

SIR CV RAMAN COACHING CENTRE – SALEM –IDAPPADI,-2025**XII- MATHS , EXERCISE1.1,2.4,3.2****MODEL QUESTION PAPER -2025****PREPARED BY Dr.G.THIRUMORTHI,M.Sc,B.Ed,Ph.D ,PHYSICS**thiruphysics1994@gmail.com,8610560810,8883610465**TOTAL MARK : 35 M****Section –A (7 x 5 = 35 m)****Answer any seven questions****1.**

$$\text{If } A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}, \text{ verify that } A(\text{adj } A) = (\text{adj } A)A = |A|I_3.$$

2.

$$\text{If } F(\alpha) = \begin{bmatrix} \cos \alpha & 0 & \sin \alpha \\ 0 & 1 & 0 \\ -\sin \alpha & 0 & \cos \alpha \end{bmatrix}, \text{ show that } [F(\alpha)]^{-1} = F(-\alpha).$$

3.

$$\text{If } A = \frac{1}{9} \begin{bmatrix} -8 & 1 & 4 \\ 4 & 4 & 7 \\ 1 & -8 & 4 \end{bmatrix}, \text{ prove that } A^{-1} = A^T.$$

4.

$$A = \begin{bmatrix} 1 & \tan x \\ -\tan x & 1 \end{bmatrix}, \text{ show that } A^T A^{-1} = \begin{bmatrix} \cos 2x & -\sin 2x \\ \sin 2x & \cos 2x \end{bmatrix}.$$

5. The complex numbers u , v and w are related by $\frac{1}{u} = \frac{1}{v} + \frac{1}{w}$.

6. Show that (i) $(2+i\sqrt{3})^{10} - (2-i\sqrt{3})^{10}$ is purely imaginary

(ii) $\left(\frac{19-7i}{9+i}\right)^{12} + \left(\frac{20-5i}{7-6i}\right)^{12}$ is real

7. Prove that a straight line and parabola cannot intersect at more than two points

8. Find a polynomial equation of minimum degree with rational coefficients, having $2 + \sqrt{3}i$ as a root

9. Prove that a line cannot intersect a circle at more than two points.

10. Form a polynomial equation with integer coefficients with $\sqrt{\frac{\sqrt{2}}{\sqrt{3}}}$ as a root

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