2 + (5 - 2a)x \leq 10a$.

Answers Key

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

5. (C) **6.** (1) **7.** (C)

8. $a \geq \frac{5}{2}$