

**SAINIK SCHOOL GOPALGANJ**

**ASSIGNMENT ON CHAPTER-4 (DETERMINANTS)**

**CLASS – XII**

1. If a, b and c are all positive and are  $p^{\text{th}}$ ,  $q^{\text{th}}$  and  $r^{\text{th}}$  terms of a GP, then what is

the value of determinant  $\begin{vmatrix} \log a & p & 1 \\ \log b & q & 1 \\ \log c & r & 1 \end{vmatrix}$  ?

2. If  $A^2 - A + I = 0$ , then find the inverse of A .

3.  $\begin{vmatrix} x+1 & 3 & 5 \\ 2 & x+2 & 5 \\ 2 & 3 & x+4 \end{vmatrix} = 0$ , then find the value of x .

4. Let  $X = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$ ,  $A = \begin{bmatrix} 1 & -1 & 2 \\ 2 & 0 & 1 \\ 3 & 2 & 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 3 \\ 1 \\ 4 \end{bmatrix}$ . If  $AX = B$ , then find the value of X .

5. Using properties of determinants Prove that  $\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)^3$

6. If  $\begin{vmatrix} 1 & a & a^3 \\ 1 & b & b^3 \\ 1 & c & c^3 \end{vmatrix} = k.(a-b).(b-c).(c-a)$ , then find the value of k .

7. Using matrices ,Solve the system of linear equations  $2x + 3y + 3z = 5$ ,  $x - 2y + z = -4$  and  $3x - y - 2z = 3$ .

8. Use the product  $\begin{bmatrix} 1 & 1 & 2 \\ 0 & 2 & 3 \\ 3 & 2 & 4 \end{bmatrix} \cdot \begin{bmatrix} 2 & 0 & 1 \\ 9 & 2 & 3 \\ 6 & 1 & 2 \end{bmatrix}$  to solve the system of equations

$$x - y + 2z = 1, \quad 2y - 3z = 1, \quad 3x - 2y + 4z = 2$$

9. For the  $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 2 \end{bmatrix}$ , show that  $A^3 - 6A^2 + 5A + 11I = O$ , hence find  $A^{-1}$ .

10. Using properties of determinants Prove that  $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} =$

$$abc \cdot \left(1 + \frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$$