MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 80

Mathematics

1. If $f: R \to R, f(x) = \frac{\alpha x^2 + 6x - 8}{\alpha + 6x - 8x^2}$ is onto then $\alpha \in$

A. (2, 14)

B. [2, 14)

C. $(2, 14]$

D. [2, 14]`

Answer: A

Watch Video Solution

2. The compound statement $(p \Leftrightarrow q) \vee (p \Leftrightarrow \sim q)$ is logically equivalent to

A. $p \Leftrightarrow q$

B. $p \vee q$

C. tautology

D. contradiction

Answer: C

Watch Video Solution

3. The value of $\lim_{x \to \infty} \left[\frac{e^2}{\left(1 + \frac{2}{x}\right)^x} \right]^{\frac{x}{2}}$ is equal to

A. e

B. e^{-1}

C. $e^{\frac{1}{2}}$

D. $e^{-\frac{1}{2}}$

Answer: A

Watch Video Solution

4. The mean of n items is $\bar{x}$. If the first item is increased by n, second by $n-1$ and so on and last by 1, then the new mean is

A. $\bar{x} + \frac{n(n+1)(2n+1)}{6}$

B. $\bar{x} + \frac{(n+1)(2n+1)}{6}$

C. $\bar{x} + \frac{n+1}{2}$

D. $\bar{x} + \frac{(n+1)}{4}$

Answer: C

Watch Video Solution

5. If $\left[\sin^{-1} x\right]^2 - 2\left[\sin^{-1} x\right] + 1 \leq 0$ (where, [.] represents the greatest integral part of x), then

A. $x \in [\sin 1, \sin 2] \cup [-1, 0]$

B. $x \in [-\sin 1, 0] \cup [\sin 1, 1]$

C. $x \in [\sin 1, 1] \cup [-\sin 1, 0]$

D. $x \in [-\sin 1, \sin 2]$

Answer: C

Watch Video Solution

6. If the number of integral of solutions of $x + y + z + w < 25$ are $.^{23} C_{\lambda}$, such that

$x > -2, y > 1, z \geq 0, w > 3$, then the value of λ is

A. 3

B. 5

C. 17

D. 19

Answer: D

Watch Video Solution

7. From a point P(3, 3) on the circle $x^2 + y^2 = 18$ two chords PQ and PR each of he length 2 units are drawn on this circle. Then, the value of the length PM is equal

to (where, M is the midpoint of the line segment joining Q and R)

A. $\frac{1}{3\sqrt{2}}$ units

B. $\frac{1}{2}$ units

C. $\frac{\sqrt{2}}{3}$ units

D. $\frac{4}{9}$ units

Answer: C

Watch Video Solution

8. The number of solutions of the equation $(3+\cos x)^2 = 4 - 2\sin^8 x$ in $[0, 9\pi)$ is equal to

A. 4

B. 5

C. 6

D. 7

Answer: A

Watch Video Solution

9. If A and B are two events defined on a sample space with the probabilities $P(A) = 0.5, P(B) = 0.69$ and $P\left(\frac{A}{B}\right) = 0.5,$ thent the value of $P\left(\frac{A}{A^c \cup B^c}\right)$ is equal to

A. $\frac{2}{5}$

B. $\frac{3}{13}$

C. $\frac{31}{131}$

D. $\frac{100}{131}$

Answer: C

Watch Video Solution

10. Let

$2x + ay + 6z = 8, x + 2y + bz = 5$ and $x + y + 3z = 4$

be three equations. If these 3 equations are consistent,

then

A. $b = 3, a \neq 2$

B. $a = 2, b \neq 3$

C. $a \neq 2, b \neq 3$

D. $a \neq 2, b = 4$

Answer: B

Watch Video Solution

11. Let the equation of a line is $\frac{x-2}{1} = \frac{y-3}{2} = \frac{z-4}{3}$. An insect starts flying from $P(1, 3, 2)$ in a straight line meeting the given line at a point R(a, b, c) and then goes to the point Q

(6, 7, 5) in a straight line such that PR is perpendicular to RQ. Then the least value of $7(a+b+c)$ is equal to

A. 105

B. 45

C. 10

D. 7

Answer: B

Watch Video Solution

12. Let $A = \begin{bmatrix} a & b \\ c & a \end{bmatrix} \forall a, b, c, \in \{0, 1, 2\}$. If A is a singular matrix, then the number of possible matrices

A are

A. 18

B. 27

C. 7

D. 3

Answer: C

Watch Video Solution

13. $\int\left(\frac{dx}{(x+100)\sqrt{x+99}}\right)=f(x)+c$

then find $f(-99)$

Watch Video Solution

14. The number of tangents that can be drawn to $y = e^x$ from $(\pi, 0)$ is

A. 0

B. 1

C. 4

D. 5

Answer: B

Watch Video Solution

15. The area bounded by $y = \left(x^2 - x\right)^2$ with the x - axis, between its two relative minima, is A sq, units, the value of 15A is equal to

A. 1

B. 2

C. $\frac{1}{2}$

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

Answer: C

Watch Video Solution

16. The curve passing through $P(\pi^2, \pi)$ is such that for a tangent drawn to it at a point Q, the ratio of the y - intercept and the ordinate of Q is $1:2$. Then, the equation of the curve is

A. $y = \pi x^2$

B. $y = \pi\sqrt{x}$

C. $y = \sqrt{x}$

D. $y = \pi^2 x$

Answer: C

Watch Video Solution

17. The sum of all the values of p for which the lines $x + y - 1 = 0, px + 4y + 2 = 0$ and $4x + py + 7 = 0$ are concurrent is euqal to

A. 0

B. -9

C. -13

D. 3

Answer: C

Watch Video Solution

18. If 11 arithmetic means are inserted between 20 and 10, the number of integral arithmetic means are

A. 1

B. 6

C. 7

D. 8

Answer: A

 Watch Video Solution

19. If $x^2 + y^2 = a^2$ and $\frac{x^2}{16} + \frac{y^2}{9} = 1$ intersect at 4 points P, Q, R and S which form a square, then the area (in sq. units) of the square is

A. $\frac{144}{25}$

B. $\frac{25}{4}$

C. $\frac{15}{2}$

D. $\frac{576}{25}$

Answer: D

Watch Video Solution

20. the minimum value of $|8Z - 8| + |2Z - 4|$ exists, when Z is equal to (where, Z is a complex number)

A. 2

B. 1.5

C. 0

D. 1

Answer: D

Watch Video Solution

21. The remainder obtained when 27^{50} is divided by 12 is

Watch Video Solution

22. Let

$$f(x) = \begin{cases} \dfrac{1-\cos x}{(2\pi - x)^2} \cdot \dfrac{\tan^2 x}{\ln(1+4\pi^2-4\pi x+x^2)} & : \quad x \neq 2\pi \\ \lambda & : \quad x = 2\pi \end{cases}$$ is

continuous at $x = 2\pi$, then the value of λ is equal to

Watch Video Solution

23. Let $\vec{V}(\theta) = (\cos\theta + \sec\theta)\hat{a} + (\cos\theta - \sec\theta)$

where $\hat{a}$ and $\hat{b}$ are unit vectors and the angle between

$\hat{a}$ and $\vec{g}$ is 60°, then the minimum value of $\left|\vec{V}\right|^4$ is equal to

Watch Video Solution

24. If $\lim_{n\to\infty} \Sigma_{r=1}^{2n} \frac{3r^2}{n^3} e^{\frac{r^3}{n^3}} = e^a - e^b$, then $a+b$ is equal to

Watch Video Solution

25. Let PQ be the focal chord of the parabola $y^2 = 4x$. If the centre of the circle having PQ as its diameter lies on the line $y = \frac{4}{\sqrt{5}}$, then the radius (in units) is equal to

Watch Video Solution