JEE Main April 2026

Question Paper With Text Solution

06 April | Shift-1

MATHEMATICS

MATRIX

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

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JEE MAIN APRIL 2026 | 6TH APRIL SHIFT-1

SECTION – A

Question ID : 6952782136

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

(1) 2 (2) 5 (3) 10 (4) 13

Ans. (2)

Sol.

Question ID : 6952782137

2. Let one root of the quadratic equation in x : $(k^2-15k+27)x^2+9(k-1)x+18=0$ be twice the other. Then the length of the latus rectum of the parabola $y^2=6kx$ is equal to :

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

Ans. (4)

Sol.

Question ID : 6952782138

3. Let e_1 and e_2 be two distinct roots of the equation $x^2-ax+2=0$. Let the sets $\{a\in R : e_1$ and e_2 are the eccentricities of hyperbolas$\}=(\alpha,\beta)$, and $\{a\in R : e_1$ and e_2 are the eccentricities of an ellipse and a hyperbola, respectively$\}=(\gamma,\infty)$. Then $\alpha^2+\beta^2+\gamma^2$ is equal to :

(1) 18 (2) 22 (3) 26 (4) 34

Ans. (3)

Sol.

Question ID : 6952782139

4. Let the set of all values of $k\in R$ such that the equation $z(\bar{z}+2+i)+k(2+3i)=0$, $z\in C$, has at least one solution, be the interval $[\alpha,\beta]$. Then $9(\alpha+\beta)$ is equal to :

(1) -10 (2) -8 (3) $10\sqrt{13}$ (4) $8\sqrt{13}$

Ans. (1)

Sol.

Question ID : 6952782140

5. The value of $1^3 - 2^3 + 3^3 - \ldots\ldots\ldots + 15^3$ is :

(1) 1706 (2) 1856 (3) 1982 (4) 2403

Ans. (2)

Sol.

Question ID : 6952782141

6. The sum of the first ten terms of an A.P. is 160 and the sum of the first two terms of a G.P. is 8. If the first term of the A.P. is equal to the common ratio of the G.P. and the first term of the G.P. is equal to common difference of the A.P., then the sum of all possible values of the first term of the G.P. is :

(1) $\frac{34}{9}$ (2) $\frac{34}{13}$ (3) $\frac{32}{9}$ (4) $\frac{32}{13}$

Ans. (1)

Sol.

Question ID : 6952782142

7. The number of 4-letter words, with or without meaning, each consisting of two vowels and two consonants that can be formed from the letters of the word INCONSEQUENTIAL, without repeating any letter, is :

(1) 2670 (2) 2840 (3) 2920 (4) 3600

Ans. (4)

Sol.

Question ID : 6952782143

8. If the coefficients of the middle terms in the binomial expansions of $(1 + \alpha x)^{26}$ and $(1 - \alpha x)^{28}$, $\alpha \neq 0$, are equal, then the value of α is :

(1) 1 (2) $\frac{14}{13}$ (3) $\frac{27}{7}$ (4) $\frac{7}{27}$

Ans. (4)

Sol.

Question ID : 6952782144

9. A data consists of 20 observations $x_1, x_2, \ldots\ldots, x_{20}$. If $\sum_{i=1}^{20}(x_i+5)^2 = 2500$ and $\sum_{i=1}^{20}(x_i-5)^2 = 100$, then the ratio of mean to standard deviation of this data is :

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

Ans. (2)

Sol.

Question ID : 6952782145

10. A bag contains (N + 1) coins–N fair coins, and one coin with 'Head' on both sides. A coin is selected at random and tossed. If the probability of getting 'Head' is $\frac{9}{16}$, then N is equal to :

(1) 5 (2) 7 (3) 8 (4) 9

Ans. (2)

Sol.

Question ID : 6952782146

11. If the eccentricity e of the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ passing through $(6, 4\sqrt{3})$ satisfies $15(e^2+1)=34e$, then the length of the latus rectum of the hyperbola $\frac{x^2}{b^2}-\frac{y^2}{2(a^2+1)}=1$ is :

(1) 10 (2) 20 (3) 25 (4) 30

Ans. (1)

Sol.

Question ID : 6952782147

12. Let chord PQ of length $3\sqrt{13}$ of the parabola $y^2 = 12x$ be such that the ordinates of points P and Q are in the ratio 1 : 2. If the chord PQ subtends an angle α at the focus of the parabola, then $\sin\alpha$ is equal to :

(1) $\frac{3}{5}$ (2) $\frac{4}{5}$ (3) $\frac{5}{13}$ (4) $\frac{12}{13}$

Ans. (1)

Sol.

Question ID : 6952782148

13. Let $0 < \alpha < 1, \beta = \frac{1}{3\alpha}$ and $\tan^{-1}(1-\alpha) + \tan^{-1}(1-\beta) = \frac{\pi}{4}$. Then $6(\alpha+\beta)$ is equal to :

(1) 6 (2) 7 (3) 8 (4) 9

Ans. (2)

Sol.

Question ID : 6952782149

14. Let $S = \{\theta \in (-2\pi, 2\pi) : \cos\theta + 1 = \sqrt{3}\sin\theta\}$. Then $\sum_{\theta \in S} \theta$ is equal to :

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

Ans. (2)

Sol.

Question ID : 6952782150

15. Let the image of the point P(1, 6, a) in the line $L : \frac{x}{1} = \frac{y-1}{2} = \frac{z-a+1}{b}$, $b > 0$ be $Q\left(\frac{a}{3}, 0, a+c\right)$. If $S(\alpha, \beta, \gamma)$, $\alpha > 0$ is the point on L such that the distance of S from the foot of perpendicular from the point P on L is $2\sqrt{14}$, then $\alpha + \beta + \gamma$ is equal to :

(1) 19 (2) 20 (3) 21 (4) 22

Ans. (3)

Sol.

Question ID : 6952782151

16. Let a line L be perpendicular to both the lines $L_1 : \frac{x+1}{3} = \frac{y+3}{5} = \frac{z+5}{7}$ and $L_2 : \frac{x-2}{1} = \frac{y-4}{4} = \frac{z-6}{7}$. If θ is the acute angle between the lines L and $L_3 : \frac{x-\frac{8}{7}}{2} = \frac{y-\frac{4}{7}}{1} = \frac{z}{2}$ then $\tan\theta$ is equal to :

(1) $\frac{3}{2}\sqrt{2}$ (2) $\frac{5}{2}\sqrt{2}$ (3) $\frac{5}{3}\sqrt{2}$ (4) $\frac{4}{3}\sqrt{2}$

Ans. (2)

Sol.

Question ID : 6952782152

17. The value of $\lim\limits_{x\to 0}\left(\frac{x^2\sin^2 x}{x^2-\sin^2 x}\right)$ is :

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

Ans. (2)

Sol.

Question ID : 6952782153

18. The value of the integral $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}}\left(\frac{32\cos^4 x}{1+e^{\sin x}}\right)dx$ is :

(1) $4\pi + 2$ (2) $3\pi + 8$ (3) $3\pi + 4$ (4) $4\pi + 3$

Ans. (2)

Sol.

Question ID : 6952782154

19. The area of the region $\{(x, y) : 0 \le y \le 6 - x, y^2 \ge 4x - 3, x \ge 0\}$ is :

(1) 8 (2) 9 (3) 12 (4) 15

Ans. (2)

Sol.

Question ID : 6952782155

20. Let e be the base of natural logarithm and let $f:\{1,2,3,4\}\to\{1,e,e^2,e^3\}$ and $g:\{1,e,e^2,e^3\}\to\left\{1,\frac{1}{2},\frac{1}{3},\frac{1}{4}\right\}$ be two bijective functions such that f is strictly decreasing and g is strictly increasing. If $\phi(x)=\left[f^{-1}\left\{g^{-1}\left(\frac{1}{2}\right)\right\}\right]^x$, then the area of the region $R=\{(x,y):x^2\le y\le\phi(x),0\le x\le 1\}$ is :

(1) $\frac{3-\log_e(2)}{3\log_e(2)}$ (2) $\frac{1}{3\log_e(2)}$ (3) $3+\log_e(2)$ (4) $\frac{3+\log_e(2)}{2+\log_e(3)}$

Ans. (1)

Sol.

SECTION – B

Question ID : 6952782156

21. Let $A=\begin{bmatrix}-1&1&-1\\1&0&1\\0&0&1\end{bmatrix}$, satisfy $A^2+\alpha(\text{adj}(\text{adj}(A)))+\beta(\text{adj}(A)(\text{adj}(\text{adj}(A))))=\begin{bmatrix}2&-2&2\\-2&0&-1\\0&0&-1\end{bmatrix}$ for some $\alpha,\beta\in\mathbb{R}$. Then $(\alpha-\beta)^2$ is equal to _____.

Ans. (4)

Sol.

Question ID : 6952782157

22. Let the centre of the circle $x^2+y^2+2gx+2fy+25=0$ be in the first quadrant and lie on the line $2x-y=4$. Let the area of an equilateral triangle inscribed in the circle be $27\sqrt{3}$. Then the square of the length of the chord of the circle on the line $x=1$ is _____.

Ans. (80)

Sol.

Question ID : 6952782158

23. If $\vec{a}=\hat{i}+\hat{j}+\hat{k}, \vec{b}=\hat{j}-\hat{k}$ and $\vec{c}$ be three vectors such that $\vec{a}\times\vec{c}=\vec{b}$ and $\vec{a}\cdot\vec{c}=3$ then $\vec{c}\cdot(\vec{a}-2\vec{b})$ is equal to _____.

Ans. (3)

Sol.

Question ID : 6952782159

24. For the functions $f(\theta)=\alpha\tan^2\theta+\beta\cot^2\theta$ and $g(\theta)=\alpha\sin^2\theta+\beta\cos^2\theta, \alpha>\beta>0$, let $\min\limits_{0<\theta<\frac{\pi}{2}} f(\theta)=\max\limits_{0<\theta<\pi} g(\theta)$. If the first term of a G.P. is $\left(\frac{\alpha}{2\beta}\right)$, its common ratio is $\left(\frac{2\beta}{\alpha}\right)$ and the sum of its first 10 terms is $\frac{m}{n}$, $\gcd(m,n)=1$, then $m+n$ is equal to _____.

Ans. (1279)

Sol.

Question ID : 6952782160

25. Let $y=y(x)$ be the solution of the differential equation $(x^2-x\sqrt{x^2-1})dy+(y(x-\sqrt{x^2-1})-x)dx=0, x\geq 1$. If $y(1)=1$ then the greatest integer less than $y\left(\sqrt{5}\right)$ is _____.

Ans. (3)

Sol.