JEE MAIN 28 JANUARY 2025 SHIFT 2

MATHEMATICS QUESTION PAPER WITH ANSWER KEY

Q.No.	Questions	Answers
1	Let $f(x) = \int dx / (x^{1/4}(x^{1/4} + 1))$ If $f(0) = -6$, then find $f(2) = ?$	$4[(1/2^{1/2}) - 2^{1/4} + \ln \lvert 1 + 2^{1/4} \rvert - 6$
2	Area bounded between the curves C_1: $x(1 + y^2) - 1 = 0$ and C_2: $y^2 - 2x = 0$ is (in sq. unit)	$\pi/2 - 1/3$
3	There are three bags such that bag 1 has 4 white, 6 blue, bag 2 has 6 white and 4 blue and bag 3 has 5 white and 5 blue balls. A bag is randomly selected and a ball is randomly picked out of it, it comes out to be white then probability that selected bag was bag 2.	2/5
4	If S is a set of words formed by all the letters of word "GARDEN", then find the probability that the vowels are not in alphabetical order.	1/2
5	In an isosceles triangle two sides are $x + 2y = 4$, $x + y = 4$, then the sum of all possible value of slope of third side of triangle is	2/3
6	If $\alpha, \beta, \gamma, \delta$ are real numbers such that $\alpha + i\beta$ and $\gamma + i\delta$ are roots of the equation $x^2 - (3 - 2i)x - (2i - 2) = 0$ (where $i = \sqrt{-1}$), then $(\alpha\gamma + \beta\delta)$ is equal to	2
7	The domain of the function $f(x) = \sec^{-1}(2[x] + 1)$ is (where $[\cdot]$ represents greatest integer function)	$(-\infty, \infty)$
8	If p is the number of possible values of r such that T_r, T_{r+1}, T_{r+2} are three terms of $(a + b)^{12}$ are in a geometric progression and if q is the sum of rational terms in the expansion of $(3^{1/4} + 4^{1/3})^{12}$ then $(p + q)$ is	283
9	Let P, be image of parabola P: $y^2 = 4x$ with respect to line $x + y + 1 = 0$. Let the line $y + 5 = 0$ intersect P_i at A and B. If a is the distance between A and B and d be the area of triangle SAB where S is the focus of parabola P_i. Then $(a + d)$ is	20