JEE-Main-08-04-2025 (Memory Based)
[EVENING SHIFT]
Maths

Question: The number of rational terms in the binomial expansion of $\left(5^{\frac{1}{2}} + 7^{\frac{1}{8}}\right)^{1016}$

Options:
(a) 129
(b) 128
(c) 127
(d) 130
Answer: (b)

Question:
$$\frac{1}{1^4} + \frac{1}{2^4} + \frac{1}{3^4} + \ldots = \frac{\pi^4}{90}$$
$$\frac{1}{1^4} + \frac{1}{3^4} + \frac{1}{5^4} + \ldots = \alpha$$
$$\frac{1}{2^4} + \frac{1}{4^4} + \frac{1}{6^4} + \ldots = \beta \quad \textbf{Then find } \frac{\alpha}{\beta}.$$

Options:
(a) 15
(b) 14
(c) 23
(d) 18
Answer: (a)

Question: There are 12 points in a plane in which 5 are collinear such that no three of them are in straight line, then the number of triangles that can be formed from any 3 vertices from 12 points.
Options:
(a) 220
(b) 210
(c) 230
(d) 240
Answer: (b)

Question: Two lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ **and** $\frac{x-\lambda}{3} = \frac{y-3}{4} = \frac{z-4}{5}$

has shortest distance $\frac{1}{\sqrt{6}}.$ **If** λ_1, λ_2 **are values of** λ, **then radius of circle passing through**
(0, 0), (λ_1, λ_2), (λ_2, λ_1) is _____ .
Answer: ()

$(1, 2, 3)(\lambda, 3, 4)$

$$\frac{\left[\overline{AC}\overline{b}\overline{d}\right]}{\left|\overline{b}\times\overline{d}\right|}$$

$$\begin{vmatrix} \lambda - 1 & 1 & 1 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \end{vmatrix}$$

$= (\lambda - 1)(-1) - 1(-2) + 1(-1)$

$$\frac{|1 - \lambda + 2 - 1|}{\sqrt{1^2 + 2^2 + 1^2}} = \frac{1}{\sqrt{6}}$$

$|2 - \lambda| = 1$

$\lambda = 1, 3$

$x^2 + y^2 + 2gx + 2fy = 0$

$10 + 29 + 6f = 0$

$g + 3f = -5$

$3g + f = -5$

$9g + 3f = -15$

$-8g = 10$

$g = -\frac{5}{4} f = -\frac{5}{4}$

$r = \sqrt{\frac{25}{16} + \frac{25}{16}}$

$= \frac{5\sqrt{2}}{4}$

Question: Probability of event A is 0.7 and event B is 0.4, P(A ∩ BC) = 0.5, then the value P(B|A ∪ BC) is equal to
Options:
(a) $\frac{1}{2}$
(b) $\frac{1}{3}$
(c) $\frac{1}{4}$
(d) $\frac{3}{4}$
Answer: (c)

Question: $\displaystyle\int_{-1}^{3/2} \left| \pi^2 x \sin(\pi x) \right| dx$

Options:
(a) $4\pi + 1$
(b) $3\pi + 1$

(c) $5\pi + 1$
(d) $6\pi + 1$
Answer: (b)

Question: The product of last 2 digits of $(1919)^{1919}$ is
Options:
(a) 56
(b) 63
(c) 45
(d) 54
Answer: (b)

Question: There are 12 points in a plane in which 5 are collinear such that no three of them are in straight line, then the number of triangles that can be formed from any 3 vertices from 12 points
Options:
(a) 220
(b) 210
(c) 230
(d) 240
Answer: (b)

Question: If $A = \begin{bmatrix} 2 & 2+p & 2+p+q \\ 4 & 6+2p & 8+3p+2q \\ 6 & 12+3p & 20+6p+3q \end{bmatrix}$, **then the**
Value $\det(adj(adj(3A))) = 2^m.3^n$, **of then m + n is equal to**
Options:
(a) 20
(b) 24
(c) 36
(d) 18
Answer: (b)

Question: If f(x) = x - 1 and g(x) = ex and $\frac{dy}{dx} = \left(e^{-2\sqrt{x}} g(f(f(x))) - \frac{y}{\sqrt{x}} \right)$, **where y (0) = 0. Then y(1) equals to**
Options:
(a) $\dfrac{2e - 1}{e^4}$
(b) $\dfrac{e - 1}{e^4}$
(c) $\dfrac{e^3 - 1}{e^4}$
(d) $\dfrac{e^2 - 1}{e^4}$
Answer: (b)

Question: Value of $\cot^{-1}\left(\dfrac{\sqrt{1+\tan^2 2}+1}{\tan 2}\right) - \cot^{-1}\left(\dfrac{\sqrt{1+\tan^2 2}-1}{\tan 2}\right)$ **is**

Options:

(a) $\dfrac{\pi}{2} + \dfrac{5}{2}$

(b) $\dfrac{\pi}{2} - \dfrac{3}{2}$

(c) $2 - \dfrac{\pi}{2}$

(d) $3 + \dfrac{\pi}{2}$

Answer: (c)

Question: The sum of squares of roots of $|x - 2|^2 - |x - 2| - 2 = 0$ **and** $x^2 - 2|x - 3| - 5 = 0$ **equals to**

Answer: (42)