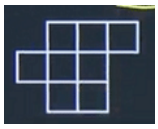
JEE Main 2 April 2025 Shift 2

Mathematics Question Paper with Answer Key

Q.No.	Question	Answers
1	Total number of terms in an A.P are even. Sum of odd terms is 24 and sum of even terms is 30. Last term exceeds the first term by 21/2. Find the total number of terms.	8
2	If the domain of the function $f(x) = 1/\sqrt{3x+10-x^2} + 1/\sqrt{x+\|x\|}$ is (a, b) then $(1+a)^2 + b^2$ is equal to:	26
3	Find the eccentricity of ellipse in which length of minor axis is equal to one-fourth of the distance between foci.	$4/\sqrt{17}$
4	If $dy/dx + 2y\sec^2x = 2\sec^2x + 3\tan x \cdot \sec^2x$ and $f(0)= 5/4$. Then the value of $12(y(\pi/4) - 1/e^2)$ equals to:	21
5	Evaluate $\int_{-2}^{2} 9x^2/1+5x\ dx$	24
6	If the mean and variance of eight observations a, b, 8, 12, 10, 6, 4, 15, is 9 and 9.25, respectively. Then a + b + ab is equal to	93
7	If two vectors $\vec{a}$ and $\vec{b}$ is given by $\vec{a} = \hat{i} + 2\hat{j} + 3\hat{k}$ and $\vec{b} = -\hat{i} + 4\hat{j} + 8$ and the vectors $\vec{c}$ and $\vec{d}$ are related as $(\vec{a} - \vec{c}) \times \vec{b} = 5\hat{i} - 2\hat{j} + 3\hat{k}$ and $\vec{b} \times \vec{c} = \vec{d}$. Then $\left\|\vec{a} \cdot \vec{d}\right\|$ is equal to	10
8	If $y = \cos(\pi/3 + \cos^{-1}(x/2))$, then which of the following is true.	$x^2 - 2xy + 4y^2 = 3$

9	$4\int_0^1 \frac{1}{\sqrt{3+x^2}+\sqrt{1+x^2}}dx - 3\ln\sqrt{3}$ is equal to	$2 - \sqrt{2} - \ln(\sqrt{2}+1)$
10	The image of the point (1, 0, 3) about the line passing through $\rightarrow a = 3\hat{i} + 2\hat{j} - \hat{k}$ and whose direction ratio are $\rightarrow r = 4\hat{i} + 2\hat{j} - \hat{k}$ is	(-23/21, 20/21, -73/21)
11	If the curve $x^2 = 4y$ intersects the line $y = 2(x + 6)$ at (a, b) in 2nd quadrant, then $\int_a^b x^4/1 + 5^x\, dx$ is	1024/5
12	If the sum of series $\frac{1}{1+4.1^4}+\frac{2}{1+4.2^4}+\frac{3}{1+4.3^4}+\ldots+\frac{10}{1+4.10^4}$ is m/n, where m and n are natural coprime numbers, then (m + n) is	276
13	A bag is randomly selected and a ball is drawn. If drawn ball is red, then probability that ball is selected from bag I is p. If ball drawn is green then probability that ball is selected from bag III is q. Then 1/p + 1/q equals to. <table><tr><th></th><th>Red</th><th>Blue</th><th>Green</th></tr><tr><td>Bag-I</td><td>3</td><td>3</td><td>4</td></tr><tr><td>Bag-II</td><td>4</td><td>3</td><td>3</td></tr><tr><td>Bag-III</td><td>5</td><td>2</td><td>3</td></tr></table>	22/3
14	If $\lim_{x\to 0} \frac{\cos 2x + a\cos^4 x - b}{x^4} = L$ (finite) then $a + b$ equals t	-1
15	In the given figure, number of ways to fill a, b, c, d and e into boxes such that no row empty and at most one letter is filled in one box, is 	5760

16	If the non-zero 3 x 3 matrix A satisfies $A^2(A - 4I) - 4(A - I) = 0$ and if $A^5 = \alpha A^2 + \beta A + \gamma I$, where I is 3 x 3 identity matrix, then $\alpha + \beta + \gamma$ is equal to	76
17	If PQ be the focal chord of a parabola $y^2 = 16x$ such that P(1, -4) and PF/QF = m/n, (F is focus) where m and n are coprime natural numbers, then $m^2 + n^2$ is	17