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EE24BTECH11010 - Balaji B

1) If z is a complex number, then the number of common roots of the equations z^{1985} +

2) Suppose 2-p, p, $2-\alpha$, α are the coefficients of four consecutive terms in the expansion

c) 1

d) 3

c) 6

d) 10

 $z^{100} + 1 = 0$ and $z^3 + 2z^2 + 2z + 1 = 0$, is equal to

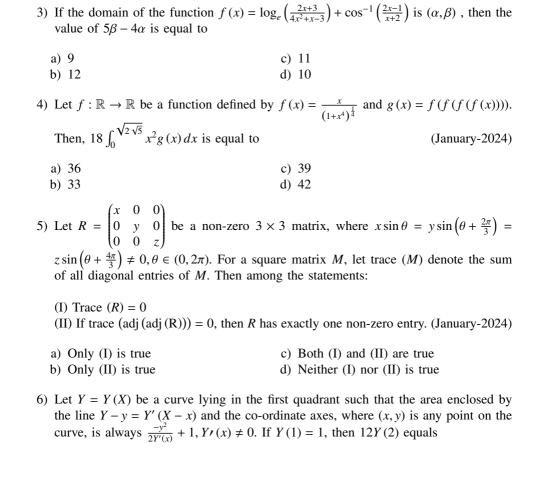
of $(1+x)^n$. Then the value of $p^2 - \alpha^2 + 6\alpha + 2p$ equals

a) 0

b) 2

a) 8

b) 4



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- 7) Let a line passing through the point (-1,2,3) intersect the lines $L_1: \frac{x-1}{3} = \frac{y-2}{2} = \frac{z+1}{-2}$ at $M(\alpha,\beta,\gamma)$ and $L_2: \frac{x+2}{-3} + \frac{y-2}{-2} + \frac{z-1}{4}$ at N(a,b,c). Then, the value of $\frac{(\alpha+\beta+\gamma)^2}{(a+b+c)^2}$ equals (January-2024)
- 8) Consider two circles $C_1: x^2 + y^2 = 25$ and $C_2: (x \alpha) + y^2 = 16$, where $\alpha \in (5,9)$. Let the angle between the two radii (one to each circle) drawn from one of the intersection points of C_1 and C_2 be $\sin^{-1}\left(\frac{\sqrt{63}}{8}\right)$. If the length of common chord of C_1 and C_2 is β , then the value of $(\alpha\beta)^2$ equals

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- 9) Let $\alpha = \sum_{k=0}^{n} \left(\frac{\binom{nC_k)^2}{k+1}}{k+1} \right)$ and $\beta = \sum_{k=0}^{n-1} \binom{nC_k \cdot nC_{k+1}}{k+2}$. If $5\alpha = 6\beta$, then *n* equals (January-2024)
- 10) Let S_n be the sum to n-terms of an arithmetic progression 3,7,11 , If 40 < $\left(\frac{6}{n(n+1)}\sum_{k=1}^n S_k\right) < 42$, then n equals

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11) In an examination of Mathematics paper, there are 20 questions of equal marks and the question paper is divided into three sections: A, B and C. A student is required to attempt total 15 questions taking at least 4 questions from each section. If section A has 8 questions, section B has 6 questions and section C has 6 questions, then the total number of ways a student can select 15 questions is

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12) The number of symmetric relations defined on the set {1,2,3,4} which are not reflexive is

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13) The number of real solutions of the equation $x(x^2 + 3|x| + 5|x - 1| + 6|x - 2|) = 0$ is

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14) The area of the region enclosed by the parabola $(y-2)^2 = x-1$, the line x-2y+4=0 and the positive coordinate axes is

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15) The variance σ^2 of the data

x_i	0	1	5	6	10	12	17
f_i	3	2	3	2	6	3	3

Is

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