JEE Main April 2026

Question Paper With Text Solution

04 April | Shift-1

MATHEMATICS

MATRIX

JEE Main & Advanced | XI-XII Foundation| VI-X Pre-Foundation

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JEE MAIN APRIL 2026 | 4TH APRIL SHIFT-1

SECTION – A

Question ID : 695278226

1. Let [.] denote the greatest integer function. If the domain of the function $f(x) = \cos^{-1}\left(\frac{4x + 2[x]}{3}\right)$ is $[\alpha, \beta]$, then $12(\alpha + \beta)$ is equal to :

(1) 6 (2) 8 (3) 9 (4) 4

Ans. Official answer NTA (1)

Sol.

Question ID : 695278227

2. If the set of all solutions of $|x^2 + x - 9| = |x| + |x^2 - 9|$ is $[\alpha, \beta] \cup [\gamma, \infty)$, then $(\alpha^2 + \beta^2 + \gamma^2)$ is equal to :

(1) 9 (2) 18 (3) 36 (4) 72

Ans. (2)

Sol.

Question ID : 695278228

3. Let z be a complex number such that $|z + 2| = |z - 2|$ and $\arg\left(\frac{z+3}{z-i}\right) = \frac{\pi}{4}$. Then $|z|^2$ is equal to :

(1) 9 (2) 4 (3) 5 (4) 1

Ans. (1)

Sol.

Question ID : 695278229

4. The number of functions $f : \{1, 2, 3, 4\} \to \{a, b, c\}$, which are not onto, is :

(1) 48 (2) 45 (3) 51 (4) 35

Ans. (2)

Sol.

Question ID : 695278230

5. Let $S=\left\{A=\begin{bmatrix}a & b\\ c & d\end{bmatrix}: a,b,c,d\in\{0,1,2,3,4\} \text{ and } A^2-4A+3I=0\right\}$ be a set of 2×2 matrices. Then the number of matrices in S, for which the sum of the diagonal elements is equal to 4, is :

(1) 20 (2) 17 (3) 21 (4) 19

Ans. (4)

Sol.

Question ID : 695278231

6. Let $A=\begin{bmatrix}1 & 1 & 2\\ -2 & 0 & 1\\ 1 & 3 & 5\end{bmatrix}$. Then the sum of all elements of the matrix adj(adj(2(adj A)$^{-1}$)) is equal to :

(1) 3 (2) 4 (3) –4 (4) –3

Ans. (4)

Sol.

Question ID : 695278232

7. The first term of an A.P. of 30 non-negative terms is $\frac{10}{3}$. If the sum of this A.P. is the cube of its last term, then its common difference is :

(1) $\frac{5}{87}$ (2) $\frac{25}{83}$ (3) $\frac{15}{29}$ (4) $\frac{5}{29}$

Ans. (1)

Sol.

Question ID : 695278233

8. The number of ways, of forming a queue of 4 boys and 3 girls such that all the girls are not together, is :

(1) 5040 (2) 3050 (3) 3410 (4) 4320

Ans. (4)

Sol.

Question ID : 695278234

9. Let the smallest value of $k \in N$, for which the coefficient of x^3 in $(1+x)^3+(1+x)^4+(1+x)^5+...+(1+x)^{99}+(1+kx)^{100}$, $x \neq 0$ is $\left(43n+\frac{101}{4}\right)({}^{100}C_3)$ for some $n \in N$ be p. Then the value of $p+n$ is :

(1) 10 (2) 11 (3) 12 (4) 13

Ans. (2)

Sol.

Question ID : 695278235

10. Suppose that the mean and median of the non-negative numbers 21, 8, 17, a, 51, 103, b, 13, 67, $(a > b)$, are 40 and 21, respectively. If the mean deviation about the median is 26, then 2a is equal to :

(1) 109 (2) 117 (3) 161 (4) 131

Ans. (4)

Sol.

Question ID : 695278236

11. Let the line $L_1 : x+3=0$ intersect the lines $L_2 : x-y=0$ and $L_3 : 3x+y=0$ at the points A and B, respectively. Let the bisector of the obtuse angle between the lines L_2 and L_3 intersect the line L_1 at the point C. Then $BC^2 : AC^2$ is equal to :

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

Ans. (1)

Sol.

Question ID : 695278237

12. Let the vertex A of a triangle ABC be (1, 2), and the mid-point of the side AB be (5, –1). If the centroid of this triangle is (3, 4) and its circumcenter is (α, β), then $21(\alpha+\beta)$ is equal to :

(1) 309 (2) 403 (3) 497 (4) 524

Ans. (3)

Sol.

Question ID : 695278238

13. Suppose that two chords, drawn from the point (1, 2) on the circle $x^2 + y^2 + x - 3y = 0$ are bisected by the y-axis. If the other ends of these chords are R and S, and the mid point of the line segment RS is (α, β), then $6(\alpha + \beta)$ is equal to :

(1) 1 (2) 3 (3) 4 (4) 6

Ans. (2)

Sol.

Question ID : 695278239

14. A line with direction ratios 1, –1, 2 intersects the lines $\frac{x}{2} = \frac{y}{3} = \frac{z+1}{3}$ and $\frac{x+1}{-1} = \frac{y-2}{1} = \frac{z}{4}$ at the points P and Q, respectively. If the length of the line segment PQ is α, then $225\alpha^2$ is equal to :

(1) 1024 (2) 1014 (3) 1104 (4) 1204

Ans. (2)

Sol.

Question ID : 695278240

15. The square of the distance of the point (–2, –8, 6) from the line $\frac{x-1}{1} = \frac{y-1}{2} = \frac{z}{-1}$ along the line $\frac{x+5}{1} = \frac{y+5}{-1} = \frac{z}{2}$ is equal to :

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

Ans. (2)

Sol.

Question ID : 695278241

16. If $y = \tan^{-1}\left(\frac{3\cos x - 4\sin x}{4\cos x + 3\sin x}\right) + 2\tan^{-1}\left(\frac{x}{1+\sqrt{1-x^2}}\right)$, then $\frac{dy}{dx}$ at $x = \frac{\sqrt{3}}{2}$ is equal to :

(1) 3 (2) –1 (3) 1 (4) 2

Ans. (3)

Sol.

Question ID : 695278242

17. Let f be a real polynomial of degree n such that $f(x)=f'(x)f''(x)$ for all $x \in R$. If $f(0) = 0$ then $36\left(f'(2)+f''(2)+\int_0^2 f(x)dx\right)$ is equal to :

(1) 42 (2) 46 (3) 56 (4) 66

Ans. (3)

Sol.

Question ID : 695278243

18. The area of the region $\{(x, y) : y \le \pi - |x|, y \le |x \sin x|, y \ge 0\}$ is :

(1) $1+\frac{\pi^2}{8}$ (2) $2+\frac{\pi^2}{4}$ (3) $\frac{\pi^2}{8}-1$ (4) $4+\frac{\pi^2}{2}$

Ans. (2)

Sol.

Question ID : 695278244

19. Let $\int_{-2}^{2}(|\sin x|+[x\sin x])dx = 2(3-\cos 2)+\beta$, where [.] is the greatest integer function. Then $\beta \sin\left(\frac{\beta}{2}\right)$

(1) 1 (2) 2 (3) 4 (4) 8

Ans. (2)

Sol.

Question ID : 695278245

20. Let y = y(x) be the solution of the differential equation $\frac{dy}{dx}=(1+x+x^2)(1-y+y^2)$, $y(0)=\frac{1}{2}$. Then $(2y(1)-1)$ is equal to :

(1) $\sqrt{3}\tan\left(\frac{11\sqrt{3}}{6}\right)$ (2) $\frac{\sqrt{3}}{2}\tan\left(\frac{11\sqrt{3}}{12}\right)$ (3) $\sqrt{3}\tan\left(\frac{11\sqrt{3}}{12}\right)$ (4) $\frac{\sqrt{3}}{2}\tan\left(\frac{11\sqrt{3}}{6}\right)$

Ans. (3)

Sol.

SECTION – B

Question ID : 695278246

21. A coin is tossed 8 times. If the probability that exactly 4 heads appear in the first six tosses and exactly 3 heads appear in the last five tosses is p, then 96p is equal to _____.

Ans. (9)

Sol.

Question ID : 695278247

22. Consider the parabola $P : y^2 = 4kx$ and the ellipse $E : \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$. Let the line segment joining the points of intersection of P and E, be their latus rectums. If the eccentricity of E is e, then $e^2 + 2\sqrt{2}$ is equal to _____.

Ans. (3)

Sol.

Question ID : 695278248

23. If $A = \frac{\sin 3°}{\cos 9°} + \frac{\sin 9°}{\cos 27°} + \frac{\sin 27°}{\cos 81°}$ and $B = \tan 81° - \tan 3°$, then $\frac{B}{A}$ is equal to _____.

Ans. (2)

Sol.

Question ID : 695278249

24. Let $\overrightarrow{a_k} = (\tan\theta_k)\hat{i} + \hat{j}$ and $\overrightarrow{b_k} = \hat{i} - (\cot\theta_k)\hat{j}$, where $\theta_k = \frac{2^{k-1}\pi}{2^n + 1}$, for some $n \in N$, $n > 5$. Then the value of

$\frac{\sum_{k=1}^{n} |\overrightarrow{a_k}|^2}{\sum_{k=1}^{n} |\overrightarrow{b_k}|^2}$ is _____.

Ans. (3)

Sol.

Question ID : 695278250

25. The number of points, at which the function $f(x) = \max\{6x, 2 + 3x^2\} + |x - 1| \cos|x^2 - \frac{1}{4}|, x \in (-\pi, \pi)$ is not differentiable, is _____.

Ans. (3)

Sol.