



## CLASS XII MATHS - Set A

**Time: 1 hour**

**Test-2 (Adjoint-Inverse & Solution of equation)**

**M.M.32**

### One marks questions

1. If  $A = \begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix}$ , then find the value of  $|adjA|$ ?.      2. If  $A = \begin{bmatrix} 2 & 3 \\ 5 & 9 \end{bmatrix}$  write  $(adj.A)^T$  . ?

3. If A is a non-singular matrix such that  $A^{-1} = \begin{bmatrix} 5 & 3 \\ -2 & -1 \end{bmatrix}$ , then write the value  $(A^T)^{-1}$

4. For any  $3 \times 3$  matrix, if  $A(adjA) = \begin{bmatrix} 13 & 0 & 0 \\ 0 & 13 & 0 \\ 0 & 0 & 13 \end{bmatrix}$  Find  $|A|$  .?

### 4 Marks Questions

5. Find the inverse of the matrix  $A = \begin{bmatrix} a & b \\ c & \frac{1+bc}{a} \end{bmatrix}$  and show that  $aA^{-1} = (a^2 + bc + 1)I - aA$

### 6 Marks Questions

6. Use product  $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix} \begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$  to solve the linear equation:  $2y - 3z = 1$   
 $x - y + 2z = 1$   
 $3x - 2y + 4z = 2$

7. Using matrices, solve the following system of linear equation :  
 $x + y + z = 4, 2x + y - 3z = -9, 2x - y + z = -1$

Or Using elementary transformation, find the inverse of the following matrix  $\begin{bmatrix} 2 & 5 & 3 \\ 3 & 4 & 1 \\ 1 & 6 & 3 \end{bmatrix}$ .

8. Find  $A^{-1}$  if  $A = \begin{bmatrix} -1 & 2 & 5 \\ 2 & -3 & 1 \\ -1 & 1 & 1 \end{bmatrix}$ . Hence solve the system of linear equations

$$-x + 2y + 5z = 2, \quad 2x - 3y + z = 15, \quad -x + y + z = -3$$

9. 85. Two factories decided to award their employees for three values of (a) adaptable to new techniques, (b) careful and alert in difficult situations and (c) keeping calm in tense situations, at the rate of Rs.  $x$ , Rs.  $y$  and Rs.  $z$  per person respectively. The first factory decided to honour respectively 2, 4, and 3 employees with total prize money of Rs. 29000. The second factory decided to honour respectively 5, 2 and 3 employees with the prize money of Rs. 30,500. If the three prizes per person Together cost Rs. 9, 500, then Solve these equations using matrices.