# RK VISION ACADEMY

NEET | IIT – JEE | FOUNDATION

**CBSE PRACTICE PAPER(2024)**

**(Mathematics)**

**Grade : XII** **Marks: 40 marks**

**Chapter: DETERMINANTS Set-2** **Time: 90 minutes**

## SECTION A

**(This section comprises of Multiple-choice questions (MCQ) of 1 mark each.)**

1. Let $\begin{vmatrix} 3 & y \\ x & 1 \end{vmatrix} = \begin{vmatrix} 3 & 2 \\ 4 & 1 \end{vmatrix}$. Then, the number of all possible pair of values of x and y, if x and y are natural numbers.

(a) 1 (b) 2 (c) 3 (d) 4

2. If the area of a triangle with vertices (-3, 0), (3, 0) and (0, k) is 9 sq units, then the value of k is

(a) ±4 (b) ± 2 (c) ±3 (d) ± 1

3. Value of $x$, if $\begin{vmatrix} 2 & 4 \\ 5 & 1 \end{vmatrix} = \begin{vmatrix} 2x & 4 \\ 6 & x \end{vmatrix}$. is

(a) ± √3 (b) 2 (c) ± 3 (d) ± √2

4. Find x. if $\begin{bmatrix} 1 & 2 & x \\ 1 & 1 & 1 \\ 2 & 1 & -1 \end{bmatrix}$ is singular

(a) 1 (b) 2 (c) 3 (d) 4

5. Find the value of x for which the matrix A=$\begin{bmatrix} 3-x & 2 & 2 \\ 2 & 4-x & 1 \\ -2 & -4 & -1-x \end{bmatrix}$ is singular.

(a) 0, 1 (b) 1, 3 (c) 0, 3 (d) 3, 2

6. The area of a triangle with vertices (-3, 0), (3, 0) and (0, k) is 9 sq. units. The value of k will be

(a) 9 (b) 3 (c) -9 (d) 6

7. For what value of x, matrix $\begin{vmatrix} 6-x & 4 \\ 3-x & 1 \end{vmatrix}$ is a singular matrix?

(a) 1 (b) 2 (c) -1 (d) -2

8. If the points (3, -2), (x, 2), (8, 8) are collinear, then find the value of x.

(a) 2 (b) 3 (c) 4 (d) 5

9. Using determinants, find the equation of the line joining the points (1, 2) and (3, 6).

(a) y = 2x (b) x = 3y (c) y = x (d) 4x – y = 5

10 If $\begin{bmatrix} 5 & 3 & 8 \\ 2 & 0 & 1 \\ 1 & 2 & 3 \end{bmatrix}$, then write the minor of the element $a_{23}$.

(a) 7 (b) -7 (c) 4 (d) 8

## SECTION B

**(This section comprises of very short answer type-questions (VSA) of 2 marks each.)**

11 If $\begin{vmatrix} 2x & 8 \\ 5 & x \end{vmatrix} = \begin{vmatrix} 6 & -2 \\ 7 & 3 \end{vmatrix}$, then write the value of x.

12 If $\begin{vmatrix} 3x & 7 \\ -2 & 4 \end{vmatrix} = \begin{vmatrix} 8 & 7 \\ 6 & 4 \end{vmatrix}$, then write the value of x.

13 Write the value of the determinant $\begin{vmatrix} p & p+1 \\ p-1 & p \end{vmatrix}$

## SECTION C

**(This section comprises of short answer type questions (SA) of 3 marks each)**

14 Using matrix method, solve the system of equations 3x + 2y – 2z = 3, x + 2y + 3z = 6, 2x – y + z = 2 .

15 If $A = \begin{vmatrix} 1 & 2 & 0 \\ -2 & -1 & -2 \\ 0 & -1 & 1 \end{vmatrix}$ find $A^{-1}$

16 Show that the points (a + 5, a – 4), (a – 2, a + 3) and (a, a) do not lie on a straight line for any value of a.

## SECTION D

**(This section comprises of long answer-type questions (LA) of 5 marks each)**

17 Solve the following system of equations by matrix method when x ≠ 0, y ≠ 0 and z ≠ 0.

$$\frac{2}{x} - \frac{3}{y} + \frac{3}{z} = 10, \frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 10$$

and $\frac{3}{x} - \frac{1}{y} + \frac{2}{z} = 13.$

18 The sum of three numbers is 6. Twice the third number when added to the first number gives 7. On adding the sum of the second and third numbers to thrice the first number, we get 12. Find the numbers, using matrix method.

19 Given, $A = \begin{bmatrix} 5 & 0 & 4 \\ 2 & 3 & 2 \\ 1 & 2 & 1 \end{bmatrix}, B^{-1} = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$

Compute $(AB)^{-1}$.