



MATHS

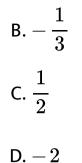
BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 92

Mathematics

1. The value of a, such that the volume of the parallelopiped formed by the vectors $\hat{i} + \hat{j} + \hat{k}, \hat{j} + a\hat{k}$ and $a\hat{i} + \hat{k}$ becomes minimum, is

A. 3



Answer: C



2. AandB toss a fair coin each simultaneously 50 times. The probability that both of them will not get tail at the same toss is $(3/4)^{50}$ b. $(2/7)^{50}$ c. $(1/8)^{50}$ d. $(7/8)^{50}$

A.
$$\left(\frac{3}{4}\right)^{10}$$

B. $\left(\frac{2}{7}\right)^{10}$

$$\mathsf{C.} \left(\frac{1}{4}\right)^{10}$$
$$\mathsf{D.} \left(\frac{1}{2}\right)^{10}$$

Answer: A



3. A plane P = 0 passes through the line of intersection of the planes x + y + z + 3 = 0 and x - y + z - 2 = 0. If the plane P divides the ratio 2:1 internally and the equation of the plane is ax - 2y + bz = c where $a, b, c \in N$, then the value of 3a + 4b - 5c is equal to

A. 22

B. 32

C. 42

D. 10

Answer: B



4. Let A and B are two non - singular matrices of order 3 such that A + B = 2I and $A^{-1} + B^{-1} = 3I$, then AB is equal to (where, I is the identity matrix of order 3)

A. A

B. B

C.
$$\frac{2I}{3}$$

D. 2I

Answer: C

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5. Let f(b) be the minimum value of the expression $y=x^2-2x+ig(b^3-3b^2+4ig)\,orall x\in R.$ Then, the maximum value of f(b) as b varies from 0 to 4 is

A. 20

B. 19

C. 63

D. 64

Answer: B



6. Consider the intergral $A = \int_0^1 \frac{e^x - 1}{x} dx$ and $B = \int_0^1 \frac{x}{e^2 - 1} dx$. Then, which of the following is incorrect?

A. B < 1B. A > 1C. B > AD. $A > rac{1}{2}$

Answer: C





7. If $a,b\in R$ satisfy the equation $a^2+4b^2-4=0$, then

the minimum value of (2a + 3b) will be

B.-5

C.-6

 $\mathsf{D.}-10$



8. The equation of the curve satisfying the differential equation $x^2 dy = (2-y) dx$ and passing through P(1,4) is

A.
$$y = x^2 + 3$$

B. $y = 2 + 2e^{rac{1}{x} - 1}$
C. $y = \sin(x - 1) + 4$
D. $y = 2e^{x - 1} + 2$

9. The domain of
$$f(x)=rac{x}{16-x^2}+\log_2ig(x^3-2xig)$$
 is

$$\begin{array}{l} \mathsf{A}. \ \big(-\sqrt{2}, 0 \big) \cup \big(\sqrt{2}, \infty \big) \\ \\ \mathsf{B}. \ \big(-\sqrt{2}, 0 \big) \cup \big(\sqrt{2}, 4 \big) \\ \\ \mathsf{C}. \ \big(-\sqrt{2}, 0 \big) \cup \big(4, 00 \big) \\ \\ \\ \mathsf{D}. \ \big(-\sqrt{2}, 0 \big) \cup \big(\sqrt{2}, 4 \big) \cup \big(4, \infty \big) \end{array}$$

Answer: D



10. Let p.q and r be three statements, then $(\neg p
ightarrow q)
ightarrow r$ is equivalent to A. $(\neg p \lor r) \land (q \lor r)$

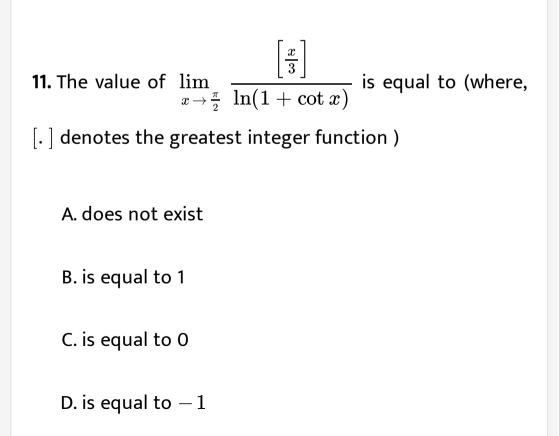
 $\texttt{B.}\,(p \rightarrow r) \land (q \rightarrow r)$

$$\mathsf{C}.\,({\scriptstyle{\,{\scriptstyle{\sim}}}} p \wedge r) \lor (q \lor r)$$

D.
$$(p
ightarrow q)
ightarrow r$$

Answer: B

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Answer: C



12. A data consists of n observations : x_1, x_2, \ldots, x_n . If $\sum_{i=1}^n (x_i + 1)^2 = 11n$ and $\sum_{i=1}^n (x_i - 1)^2 = 7n$, then the variance of this data is



B. 8

C. 6

D. 7

Answer: D





13. Which of the following is a correct statement ?

A. Continuity at x = a is sufficient for differentiability

at x = a

B. Differentiability at x = a is sufficient for continuity

at x = a

C. Existence of limit at x = a is sufficient for continuity

at x = a

D. Differentiability at x = a is necessary for existence

of tangent at x = a

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14. The term independent of x in the expansion of

$$\left(x-rac{1}{x}
ight)^4 \left(x+rac{1}{x}
ight)^3$$
 is:

A. -3

B. 0

C. 1

D. 3

Answer: B

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15. The number of ways in which four different toys and five indistinguishable marbles can be distributed between 3 boys, if each boy receives at least one toy and at least one marble, is

A. 42

B. 100

C. 150

D. 216

Answer: D



16. If p^{th} , $2p^{\text{th}}$ and $4p^{\text{th}}$ terms of an arithmetic progression are in geometric progression, then the common ratio of the geometric progression is

A. 1

B. 2

C. 3

D. 4



17. The position vectors of vertices of $\triangle ABC$ are (1, -2), (-7, 6) and $\left(\frac{11}{5}, \frac{2}{5}\right)$ respectively. The

measure of the interior angle A of the $\ riangle ABC, \,$ is,

A.
$$(75^{\circ}, 90^{\circ})$$

B. $(60^{\circ}, 75^{\circ})$
C. $(45^{\circ}, 60^{\circ})$

D. $(120^\circ, 150^\circ)$



18. The two circles $x^2 + y^2 = ax$ and $x^2 + y^2 = c^2(c > 0)$ touch each other, if $\left|\frac{c}{a}\right|$ is equal to

A. 2

$$\mathsf{B.}\,\frac{1}{2}$$

C. 1

D. None of these

Answer: C



19. The area (in sq. units) bounded by the curve $y = |x - \pi| + |x - e|$, the ordinates at its points of non - differentiability and the x - axis is

A. $\pi + 2e$ B. $2\pi + e$ C. $(\pi - e)^2$ D. $\pi^2 - e^2$

Answer: C



20. If z and w are complex numbers satisfying $ar{z}+i\overline{w}=0$ and $amp(zw)=\pi$, then amp(w) is equal to (where, $amp(w)\in(-\pi,\pi]$)

A.
$$\frac{\pi}{4}$$

B. $\frac{-\pi}{4}$
C. $\frac{\pi}{2}$
D. $\frac{3\pi}{4}$

Answer: A



21.

an identity in x where a, b, c, d are independent of x, then

the value of
$$rac{13}{25}abcd$$
 is

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22. If

$$I = \int \!\! rac{x^3-1}{x^5+x^4+x+1} dx = rac{1}{4} {
m ln}(f(x)) - {
m ln}(g(x)) + c$$

(where, c is the constant of integration) and

$$f(0)=g(0)=1$$
,then the value of $f(1).\ g(1)$ is equal to

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23. If $f: R \to \left[\frac{\pi}{3}, \pi\right)$ defined by $f(x) = \cos^{-1}\left(\frac{\lambda - x^2}{x^2 + 3}\right)$ is a surjective function, then λ

is equal to

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24. The number of solutions of the equation $\tan x + \sec x = 2\cos x$ lying in the interval $[0, 5\pi]$ is

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25. Tangents are drawn from any point on the directrix of $y^2=16x$ to the parabola. If thelocus of the midpoint of

chords of contact is a parabola, then its length (in units)

of the latus rectum is

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