JEE MAIN 3 APRIL 2025 SHIFT 2

MATHEMATICS QUESTION PAPER WITH ANSWER KEY

Q.No.	Question	Answers
1	If $\lim_{x\to 0}\left(\frac{\tan x}{x}\right)^{\frac{1}{x^2}} = p$, then 96 ln p is	32
2	Let A = {-3, -2, -1, 0, 1, 2, 3}. A relation R is defined such that xRy if y = max{x, 1}. Number of elements required to make it reflexive is l, number of elements required to make it symmetric as m and number of elements in the relation R is n. Then value of l + m + n is equal to	15
3	Let a circle C with radius r passes through four distinct points (0,0), (k, 3k), (2, 3), and (-1, 5), such that k ≠ 0, then (10k + $2r^2$) is equal to	3. 27
4	I = $\int_0^{\pi} \frac{8x}{4\cos^2 x + \sin^2 x}\,dx$ equals to	3. $2\pi^2$
5	$S = 1 + \frac{1+3}{1!} + \frac{1+3+5}{2!} + \ldots \infty$. The value of S is equal to	3. 5e
6	Let y = f(x) be the solution of the differential equation $\frac{dy}{dx} + 3y\tan^2 x + 3y = \sec^2 x$ such that $f(0) = \frac{e^3}{3} + 1$, then $f(\frac{\pi}{4})$ is equal to	2. $\frac{2}{3}(1 + \frac{1}{E^3})$
7	Area bounded by $\lvert x - y\rvert \le y \le 4\sqrt{x}$ is equal to (in square units)	2. 1024/3
8	If $(1+x+x^2)^{10} = 1+a_1x+a_2x^2+\ldots$, then $(a_1+a_3+a_5+\ldots a_{19})-11a_2$ equals to	28919
9	Let $A(z_1)$, $B(z_2)$ and $C(z_3)$ are the vertices of an equilateral triangle. If z_0 is th centroid of triangle ABC and $\lvert z_1 - z_2\rvert = 1$, then the value of $\sum_{i=1}^{3}\lvert z_1 - z_0\rvert^2$ equal to	1. 1
10	If f(x) = ||x+2| - 2|x||, then number of points of local maxima and local minima is	2. 3
11	x(x-2)(12-k) = 2 has both roots same. The distance of (k, k/2) from the line 3x + 4y + 5 = 0 is	3. 15

12	The shortest distance between the parabola $y^2 = 8x$ and the circle $x^2 + y^2 + 12y + 35 = 0$	1. $(2\sqrt{2} - 1)$
13	Let $f(x) = \log_4(1 - \log_7(x^2 - 9x + 8))$. If the domain of $f(x)$ is $(\alpha, \beta) \cup (\gamma, \delta)$. Then $\alpha + \beta + \gamma + \delta$ equals to	1. 18
14	If the coordinates of foci of a hyperbola 3x2-y2-αx+βy+γ = 0 are (4, 2) and (8, 2). Then (α+β+γ) is equal to	4. 141
15	Let the probability distribution is defined for a random variable x as p (x)=k (1-3^{-x}) for x = 0, 1, 2, 3. Then P (x ≥ 2) is:	2. 25/34
16	If the mean and variance of a data $x_1 = 1, x_2 = 4, x_3 = a, x_4 = 7, x_5 = b$ 10 respectively. If new data is $r + x_r, r \in \{1, 2, 3, 4, 5\}$, then the new va	3. 20.4
17	Let 9 points lie on the line y = 2x and 12 points on the line y = x/2 in the first quadrant. Find the number of triangles formed using these points and origin.	1. 1134