JEE MAIN 3 APRIL 2025 SHIFT 1

MATHEMATICS QUESTION PAPER WITH ANSWER KEY

Q. No.	Question	Answers
1	Let A be 3 x 3 matrix such that det(A) = 5. If $\det(3\text{adj}(2A\text{adj}(2A))) = 2^{\alpha}\cdot 3^{\beta}\cdot 5^{\gamma}$, then $(\alpha+\beta+\gamma)$ is equal to	3. 27
2	The sum of all rational number in $(2+\sqrt{3})^8$ is	2. 18817
3	If the sum $\sum_{r=1}^{9}\left(\frac{r+3}{2^r}\right)\cdot {}^9C_r = \alpha\cdot\left(\frac{3}{2}\right)^9 - \beta$, then the	2. 81
4	Let Sn = 1 + 3 + 11 + 25 + 45 + ... Then sum upto 20th term equals to	3. 7240
5	Evaluate $\int x^3\sqrt{1-x^2}dx$	1. $-\frac{1}{15}(1-x^2)^{\frac{3}{2}}(3x^2$
6	A relation $R = \{(x, y): x, y \in A = \{-3, -2, -1, 0, 1, 2, 3\}$ such that $x^2 + 2y \le 4\}$. Then, the number of ordered pairs in relation R be r and number of ordered pairs required to add in R so that it becomes reflexive relations is m, then $r + m$ is equal to	2. 28
7	The radius of circle touching both parabolas $y = x^2 + 2$ and $x = y^2 + 2$ is	4. $\frac{7\sqrt{2}}{4}$
8	$3x + 2\tan x = \pi, x \in [-2\pi, 2\pi] - \left\{\pm\frac{\pi}{2}, \pm\frac{3\pi}{2}\right\}$. Th satisfy is	2. 5
9	Let $\int_0^x g(t)dt = x - \int_0^x tg(t)dt, x \ge 0$ and $\frac{dy}{dx} - y\tan x = 2(x+1)\sec x\, g(x)$ satisfying the condition $y(0) = 0$. Then $y\left(\frac{\pi}{3}\right)$ is	$\frac{4\pi}{3}$

10	Let α, β are the roots of the equation $x^2 + \sqrt{3}x - 16 = 0$ and γ, δ are the roots of the equation $x^2 + 3x - 1 = 0$. If $Q_n = \alpha^n + \beta^n \forall n \in N$ and $P_n = \gamma^n + \delta^n \forall n \in N$ then the value of $\frac{Q_{25} + \sqrt{3}Q_{24}}{2Q_{23}} + \left(\frac{P_{25} - P_{23}}{P_{24}}\right)$ is	1. 5
11	If y = max{|x|, x, |x-2|}, then the area under the curve from x = 2 to x = 4 is (in square units)	1. 15
12	Let a line passing through $(4, 1, 3)$ intersects the lines $l_1: \frac{x-1}{3} = \frac{y-2}{4} = \frac{z-3}{5}$ at (α, β, γ) and $l_2 : x - 1 = y = -z + 4$ at (a, b, c) then find $\begin{vmatrix} 63 & 21 & -21 \\ \alpha & \beta & \gamma \\ a & b & c \end{vmatrix}$ is equal to	2. 204
13	Let a_1, a_2, a_3 ... be the terms of an increasing G.P. such that $a_3.a_5 = 729$ and $a_3 + a5 = 111/4$, then $24(a_1 + a_2 + a_3)$ is equal to	2. 129