



## MATHS

### BOOKS - NTA MOCK TESTS

### NTA JEE MOCK TEST 80

#### Mathematics

1. If  $f: R \rightarrow R$ ,  $f(x) = \frac{\alpha x^2 + 6x - 8}{\alpha + 6x - 8x^2}$  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  $\lim_{x \rightarrow \infty} \left[ \frac{e^2}{\left(1 + \frac{2}{x}\right)^x} \right]^{\frac{x}{2}}$  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  $[\sin^{-1} x]^2 - 2[\sin^{-1} x] + 1 \leq 0$  (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 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  $\lambda$  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 the 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  $P(A) = 0.5$ ,  $P(B) = 0.69$  and  $P\left(\frac{A}{B}\right) = 0.5$ , then

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

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

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  $y = (x^2 - x)^2$  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 equal 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

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

continuous at  $x = 2\pi$ , then the value of  $\lambda$  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  $60^\circ$ , then the minimum value of  $\left| \vec{V} \right|^4$  is equal to

 [Watch Video Solution](#)

24. If  $\lim_{n \rightarrow \infty} \sum_{r=1}^{2n} \frac{3r^2}{n^3} e^{\frac{r^3}{n^3}} = e^a - e^b$ , 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**