RAMA STUDY CENTRE WHATSAPP-8754834604
MATHEMATICS - XII STANDARD
CHAPTER -1 [IMPORTANT QUESTIONS]

1) If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is non singular matrix, find A^{-1}

2) Find the inverse of the matrix $\begin{bmatrix} 2 & -1 & 3 \\ -5 & 3 & 1 \\ -3 & 2 & 3 \end{bmatrix}$

3) a) Left cancellation law   b) Right cancellation law
   c) Reversal law for inverse   d) Law of double inverse

4) If A is a non singular matrix of odd order, prove that $|adjA|$ is positive.

5) If A is symmetric, prove that $adjA$ is also symmetric

6) Prove that $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ is orthogonal.

7) If $A = \begin{bmatrix} 3 & 2 \\ 7 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & -3 \\ 5 & 2 \end{bmatrix}$, verify that $(AB)^{-1} = B^{-1}A^{-1}$

8) Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 1 & 4 \\ 3 & 0 & 5 \end{bmatrix}$ by reducing it to a row-echelon form.

9) Find the inverse of non singular matrix $A = \begin{bmatrix} 2 & -1 \\ 5 & -2 \end{bmatrix}$ by Gauss-Jordan method.

10) Solve the following system of linear equations, using matrix inversion method. $5x+2y=3$, $3x+2y=5$

11) Four men and 4 women can finish a piece of work jointly in 3 days while 2 men and 5 women can finish the same work jointly in 4 days. Find the time taken by one man alone and that of one women alone to finish the same work by using matrix inversion method.

12) Cramer's rule is not applicable to solve the system $3x+y+z=2$, $x-3y+2z=1$, $7x-y+4z=5$. Why?

13) If ax^2+bx+c is divided by $x+3$, $x-5$ and $x-1$, the remainders are 21, 61 and 9 respectively. Find a, b and c (Use Gaussian elimination method)

14) A boy is walking along the path $y = ax^2+bx+c$ through the points $(-6,8)$, $(-2,12)$ and $(3,8)$. He wants to meet his friend at $P(7,60)$. Will he meet his friend? (Use Gaussian elimination method)

15) Test for consistency and if possible, solve the following systems of equations by rank method
   i) $2x + 2y + z = 5$, $x - y + z = 1$, $3x + y + 2z = 4$.

16) Find the condition on a, b and c so that the following system of linear equations has one parameter family of solutions : $x + y + z = a$, $x + 2y + 3z = b$ and $3x + 5y + 7z = c$

17) Investigate for what values of λ and μ the system of linear equations $x + 2y + z = 7$, $x + y + \lambda z = \mu$, $x + 3y - 5z = 5$ has i) no sln ii) a unique sln iii) an infinite number of sln

18) By using Gaussian elimination method, balance the chemical reaction equations i) $C_5H_8 + O_2 \longrightarrow CO_2 + H_2O$
   ii) $C_2H_6 + O_2 \longrightarrow H_2O + CO_2$

19) Solve the following system of homogeneous equations $2x + 3y - z = 0$, $x - y - 2z = 0$, $3x + y + 3z = 0$.

20) If the system of equations $px + by + cz = 0$, $ax + qy + cz = 0$, $ax + by + rz = 0$ has non trivial solution and $p \neq a$, $q \neq b$, $r \neq c$, prove that $\dfrac{p}{p-a} + \dfrac{q}{q-b} + \dfrac{r}{r-c} = 2$.

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