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JEE (MAIN) 2026

MEMORY BASED QUESTIONS & TEXT SOLUTION

SHIFT-1

DATE & DAY: 22 January 2026 & Thursday

PAPER-1

Duration: 3 Hrs.
Time: 09:00 – 12:00 IST

SUBJECT: MATHEMATICS

MATHEMATICS

1. If sum of first 4 terms of an A.P is 6 and sum of first 6 terms is 4, then sum of first 12 terms of an A.P is

(1) -23 (2) -21 (3) -22 (4) -24

Ans. **(1)**

2. Find the number of real solutions $x|x+4| + 3|x+2| + 10 = 0$

Ans. **(1)**

3. The coefficient of x^{48} in $1 \cdot (1+x) + 2 \cdot (1+x)^2 + 3 \cdot (1+x)^3 + \cdots \ldots + 100 \cdot (1+x)^{100}$ is

(1) $\left(^{101}C_{46}\right) - 100$ (2) $100\left(^{101}C_{49}\right) - {}^{101}C_{50}$

(3) $100\left(^{101}C_{46}\right) - {}^{101}C_{47}$ (4) $^{101}C_{47} - {}^{101}C_{46}$

Ans. **(2)**

4. If $A = \begin{bmatrix} 2 & 3 \\ 3 & 5 \end{bmatrix}$, then the value of $|A^{2025} - 3A^{2024} + A^{2023}|$ is

(1) 18   (2) 17   (3) 20   (4) 16

Ans. **(4)**

5. If the domain of the function $\dfrac{1}{\ln(10-x)} + \sin^{-1}\left(\dfrac{x+2}{2x+3}\right)$

is $(-\infty, -a] \cup (-1, b) \cup (b, c)$, then $(b + c + 3a)$ is equal to

(1) 22   (2) 23   (3) 24   (4) 21

Ans. **(3)**

6. Let $M = \{1, 2, 3, \ldots, 16\}$ and R be a relation on M defined by xRy if and only if $4y = 5x - 3$. Then, the number of elements required to added in R to make it symmetric is

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

Ans. **(1)**

7. The solution of the differential equation $xdy - ydx = \sqrt{x^2 + y^2}\,dx$ is (where c is integration constant)

(1) $\sqrt{x^2 + y^2} = cx + y$ (2) $\sqrt{x^2 + y^2} = cx^2 + y$

(3) $\sqrt{x^2 + y^2} = cx - y$ (4) $\sqrt{x^2 + y^2} = cx^2 - y$

Ans. **(4)**

8. The number of values of x satisfying $\tan^{-1}(4x) + \tan^{-1}(6x) = \dfrac{\pi}{6}$ and $x \in \left[-\dfrac{1}{2\sqrt{6}}, \dfrac{1}{2\sqrt{6}}\right]$ is

(1) 3   (2) 0   (3) 2   (4) 1

Ans. **(4)**

9. The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \dfrac{dx}{[x]+4}$ is Where $[.]$ denotes greatest integer function.

(1) $\dfrac{\pi}{20} + \dfrac{7}{20}$ (2) $\dfrac{7\pi}{20} + \dfrac{1}{60}$ (3) $\dfrac{7\pi}{20} - \dfrac{1}{60}$ (4) $\dfrac{7\pi}{20} - \dfrac{7}{60}$

Ans. **(4)**

10. If the area of the region $\{(x, y): x^2 + 1 \leq y \leq 3 - x\}$ is divided by the line $x = -1$ in the ratio $m:n$ (where m and n are coprime natural numbers). Then, the value of $m + n$ is:

Ans. **(27)**

11. The value of α for which the line $\alpha x + 2y = 1$ never touches the hyperbola $\frac{x^2}{9} - \frac{y^2}{1} = 1$ is

(1) $R - \left\{-\frac{\sqrt{5}}{2}, \sqrt{\frac{5}{2}}\right\}$

(2) $R - \{-\sqrt{5}, \sqrt{5}\}$

(3) $R - \left\{-\frac{\sqrt{5}}{3}, \frac{\sqrt{5}}{3}\right\}$

(4) R

Ans. **(3)**

12. If probability distribution is given by

x	0	1	2	3	4	5	6	7
$P(x)$	k	$2k^2$	$6k^2$	$2k^2 + k$	$4k$	k	k	k

Then, the value of $P(3 < x \leq 6)$ is

(1) 0.6   (2) 0.8   (3) 0.4   (4) 0.2

Ans. **(1)**

13. If the image of the point $P(3,2,a)$ reflected about the line $\frac{x-3}{2} = \frac{y-5}{5} = \frac{z-2}{-2}$ is $(5, b, c)$. Then the value of $a^2 + b^2 + c^2$ is

(1) $\frac{4849}{8}$ (2) $\frac{4245}{4}$ (3) $\frac{3947}{8}$ (4) $\frac{2429}{4}$

Ans. **(1)**

14. If $S = \{1, 2 \ldots .50\}$, two numbers α and β are selected at random find the probability that product is divisible by 3:

(1) $\frac{664}{1225}$ (2) $\frac{646}{1225}$ (3) $\frac{527}{1225}$ (4) $\frac{461}{1225}$

Ans. **(1)**

15. If the end points of chord of parabola $y^2 = 12x$ are (x_1, y_1) and (x_2, y_2) and it subtend $90°$ at the vertex of parabola then $(x_1 x_2 - y_1 y_2)$ equals:

(1) 288   (2) 280   (3) 290   (4) not possible

Ans. **(1)**

16. If $\int (\cos x)^{-5/2}(\sin x)^{-11/2}dx = \frac{p_1}{q_1}(\cot x)^{9/2} + \frac{p_2}{q_2}(\cot x)^{5/2} + \frac{p_3}{q_3}(\cot x)^{1/2} - \frac{p_4}{q_4}(\cot x)^{-3/2} + c$

(where c is constant of integration), then value of $\frac{15p_1p_2p_3p_4}{q_1q_2q_3q_4}$ is

(1) 14   (2) 16   (3) 10   (4) 9

Ans. **(2)**