4 April Mathematics JEE Main 2025 Shift 1 Question Paper with Answer Key

Q.No.	Question	Answers
1	Solve $\int_{-1}^{1} \frac{1+2x}{e^{-x}+ex} dx$.	2 (tan-1 e- π/4)
2	If the equation of an ellipse E is $x^2/9 + y^2/16 = 1$ then the length of latus rectum of E is	9/2
3	The sum of the series $1+3+5^2+7+9^2$ + ... upto 80 terms is	338160
4	Let there be two A.P's with each having 2025 terms. Find the number of distinct terms in union of these two A.P.'s, second A.P. is 9, 16, 23, ... first A.P. is 1, 6, 11, ... and Second A.P. is 9, 16, 23....	3761
5	Consider a committee of 12 members is formed randomly out of 4 Engineers, 2 Doctors and 10 Professors. Find the probability that the committee has exactly 3 Engineers and 1 Doctor.	16
6	The number of integral values of n ∈ N for which the equation $x^2 + 4x - n = 0$, η ∈ [20,100] have roots, is	6
7	Let $1x-51 \leq 4\sqrt{x}$. If the Area enclosed is A, then 3A equals to	368
8	If $10\sin^4\theta + 15\cos^4\theta = 6$, then find the value of $\frac{27\,\text{cosec}^6\theta + 8\sec^6\theta}{8\sec^8\theta}$	4/5
9	Find the length of latus rectum of an ellipse if foci are (2, 5) and (2, -3) and the eccentricity of the ellipse is	18/5
10	If $\lim_{x\to 1^+} \frac{(x-1)[6+\lambda\cos(x-1)]+\mu\sin(x-1)}{(x-1)^3} = -1$. Then the value of λ + μ is	-6
11	Let a and ß be the number of points where the function, f(x) = max(x, x^3, x^5, ..., x^{21}} is not continuou differentiable respectively, then find a + B	3
12	If $f(x) = 1 - 2x + \int_0^x e^{x-t} f(t)dt$, , then the area bounded by the curve y = f(x) and coordinate axes is (in square units)	1/2
13	The value of $\sin^{-1}\left(\frac{\sqrt{3}x}{2} + \frac{1}{2}\sqrt{1-x^2}\right)$, $-\frac{1}{2} < x < \frac{1}{\sqrt{2}}$ is equivalen	$\frac{2\pi}{3} - \cos^{-1}x$, $-\frac{1}{2} < x <$
14	There are 10 pens such that 3 pens are defective. Let X represent the number of defective pen selerted. If two pens are selected at random then variance of X is	28/75
15	Given two lines $L_1: \frac{x-3}{3} = \frac{y-\alpha}{1} = \frac{z+2}{-2}$ and $L_2: \frac{x+1}{2} = \frac{y+2}{1} = \frac{z-\beta}{-1}$ If shortest distance between L_1 and L_2 is $30\sqrt{3}$. Then the value of $\lvert\alpha + \beta\rvert$	90

16	If $\vec{v} = 2\hat{i} + \hat{j} - \lambda\hat{k}, (\lambda > 0)$, $\vec{u} = 3\hat{i} - \hat{j}$ and $\vec{v}_1$ is parallel to $\vec{u}$, $\vec{v}_2$ to $\vec{u}$ and $\vec{v} = \vec{v}_1 + \vec{v}_2$. If angle between $\vec{v}$ and $\vec{v}_1$ is $cos^1\left(\frac{\sqrt{5}}{2\sqrt{7}}\right)$, t equals to	14