
ISC CLASS XII MATHEMATICS (TEST PAPER 17) - SET 17

Time Allowed: 3 hours

Maximum Marks: 80

SECTION A (Compulsory - 65 Marks)

Question 1 (10×1 Mark = 10 Marks)

1. $\boxed{-2}$

2. $\boxed{1}$

3. $\boxed{(-\infty, 0)}$

4. $\boxed{0}$

5. $\boxed{\frac{dy}{dx} = \frac{y(y - x \log y)}{x(x - y \log x)}}$

6. $\boxed{0}$

7. $\boxed{\text{Order: 1, Degree: 2}}$

8. $\boxed{2}$

9. $\boxed{0.2}$

10. $\boxed{37.5}$

Question 2 (3×2 Marks = 6 Marks)

1. $\boxed{\frac{d^2y}{dx^2} = \frac{\sec^3 t}{at}}$

2. $\boxed{900 \text{ cm}^3/\text{s}}$

3. $\boxed{\begin{array}{c|c|c|c|c} X = x & 1 & 2 & 3 & 4 \\ \hline P(X = x) & \frac{1}{2} & \frac{1}{4} & \frac{1}{8} & \frac{1}{8} \end{array}}$

Question 3 (4×4 Marks = 16 Marks)

1. $\boxed{\text{Local maxima at } x = -1 \text{ and local minima at } x = 2.}$

2. $\boxed{\tan^{-1} y = x + \frac{x^2}{2} + \frac{\pi}{4}}$

3. $\boxed{\log |x| - \frac{1}{3} \log |x^3 + 1| + C}$

4. $\boxed{A^{-1} = \frac{1}{9} \begin{pmatrix} 3 & 1 & -2 \\ -6 & 7 & 4 \\ 3 & -5 & 1 \end{pmatrix}}$ (Corrected)

Question 4 (3×6 Marks = 18 Marks)

1. Length for the square: $\frac{4L}{4+\pi}$, Length for the circle: $\frac{\pi L}{4+\pi}$
2. $\frac{\pi}{8} \log 2$
3. $x = \frac{26}{3}, \quad y = -\frac{1}{3}, \quad z = -\frac{7}{3}$ (Corrected)

Question 5 (15 Marks)

- (a) $2 \tan^{-1} \left(\frac{1}{3} \right) + \tan^{-1} \left(\frac{1}{7} \right) = \frac{\pi}{4}$
- (b) $\frac{97}{244}$
- (c) The function f is one-one. (Corrected)

SECTION B (Optional - 15 Marks)

Question 6 (5 Marks)

1. $\sqrt{42}$
2. $\lambda = -\frac{11}{2}$ or $\lambda = -\frac{25}{2}$

Question 7 (10 Marks)

1. $13x - 12y - 3z + 12 = 0$
2. $\frac{32}{3}$

SECTION C (Optional - 15 Marks)

Question 8 (5 Marks)

1. $x = 5$ units, Minimum marginal cost = 3

Question 9 (10 Marks)

1. Maximum value of Z is 16 at the point $(0, 4)$.
2. $r = -0.75, \quad \sigma_y = 2$