Std : 12th  Maths Practical’s Practice Questions

1. If \( A = \begin{bmatrix} 4 & -5 & -11 \\ 1 & -3 & 1 \\ 2 & 3 & -7 \end{bmatrix} \) find \( A^{-1} \) by using adjoint method down & hence solve the following equations. (Prac. No.2)

\[
4x - 5y - 11z = 12 \\
x - 3y + z = 1 \\
2x + 3y - 7z = 2
\]

2. The sum of the three numbers is 6. Twice the third number when added to first number gives 7. On adding the sum of second & third numbers to thrice the first number we get 12. Find numbers using adjoint method of matrices. (Prac. No.2)

3. For the following circuit show that irrespective of the status of the switches the lamp will always be open (Prac. No.6)

4. Represent the following switching circuit in symbolic form & construct its switching table. What is your conclusions from the table? (Prac. No.6)

5. Find the volume of a tetrahedron whose vertices are \( A(-1,2,3), B(3,-2,1), C(2,1,3), D(-1,-2,4) \) (Prac. No.7)

6. Find the shortest distance between the two lines \( \frac{x-3}{1} = \frac{y-5}{-2} = \frac{z-7}{1} \) & \( \frac{x+1}{7} = \frac{y+1}{-6} = \frac{z+1}{1} \) (Prac. No.9)

Continue…..
7. Prove that the lines \( \frac{x-2}{1} = \frac{y-4}{4} = \frac{z-6}{7} \) \& \( \frac{x+1}{3} = \frac{y+3}{5} = \frac{z+5}{7} \) are coplanar also find equation of plane containing these two lines. (Prac. No.10)

8. In \( \triangle ABC \), prove that \( a \sin A - b \sin B = c \sin (A - B) \) (Prac. No.13)

9. Find the general solution of \( \sqrt{3} \cos x - \sin x = 1 \) (Prac. No.16)

10. If \( \vec{u} = \hat{i} - 2\hat{j} + \hat{k} \); \( \vec{v} = 3\hat{i} + \hat{k} \); \( \vec{w} = \hat{j} - \hat{k} \) are given find \([\vec{u} + \vec{v}] \cdot [(\vec{u} \times \vec{v}) \times (\vec{v} \times \vec{w})] \) (Prac. No.7)

11. The surface area of a spherical balloon is increasing at the rate \( 2 \text{cm}^2 / \text{sec} \). At what rate is the volume of the balloon increasing when the radius of balloon is 6 cm. (Prac. No.3)

12. Find the equations of the tangent and normal to the curve at \( t = 2 \), where \( x = \frac{1}{t} \), \( y = t - \frac{1}{t} \) (Prac. No.4)

13. Verify Rolle’s theorem for the given functions. \( f(x) = x^2 - 5x + 9 \) \( x \in [1, 4] \) (Prac. No.4)

14. Find the maximum & minimum value of function \( f(x) = x^2 e^x \) (Prac. No.5)

15. Find the area of the region lying between the parabolas \( y^2 = x \) & \( x^2 = y \) (Prac. No.8)

16. Let \( X \sim B(n, p) \)
   (i) If \( n = 10 \), \( E(x) = 5 \) find \( p \) & \( \text{var}(x) \)
   (ii) If \( E(x) = 5 \) & \( \text{var}(x) = 2.5 \) find \( n \) & \( p \) (Prac. No.14)

17. A fair coin is tossed 9 times. Find the probability that it shows heads Exactly 5 times (Prac. No.14)

18. The p.m.f of a.r.v \( X \) is given by
   \[ P(X = 3x) = \frac{5^x C^x}{2^5} \quad \text{x = 0, 1, 2, ..., 5} \]
   \[ = 0 \quad \text{otherwise} \]
   Show that, \( P(X \leq 2) = P(X \geq 3) \) (Prac. No.15)

19. Find \( k \), if function \( f \) defined by \( f(x) = kx(1-x) = 0 < x < 1 \)
   \[ = 0 \quad \text{Otherwise} \]
   Is the p.d.f of r.v.\( X \). also find \( P \left( X < \frac{1}{2} \right) \) & \( P \left( \frac{1}{4} < X < \frac{1}{2} \right) \) (Prac. No.15)

20. Verify LMVT for the given function.
   \( f(x) = x(2 - x) \quad x \in [0, 1] \) (Prac. No.4)