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JEE (MAIN) 2026

MEMORY BASED QUESTIONS & TEXT SOLUTION

SHIFT-1

DATE & DAY: 21st January 2026 & Wednesday

PAPER-1

Duration: 3 Hrs.

Time: 09:00 – 12:00 IST

SUBJECT: MATHEMATICS

Selections in JEE (Advanced)/
IIT-JEE Since 2002

52979

Classroom: 35901 | Distance: 17078

Selections in JEE (Main)/
AIEEE Since 2009

262693

Classroom: 194471 | Distance: 68222

Selections in NEET (UG)/
AIPMT/AIIMS Since 2012

22733

Classroom: 15409 | Distance: 7324

Admission Open for 2026-27

Target: JEE (Advanced) | JEE (Main) | NEET (UG) | PCCP (Class V to X)

100% Scholarship on the basis of Class 10th, 12th
& JEE (Main) 2026 %ile / AIR

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MATHEMATICS

1. The value of $\operatorname{cosec} 10^\circ - \sqrt{3} \sec 10^\circ$

- (1) 1 (2) 2 (3) 4 (4) None of these

Ans. (3)

2. If $A = \begin{bmatrix} \alpha & 2 \\ 1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 1 \\ \beta & 1 \end{bmatrix}$ and $A^2 - 4A + 2I = 0$; $B^2 - 2B + I = 0$, then $|\operatorname{adj}(A^3 - B^3)|$ is equal to

- (1) 11 (2) 7 (3) -11 (4) 121

Ans. (1)

3. The value of $\int_0^{\pi/2} |\sin x + \sin 2x + \sin 3x| dx$ is

- (1) $\frac{8}{3}$ (2) $\frac{7}{3}$ (3) $\frac{2}{3}$ (4) 3

Ans. (2)

4. If $y = y(x)$ and $(1 + x^2)dy + (1 - \tan^{-1} x)dx = 0$ and $y(0) = 1$ then $y(1)$ is

- (1) $\frac{\pi^2}{32} + \frac{\pi}{4} + 1$ (2) $\frac{\pi^2}{32} - \frac{\pi}{4} + 1$ (3) $\frac{\pi^2}{32} - \frac{\pi}{2} - 1$ (4) $\frac{\pi^2}{32} - \frac{\pi}{2} + 1$

Ans. (2)

5. The sum of all roots of equation $(x - 1)^2 - 5|x - 1| + 6 = 0$ is

- (1) 4 (2) 1 (3) 5 (4) 3

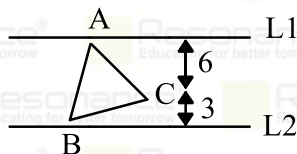
Ans. (1)

6. The number of relations defined on the set $\{a, b, c, d\}$ which are both reflexive and symmetric is equal to

- (1) 16 (2) 1024 (3) 64 (4) 256

Ans. (3)

7. If L_1 and L_2 are two parallel lines and $\triangle ABC$ is an equilateral triangle then area of triangle ABC is



- (1) $7\sqrt{3}$ (2) $4\sqrt{3}$ (3) $21\sqrt{3}$ (4) 84

Ans. (3)

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8. The locus of point of intersection of tangent drawn to the circle $(x - 2)^2 + (y - 3)^2 = 16$, which subtends an angle of 120° is

(1) $3x^2 + 3y^2 - 12x - 18y - 25 = 0$ (2) $x^2 + y^2 - 12x - 18y - 25 = 0$
(3) $3x^2 + 3y^2 + 12x + 18y - 25 = 0$ (4) $x^2 + y^2 + 12x + 18y - 25 = 0$

Ans. (1)

9. If $a_1, a_2, a_3, \dots$ are in increasing geometric progression such that $a_1 + a_3 + a_5 = 21$
 $a_1 a_3 a_5 = 64$ then $a_1 + a_2 + a_3$ is

(1) 5 (2) 7 (3) 10 (4) 15

Ans. (2)

10. If $x^2 + x + 1 = 0$, then $\left(x + \frac{1}{x}\right)^4 + \left(x^2 + \frac{1}{x^2}\right)^4 + \left(x^3 + \frac{1}{x^3}\right)^4 + \dots + \left(x^{25} + \frac{1}{x^{25}}\right)^4$ is

(1) 175 (2) 162 (3) 145 (4) 128

Ans. (3)

11. If the mean and variance of observations $x, y, 12, 14, 4, 10, 2$ is 8 and 16 respectively where $x > y$. Then, the value of $3x - y$ is

(1) 18 (2) 20 (3) 22 (4) 24

Ans. (1)

12. Ellipse

$E: \frac{x^2}{36} + \frac{y^2}{16} = 1$, A hyperbola confocal with ellipse and eccentricity of hyperbola is equal to 5.

The length of latus rectum of hyperbola is, if principal axis of hyperbola is x -axis?

(1) $\frac{96}{\sqrt{5}}$ (2) $24\sqrt{5}$ (3) $18\sqrt{5}$ (4) $12\sqrt{5}$

Ans. (1)

13. If $A = \{1, 2, 3, 4, 5, 6\}$, $B = \{1, 2, 3, \dots, 8, 9\}$. Then the number of strictly increasing functions from $A \rightarrow B$ such that $f(i) \neq i \forall i = 1, 2, 3, 4, 5, 6$ are

(1) 28 (2) 22 (3) 21 (4) 27

Ans. (1)

14. If O is the vertex of the parabola $x^2 = 4y$, Q is the point on parabola. If C is the locus of point which divides OQ in ratio 2:3. The equation of chord of C which bisected at point $(1, 2)$.

(1) $5x - 4y + 3 = 0$ (2) $5x - 4y - 3 = 0$
(3) $5x + 4y + 3 = 0$ (4) $5x + 4y - 3 = 0$

Ans. (1)

15. The value of $\int_{-\pi}^{\frac{\pi}{6}} \frac{\pi + 4x^{11}}{1 - \sin\left(x + \frac{\pi}{6}\right)} dx$

(1) 3π (2) 4π (3) 6π (4) 12π

Ans. (2)

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16. If $f(3) = 18, f'(3) = 0$ and $f''(3) = 4$. Then, the value of $\lim_{x \rightarrow 1} \ln \left(\frac{f(x+2)}{f(3)} \right)^{\frac{18}{(x-1)^2}}$ is equal to

- (1) 2 (2) 4 (3) 6 (4) 8

Ans. (1)

17. In binomial expansion of $(ax^2 + bx + c)(1 - 2x)^{26}$, the coefficient of x, x^2, x^3 is $-56, 0$ and 0 respectively, then $(a + b + c)$ is equal to

- (1) 1500 (2) 1403 (3) 1300 (4) 1483

Ans. (2)

18. If the domain of the function $\cos^{-1} \left(\frac{2x-5}{11x-7} \right) + \sin^{-1}(2x^2 - 3x + 1)$ is $[0, a] \cup \left[\frac{12}{13}, b \right]$ then $\frac{1}{ab}$ is equal to

- (1) -3 (2) 2 (3) 3 (4) 4

Ans. (3)

19. Area enclosed by $x^2 + 4y^2 \leq 4, y \leq |x| - 1, y \geq 1 - |x|$ is

- (1) $4\sin^{-1} \left(\frac{3}{5} \right) + \frac{6}{5}$ (2) $\sin^{-1} \left(\frac{3}{5} \right) - \frac{6}{5}$
(3) $4\sin^{-1} \left(\frac{3}{5} \right) + \frac{12}{5}$ (4) $4\sin^{-1} \left(\frac{3}{5} \right) - \frac{6}{5}$

Ans. (4)

20. If $a_1 = 1$ and for $\forall n \geq 1, a_{n+1} = \frac{1}{2}a_n + \frac{n^2 - 2n - 1}{n^2(n+1)^2}$ then $\left| \sum_{n=1}^{\infty} \left(a_n - \frac{2}{n^2} \right) \right|$ is equal to

Ans. (2)

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