JEE-Main-09-04-2024 (Memory Based)
[MORNING SHIFT]

Maths

Question: A ray of light passing through (1,2) after reflecting on x- axis at point Q passes through R(3, 4). If S(h,k) is such that PQRS is a parallelogram, then find the value of hk^2.
Options:
(a) 90
(b) 84
(c) 98
(d) 108
Answer: (b)

Question: Tetrahedral dice having outcomes (1,2,3,4)
Options:
(a) 4
(b) 5
(c) 6
(d) 7
Answer: (b)

Question: A circle passes through (0,0) and (1,0) and touches the circle $x^2 + y^2 = 9$. Then the locus of the centre of the circle is:
Options:
(a) Circle
(b) Parabola
(c) Hyperbola
(d) Straight Line
Answer: (a)

Question: $\vec{A}, \vec{B}$ and $\vec{C}$ are given as $\vec{A} = \alpha\hat{i} + 4\hat{j} + 5\hat{k}$ $\vec{B} = 2\hat{i} + 5\hat{j} + 6\hat{k}$ $\vec{C} = \vec{A} + \vec{B}$ $\left|\vec{C}\right| = \left|\vec{A} - \vec{B}\right|$ is equal to:
Options:
(a) 25,731
(b) -25,669
(c) -25,731
(d) 25,669
Answer: (c)

Question: If set A = {z : |z-1| ≤ 1} and set B = {z : |z-5i| ≤|z -5|}, if z = a + ib, where a, b ∈ 𝕀, then sum of modulus squares of A ∩ B is :
Options:

(a) 0
(b) 2
(c) 4
(d) 5
Answer: (b)

Question: If $\dfrac{1}{(1+d)(1+2d)} + \dfrac{1}{(1+2d)(1+3d)} + ... + \dfrac{1}{(1+9d)(1+10d)} = 1,$ then value of 50d is (d > 0):

Options:
(a) 50
(b) 60
(c) 25
(d) 30
Answer: (c)

Question: The remainder when $(428)^{2024}$ is divided by 21 is:
Answer: (1)

Question: If A is 3 x 3 matrix, det(3adj (2 adj A)) = 2^{-13}. 3^{-10} and det(3adj (2A)) =2^{-m}. 3^{-n} then $2^m +2^n$ is equal to :
Answer: (14)

Question: If f(x) =$3ax^3 + bx^2 + cx + 1$ and f(1) = 41, f'(1) = 2 and f''(1) = 4 then $(a^2 + b^2 + c^2)$ is _____.
Answer: (8)

Question: If domain of f(x) $\sin^{-1}\left(\dfrac{x-1}{2x+3}\right)$ is R - $(\alpha, \beta]$ then $12\alpha\beta$ is equal to :
Answer: (32)

Question: A = {2,4,6,8}, B = {3,7,6,9}. R : A X B → A X B such that (a_1, b_1) R (a_2, b_2) $\Leftrightarrow$ $a_1 + a_2 = b_1 + b_2$ where $(a_1, b_1) \in$ A, $(a_2,b_2) \in$ B. Find number of elements in the relation.
Answer: (9)

Question: Let $\int \dfrac{2 - \tan x}{3 + \tan x} dx = \dfrac{1}{2}(ax + \log_e|\beta \sin x + v \cos x|) + C,$ where c is constant of integration. Then $\alpha + \dfrac{\gamma}{\beta} =$

Options:
(a) 4
(b) 7
(c) 1
(d) 3
Answer: ()

Question: Let $|\cos \theta \cos(60 -\theta)| \leq$ ⅛, $\theta \in [0,2\pi]$. Then the sum of all $\theta \in [0,2\pi]$, where cos 3θ attains its maximum value is

Options:
(a) 15π
(b) 9π
(c) 6π
(d) 18π
Answer: (c)

Question: The coefficient of x^{70} in $x^2(1 + x)^{98} + x^3(1 + x)^{97} + x^4(1 + x)^{96} +....+ x^{54}(1 + x)$ ^9C_p $-^{46}C_q$ is. Then a possible value of $p + q$ is
Options:
(a) 68
(b) 55
(c) 83
(d) 61
Answer: (c)

Question: A variable line L passes through the point (3,5), and intersects the +ve coordinate axes at the points A and B. The minimum area of the ΔOAB, where o is the origin is :
Options:
(a) 25
(b) 40
(c) 35
(d) 30
Answer: (d)