MATHS

BOOKS - NTA MOCK TESTS

NTA TPC JEE MAIN TEST 44

Mathematics

1. Coefficient of x^6 in the epansion

$\left(x + \frac{1}{x^2}\right)^6$ is

A. 10

B. 15

C. 16

D. None

Answer: D

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2. For any complex number z in the largand plane, the minimum value of

$|Z| + |z - e^{-\alpha}|_{+} z - 5e^{i\alpha}|$

$+|z - 7e^{i\alpha}| + |Z - 32e^{i\alpha}|$

A. 22

B. 32

C. 38

D. 42

Answer: C

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3. Let A and B be 3×3 symmetric matrices such that X = AB + BA and Y = AB -BA. Then $\left[(XY)^T\right.$ is equal to $(XY)^T$ is the transpose of matrix XY.]

A. XY

B. YX

C. $-XY$

D. $-YX$

Answer: D

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4. Three persons A, B, C throw a die in succession. The one getting six wins. If A starts then the probability of B winning is

A. $\frac{36}{91}$

B. $\frac{25}{91}$

C. $\frac{41}{91}$

D. $\frac{30}{91}$

Answer: D

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5. Remainder wen $\sum_{r=0}^{n}\left((r!)^3+(r\sim)^2+(r!)\right)$ is divided by $36(n \geq 4)$ is equal to

A. 2

B. 8

C. 26

D. none of these

Answer: C

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6. If A is the set of een natural numbers less than 9 and B is the set of prime numbes less than 7, then the number of relation from set A to set B is

A. 2^8

B. 2^{12}

C. 4^2

D. $2^{12} - 1$

Answer: B

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7. Radius of largest circle which passes through the focus of the parabola $y^2 = 5x$, and is contained in the parabola, is

A. 4

B. $\frac{21}{5}$

C. 5

D. $\frac{26}{5}$

Answer: C

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8. Area of triangle formed by lines $x^2 - y^2 = 0$ and any tangent to the hyperbola $x^2 - y^2 = 16$ is :

A. 2 sq. units

B. 4 sq. units

C. 8 sq. units

D. 16 sq. units

Answer: D

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9. Tangent to parabola $y^2 = 4p(x+1)$ cuts hyperbola $xy = 2$ I A and B, then locus of mid points of AB is

A. $\frac{x}{y} + (2x - 1) = 0$

B. $\frac{x^2}{y^2} + 2x - 1 = 0$

C. $\frac{x}{y} + (2x - 1)^2 = 0$

D. $\frac{x^2}{y^2} + (2x + 1) = 0$

Answer: D

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10. A line passes through (2,2) and is perpendicular to the line $3x + y = 3$ its y intercept is

A. $\frac{1}{3}$

B. $\frac{2}{3}$

C. 1

D. $\frac{4}{3}$

Answer: D

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11. The equation of a plane containing the line of intersection of the planes $2xy - 4 = 0$ and $y + z - 4 = 0$ and passing through the point (1,1,0) is :

A. $x + 3y + z = 4$

B. $x - y - z = 0$

C. $x - 3y - 2z = -2$

D. $2x - z = 2$

Answer: B

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12. Let $\vec{a}$, $\vec{b}$, $\vec{c}$ be 3 mutually perpendicular unit vectors. If an unknow vector $\vec{x}$ satisfies the equation $\vec{a} \times \left(\left(\vec{x} - \vec{b} \right) \times \vec{a} \right) + \vec{b}$ then $\vec{x}$ $\times \left(\left(\vec{x} - \vec{c} \right) \times \vec{b} \right) + \vec{c}$ $\times \left(\left(\vec{x} - \vec{a} \right) \times \vec{c} \right) = \vec{0}$ is equal to

A. $\vec{a} + \vec{b} + \vec{c}$

B. $\frac{\vec{a} + \vec{b} + \vec{c}}{2}$

C. $\frac{\vec{a} + \vec{b} + \vec{c}}{3}$

D. $\frac{\vec{a} + \vec{b} + \vec{c}}{4}$

Answer: B

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13. The value of $\lim_{x \to 0} \frac{\left(1 + 4x + x^2\right)^{\frac{1}{x}} - \left(1 + 4x - 5x^2\right)^{\frac{1}{x}}}{x}$ is

A. $5e^4$

B. $6e^4$

C. $7e^4$

D. $8e^4$

Answer: B

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14. Let $f(x) = \begin{cases} \frac{\sin ax^2}{x^2} & x \neq 0 \\ \frac{3}{4} + \frac{1}{4a} & x = 0 \end{cases}$ for what values of a, f (x) is continuous at x =0

A. $1, -\frac{1}{4}$

B. $1, 0$

C. $\frac{1}{4}, -1$

D. noen of these

Answer: A

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15. The general solution of the differential equation,

$\sin 2x\left(\frac{dy}{dx}-\sqrt{\tan x}\right)-y=0,$ is

A. $y\sqrt{\tan x}=x+c$

B. $y\sqrt{\cot x}=\tan x+c$

C. $y\sqrt{\tan x}=\cot x+c$

D. $y\sqrt{\cot x}=x+c$

Answer: D

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16. If

$$\int \frac{dx}{\cos^3 x\sqrt{2\sin 2x}} = (\tan x)^4 + C(\tan x)^B, + K$$

where k is a constant of integration, then A + B + C equals

A. $\frac{16}{5}$

B. $\frac{27}{10}$

C. $\frac{7}{10}$

D. $\frac{21}{5}$

Answer: A

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17. The value of $\prod_{r=}^{7} \cos \frac{\pi r}{15}$ is

A. $\frac{1}{64}$

B. $\frac{1}{128}$

C. $\frac{1}{32}$

D. $\frac{1}{4}$

Answer: B

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18. The solution of the equation $\cos^2 x - 2\cos x = 4\sin x$ is $+4\sin^2 x (0 \leq x \leq \pi)$

A. $\pi + \tan^{-1}\left(\frac{-1}{2}\right)$

B. $\pi - \cot^{-1}\left(\frac{1}{2}\right)$

C. $\pi - \tan^{-1} 2$

D. none of these

Answer: A

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19. The domain set of defination of the function

$f(x) = \sqrt{\cos(\sin x)} + \sin^{-1}\left(\frac{1+x^2}{2x}\right)$ is

A. $-1 < x \leq 1$

B. $x \geq 1$

C. $x \leq 1$

D. $x = \pm 1$

Answer: D

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20. Which is a contradiction from the following ?

A. $(p \wedge q) \wedge \sim(p \vee q)$

B. $p \wedge (\sim p \wedge q)$

C. $(\pi mpliesq) \Rightarrow p$

D. none of these

Answer: A

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21. Let , A is a non-singular idempotent matrix of order 3×3 and B is an involuntary matri of same order. If $\det(A) \neq$ det (B) , then det $\left(A^{-5}B^{-2}\right) =$

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22. If a, b, c, d and e ar positive ral numbers such that

$a + b + c + d + e = 15$ and

$ab^2c^3d^4e^5 = (120)^3(50)$, then the value of $a^2 + b^2 + c^2 + d^2 + e^2$ is .....

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23. A circular sector is formed by a thread of length l, Then the ratio of maximum area of sector thus formed to maximum area of rectangle formed by same thread is .....

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24. The mean and standard deviation of 20 observations are found to be 10 and 2, respectively. On review, it was found that an

observation 8 was incorrect. Then the correct standard deviation if the wrong item is omitted is .....

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25. If 'A' is the number of ways such that the number 7056 can be resolved as a product of two factors then find the digit in the units place of 'A'.

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26. Let f be a function such that $f(x)+f\left(\frac{1}{1-x}\right)=\frac{2(1-2x)}{x(1-x)}$ where $x \in R-\{0,1\}$, then the value of f (2) must be

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27. Let the area of the region bounded by $x+1=0, y=0, y=x^2+x+1$ and tangent to $y=x^2+x+1 at x=1$ at A, then 3A is

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28. If $\widehat{a}$ is parallel to the line of intersection of the plane determined by the vectors $\hat{j}+\hat{k}, \hat{j}$ and the plane determined by the vectors $\hat{i}+\hat{j}, \hat{j}-\hat{k}$. If the angle between $\widehat{a}$ and $2\hat{i}+\hat{j}-2\hat{k}$ is $n\pi$, then the value of n is

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