MATHS

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 66

Mathematics

1. Let $x_1, x_2, \ldots\ldots, x_3$ be n observations such that $\Sigma x_i^2 = 300$ and $\Sigma x_1 = 90$. Then a possible value of n among the following is

A. 25

B. 18

C. 29

D. 22

Answer: C

Watch Video Solution

2. The domain of the function $f(x) = \frac{1}{\sqrt{[x]^2 - [x] - 20}}$ is (where, $[.]$ represents the greatest integer function)

A. $(-\infty, -4) \cup [6, \infty)$

B. $(-\infty, 4] \cup [6, \infty)$

C. $(-\infty, 4) \cup (6, \infty)$

D. None of these

Answer: A

Watch Video Solution

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

A. e^2

B. e^{-1}

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

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

Answer: A

Watch Video Solution

4. A person standing at the foot of a tower walks a distance of 3 meters from the tower and observes that the angle of elevation of the top of the tower is 30°. He then walks a distance 4 meters perpendicular to the previous direction and observes the angle of elevation to be β. Then, $\cos 2\beta$ is equal to

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

B. $\frac{1}{\sqrt{3}}$

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

D. $\frac{11}{14}$

Answer: D

Watch Video Solution

5. 12 people are asked questions in succession in a random order and exactly 3 out of 12 people know the answer. The probability that the 6^{th} person asked is the 2^{nd} person to know the answer, is

A. $\frac{10}{21}$

B. $\frac{3}{22}$

C. $\frac{7}{11}$

D. $\frac{5}{12}$

Answer: B

Watch Video Solution

6. Let $P_1 : x + y + 2z - 4 = 0$ and $P_2 : 2x - y + 3z + 5 = 0$ be the planes. Let $A(1, 3, 4)$ and $B(3, 2, 7)$ be two points in space. The equation of a third plane P_3 through the line of intersection of P_1 and P_2 and parallel to AB is

A. $x - 4y - 2z + 3 = 0$

B. $x - 4y - 2z + 9 = 0$

C. $2x - 3y + 4z + 9 = 0$

D. $3y + z - 13 = 0$

Answer: D

Watch Video Solution

7. A point P moves such that the chord of contact of P with respect to the circle $x^2 + y^2 = 4$ passes through the point (1, 1). The coordinates of P when it is nearest to the origin are

A. (1, 2)

B. (2, 2)

C. (3, 3)

D. $(\sqrt{2}, \sqrt{2})$

Answer: B

Watch Video Solution

8. If A and B are square matrices of the same order such that $A = -B^{-1}AB$ then $(A + 3B)^2$ is equal to

A. $A + 3B$

B. $A^2 + 9B^2$

C. $A^2 + 6AB + AB^2$

D. O

Answer: B

Watch Video Solution

9. The point $P(2, 1)$ is shifted through a distance of $3\sqrt{2}$ units measured perpendicular to the line $x - y = 1$ in the direction of decreasing ordinates, to reach at Q. The image of Q with respect to be line $y + x = 1$ is

A. $(3, -4)$

B. $(-3, 2)$

C. $(0, -1)$

D. $(5, -2)$

Answer: A

Watch Video Solution

10. The value of $\lambda \in R$ such that $(x, y, z) \neq (0, 0,)$ and $\left(2\hat{i} + 3\hat{j} - 4\hat{k}\right)x + \left(3\hat{i} - \hat{j} + 2\hat{k}\right)y + \left(i - 2\hat{j}\right)z =$ lies in

A. (1, 2)

B. (2, 3)

C. (3, 4)

D. (0, 1)

Answer: C

Watch Video Solution

11. Let there be two prabolas $y^2 = 4x$ and $y^2 = -8x$. Then the locus of the mid - points of the intercepts between the parabolas made on the lines parallel to the common axis is

A. $y^2 = 16x$

B. $x^2 = 16y$

C. $y^2 = -8x$

D. $x^2 = 8y$

Answer: A

Watch Video Solution

12. If $z_1 = 2 + 3i$, $z_2 = 3 - 2i$ and $z_3 = -1 - 2\sqrt{3}i$, then which of the following is true? (where, $i^2 = -1$)

A. $arg\left(\frac{z_2}{z_3}\right) = arg\left(\frac{z_2 - z_1}{z_3 - z_1}\right)$

B. $arg\left(\frac{z_2}{z_3}\right) = arg\left(\frac{z_3}{z_1}\right)$

C. $\frac{1}{2}arg\left(\frac{z_2}{z_3}\right) = arg\left(\frac{z_2 - z_1}{z_3 - z_1}\right)$

D. $2arg\left(\frac{z_3}{z_2}\right) = arg\left(\frac{z_3 - z_1}{z_2 - z_1}\right)$

Answer: C

Watch Video Solution

13. If $\left|\frac{x^2 + mx + 1}{x^2 + x + 1}\right| < 3$ for all real x, then

A. $m < -1$

B. $-1 < m < 6$

C. $-1 < m < 5$

D. $m > 6$

Answer: C

Watch Video Solution

14. The arithmetic mean of two numbers is $18\frac{3}{4}$ and the positive square root of their product is 15. The larger of the two numbers is

A. 24

B. 25

C. 20

D. 30

Answer: D

Watch Video Solution

15. The area (in sq. units) bounded by $x^2 + y^2 = 1$ and the curve $y^2 \geq x^2$, above the x - axis is

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

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

C. $\frac{1}{6}$

D. $\frac{\pi}{6}$

Answer: B

Watch Video Solution

16. If $0 < \alpha < \frac{\pi}{16}$ and $(1 + \tan\alpha)(1 + \tan 4\alpha) = 2$, then the value of α is equal to

A. $\frac{\pi}{18}$

B. $\frac{\pi}{20}$

C. $\frac{\pi}{24}$

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

Answer: B

Watch Video Solution

17. If $f'\left(x^2-4x+3\right)>0$ for all $x \in (2,3)$ then f(sinx) is increasing on

A. $x \in (0, \pi)$

B. $x \in \left(0, \frac{\pi}{2}\right)$

C. $x \in \left(\pi, \frac{5\pi}{4}\right)$

D. $x \in \left(\frac{3\pi}{2}, 2\pi\right)$

Answer: D

Watch Video Solution

18. If the value of the limit $\lim_{n \to \infty} \frac{1^{10} + 2^{10} + \ldots n^{10}}{n^{11}}$ is equal to K, then the value of $\left[\frac{1}{2K}\right]$ is equal to (where, $[.]$ represents the greatest integer function)

A. 4

B. 5

C. 10

D. 11

Answer: B

Watch Video Solution

19. The solution of the differential equation $y \cos x . dx = \sin x . dy + xy^2 dx$ is (where, c is an arbitrary constant)

A. $\sin x = xy^2 + c$

B. $2\sin x = x^2y + cy$

C. $2\sin x = xy^2 + c$

D. $\sin x = x^2y + cy$

Answer: B

Watch Video Solution

20. $5^2 5^4 5^6 \ldots\ldots\ldots\ldots\ldots 5^{2x} = (0.04)^{-28}$,

A. 7

B. 5

C. 6

D. 3

Answer: A

Watch Video Solution

21. If $\tan^{-1}.\frac{x}{\pi} \leq \frac{\pi}{6}$, then the maximum vlaue of $\sqrt{3}x$ is $(\text{Use } \pi = 3.14)$

Watch Video Solution

22. Let A be a square matrix of order 3, A^T be the transpose matrix of matrix A and $AA^T = 4I$. If $d = \left|\frac{2A^T + AA^T + adjA}{2}\right|$, then the value of 12d is equal to $(|A| < 0)$

Watch Video Solution

23. Values of m, for which the line $y = mx + 2\sqrt{5}$ is a tangent to the hyperbola $16x^2 - 9y^2 = 144$, are the roots of the equation $x^2 - (a+b)x - 4 = 0$, then the value of $(a+b)$ is equal to

Watch Video Solution

24. If $K = .^{11}C_2 + 2\left[.^{10}C_2 + .^{9}C_2 + .^{8}C_2 + .^{2}C_2\right]$ then the value of $\frac{K}{100}$ is equal to

Watch Video Solution

25. Let $\int \sin(2x)\ln(\cos x)dx = f(x)\cos^2 x + C$, (where, C is the constant of integration) and $f(0) = \frac{1}{2}$, If $f\left(\frac{\pi}{3}\right)$ is equal to $\frac{1}{a} + \ln b$, then the value of $a + b$ is

Watch Video Solution