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JEE (MAIN) 2026

MEMORY BASED QUESTIONS & TEXT SOLUTION

SHIFT-2

DATE & DAY: 22 January 2026 & Thursday

PAPER-1

Duration: 3 Hrs.

Time: 03:00 PM – 06:00 PM

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)

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MATHEMATICS

1. If complex numbers Z_1, Z_2, \dots, Z_n satisfy the equation $4Z^2 + \bar{Z} = 0$, then $\sum_{i=1}^n |Z_i|^2$ is equal to

- (1) $\frac{3}{16}$ (2) $\frac{3}{64}$ (3) $\frac{9}{64}$ (4) $\frac{1}{16}$

Ans. (1)

2. Let α, β be the roots of quadratic equation $12x^2 - 20x + 3\lambda = 0, \lambda \in \mathbb{Z}$. If $1/2 \leq |\beta - \alpha| \leq 3/2$ then the sum of all possible values of λ is ____

Ans. (3)

3. Area enclosed by $4x^2 + y^2 \leq 8$ and $y^2 \leq 4x$ (in square unit) is

- (1) $(\pi + \frac{4}{3})$ sq. unit (2) $(\pi - \frac{4}{3})$ sq. unit
(3) $(\pi + \frac{2}{3})$ sq. unit (4) $(\pi - \frac{2}{3})$ sq. unit

Ans. (3)

4. The number of elements in the relation $R = \{(x, y) : 4x^2 + y^2 < 52, x, y \in \mathbb{Z}\}$ is

Ans. (77)

5. If the mean deviation about the median of the numbers $k, 2k, 3k \dots 1000k$ is 500, then k^2 is equal to

- (1) 4 (2) 9 (3) 16 (4) 1

Ans. (1)

6. $x - ny + z = 6$
 $x - (n - 2)y + (n + 1)z = 8$
 $(n - 1)y + z = 1$

Let n = number on the dies when rolled randomly then P (that system equation has unique solution) = $\frac{k}{6}$, then sum of value of k and all possible value of n is

- (1) 22 (2) 21 (3) 20 (4) 24

Ans. (4)

7. If $\lim_{x \rightarrow 0} \frac{e^{(a-1)x} + 2\cos bx + (c-2)e^{-x}}{x\cos x - \log_e(1+x)} = 2$, then $a^2 + b^2 + c^2$ is equal to?

- (1) 12 (2) 7 (3) 6 (4) 8

Ans. (2)

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8. Let the domain of function

$$f(x) = \log_3 \log_5 \left(7 - \log_2 (x^2 - 10x + 85) \right) + \sin^{-1} \left(\left| \frac{3x-7}{17-x} \right| \right) \text{ be } (\alpha, \beta) \text{ Then } \alpha + \beta \text{ is equal}$$

Ans. (9)

9. If $P(10, 2\sqrt{15})$ lies on hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ and length of latus rectum = 8, then the square of area of ΔPS_1S_2 is [where S_1 & S_2 are the focii of the hyperbola]

- (1) 2700 (2) 2400 (3) 1750 (4) 3600

Ans. (1)

10. If a, b, c are in A.P where $a + b + c = 1$ and $a, 2b, c$ are in G.P., then the value of $9(a^2 + b^2 + c^2)$ is equal to

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

Ans. (2)

11. If $f(x) = [x]^2 - [x + 3] - 3$, $[]$ denotes G.I.F. then

- (1) $f(x) = 0$ then finites many solutions (2) $\int_0^2 f(x) dx = -6$
(3) $f(x) < 0$ only in $[-1, 3)$ (4) $f(x) > 0$ only in $(-2, 4)$

Ans. (3)

12. If $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ is a Solution of Systems of equation $AX = B$ where $\text{Adj}A = \begin{pmatrix} 4 & 2 & 2 \\ -5 & 0 & 5 \\ 1 & -2 & 3 \end{pmatrix}$ & $B = \begin{bmatrix} 4 \\ 0 \\ 2 \end{bmatrix}$ then $|x + y + z|$ is equal to

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

Ans. (2)

13. Let f and g be the functions satisfying $f(x + y) = f(x)f(y)$, $f(1) = 7$ and $g(x + y) = g(x)g(y)$, $g(1) = 1$ for all $x, y \in N$, if $\sum_{x=1}^n \left(\frac{f(x)}{g(x)} \right) = 19607$, $n = ?$

- (1) 6 (2) 4 (3) 7 (4) 5

Ans. (4)

14. If $\int_0^{64} \left(x^{\frac{1}{3}} + \text{floor} \left(x^{1/3} \right) \right) dx = \alpha$ and $\int_0^{\frac{\pi}{2}} \frac{\sin^2 x}{\sin^6 x + \cos^6 x} dx = \pi\beta$, then the value of $\alpha\beta^2$ is equal to

- (1) 87 (2) 77 (3) 67 (4) 57

Ans. (1)

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15. let C_r denote the coefficient of x^r in the binomial expansion of $(1+x)^n, n \in N, 0 \leq r \leq n$.

If $P_n = C_0 - C_1 + \frac{2^2}{3}C_2 - \frac{2^3}{4}C_3 + \dots + \frac{(-2)^n}{n+1}C_n$ then the value of $\sum_{n=1}^{25} \frac{1}{p^{2n}}$ equals

- (1) 650 (2) 675 (3) 580 (4) 525

Ans. (2)

16. Let L be line $\frac{x+1}{2} = \frac{y+1}{3} = \frac{z+3}{6}$ & let S be the set of all points (a, b, c) on L , whose distance from line

$\frac{x+1}{2} = \frac{y+1}{3} = \frac{z-9}{0}$ along the line L is 7. Then $\sum_{(a,b,c) \in S} (a+b+c)$ is equal to:

- (1) 34 (2) 6 (3) 28 (4) 40

Ans. (1)

17. Among the statements

S_1 : If $A(5, -1)$ and $B(-2, 3)$ are two vertices of a triangle, whose orthocenter is $(0, 0)$, then its third vertex is $(-4, -7)$

S_2 : If positive numbers $2a, b, c$ are three consecutive, in terms of an A.P, then the lines $ax + by + c = 0$ are concurrent at $(2, -2)$

- (1) both are correct (2) only S_1 is correct
(3) both are incorrect (4) only S_2 is correct

Ans. (4)

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