

JEE MAIN 24 JANUARY 2025 SHIFT 2

MATHEMATICS QUESTION PAPER WITH ANSWER KEY

Q.No.	Questions	Answers
1	If $7 = 5 + (1/7)(5 + a) + (1/7^2)(5 + 2a) + \dots \infty$, then find the value of a.	6
2	If A and B are binomial coefficients of 30th and 12th term of binomial expansion $(1 + x)^{2n - 1}$. If $2A = 5B$, then the value of n is	21
3	The equation of chord of the ellipse $(x^2)/25 + (y^2)/16 = 1$ with (3, 1) as mid-point is	$48x + 25y - 169 = 0$
4	If system of equations $x + 2y - 3z = 2$ $2x + \lambda y + 5z = 5$ $4x + 3y + \mu z = 33$ has infinite solutions, then $\lambda + \mu$ is equal to	1334/5
5	Let S denotes the sum of the first n terms of an arithmetic progression. If $S_{40} = 1030$ and $S_{12} = 57$, then the value of $S_{30} - S_{10}$ is	515
6	Consider an event E such that a matrix of order 2×2 is invertible with entries 0 or 1. Then $P(E)$ is (where $P(X)$ denotes the probability of event X)	3/8
7	The area of region enclosed by the curves $y = e^x$, $y = e^x - 1 $ and y-axis is (in sq. units)	$1 - \ln 2$
8	The number of real roots of the equation $x^2 + 3x + 2 = \min(x + 2 , x - 3)$ is	2
9	A function $f: \mathbb{R} \rightarrow (-1, 1)$ such that $f(x) = (2^x - 2^{-x})/(2^x + 2^{-x})$. The function f is	Both one-one and onto
10	Let $a = 3\hat{i} + 2\hat{j} - k$, $b = a \times (\hat{i} - 2\hat{j})$ and $d = b \times k$, then projection of $c - 2\hat{j}$ on a is equal to	$(3\sqrt{14})/14$

11	The point P $(11/2, \alpha)$ lies on or inside the triangle formed by the lines $x + y = 11$, $x + 2y = 16$, and $2x + 3y = 29$, then minimum value of 10α is equal to	55
----	--	----