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MATHEMATICS · EAPCET (EAMCET)

Determinants

Previous Year Questions with answers

165 questions · **106** papers · **2010–2026** · newest paper first

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What is in this PDF: every Determinants question we hold from past AP and TS EAPCET (called EAMCET until 2020 in Andhra Pradesh and 2023 in Telangana) papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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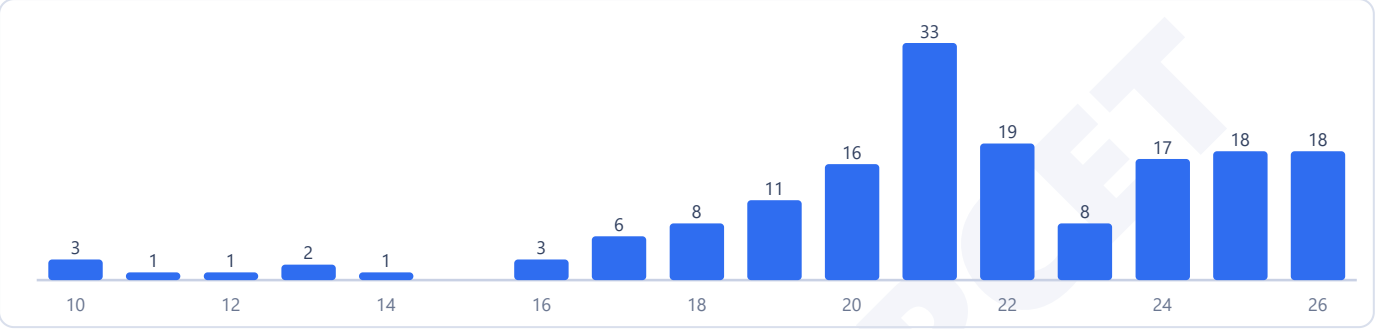
Chapter at a glance

1.3%	165	54 of 77	165 / 0
of Mathematics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Rising: 1.2 questions per paper in 2024–2026 against 0.9 in 2022–2023.

Questions per year



Counts are the questions we hold: 165 in 106 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2010–2026)

Evaluation & Properties	136
Applications	29

How often it comes up

Determinants provides foundational computational machinery for geometric areas and linear algebra throughout the syllabus. Across the complete archive from 2010 through 2026, Determinants delivered 165 questions across 149 evaluated exam papers, featuring in 106 sittings to record an average of 1.1 questions per paper and a 1.4 percent subject share. Modern test cycles between 2022 and 2026 reflect similar metrics: examiners set 80 questions across 77 sittings, with questions appearing in 54 papers to yield an average of 1.0 question per paper and a 1.3 percent subject share. This ranks Determinants at position 23 of 29 mathematics chapters.

While tested each calendar cycle, the unit is omitted from twenty-three papers out of 77 in the modern window. During the three most recent testing years from 2024 to 2026, candidates encountered 53 questions across 46 papers (present in 36 papers, averaging 1.2 per test and a 1.4 percent share). In earlier testing from 2010 to 2021, the chapter contributed 85 questions across 72 sittings (present in 52 papers, averaging 1.2 per test and a 1.5 percent share). Evaluating historical variation, comparing early testing with the last three years shows the share is about the same, and comparing recent testing with the last three years also shows the share is about the same. At the regional level from 2022 to 2026, Andhra Pradesh administered 42 questions across 48 papers (28 papers with questions, 0.9 per test, 1.1 percent share), while Telangana administered 38 questions across 29 papers (26 papers with questions, 1.3 per test, 1.6 percent share).

Most-asked topics

Syllabus problems divide into core algebraic properties and geometric or system applications:

- **Evaluation & Properties**: Accounting for 136 total questions, with 66 emerging in modern papers (tested through 2026). Core skills include elementary row and column operations, factor theorem for polynomial determinants, circulant determinants, skew-symmetric determinants of odd and even order, trigonometric determinants, and differentiation of determinants.

- **Applications**: Delivering 29 total questions, with 14 in recent papers (last asked in 2026). Key topics include area of triangles in Cartesian coordinates, condition of collinearity of three points, condition for concurrency of three straight lines, and non-trivial solutions of homogeneous linear systems.

What the questions look like

Examiners test shortcut evaluation techniques using algebraic symmetries and row operations.

A standard problem presents a three-by-three determinant whose entries contain algebraic powers or factorials. Rather than direct brute-force expansion, candidates perform systematic row operations like row one minus row two and row two minus row three to factor out common terms such as x minus y and y minus z. Another common question type involves a determinant whose elements depend linearly on a variable x, resulting in a quadratic or cubic polynomial in x; candidates must find the minimum value of this polynomial or sum its coefficients. Questions also frequently ask for parameter values that force a homogeneous linear system to admit non-trivial solutions, which requires setting the coefficient determinant to zero.

How to practise it

Practice identifying standard determinant forms like Vandermonde determinants and circulant determinants. A circulant determinant with first row a, b, c expands to negative of a cubed plus b cubed plus c cubed minus three a b c, which factors into negative of a plus b plus c times the sum of pairwise squared differences.

Always prioritize elementary operations that produce zeroes along a single row or column before expanding along that line. When an equation involves cyclic variables like a, b, and c, test small symmetric integers like zero, one, and two to verify coefficients rapidly without expanding lengthy algebraic minors. Review the differentiation rule for determinants: the derivative of a determinant equals the sum of determinants obtained by differentiating one row (or column) at a time while keeping the others unchanged.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If $A=\begin{bmatrix}3 & x & 2\\ 2x & 3 & -1\\ 1 & 2 & 3x\end{bmatrix}$ is a singular matrix and $x>0$, then $\sqrt{3}\,x=$

(A) $\sqrt{21}$
(B) $\sqrt{11}$
(C) $\sqrt{13}$
(D) $\sqrt{17}$

Answer: (D) $\sqrt{17}$ · The council's preliminary key

Q2 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If f, g, h are differentiable functions of x, then $\begin{vmatrix} f & g & h \\ (xf)' & (xg)' & (xh)' \\ f' & g' & h' \end{vmatrix} =$

(A) $fg'-gh'$
(B) $gh'+xf'$
(C) 0
(D) $x(f'+g'+h')$

Answer: (C) 0 · The council's preliminary key

Q3 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If θ_1 and θ_2 are the values of $\theta\in(0,\pi)$ for which the system of linear equations $x+3y+7z=0$, $-x+4y+7z=0$, $(\sin 3\theta)x+(\cos 2\theta)y+2z=0$ has a non-trivial solution, then $|\theta_1-\theta_2|=$

(A) $\frac{\pi}{6}$
(B) $\frac{\pi}{3}$
(C) $\frac{\pi}{2}$
(D) $\frac{2\pi}{3}$

Answer: (D) $\frac{2\pi}{3}$ · The council's preliminary key

Q4 AP EAPCET 2026 · 14 May · Shift 2 MCQ

The set of all values of θ satisfying $0<\theta<\frac{\pi}{2}$ and

$$\begin{vmatrix} 1+\sin^2\theta & \cos^2\theta & 4\sin 4\theta \\ \sin^2\theta & 1+\cos^2\theta & 4\sin 4\theta \\ \sin^2\theta & \cos^2\theta & 1+4\sin 4\theta \end{vmatrix}=0$$

is

(A) $\left\{\frac{7\pi}{24}\right\}$
(B) $\left\{\frac{11\pi}{24}\right\}$
(C) $\left\{\frac{7\pi}{24}, \frac{11\pi}{24}\right\}$
(D) $\left\{\frac{5\pi}{24}, \frac{13\pi}{24}\right\}$

Answer: (C) $\left\{\frac{7\pi}{24}, \frac{11\pi}{24}\right\}$ · The council's preliminary key

Q5 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If $f(x) = \begin{vmatrix} 2+\frac{\sin x}{x} & 1 & 3 \\ 2 & 1+\frac{\sin x}{x} & 3 \\ 2 & 1 & 3+\frac{\sin x}{x} \end{vmatrix}$, then $\lim_{x\to 0} f(x) =$

(A) 1
(B) 0
(C) 5
(D) 7

Answer: (D) 7 · The council's preliminary key

Q6 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If α, β, γ are the roots of the equation $x^3 + bx + c = 0$, then $\begin{vmatrix} \alpha & \beta & \gamma \\ \beta & \gamma & \alpha \\ \gamma & \alpha & \beta \end{vmatrix} =$

(A) $-b^3$
(B) $b^3 - 3c$
(C) $b^2 - 3c$
(D) 0

Answer: (D) 0 · The council's preliminary key

Q7 AP EAPCET 2026 · 13 May · Shift 1 MCQ

For a fixed positive integer n, if

$$D = \begin{vmatrix} n! & (n+1)! & (n+2)! \\ (n+1)! & (n+2)! & (n+3)! \\ (n+2)! & (n+3)! & (n+4)! \end{vmatrix}$$

, then $\frac{D}{n!\,(n+1)!\,(n+2)!} =$

(A) -4

(B) -2

(C) 2

(D) 4

Answer: (C) 2 · The council's preliminary key

Q8 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If $y = \begin{vmatrix} \sin x & \cos x & \sin x \\ \cos x & -\sin x & \cos x \\ x & 1 & 1 \end{vmatrix}$, then $\frac{dy}{dx} =$

(A) $x \cos x$

(B) $x \sin x$

(C) $\sin x + \cos x$

(D) 1

Answer: (D) 1 · The council's preliminary key

Q9 AP EAPCET 2026 · 13 May · Shift 1 MCQ

The number of distinct real roots of

$$\begin{vmatrix} \sin x & \cos x & \cos x \\ \cos x & \sin x & \cos x \\ \cos x & \cos x & \sin x \end{vmatrix} = 0$$

in the interval $\left(\frac{-\pi}{4}, \frac{\pi}{4}\right)$ is

(A) 0

(B) 1

(C) 2

(D) 3

Answer: (A) 0 · Checked by our team

Q10 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If $A = \begin{bmatrix} a & 2b & 3c \\ 2b & c & 3a \\ 3c & 2a & b \end{bmatrix}$ and $\det(A) = pa^3 + qb^3 + rc^3 + s(abc)$, then $p + q + r + s =$

(A) 12

(B) 20

(C) 24

(D) 30

Answer: (A) 12 · The council's preliminary key

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Q11 AP EAPCET 2026 · 12 May · Shift 1 MCQ

For a system of linear equations $AX = B$ solved by Cramer's rule, if $\Delta_1 = 3$, $\Delta_2 = 1$, $\Delta_3 = 1$ and $2x - y + 8z = 13$ is one of the equations of the system then $\Delta =$

(A) $\Delta_1 + \Delta_2$
(B) $\Delta_1 + \Delta_2 + \Delta_3$
(C) $\Delta_1 - \Delta_2 - \Delta_3$
(D) $\frac{\Delta_1}{\Delta_2}$

Answer: (C) $\Delta_1 - \Delta_2 - \Delta_3$ · The council's preliminary key

Q12 AP EAPCET 2026 · 12 May · Shift 2 MCQ

$$\begin{vmatrix} -a^2 & ab & ac \\ ab & -b^2 & bc \\ ac & bc & -c^2 \end{vmatrix} =$$

(A) $a^2b^2c^2$
(B) $2a^2b^2c^2$
(C) $3a^2b^2c^2$
(D) $4a^2b^2c^2$

Answer: (D) $4a^2b^2c^2$ · The council's preliminary key

Q13 AP EAPCET 2026 · 12 May · Shift 2 MCQ

If the system of equations $x - ky - z = 0,\ kx - y - z = 0,\ x + y - z = 0$ has non-trivial solution, then the possible values of k are

(A) $-1, 2$
(B) $1, 2$
(C) $1, -2$
(D) $-1, 1$

Answer: (D) $-1, 1$ · Checked by our team

Q14 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & 7 & 49 \\ 2 & 16 & 130 \\ 2 & 18 & 170 \end{bmatrix}$, then $\det A =$

(A) 2^3
(B) 2^4
(C) 2^5
(D) 2^6

Answer: (B) 2^4 · The council's preliminary key

Q15 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If P and A are nonsingular matrices such that $|P| = |A| = 4$, $|A + 4I| = 14$, then $\frac{|P^{-1}AP + |A|I|}{|A| + |P| - 1} =$

(A) $\frac{7}{2}$
(B) 2
(C) 14
(D) $\frac{29}{7}$

Answer: (B) 2 · The council's preliminary key

Q16 TS EAPCET 2026 · 10 May · Shift 1 MCQ

Number of values of θ lying in the interval $(-\pi, \pi)$ such that $\begin{vmatrix} \cos\theta & -\sin\theta & 1 \\ \sin\theta & 1 & -\cos\theta \\ 1 & \cos\theta & \sin\theta \end{vmatrix} = 2$ is

(A) 1
(B) 0
(C) 2
(D) 3

Answer: (B) 0 · The council's preliminary key

Q17 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If $\begin{vmatrix} x-3 & 2 & 1 \\ 3 & x-2 & 1 \\ 3 & 2 & x-1 \end{vmatrix} = (x-2)(px^2 + qx + r) + 8$, then $3p - 2q + r =$

(A) 0
(B) 3
(C) 5
(D) 1

Answer: (B) 3 · The council's preliminary key

Q18 TS EAPCET 2026 · 9 May · Shift 2 MCQ

Let $A=\begin{bmatrix} x & 2 & -1 \\ -2 & 1 & 2x \\ 3x & 2 & 1 \end{bmatrix}$ and $\det(A)=f(x)$. If $f(x)$ attains its minimum value 'm' at $x=n$, then $\left|\frac{m}{n}\right|=$

(A) $\frac{15}{2}$

(B) 30

(C) 60

(D) $\frac{15}{4}$

Answer: (B) 30 · The council's preliminary key

Q19 AP EAPCET 2025 · 27 May · Shift 1 MCQ

A value of θ lying between 0 and $\frac{\pi}{2}$ and satisfying

$$\begin{vmatrix} 1+\sin^2\theta & \cos^2\theta & 4\sin 4\theta \\ \sin^2\theta & 1+\cos^2\theta & 4\sin 4\theta \\ \sin^2\theta & \cos^2\theta & 1+4\sin 4\theta \end{vmatrix}=0$$

is

(A) $\frac{5\pi}{24}$

(B) $\frac{7\pi}{24}$

(C) $\frac{\pi}{8}$

(D) $\frac{3\pi}{8}$

Answer: (B) $\frac{7\pi}{24}$ · The council's preliminary key

Q20 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If $x^a y^b=e^m$, $x^c y^d=e^n$, $\Delta_1=\begin{vmatrix} m & b \\ n & d \end{vmatrix}$, $\Delta_2=\begin{vmatrix} a & m \\ c & n \end{vmatrix}$, $\Delta_3=\begin{vmatrix} a & b \\ c & d \end{vmatrix}$, then the values of x and y are respectively (e is the base of natural logarithm)

(A) $\frac{\Delta_1}{\Delta_3}$ and $\frac{\Delta_2}{\Delta_3}$

(B) $\frac{\Delta_2}{\Delta_1}$ and $\frac{\Delta_3}{\Delta_1}$

(C) $\log\left(\frac{\Delta_1}{\Delta_3}\right)$ and $\log\left(\frac{\Delta_2}{\Delta_3}\right)$

(D) $e^{\frac{\Delta_1}{\Delta_3}}$ and $e^{\frac{\Delta_2}{\Delta_3}}$

Answer: (D) $e^{\frac{\Delta_1}{\Delta_3}}$ and $e^{\frac{\Delta_2}{\Delta_3}}$ · The council's preliminary key

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Q21 AP EAPCET 2025 · 24 May · Shift 1 MCQ

$f(x)$ is an nth degree polynomial satisfying $f(x)=\frac{1}{2}\begin{vmatrix} f(x) & f\left(\frac{1}{x}\right)-f(x) \\ 1 & f\left(\frac{1}{x}\right) \end{vmatrix}$. If $f(2)=33$, then the value of $f(3)$ is

(A) 126
(B) 214
(C) 244
(D) -124

Answer: (C) 244 · The council's preliminary key

Q22 AP EAPCET 2025 · 23 May · Shift 1 MCQ

$A=\begin{bmatrix} 0 & k & k \\ k & -4 & -6 \\ k & -3 & -5 \end{bmatrix}$ is a singular matrix for

(A) $k=2$ only
(B) $k=\pm 2$ only
(C) no real value of k
(D) all real values of k

Answer: (D) all real values of k · The council's preliminary key

Q23 AP EAPCET 2025 · 23 May · Shift 1 MCQ

$$\begin{vmatrix} 2 & 1 \\ 3 & 1 \end{vmatrix}+\begin{vmatrix} 1 & 1/3 \\ 3 & 1 \end{vmatrix}+\begin{vmatrix} 1/2 & 1/9 \\ 3 & 1 \end{vmatrix}+\begin{vmatrix} 1/4 & 1/27 \\ 3 & 1 \end{vmatrix}+\ldots\infty=$$

(A) 0
(B) $\frac{1}{2}$
(C) $-\frac{1}{2}$
(D) -1

Answer: (C) $-\frac{1}{2}$ · The council's preliminary key

Q24 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If α is a real root of the equation $x^3+6x^2+5x-42=0$, then the determinant of the matrix $\begin{bmatrix} \alpha-1 & \alpha+1 & \alpha+2 \\ \alpha-2 & \alpha+3 & \alpha-3 \\ \alpha+4 & \alpha-4 & \alpha+5 \end{bmatrix}$ is

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(A) 90
(B) 120
(C) -105
(D) -135

Answer: (C) -105 · The council's preliminary key

Q25 AP EAPCET 2025 · 22 May · Shift 1 MCQ

A is the set of all matrices of order 3 with entries 0 or 1 only. B is the subset of A consisting of all matrices with determinant value 1. If C is the subset of A consisting of all matrices with determinant value -1, then

(A) $A = B \cup C$
(B) C is empty
(C) B and C contain the same number of elements
(D) B has twice as many elements as C

Answer: (C) B and C contain the same number of elements · The council's preliminary key

Q26 AP EAPCET 2025 · 22 May · Shift 1 MCQ

Consider the matrices

$$A = \begin{bmatrix} x & y & 0 \\ -3 & 1 & 2 \\ 1 & -2 & z \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & -2 & -2 \\ 2 & 0 & 1 \\ 2 & 1 & 0 \end{bmatrix}$$

If the cofactors of the elements z, 1 in 3rd row and x of A are 9, 4, 3 respectively then $AB =$

(A) $\begin{bmatrix} -7 & -4 & -8 \\ -1 & 8 & 7 \\ 3 & -3 & -4 \end{bmatrix}$
(B) $\begin{bmatrix} 7 & -6 & 8 \\ -5 & 4 & -5 \\ -5 & -3 & -4 \end{bmatrix}$
(C) $\begin{bmatrix} 7 & -6 & -4 \\ 3 & 8 & 7 \\ -5 & -3 & -4 \end{bmatrix}$
(D) $\begin{bmatrix} 7 & -6 & 8 \\ -1 & 8 & -5 \\ 3 & -3 & -4 \end{bmatrix}$

Answer: (C) $\begin{bmatrix} 7 & -6 & -4 \\ 3 & 8 & 7 \\ -5 & -3 & -4 \end{bmatrix}$ · The council's preliminary key

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Q27 AP EAPCET 2025 · 21 May · Shift 2 MCQ

In solving a system of linear equations $AX = B$ by Cramer's rule, in the usual notation, if $\Delta_1 = \begin{vmatrix} -11 & 1 & -7 \\ -4 & 1 & -2 \\ 5 & 1 & 1 \end{vmatrix}$ and $\Delta_3 = \begin{vmatrix} 4 & 1 & -11 \\ 1 & 1 & -4 \\ 4 & 1 & 5 \end{vmatrix}$, then $X =$

(A) $\begin{bmatrix} -1 \\ 1 \\ 2 \end{bmatrix}$

(B) $\begin{bmatrix} 2 \\ 1 \\ -1 \end{bmatrix}$

(C) $\begin{bmatrix} 1 \\ -1 \\ 2 \end{bmatrix}$

(D) $\begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix}$

Answer: (C) $\begin{bmatrix} 1 \\ -1 \\ 2 \end{bmatrix}$ · The council's preliminary key

Q28 TS EAPCET 2025 · 4 May · Shift 1 MCQ

The positive value of 'a' for which the system of linear homogeneous equations $x + ay + z = 0,\ ax + 2y - z = 0,\ 2x + 3y + z = 0$ has non-trivial solutions is

(A) 0

(B) 1

(C) $\frac{1+\sqrt{5}}{2}$

(D) $\frac{\sqrt{5}-1}{2}$

Answer: (C) $\frac{1+\sqrt{5}}{2}$ · The council's preliminary key

Q29 TS EAPCET 2025 · 4 May · Shift 1 MCQ

$K = \begin{vmatrix} 3 & 4 \\ 5 & 4 \end{vmatrix} + \begin{vmatrix} 1 & -1 \\ 5 & 4 \end{vmatrix} + \begin{vmatrix} \frac{1}{3} & \frac{1}{4} \\ 5 & 4 \end{vmatrix} + \begin{vmatrix} \frac{1}{9} & -\frac{1}{16} \\ 5 & 4 \end{vmatrix} + \cdots$ to ∞, then $K =$

(A) 1

(B) 2

(C) 3

(D) 4

Answer: (B) 2 · The council's preliminary key

Q30 TS EAPCET 2025 · 4 May · Shift 2 MCQ

The number of real values of 'a', for which the system of equations $2x + 3y + az = 0$, $x + ay - 2z = 0$ and $3x + y + 3z = 0$ has nontrivial solutions is

(A) 2
(B) 1
(C) 0
(D) Infinity

Answer: (C) 0 · The council's preliminary key

Q31 TS EAPCET 2025 · 3 May · Shift 1 MCQ

The system of linear equations $(\sin\theta)x + y - 2z = 0$, $2x - y + (\cos\theta)z = 0$ and $-3x + (\sec\theta)y + 3z = 0$, where $\theta \neq (2n+1)\frac{\pi}{2}$, has non-trivial solution for

(A) no value of θ
(B) $\theta = n\pi + \frac{\pi}{4}, n \in z$
(C) $\theta = \mathrm{Tan}^{-1}\left(\frac{3}{4}\right)$
(D) $\theta = \mathrm{Tan}^{-1}\left(\frac{4}{3}\right)$

Answer: (A) no value of θ · The council's preliminary key

Q32 TS EAPCET 2025 · 3 May · Shift 1 MCQ

The sum of all the roots of the equation $\begin{vmatrix} x & -3 & 2 \\ -1 & -2 & (x-1) \\ 1 & (x-2) & 3 \end{vmatrix} = 0$ is

(A) 13
(B) 3
(C) 2
(D) 7

Answer: (B) 3 · The council's preliminary key

Q33 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If the system of linear equations $(\sin\theta)x - y + z = 0$, $x - (\cos\theta)y + z = 0$, $x + y + (\sin\theta)z = 0$ has non-trivial solution, then the least positive value of θ is

(A) $\frac{\pi}{6}$
(B) $\frac{\pi}{4}$
(C) $\frac{\pi}{3}$
(D) $\frac{\pi}{2}$

Answer: (D) $\frac{\pi}{2}$ · The council's preliminary key

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Q34 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If $\begin{vmatrix} 9 & 25 & 16 \\ 16 & 36 & 25 \\ 25 & 49 & 36 \end{vmatrix} = K$, then K, K+1 are the roots of the equation

(A) $x^2 - 13x + 42 = 0$

(B) $x^2 - 15x + 56 = 0$

(C) $x^2 - 19x + 90 = 0$

(D) $x^2 - 17x + 72 = 0$

Answer: (D) $x^2 - 17x + 72 = 0$ · The council's preliminary key

Q35 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If $\Delta_r = \begin{vmatrix} \frac{1}{3r-2} & \frac{2}{3r-5} \\ 0 & \frac{3}{3r+1} \end{vmatrix}$, then $\sum_{r=1}^{33} \Delta_r =$

(A) 0.99

(B) 0.33

(C) 0.66

(D) 0.55

Answer: (A) 0.99 · The council's preliminary key

Q36 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If $\begin{vmatrix} 1 & 2 & 3-\lambda \\ 0 & -1-\lambda & 2 \\ 1-\lambda & 1 & 3 \end{vmatrix} = A\lambda^3 + B\lambda^2 + C\lambda + D$, then $D + A =$

(A) 1

(B) -4

(C) -5

(D) 3

Answer: (D) 3 · The council's preliminary key

Q37 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If $\begin{vmatrix} a & 1 & 1 \\ 1 & b & 1 \\ 1 & 1 & c \end{vmatrix} > 0$, then $abc >$

(A) 1
(B) -8
(C) 8
(D) 3

Answer: (B) -8 · The council's preliminary key

Q38 AP EAPCET 2024 · 22 May · Shift 2 MCQ

If α, β, γ $(\alpha < \beta < \gamma)$ are the values of x such that $\begin{bmatrix} x-2 & 0 & 1 \\ 1 & x+3 & 2 \\ 2 & 0 & 2x-1 \end{bmatrix}$ is a singular matrix then $2\alpha + 3\beta + 4\gamma =$

(A) 4
(B) 0
(C) 1
(D) 2

Answer: (A) 4 · The council's preliminary key

Q39 AP EAPCET 2024 · 21 May · Shift 2 MCQ

$$\begin{vmatrix} a+b+2c & a & b \\ c & b+c+2a & b \\ c & a & c+a+2b \end{vmatrix} =$$

(A) $(a+b+c)^3$
(B) $2(a+b+c)^3$
(C) $3(a+b+c)^3$
(D) $(a+b+c)$

Answer: (B) $2(a+b+c)^3$ · The council's preliminary key

Q40 AP EAPCET 2024 · 20 May · Shift 1 MCQ

Sum of the positive roots of the equation

$$\begin{vmatrix} x^2+2x & x+2 & 1 \\ 2x+1 & x-1 & 1 \\ x+2 & -1 & 1 \end{vmatrix} = 0$$

is

(A) $\frac{1+\sqrt{13}}{2}$

(B) 1

(C) $\frac{\sqrt{13}-1}{2}$

(D) 3

Answer: (A) $\frac{1+\sqrt{13}}{2}$ · The council's preliminary key

Q41 AP EAPCET 2024 · 20 May · Shift 2 MCQ

$$\begin{vmatrix} a & b & c \\ a^2 & b^2 & c^2 \\ 1 & 1 & 1 \end{vmatrix}$$

is not equal to

(A) $\begin{vmatrix} a+1 & b+1 & c+1 \\ a^2+1 & b^2+1 & c^2+1 \\ 1 & 1 & 1 \end{vmatrix}$

(B) $\begin{vmatrix} a-b & b-c & c \\ a^2-b^2 & b^2-c^2 & c^2 \\ 0 & 0 & 1 \end{vmatrix}$

(C) $\begin{vmatrix} a(a+1) & b(b+1) & c(c+1) \\ a+1 & b+1 & c+1 \\ -1 & -1 & -1 \end{vmatrix}$

(D) $\begin{vmatrix} a+b & b+c & c+a \\ a^2+b^2 & b^2+c^2 & c^2+a^2 \\ 2 & 2 & 2 \end{vmatrix}$

Answer: (D)

$$\begin{vmatrix} a+b & b+c & c+a \\ a^2+b^2 & b^2+c^2 & c^2+a^2 \\ 2 & 2 & 2 \end{vmatrix}$$

· The council's preliminary key

Q42 AP EAPCET 2024 · 19 May · Shift 2 MCQ

$$\begin{vmatrix} 1 & 1 & 1 \\ a^2 & b^2 & c^2 \\ a^3 & b^3 & c^3 \end{vmatrix} =$$

(A) $(a-b)(b-c)(c-a)(a+b+c)$

(B) $(a-b)(b-c)(c-a)$

(C) $(a-b)(b-c)(a-c)(ab+bc+ca)$

(D) $(a-b)(b-c)(c-a)(ab+bc+ca)$

Answer: (D) $(a-b)(b-c)(c-a)(ab+bc+ca)$ · The council's preliminary key

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Q43 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If α, β, γ are the roots of $\begin{vmatrix} 1-x & -2 & 1 \\ -2 & 4-x & -2 \\ 1 & -2 & 1-x \end{vmatrix} = 0$, then $\alpha\beta + \beta\gamma + \gamma\alpha =$

(A) 6
(B) 8
(C) 0
(D) -4

Answer: (C) 0 · The council's preliminary key

Q44 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If the determinant of a 3rd order matrix A is K, then the sum of the determinants of the matrices (AA^T) and $(A - A^T)$ is

(A) $2K$
(B) 0
(C) K^2
(D) K

Answer: (C) K^2 · The council's preliminary key

Q45 AP EAPCET 2024 · 18 May · Shift 1 MCQ

While solving a system of linear equations $AX = B$ using Cramer's rule with the usual notation if

$$\Delta = \begin{vmatrix} 1 & 1 & 1 \\ 2 & -1 & 2 \\ -1 & 1 & 5 \end{vmatrix}; \Delta_1 = \begin{vmatrix} 5 & 1 & 1 \\ 4 & -1 & 2 \\ 11 & 1 & 5 \end{vmatrix}$$

and $X = \begin{bmatrix} \alpha \\ 2 \\ \beta \end{bmatrix}$, then $\alpha^2 + \beta^2 =$

(A) 9
(B) 13
(C) 5
(D) 25

Answer: (C) 5 · The council's preliminary key

Q46 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If $x = k$ satisfies the equation $\begin{vmatrix} x-2 & 3x-3 & 5x-5 \\ x-4 & 3x-9 & 5x-25 \\ x-8 & 3x-27 & 5x-125 \end{vmatrix} = 0$, then $x = k$ also satisfies the equation

(A) $x^2 + x - 2 = 0$
(B) $x^2 - x - 6 = 0$
(C) $x^2 - 2x - 8 = 0$
(D) $x^2 + 2x - 3 = 0$

Answer: (D) $x^2 + 2x - 3 = 0$ · The council's preliminary key

Q47 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If the homogeneous system of linear equations $x - 2y + 3z = 0$, $2x + 4y - 5z = 0$, $3x + \lambda y + \mu z = 0$ has non-trivial solution, then $8\mu + 11\lambda =$

(A) 2
(B) 6
(C) -6
(D) -2

Answer: (B) 6 · The council's preliminary key

Q48 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If $a \neq b \neq c$, $\Delta_1 = \begin{vmatrix} 1 & a^2 & bc \\ 1 & b^2 & ca \\ 1 & c^2 & ab \end{vmatrix}$, $\Delta_2 = \begin{vmatrix} 1 & 1 & 1 \\ a^2 & b^2 & c^2 \\ a^3 & b^3 & c^3 \end{vmatrix}$ and $\frac{\Delta_1}{\Delta_2} = \frac{6}{11}$, then $11(a + b + c) =$

(A) 0
(B) 1
(C) $ab + bc + ca$
(D) $6(ab + bc + ca)$

Answer: (D) $6(ab + bc + ca)$ · The council's preliminary key

Q49 TS EAPCET 2024 · 10 May · Shift 2 MCQ

$A = [a_{ij}]$ is a 3×3 matrix with positive integers as its elements. Elements of A are such that the sum of all the elements of each row is equal to 6 and $a_{22} = 2$.

If $a_{ii} = \begin{cases} a_{ij} + a_{ji}, & j = i + 1 \text{ when } i < 3 \\ a_{ij} + a_{ji}, & j = 4 - i \text{ when } i = 3 \end{cases}$ for $i = 1, 2, 3$, then $|A| =$

(A) 6
(B) 18
(C) 3
(D) 12

Answer: (D) 12 · The council's preliminary key

Q50 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The system of equations $x+3by+bz=0$, $x+2ay+az=0$ and $x+4cy+cz=0$ has

(A) only zero solution for any values of a, b, c

(B) non- zero solution for any values of a, b, c

(C) non- zero solution, whenever $b(a+c)=2ac$

(D) non- zero solution, whenever $a+c=2b$

Answer: (C) non- zero solution, whenever $b(a+c)=2ac$ · The council's preliminary key

Q51 TS EAPCET 2024 · 10 May · Shift 2 MCQ

$$\begin{vmatrix} \frac{-bc}{a^2} & \frac{c}{a} & \frac{b}{a} \\ \frac{c}{b} & \frac{-ac}{b^2} & \frac{a}{b} \\ \frac{b}{c} & \frac{a}{c} & \frac{-ab}{c^2} \end{vmatrix} =$$

(A) 0

(B) 4

(C) -1

(D) $\frac{a^2+b^2+c^2}{a^2b^2c^2}$

Answer: (B) 4 · The council's preliminary key

Q52 TS EAPCET 2024 · 9 May · Shift 1 MCQ

$$\det\begin{bmatrix} \frac{a^2+b^2}{c} & c & c \\ a & \frac{b^2+c^2}{a} & a \\ b & b & \frac{c^2+a^2}{b} \end{bmatrix} =$$

(A) $(a-b)(b-c)(c-a)$

(B) $(a+b)(b+c)(c+a)$

(C) $2abc$

(D) $4abc$

Answer: (D) $4abc$ · The council's preliminary key

Q53 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If α, β, γ are the roots of the equation $\begin{vmatrix} x & 2 & 2 \\ 2 & x & 2 \\ 2 & 2 & x \end{vmatrix} = 0$ and $\min(\alpha, \beta, \gamma) = \alpha$, then $2\alpha + 3\beta + 4\gamma =$

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(A) 6
(B) 8
(C) -6
(D) -8

Answer: (A) 6 · The council's preliminary key

Q54 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If $f(x)=\begin{vmatrix}1 & 6+x & 36+x^2\\ 0 & x-3 & 3x^2-27\\ 0 & 2x-4 & 8x^2-32\end{vmatrix}$, then $\lim_{x\to 1}\dfrac{f(x)}{f(-x)}=$

(A) 2
(B) -1
(C) 0
(D) 1

Answer: (C) 0 · The council's preliminary key

Q55 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If P, Q and R are 3×3 matrices such that

$$\begin{pmatrix}3x^2+x+3 & 2x^2-x+4 & 7x^2+8x+5\\ 5x^2+3x+2 & 4x^2-2x-1 & 7x^2+5x+8\\ 3x^2+2x+5 & 4x^2-x-2 & 3x^2+8x+7\end{pmatrix}=Px^2+Qx+R,$$

then $\det R=$

(A) 0
(B) 136
(C) 48
(D) -72

Answer: (B) 136 · The council's preliminary key

Q56 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If the cofactors of the elements 3, 7 and 6 of the matrix $\begin{bmatrix}1 & 2 & 3\\ 4 & -1 & 7\\ 2 & 4 & 6\end{bmatrix}$ are a, b and c respectively, then

$[a\ b\ c]\begin{bmatrix}1\\4\\2\end{bmatrix}+[a\ b\ c]\begin{bmatrix}3\\7\\6\end{bmatrix}=$

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(A) -1

(B) 1

(C) 0

(D) 3

Answer: (C) 0 · The council's preliminary key

Q57 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If $\begin{vmatrix}(1+\alpha)^2 & (1+2\alpha)^2 & (1+3\alpha)^2\\(2+\alpha)^2 & (2+2\alpha)^2 & (2+3\alpha)^2\\(3+\alpha)^2 & (3+2\alpha)^2 & (3+3\alpha)^2\end{vmatrix} = k$, and $\alpha = -2$ then $k =$

(A) 0

(B) -24

(C) 24

(D) 64

Answer: (D) 64 · The council's preliminary key

Q58 TS EAMCET 2023 · 13 May · Shift 1 MCQ

$$\begin{vmatrix}2 & 3 & 5\\3 & 5 & 2\\5 & 2 & 3\end{vmatrix} + \begin{vmatrix}1 & 1 & 1\\7 & 11 & 13\\49 & 121 & 169\end{vmatrix} =$$

(A) 32

(B) -67

(C) 93

(D) -22

Answer: (D) -22 · The council's preliminary key

Q59 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If $A = \begin{bmatrix}5 & 5\alpha & \alpha\\0 & \alpha & 5\alpha\\0 & 0 & 5\end{bmatrix}$ and $\det(A^2) = 25$, then $|\alpha| =$

(A) 5

(B) 5^2

(C) 1

(D) $\frac{1}{5}$

Answer: (D) $\frac{1}{5}$ · The council's preliminary key

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Q60 TS EAMCET 2023 · 12 May · Shift 2 MCQ

$$\begin{vmatrix} \sqrt{3} & 2\sqrt{5} & \sqrt{5} \\ \sqrt{15} & 5 & \sqrt{10} \\ 3 & \sqrt{15} & 5 \end{vmatrix} =$$

(A) $5\sqrt{2} - 3\sqrt{3}$
(B) $5\sqrt{3} - 3\sqrt{5}$
(C) $10\sqrt{3} - 15\sqrt{2}$
(D) $15\sqrt{2} - 25\sqrt{3}$

Answer: (D) $15\sqrt{2} - 25\sqrt{3}$ · The council's preliminary key

Q61 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If $\omega \neq 1$ is a cube root of unity, then

$$\begin{vmatrix} \omega + \omega^2 & \omega^2 + \omega^9 & \omega^9 + \omega \\ \omega^{27} + \omega^{31} & \omega^{31} + \omega^{17} & \omega^{17} + \omega^{27} \\ \omega^{30} + \omega^{41} & \omega^{41} + \omega^{19} & \omega^{19} + \omega^{30} \end{vmatrix} =$$

(A) 3
(B) 2
(C) 1
(D) 0

Answer: (D) 0 · The council's preliminary key

Q62 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If $f(x) = \begin{vmatrix} x & x+1 & x+3 \\ x+2 & x+4 & x+7 \\ x+6 & x+9 & x+13 \end{vmatrix}$, then $f(5) =$

(A) -15
(B) 10
(C) -2
(D) 0

Answer: (C) -2 · The council's preliminary key

Q63 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If a, b, c are the sides of a triangle ABC and $\begin{vmatrix} b & 1 & a \\ a & 1 & c \\ c & 1 & b \end{vmatrix} = 0$, then $2(\cos A + \cos B + \cos C) =$

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(A) 1
(B) 2
(C) 3
(D) 4

Answer: (C) 3 · The council's preliminary key

Q64 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If $f(x)=\begin{vmatrix} 2\cos^2 x & \sin 2x & \sin x \\ \sin 2x & 2\sin^2 x & -\cos x \\ \sin x & -\cos x & 0 \end{vmatrix}$ then $\int_0^{\pi/4}(2|f(x)|+5f'(x))\,dx=$

(A) 0
(B) $\frac{\pi}{4}$
(C) $\frac{\pi}{2}$
(D) π

Answer: (D) π · The council's preliminary key

Q65 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

In the matrix $\begin{bmatrix} -1 & x & 3 \\ -4 & -5 & -6 \\ -7 & y & 9 \end{bmatrix}$, if the cofactors of -6 and -7 are respectively 22 and 27, then $5x+y=$

(A) 0
(B) -1
(C) -2
(D) -4

Answer: (C) -2 · The council's preliminary key

Q66 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Consider the simultaneous linear equations $\beta x+\alpha y-z=-1,\ 3x-\beta y+\alpha z=0\ \alpha x+\beta y+z=1.$ In the usual notation used in Crammer's rule, given that $\frac{\Delta_1}{\Delta}=-1,\ \frac{\Delta_2}{\Delta}=1,\ \frac{\Delta_3}{\Delta}=2$, then $(\alpha,\beta)=$

(A) $(1,2)$
(B) $(2,1)$
(C) $(-1,2)$
(D) $(1,-2)$

Answer: (B) $(2,1)$ · The council's preliminary key

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Q67 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If $\begin{vmatrix} 2+3i & i \\ 1-2i & -i \end{vmatrix} = x+iy$, then $x+y=$

(A) -2

(B) -4

(C) -8

(D) 4

Answer: (A) -2 · The council's preliminary key

Q68 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If $f(x) = \begin{vmatrix} -\sin x & 2\sin 2x & 4\cos^2 x \\ \cos x & 4\sin^2 x & 2\sin 2x \\ 0 & -\cos x & \sin x \end{vmatrix}$ then $f\left(\frac{5\pi}{4}\right) + f'\left(\frac{5\pi}{4}\right) =$

(A) 0

(B) -1

(C) -2

(D) -4

Answer: (D) -4 · The council's preliminary key

Q69 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Let A, B be two 3×3 matrices and C be a 3×3 unit matrix such that $AB - C$ is a non-singular matrix. Let $D = (AB - C)^{-1}$. Then, consider the following statements.

Statement I : $|BA| = |BA - C||BDA|$

Statement II : $ABD = DAB$

Which of the above statements is(are) true?

(A) Statement I is true, but Statement II is false

(B) Statement II is true, but Statement I is false

(C) Both Statement I and Statement II are true

(D) Both Statement I and Statement II are false

Answer: (C) Both Statement I and Statement II are true · The council's preliminary key

Q70 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

$\begin{vmatrix} 1 & 1 & 1 \\ a^2 & b^2 & c^2 \\ a^3 & b^3 & c^3 \end{vmatrix} =$

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(A) $a^2b^2(a-b)+b^2c^2(b-c)+c^2a^2(c-a)$
(B) $a^2(b^3-c^3)+b^2(c^3-a^3)+c^2(a^3-b^3)$
(C) $a^3(b^2-c^2)+b^3(c^2-a^2)+c^3(a^2-b^2)$
(D) $ab(a^3-b^3)+bc(b^3-c^3)+ca(c^3-a^3)$

Answer: (B) $a^2(b^3-c^3)+b^2(c^3-a^3)+c^2(a^3-b^3)$ · The council's preliminary key

Q71 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A, P, B are 3×3 matrices. If $|-B|=5$, $|BA^T|=15$, $|P^TAP|=-27$, then one of the values of $|P|$ is

(A) 3
(B) -5
(C) 9
(D) 6

Answer: (A) 3 · The council's preliminary key

Q72 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

Let $x=\alpha$, $y=\beta$, $z=\gamma$ be the unique solution of the system of simultaneous linear equations $2x+3y-2z+4=0$, $3x-4y+3z+5=0$, $kx-2y+z+3=0$. If $\alpha=-2$ then $k=$

(A) $\begin{vmatrix}1&2\\3&5\end{vmatrix}$
(B) $\begin{vmatrix}5&3\\1&2\end{vmatrix}$
(C) $\begin{vmatrix}3&5\\1&2\end{vmatrix}$
(D) $\begin{vmatrix}3&5\\2&1\end{vmatrix}$

Answer: (C) $\begin{vmatrix}3&5\\1&2\end{vmatrix}$ · The council's preliminary key

Q73 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

If $A=\begin{bmatrix}x&2&1\\2&x&1\\2&1&0\end{bmatrix}$ and $\det(A^3)=125$, then $x=$

(A) $1/3$
(B) 3
(C) $-\frac{1}{3}$
(D) -3

Answer: (A) $1/3$ · The council's preliminary key

Q74 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

If $A=\begin{bmatrix} x & 1 & 2 \\ 2 & 4 & x \\ -3 & 3 & 2 \end{bmatrix}$ is a singular matrix and the distinct values of x are x_1 and x_2, then $x_1+x_2+x_1x_2=$

(A) 9
(B) $11/3$
(C) $15/3$
(D) 7

Answer: (A) 9 · The council's preliminary key

Q75 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If b and c are non zero real numbers, $A=\begin{bmatrix} 1 & b & c \\ b & 2 & 3 \\ c & 3 & 4 \end{bmatrix}$ and $B=\begin{bmatrix} 0 & b & c \\ -b & 0 & 2 \\ -c & -2 & 0 \end{bmatrix}$, then $\det(A+B)=$

(A) 3
(B) 1
(C) -1
(D) 0

Answer: (A) 3 · The council's preliminary key

Q76 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

For i = 1,2,3 and j = 1,2,3
If $a_i^2+b_i^2+c_i^2=1$, $a_ia_j+b_ib_j+c_ic_j=0, \forall\, i\neq j$
and $A=\begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix}$ then $\det(AA^T)=$

(A) 0
(B) 1
(C) -1
(D) 3

Answer: (B) 1 · The council's preliminary key

Q77 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

If $A=\begin{bmatrix} \alpha^2 & 5 \\ 5 & -\alpha \end{bmatrix}$ and $\det(A^{10})=1024$, then $\alpha=$

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(A) -2
(B) -1
(C) -3
(D) 0

Answer: (C) -3 · The council's preliminary key

Q78 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

Let $A = \begin{bmatrix} 5 & \sin^2\theta & \cos^2\theta \\ -\sin^2\theta & -5 & 1 \\ \cos^2\theta & 1 & 5 \end{bmatrix}$. Then maximum value of det (A) is

(A) -125
(B) 200
(C) $-\frac{255}{2}$
(D) 145

Answer: (A) -125 · The council's preliminary key

Q79 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If a, b, c are respectively the 5th, 8th, 13th terms of an arithmetic progression, then $\begin{vmatrix} a & 5 & 1 \\ b & 8 & 1 \\ c & 13 & 1 \end{vmatrix} =$

(A) 0
(B) 1
(C) abc
(D) 520

Answer: (A) 0 · The council's preliminary key

Q80 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

Let $A = \begin{bmatrix} -2 & x & 1 \\ x & 1 & 1 \\ 2 & 3 & -1 \end{bmatrix}$. If the roots of the equation $\det A = 0$ are l, m then $l^3 - m^3 =$

(A) 35
(B) -35
(C) 19
(D) -19

Options (3) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

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Q81 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $\det A = \begin{vmatrix} 5 & 3 & 1 \\ 5 & 3 & 2 \\ 5 & 3 & m \end{vmatrix}$, $\det B = \begin{vmatrix} 2 & 3 & 1 \\ 3 & b & 2 \\ 2 & 3 & 5 \end{vmatrix}$, $\det C = \begin{vmatrix} k & 3 & 1 \\ 2 & 3 & 2 \\ 3 & 3 & 5 \end{vmatrix}$ and $\det A = \det B + \det C$, then

(A) $k = 3, b = 3, m = 5$

(B) $k = 2, b = 3, m = 10$

(C) $k = 3, b = 0, m = 5$

(D) $k = 2, b = 3, m = 5$

Answer: (A) $k = 3, b = 3, m = 5$ · The council's preliminary key

Q82 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

For what values of λ, the following equations are consistent?

$x + y - 3 = 0,\ (1+\lambda)x + (2+\lambda)y - 8 = 0,\ x - (1+\lambda)y + (2+\lambda) = 0$

(A) $-5/3$

(B) $5/3$

(C) $+2$

(D) -2

Answer: (A) $-5/3$ · The council's preliminary key

Q83 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If A and B are two square matrices with $\det A = 5$ and $\det(B^T.A^T) = -15$, then $\det B$ is equal to

(A) 3

(B) -3

(C) 0

(D) 1

Answer: (B) -3 · The council's preliminary key

Q84 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If $\Delta_k = \begin{vmatrix} 1 & 0 & 0 \\ 0 & k & k-1 \\ 0 & k-1 & k \end{vmatrix}$ then $\Delta_1 + \Delta_2 + \cdots + \Delta_{20} =$

(A) 200

(B) 40

(C) 0

(D) 400

Answer: (D) 400 · The council's preliminary key

Q85 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The values of 'x' for which the given matrix $\begin{bmatrix} -x & x & 2 \\ 2 & x & -x \\ x & -2 & -2 \end{bmatrix}$ will be non-singular are

(A) $-2 \leq x \leq 2$

(B) For all x other than 2 and -2

(C) $x \geq 2$

(D) $x \leq -2$

Answer: (B) For all x other than 2 and -2 · The council's preliminary key

Q86 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If a, b, c are real numbers such that $a^2 + b^2 + c^2 - ab - bc - ac \leq 0$, then $\begin{vmatrix} (a-b+1)^5 & b^7 - c^7 & c^9 - a^9 \\ a^{11} - b^{11} & (b-c+2)^3 & c^{13} - a^{13} \\ a^{15} - b^{15} & b^{17} - c^{17} & (c-a+3)^1 \end{vmatrix} =$

(A) $2abc$

(B) 0

(C) $24abc$

(D) 24

Answer: (D) 24 · The council's preliminary key

Q87 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

The number of solutions of the following system of linear homogenous equations $x - y + z = 0,\ x + 2y - z = 0,\ 2x + y + 3z = 0$ is _____

(A) 1

(B) 8

(C) Countable infinite

(D) Uncountable

Answer: (A) 1 · The council's preliminary key

Q88 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If each element, of a determinant of third order with value A, is multiplied by 3, then the value of newly formed determinant is _____

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(A) $3A$

(B) $9A$

(C) $27A$

(D) $-27A$

Answer: (C) $27A$ · The council's preliminary key

Q89 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If the determinant $\begin{vmatrix} \cos 2x & \sin^2 x & \cos 2x \\ \sin^2 x & \cos 2x & \cos^2 x \\ \cos 2x & \cos^2 x & \cos 2x \end{vmatrix}$ is expanded in powers of $\cos x$, then the constant term in the expansion is

(A) 1

(B) -1

(C) 0

(D) 2

Answer: (A) 1 · The council's preliminary key

Q90 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Let $A = \begin{bmatrix} 1 & 3 \\ 4 & -3 \end{bmatrix}$. Let $S = \left\{ \begin{bmatrix} x \\ y \end{bmatrix} \in R^2 / A \begin{bmatrix} x \\ y \end{bmatrix} = 3 \begin{bmatrix} x \\ y \end{bmatrix} \right\}$ what is the cardinality of S ?

(A) 1

(B) Countably infinite

(C) $|S| > 1$ but S is finite

(D) Uncountable

Answer: (D) Uncountable · The council's preliminary key

Q91 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Sum of the roots of the equation $\begin{vmatrix} x & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & x & 0 & 0 \\ 2 & 0 & x-1 & 0 \end{vmatrix} - \begin{vmatrix} 0 & x & 0 \\ 0 & 0 & x-1 \\ 2 & 2 & 0 \end{vmatrix} = 0$ is

(A) 2

(B) 3

(C) 1

(D) 5

Answer: (B) 3 · The council's preliminary key

Q92 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Let $0 \neq a \in z$ and $A = \begin{bmatrix} a & a & a-y \\ a & a+x & a \\ a & a & a \end{bmatrix}$ be a matrix. Then equation $\det A = 16$ represents

(A) a parabola
(B) a circle
(C) an ellipse
(D) a rectangular hyperbola

Answer: (D) a rectangular hyperbola · The council's preliminary key

Q93 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If ω is a root of the equation $x + \frac{1}{x} + 1 = 0$, then $\begin{vmatrix} 1 & 1+\omega & 1+\omega+\omega^2 \\ 3 & 4+3\omega & 5+4\omega+3\omega^2 \\ 6 & 9+6\omega & 11+9\omega+6\omega^2 \end{vmatrix} =$

(A) 1
(B) -1
(C) 0
(D) $1+\omega$

Answer: (B) -1 · The council's preliminary key

Q94 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If $A = \begin{bmatrix} 2 & 1 & 3 \\ -1 & 2 & 0 \\ 4 & 1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 2 & 1 \\ 1 & 2 & 3 \\ 3 & 1 & 0 \end{bmatrix}$ then $\det(2B^{-1}A^{-1}) =$

(A) $\frac{1}{6}$
(B) $\frac{-1}{24}$
(C) $\frac{1}{3}$
(D) $\frac{-1}{6}$

Answer: (D) $\frac{-1}{6}$ · The council's preliminary key

Q95 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

The value of the determinant $\begin{vmatrix} a+b & a+2b & a+3b \\ a+2b & a+3b & a+4b \\ a+4b & a+5b & a+6b \end{vmatrix}$ is _____

(A) a
(B) b
(C) 0
(D) $a+b$

Answer: (C) 0 · The council's preliminary key

Q96 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

If $\begin{vmatrix} x^3+2x^2+3x-2 & x^2+2x+4 \\ x^3-x^2-2x-1 & 3x^3-2x^2+4x-2 \end{vmatrix} = ax^6+bx^5+cx^4+dx^3+ex^2+fx+g$, then $a+b+c+d+e+f=$

(A) 23
(B) 25
(C) 21
(D) 20

Answer: (B) 25 · The council's preliminary key

Q97 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

If $A(\theta)=\begin{bmatrix} i\sin\theta & \cos\theta \\ \cos\theta & i\sin\theta \end{bmatrix}$ is a matrix where $i=\sqrt{-1}$, then which of the following is not true

(A) $\det A(\pi+\theta)=\det A(-\theta)$
(B) $\det A(-\theta)=\det A(\theta)$
(C) $\det[A(\theta)]^{-1}=1$
(D) $\det A(-\theta)=-1$

Answer: (C) $\det[A(\theta)]^{-1}=1$ · The council's preliminary key

Q98 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If A, B, C are the angles of a triangle then the system of equations $-x+y\cos C+z\cos B=0,\ x\cos C-y+z\cos A=0,\ x\cos B+y\cos A-z=0$ has _____

(A) only zero solution
(B) a non-zero solution for all triangles ΔABC
(C) only zero solution but for certain values of A, B, C
(D) a non-zero solution if ΔABC is an equilateral triangle & not for all triangles

Answer: (B) a non-zero solution for all triangles ΔABC · The council's preliminary key

Q99 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

What is the value of $\begin{vmatrix} a & b & c \\ a-b & b-c & c-a \\ b+c & c+a & a+b \end{vmatrix}$ =?

(A) $a^3+b^3+c^3+3abc$

(B) $a^3+b^3+c^3-3abc$

(C) $a^3+b^3+c^3-6abc$

(D) $a^3+b^3+c^3+6abc$

Answer: (B) $a^3+b^3+c^3-3abc$ · The council's preliminary key

Q100 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $k \in R$ and $\det A = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} = k$ then $\det B = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2+2a_1 & b_2+2b_1 & c_2+2c_1 \\ a_3 & b_3 & c_3 \end{vmatrix}$ is equal to

(A) 0

(B) 2K

(C) K

(D) K^2

Answer: (C) K · The council's preliminary key

Q101 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $\begin{vmatrix} x & x^2 & 1+x^3 \\ y & y^2 & 1+y^3 \\ z & z^2 & 1+z^3 \end{vmatrix} = 0$ and x, y, z are all distinct, then $xyz =$

(A) -1

(B) 1

(C) 0

(D) 3

Answer: (A) -1 · The council's preliminary key

Q102 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

Let Z_1, Z_2, Z_3 be three non zero complex numbers such that $a = |Z_1|, b = |Z_2|, c = |Z_3|$. if the determinant $\begin{vmatrix} a & b & c\,b & c & a\,c & a & b \end{vmatrix} = 0$, then

(A) $|Z_1| = |Z_2| = |Z_3|$

(B) $|Z_1| + |Z_2| + |Z_3| = 0$

(C) $|Z_1| + |Z_2| + |Z_3| = abc$

(D) $|Z_1 - Z_2| = |Z_2 - Z_3|$

Answer: (A) $|Z_1| = |Z_2| = |Z_3|$ · Checked by our team

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Q103 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $f(x)=\begin{vmatrix} x & x^2 & x^3 \\ 1 & 2x & 3x^2 \\ 0 & 2 & 6x \end{vmatrix}$, then the ratio $f''(x) : f'(x) =$ _____

(A) $2 : x$

(B) $x^2 : x$

(C) $3x : 2$

(D) $6 : x$

Answer: (A) $2 : x$ · The council's preliminary key

Q104 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The equation whose roots are the values of the equation $\begin{vmatrix} 1 & -3 & 1 \\ 1 & 6 & 4 \\ 1 & 3x & x^2 \end{vmatrix} = 0$ is

(A) $x^2+x+2=0$

(B) $x^2+x-2=0$

(C) $x^2+2x+2=0$

(D) $x^2-x-2=0$

Answer: (D) $x^2-x-2=0$ · The council's preliminary key

Q105 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If $a_1, a_2, \ldots a_9$ are in G.P. then $\begin{vmatrix} \log a_1 & \log a_2 & \log a_3 \\ \log a_4 & \log a_5 & \log a_6 \\ \log a_7 & \log a_8 & \log a_9 \end{vmatrix}$ is equal to

(A) $\log(a_1, a_2, \ldots a_n)$

(B) 1

(C) $(\log a_9)^9$

(D) 0

Answer: (D) 0 · The council's preliminary key

Q106 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

The value of $\begin{vmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{vmatrix}$ is

(A) abc

(B) $(a+b)(b+c)(c+a)$

(C) $4abc$

(D) $(a-b)(b-c)(c-a)$

Answer: (C) $4abc$ · The council's preliminary key

Q107 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Let a, b, c be such that $b+c \neq 0$ and $\begin{vmatrix} a & a+1 & a-1 \\ -b & b+1 & b-1 \\ c & c-1 & c+1 \end{vmatrix} + \begin{vmatrix} a+1 & b+1 & c-1 \\ a-1 & b-1 & c+1 \\ (-1)^{n+2}a & (-1)^{n-1}b & (-1)^n c \end{vmatrix} = 0$, then the value of 'n' is

(A) Zero

(B) Any even integer

(C) Any odd integer

(D) Any integer

Answer: (C) Any odd integer · The council's preliminary key

Q108 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

If $\begin{vmatrix} \alpha & \beta & \gamma \\ a & b & c \\ l & m & n \end{vmatrix} = (-1)^K \begin{vmatrix} m & n & l \\ b & c & a \\ \beta & \gamma & \alpha \end{vmatrix}$, then the least value of K is

(A) 2

(B) 3

(C) 4

(D) 5

Answer: (B) 3 · The council's preliminary key

Q109 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

If $f(x) = \begin{vmatrix} x^3+x & x+1 & x-2 \\ 2x^3+3x-1 & 3x & 3x-3 \\ x^3+2x+3 & 2x-1 & 2x-1 \end{vmatrix}$, then $\frac{d}{dx}(f(x)) =$

(A) 24

(B) 0

(C) -6

(D) 12

Answer: (A) 24 · The council's preliminary key

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Q110 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

Let A and B be two 3×3 non singular matrices, such that $\det(A^T BA) = 27$ and $\det(AB^{-1}) = 8$. Then $\det(B^T A^{-1} B) =$

(A) $\frac{3}{32}$
(B) $\frac{1}{16}$
(C) 1
(D) 16

Answer: (A) $\frac{3}{32}$ · The council's preliminary key

Q111 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If $\Delta = \begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} = K(a-b)(b-c)(c-a)$, then $K =$

(A) -1
(B) 1
(C) 2
(D) 3

Answer: (B) 1 · The council's preliminary key

Q112 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

If $A_\alpha = \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$, then determinant of $A_{\pi/5} A_{\pi/4} A_{3\pi/10} =$

(A) $\sqrt{2}$
(B) $\frac{1}{\sqrt{2}}$
(C) 0
(D) 1

Answer: (D) 1 · The council's preliminary key

Q113 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

If $\begin{vmatrix} 2 & 2k & 1 \\ 1 & k-1 & 1 \\ 2 & 1 & k+1 \end{vmatrix} = Ak^2 + Bk + C$, then $A + B + C =$

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(A) 0
(B) 1
(C) -1
(D) 2

Answer: (C) -1 · The council's preliminary key

Q114 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If $A=\int_1^{\sin\theta}\frac{t}{1+t^2}\,dt$ and $B=\int_1^{\operatorname{cosec}\theta}\frac{1}{t(1+t^2)}\,dt$ then the value of $\begin{vmatrix} A & A^2 & B \\ e^{A+B} & B^2 & -1 \\ 1 & A^2+B^2 & -1 \end{vmatrix}=$

(A) $\sin\theta$
(B) $\operatorname{cosec}\theta$
(C) 0
(D) 1

Answer: (C) 0 · The council's preliminary key

Q115 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If $ax^4+bx^3+cx^2+50x+d=\begin{vmatrix} x^3-14x^2 & -x & 3x+\lambda \\ 4x+1 & 3x & x-4 \\ -3 & 4 & 0 \end{vmatrix}$, then find '$\lambda$'.

(A) 2
(B) -2
(C) 1
(D) -1

Answer: (A) 2 · The council's preliminary key

Q116 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If $a=1+2+4+\cdots\cdots$ upto n terms, $b=1+3+9+\cdots\cdots$ upto n terms and $c=1+5+25+\cdots\cdots$ upto n terms then $\Delta=\begin{vmatrix} a & 2b & 4c \\ 2 & 2 & 2 \\ 2^n & 3^n & 5^n \end{vmatrix}=$

(A) $(30)^n$
(B) $(10)^n$
(C) 0
(D) $2^n+3^n+5^n$

Answer: (C) 0 · The council's preliminary key

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Q117 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If $f(x)=\begin{vmatrix}\cos x & x & 1\\ 2\sin x & x^2 & 2x\\ \tan x & x & 1\end{vmatrix}$ then the value of $f'(x)$ at $x=0$ is equal to

(A) -1
(B) 1
(C) 2
(D) 0

Answer: (D) 0 · The council's preliminary key

Q118 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If $f(x)=\begin{vmatrix}\cos(x+a+b) & \sin(x+a+b) & 10\\ \cos(x+b+c) & \sin(x+b+c) & 10\\ \cos(x+c+a) & \sin(x+c+a) & 10\end{vmatrix}$ then $\left(f(2019)^{f(2020)}-f(2020)^{f(2019)}\right)=$

(A) 1
(B) -1
(C) 0
(D) 2

Answer: (C) 0 · The council's preliminary key

Q119 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If $\theta\in\left(0,\frac{\pi}{2}\right)$, then $\begin{vmatrix}(\sin\theta+\operatorname{cosec}\theta)^2 & (\sin\theta-\operatorname{cosec}\theta)^2 & 2020\\ (\cos\theta+\sec\theta)^2 & (\cos\theta-\sec\theta)^2 & 2020\\ (\tan\theta+\cot\theta)^2 & (\tan\theta-\cot\theta)^2 & 2020\end{vmatrix}=$

(A) 1
(B) -1
(C) 0
(D) 2020

Answer: (C) 0 · The council's preliminary key

Q120 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

The value of $\begin{vmatrix}\log_5 729 & \log_3 5\\ \log_5 27 & \log_9 25\end{vmatrix}\times\begin{vmatrix}\log_3 5 & \log_{27} 5\\ \log_5 9 & \log_5 9\end{vmatrix}$ is

(A) 1

(B) 6

(C) $\log_5 9$

(D) $(\log_3 5) \times (\log_5 81)$

Answer: (D) $(\log_3 5) \times (\log_5 81)$ · The council's preliminary key

Q121 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

For any $a, b, c \in \mathbf{R}$, the determinant $\begin{vmatrix} bc & b+c & 1 \\ ca & c+a & 1 \\ ab & a+b & 1 \end{vmatrix}$ is equal to

(A) $a(b^2 - c^2) + b(c^2 - a^2) + c(a^2 - b^2)$

(B) $a(b - c) + b(c - a) + c(a - b)$

(C) $(a - b)(b - c)(c - a)$

(D) abc

Answer: (C) $(a - b)(b - c)(c - a)$ · The council's preliminary key

Q122 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Find the value of 'k', if $\begin{vmatrix} k-2 & 2k-3 & 3k-4 \\ k-4 & 2k-9 & 3k-16 \\ k-8 & 2k-27 & 3k-64 \end{vmatrix} = 0$

(A) 1

(B) 2

(C) 3

(D) 4

Answer: (D) 4 · The council's preliminary key

Q123 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If $f(x) = \begin{vmatrix} x-3 & 2x^2-18 & 3x^3-81 \\ x-5 & 2x^2-50 & 4x^3-500 \\ 1 & 2 & 3 \end{vmatrix}$, then $f(1)f(3) + f(3)f(5) + f(5)f(1)$ is equal to

(A) $f(1)$

(B) $f(3)$

(C) $f(1) + f(3)$

(D) $f(1) + f(5)$

Answer: (B) $f(3)$ · The council's preliminary key

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Q124 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If a and b are any two real numbers, then $\begin{vmatrix} 2a-2b-4 & 4a & 4a \\ 4 & 2-b-a & 4 \\ 2b & 2b & b-a-2 \end{vmatrix} =$

(A) $4\left[(a+b)^3+8(a+b)^2+16(a+b)+8\right]$

(B) $\frac{1}{2}(a+b+2)^3$

(C) $2\left[(a+b)^3+6(a+b)^2+12(a+b)+8\right]$

(D) $(a+b+2)^3$

Answer: (C) $2\left[(a+b)^3+6(a+b)^2+12(a+b)+8\right]$ · Official TGCHE final key

Q125 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Let $a, b, c, d \in \mathbb{R}$ be such that $ad-bc \neq 0$ and e be a positive number other than 1. If $x^a y^b = e^m$, $x^c y^d = e^n$, $\Delta_1 = \begin{vmatrix} m & b \\ n & d \end{vmatrix}$, $\Delta_2 = \begin{vmatrix} a & m \\ c & n \end{vmatrix}$ and $\Delta_3 = \begin{vmatrix} a & b \\ c & d \end{vmatrix}$, then the values of x and y are respectively

(A) e^{Δ_1/Δ_3}, e^{Δ_2/Δ_3}

(B) e^{Δ_3/Δ_2}, e^{Δ_1/Δ_2}

(C) $e^{-\Delta_1/\Delta_3}$, $e^{-\Delta_2/\Delta_3}$

(D) e^{Δ_2/Δ_1}, e^{Δ_3/Δ_1}

Answer: (A) e^{Δ_1/Δ_3}, e^{Δ_2/Δ_3} · Official TGCHE final key

Q126 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

A value of θ in $\left(0, \frac{\pi}{2}\right)$ and satisfying $\begin{vmatrix} 1+\sin^2\theta & \cos^2\theta & 4\sin 4\theta \\ \sin^2\theta & 1+\cos^2\theta & 4\sin 4\theta \\ \sin^2\theta & \cos^2\theta & 1+4\sin 4\theta \end{vmatrix} = 0$ is

(A) $\frac{\pi}{4}$

(B) $\frac{\pi}{3}$

(C) $\frac{5\pi}{24}$

(D) $\frac{7\pi}{24}$

Answer: (D) $\frac{7\pi}{24}$ · Official TGCHE final key

Q127 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

If $f(x) = \begin{vmatrix} 1+\sin x+\sin 2x+\sin 3x & \frac{3+\sin 2x}{2} & \frac{-2+\sin 3x}{3} \\ 3+4\sin x & \frac{3}{2} & \frac{4}{3}\sin x \\ 1+\sin x & \frac{1}{2}\sin x & \frac{1}{3} \end{vmatrix}$, then $\int_0^{\pi/2} (f(x)+f'(x))\,dx =$

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(A) $\frac{-1}{6}$
(B) $\frac{-1}{9}$
(C) $\frac{-2}{9}$
(D) $\frac{1}{27}$

Answer: (B) $\frac{-1}{9}$ · Official TGCHE final key

Q128 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

If p and q are two distinct real values of λ for which the system of equations
$(\lambda-1)x+(3\lambda+1)y+2\lambda z=0$
$(\lambda-1)x+(4\lambda-2)y+(\lambda+3)z=0$
$2x+(3\lambda+1)y+3(\lambda-1)z=0$
has non-zero solution, then $p^2+q^2-pq=$

(A) 15
(B) 9
(C) 3
(D) 6

Answer: (B) 9 · Official TGCHE final key

Q129 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If C and D are two $n\times n$ non-singular matrices over the set of real numbers $\mathbb{R}$ such that $CD=-DC$, then n is

(A) a natural number of the form $3k+5$, $k\in\mathbb{N}$
(B) an odd integer
(C) an even integer
(D) equal to one

Answer: (C) an even integer · Official TGCHE final key

Q130 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If $\begin{vmatrix} n^2 & (n+1)^2 & (n+2)^2 \\ (n+1)^2 & (n+2)^2 & (n+3)^2 \\ (n+2)^2 & (n+3)^2 & (n+4)^2 \end{vmatrix}=\Delta$ and $\begin{vmatrix} 1 & -4 & 7 \\ -2 & 3 & -5 \\ 3 & x & -3 \end{vmatrix}=2\Delta+1$ then $x=$

(A) 3
(B) 4
(C) 5
(D) 6

Answer: (A) 3 · Official TGCHE final key

Q131 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If the system of homogeneous equations
$tx + (t+1)y + (t-1)z = 0$
$(t+1)x + ty + (t+2)z = 0$
$(t-1)x + (t+2)y + tz = 0$
in x, y, z has a non-trivial solution, then t is a root of the equation

(A) $3t^2 - 4t + 1 = 0$
(B) $2t^2 - 3t + 1 = 0$
(C) $2t^2 + 3t + 1 = 0$
(D) $3t^2 + 4t + 1 = 0$

Answer: (C) $2t^2 + 3t + 1 = 0$ · Official TGCHE final key

Q132 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If a, b, c are real numbers such that $a - b = 1,\ b - c = 3$, then the number of matrices of the form $A = \begin{bmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{bmatrix}$ such that $|A| = -12$, is

(A) 1
(B) 2
(C) 3
(D) infinitely many

Answer: (D) infinitely many · Official TGCHE final key

Q133 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If the function $f : [a, b] \to \left[-\frac{\sqrt{3}}{4}, \frac{1}{2}\right]$ defined by $f(x) = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 1+\sin x & 1 \\ 1+\cos x & 1 & 1 \end{vmatrix}$ is one-one and onto, then

(A) $a = \frac{-\pi}{4},\ b = \frac{\pi}{6}$

(B) $a = \frac{-\pi}{2},\ b = \frac{\pi}{2}$

(C) $a = \frac{-\pi}{6},\ b = \frac{\pi}{4}$

(D) $a = -\pi,\ b = \pi$

Answer: (A) $a = \frac{-\pi}{4},\ b = \frac{\pi}{6}$ · Official TGCHE final key

Q134 TS EAMCET 2019 · 4 May · Shift 2 MCQ

A value of θ for which the following system of equations has a non-trivial solution is
$(4\sin\theta)x - 3y + z = 0,\ x - (6\cos 2\theta)y + z = 0,\ 3x - 12y + 4z = 0$

(A) $\mathrm{Tan}^{-1}\left(\frac{1}{2}\right)$

(B) $\frac{\pi}{4}$

(C) $\mathrm{Sin}^{-1}\left(\frac{3}{16}\right)$

(D) $\frac{\pi}{12}$

Answer: (C) $\mathrm{Sin}^{-1}\left(\frac{3}{16}\right)$ · Official TGCHE final key

Q135 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If $\begin{vmatrix} x^2+3x & x+1 & x-3 \\ x-1 & 2-x & x+4 \\ x-3 & x-3 & 3x \end{vmatrix} = a_0 + a_1x + a_2x^2 + a_3x^3 + a_4x^4$, then $(a_1 + a_3) + 2(a_0 + a_2 + a_4) =$

(A) -1

(B) 0

(C) 1

(D) -29

Answer: (A) -1 · Official TGCHE final key

Q136 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If the determinant of the matrix $A = \begin{vmatrix} 0 & a & b \\ -a & 0 & \beta \\ -b & \alpha & 0 \end{vmatrix}$ is zero for all a, b then $\alpha + \beta =$

(A) 0

(B) 1

(C) -1

(D) 2

Answer: (A) 0 · Official TGCHE final key

Q137 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

The equation obtained by eliminating a, b, c from the equations $x = \frac{a}{b-c}$, $y = \frac{b}{c-a}$, $z = \frac{c}{a-b}$ is

(A) $\begin{vmatrix} 1 & -x & x \\ 1 & -y & y \\ 1 & -z & z \end{vmatrix} = 0$

(B) $\begin{vmatrix} 1 & -x & x \\ 1 & 1 & -y \\ 1 & z & 1 \end{vmatrix} = 0$

(C) $\begin{vmatrix} 1 & -x & x \\ y & 1 & -y \\ -z & z & -1 \end{vmatrix} = 0$

(D) $\begin{vmatrix} x & y & 1 \\ y & x & 1 \\ 1 & x & y \end{vmatrix} = 0$

Answer: (B) $\begin{vmatrix} 1 & -x & x \\ 1 & 1 & -y \\ 1 & z & 1 \end{vmatrix} = 0$ · Official APSCHE final key

Q138 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

The maximum value of the determinant of the matrix $\begin{vmatrix} 1+\sin^2 x & \cos^2 x & 4\sin 2x \\ \sin^2 x & 1+\cos^2 x & 4\sin 2x \\ \sin^2 x & \cos^2 x & 1+4\sin 2x \end{vmatrix}$ is

(A) 0

(B) 2

(C) 4

(D) 6

Answer: (D) 6 · Official APSCHE final key

Q139 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If $f(x) = \frac{1}{9}\begin{vmatrix} \cos x & 1 & 0 \\ 1 & 2\cos x & 1 \\ 0 & 1 & 2\cos x \end{vmatrix}$, then $\frac{d^2 f}{dx^2} =$

(A) $\cos 3x$

(B) $\cos(\pi + 3x)$

(C) $\sin 3x$

(D) $\sin(\pi + 3x)$

Answer: (B) $\cos(\pi + 3x)$ · Official APSCHE final key

Q140 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If $\begin{vmatrix} a+b+2c & a & b \\ c & 2a+b+c & b \\ c & a & a+2b+c \end{vmatrix} = 2$, then $a^3+b^3+c^3-3abc =$

(A) $1-3ab-3bc-3ca$

(B) 0

(C) $1-2ab-2bc-2ca$

(D) 1

Answer: (A) $1-3ab-3bc-3ca$ · Official APSCHE final key

Q141 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $\Delta_1 = \begin{vmatrix} 1 & a^2 & a^3 \\ 1 & b^2 & b^3 \\ 1 & c^2 & c^3 \end{vmatrix}$ and $\Delta_2 = \begin{vmatrix} bc & b+c & 1 \\ ca & c+a & 1 \\ ab & a+b & 1 \end{vmatrix}$ then $\frac{\Delta_1}{\Delta_2} =$

(A) $ab+bc+ca$

(B) abc

(C) $2(ab+bc+ca)$

(D) $(a+b+c)^2$

Answer: (A) $ab+bc+ca$ · The council's preliminary key

Q142 TS EAMCET 2018 · 4 May · Shift 2 MCQ

Let A be the set of all 3×3 determinants with entries 0 or 1 only and B be the subset of A consisting of all determinants with value 1. If C is the subset of A consisting of all determinants with value -1, then

(A) $n(C)=0$

(B) $n(B)=n(C)$

(C) $A=B\cup C$

(D) $n(B)=2n(A)$

Answer: (B) $n(B)=n(C)$ · The council's preliminary key

Q143 TS EAMCET 2018 · 4 May · Shift 2 MCQ

$\begin{vmatrix} 1 & bc+ad & b^2c^2+a^2d^2 \\ 1 & ca+bd & c^2a^2+b^2d^2 \\ 1 & ab+cd & a^2b^2+c^2d^2 \end{vmatrix} =$

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(A) $(a-b)(b-c)(c-d)(a-d)(a-c)(d-b)$
(B) $(a-b)(a-c)(b-c)(b-d)(a-d)(c-d)$
(C) $(a-b)(a-c)(a-d)(b-c)(b-d)(d-c)$
(D) $(a-b)(b-c)(c-d)(b-d)$

Answer: (B) $(a-b)(a-c)(b-c)(b-d)(a-d)(c-d)$ · The council's preliminary key

Q144 TS EAMCET 2018 · 4 May · Shift 2 MCQ

The set of real values of α for which the system of linear equations:
$x+(\sin\alpha)y+(\cos\alpha)z=0$
$x+(\cos\alpha)y+(\sin\alpha)z=0$
$-x+(\sin\alpha)y-(\cos\alpha)z=0$
has a non-trivial solution is

(A) $\frac{n\pi}{2}+(-1)^n\frac{\pi}{4}+\frac{\pi}{8}$ (n is an integer)
(B) $\frac{n\pi}{2}+(-1)^n\frac{\pi}{8}$ (n is an integer)
(C) $\frac{n\pi}{2}+(-1)^n\frac{\pi}{8}-\frac{\pi}{8}$ (n is an integer)
(D) $\frac{n\pi}{2}+(-1)^n\frac{\pi}{4}-\frac{\pi}{8}$ (n is an integer)

Answer: (C) $\frac{n\pi}{2}+(-1)^n\frac{\pi}{8}-\frac{\pi}{8}$ (n is an integer) · The council's preliminary key

Q145 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

$$\begin{vmatrix}125 & 5 & 25\\ 343 & 7 & 49\\ 729 & 9 & 81\end{vmatrix} =$$

(A) $9!$
(B) $6!$
(C) $8!$
(D) $7!$

Answer: (D) $7!$ · The council's preliminary key

Q146 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

A set of values of θ for which the system of equations
$(\sin 3\theta)x-y+z=0$,
$(\cos 2\theta)x+4y+3z=0$,
$2x+7y+7z=0$
has non-trivial solutions, is

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(A) $(n+1)\frac{\pi}{2}+(-1)^n\frac{\pi}{4}$ (here n is any integer)
(B) $(n-1)\frac{\pi}{2}+(-1)^n\frac{\pi}{3}$ (here n is any integer)
(C) $\frac{n\pi}{2}+(-1)^n\frac{\pi}{6}$ (here n is any integer)
(D) $n\pi+(-1)^n\frac{\pi}{6}$ (here n is any integer)

Answer: (D) $n\pi+(-1)^n\frac{\pi}{6}$ **(here n is any integer)** · The council's preliminary key

Q147 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If the equations
$kx+(k+1)y+(k-1)z=0$,
$(k-1)x+(k+2)y+kz=0$ and
$(k+1)x+ky+(k+2)z=0$
have a non trivial solution, then the sum of all the possible values of k is

(A) 0
(B) $-\frac{1}{2}$
(C) $\frac{1}{2}$
(D) 1

Answer: (B) $-\frac{1}{2}$ · The council's preliminary key

Q148 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

In Δ ABC, if $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}=0$, then $\cos A\cos B+\cos B\cos C+\cos C\cos A=$

(A) -1
(B) $\frac{3}{4}$
(C) $\frac{9}{4}$
(D) 1

Answer: (B) $\frac{3}{4}$ · The council's preliminary key

Q149 TS EAMCET 2017 · 12 May · Offline MCQ

If $\Delta=\begin{vmatrix} 1 & 5 & 6 \\ 0 & 1 & 7 \\ 0 & 0 & 1 \end{vmatrix}$ and $\Delta'=\begin{vmatrix} 1 & 0 & 1 \\ 3 & 0 & 3 \\ 4 & 6 & 100 \end{vmatrix}$, then

(A) $\Delta^2-3\Delta^1=0$
(B) $(\Delta+\Delta^1)^2-3(\Delta+\Delta^1)+2=0$
(C) $(\Delta+\Delta^1)^2+3(\Delta+\Delta^1)+5=0$
(D) $\Delta+3\Delta^1+1=0$

Answer: (B) $(\Delta+\Delta^1)^2-3(\Delta+\Delta^1)+2=0$ · The council's preliminary key

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Q150 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If $\Delta = \begin{vmatrix} 1 & \cos\theta & 1 \\ -\cos\theta & 1 & \cos\theta \\ -1 & -\cos\theta & 1 \end{vmatrix}$, then Δ lies in the interval

(A) $(2, 4)$
(B) $[2, 4]$
(C) $[-1, 1]$
(D) $[1, 4]$

Answer: (B) $[2, 4]$ · The council's preliminary key

Q151 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If $\alpha = \cos\frac{\pi}{3} + i\sin\frac{\pi}{3}$ then the value of the determinant $\begin{vmatrix} 1 & \alpha & \alpha^2 \\ \alpha^2 & 1 & \alpha \\ \alpha & \alpha^2 & 1 \end{vmatrix}$ is

(A) 0
(B) 1
(C) -4
(D) 4

Answer: (D) 4 · The council's preliminary key

Q152 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If $\begin{vmatrix} a & a^3 & a^4 \\ b & b^3 & b^4 \\ c & c^3 & c^4 \end{vmatrix} = k(a-b)(b-c)(c-a)$ then $k =$

(A) $abc(ab + bc + ca)$
(B) $4(ab + bc + ca)(abc)$
(C) abc
(D) $ab + bc + ca$

Answer: (A) $abc(ab + bc + ca)$ · The council's preliminary key

Q153 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If $\begin{vmatrix} x^2 + x & x + 1 & x - 2 \\ 2x^2 + 3x - 1 & 3x & 3x - 3 \\ x^2 + 2x + 3 & 2x - 1 & 2x - 1 \end{vmatrix} = xA + B$, where A and B are determinants of order 3 not involving x, then $|A| =$

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(A) 27
(B) 24
(C) 19
(D) -8

Answer: (B) 24 · The council's preliminary key

Q154 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If $\Delta(x) = \begin{vmatrix} e^x & -1 \\ \sin x - 1 & 1 \end{vmatrix}$, then $\lim_{x \to 0} \frac{\Delta(x)}{x} =$

(A) 1
(B) 2
(C) -1
(D) 3

Answer: (B) 2 · The council's preliminary key

Q155 TS EAMCET 2016 · 15 May · Offline MCQ

If $A(x) = \begin{vmatrix} x+1 & 2x+1 & 3x+1 \\ 2x+1 & 3x+1 & x+1 \\ 3x+1 & x+1 & 2x+1 \end{vmatrix}$ then $\int_0^1 A(x)\,dx =$

(A) -15
(B) $\frac{-15}{2}$
(C) -30
(D) -5

Answer: (B) $\frac{-15}{2}$ · Official TGCHE final key

Q156 AP EAMCET 2016 · 29 Apr · Offline MCQ

If a, b, c are distinct positive real numbers, then the value of the determinant $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$

(A) < 0
(B) > 0
(C) 0
(D) ≥ 0

Answer: (A) < 0 · The council's preliminary key

Q157 AP EAMCET 2016 · 29 Apr · Offline MCQ

If x_1, x_2, x_3 as well as y_1, y_2, y_3 are in geometric progression with the same common ratio, then the points $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ are

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(A) vertices of an equilateral triangle
(B) vertices of a right angled triangle
(C) vertices of a right angled isosceles triangle
(D) collinear

Answer: (D) collinear · The council's preliminary key

Q158 AP EAMCET 2014 · 22 May · Offline MCQ

If $k > 1$, and the determinant of the matrix A^2, where $A = \begin{bmatrix} k & k\alpha & \alpha \\ 0 & \alpha & k\alpha \\ 0 & 0 & k \end{bmatrix}$, is k^2 then $|\alpha| =$

(A) $\frac{1}{k^2}$
(B) k
(C) k^2
(D) $\frac{1}{k}$

Answer: (D) $\frac{1}{k}$ · The council's preliminary key

Q159 AP EAMCET 2013 · 10 May · Offline MCQ

$$\begin{vmatrix} x+2 & x+3 & x+5 \\ x+4 & x+6 & x+9 \\ x+8 & x+11 & x+15 \end{vmatrix} =$$

(A) $3x^2 + 4x + 5$
(B) $x^3 + 8x + 2$
(C) 0
(D) -2

Answer: (D) -2 · The council's preliminary key

Q160 AP EAMCET 2013 · 10 May · Offline MCQ

The number of real values of t such that the system of homogeneous equations
$tx + (t+1)y + (t-1)z = 0$
$(t+1)x + ty + (t+2)z = 0$
$(t-1)x + (t+2)y + tz = 0$
has non-trivial solutions, is

(A) 3
(B) 2
(C) 1
(D) 4

Answer: (C) 1 · The council's preliminary key

Q161 AP EAMCET 2012 · 12 May · Offline MCQ

$$f(x)=\begin{vmatrix}1 & x & x+1\\ 2x & x(x-1) & x(x+1)\\ 3x(x-1) & x(x-1)(x-2) & (x-1)x(x+1)\end{vmatrix}\Rightarrow f(2012)=$$

(A) 0

(B) 1

(C) -500

(D) 500

Answer: (A) 0 · Official APSCHE final key

Q162 AP EAMCET 2011 · 8 May · Offline MCQ

$$\begin{vmatrix}24 & 25 & 26\\ 25 & 26 & 27\\ 26 & 27 & 27\end{vmatrix}=$$

(A) 0

(B) -1

(C) 1

(D) 2

Answer: (C) 1 · The council's preliminary key

Q163 AP EAMCET 2010 · 30 May · Offline MCQ

$$f(x)=\begin{vmatrix}2\cos x & 1 & 0\\ x-\frac{\pi}{2} & 2\cos x & 1\\ 0 & 1 & 2\cos x\end{vmatrix}\Rightarrow f'(\pi)=$$

(A) 0

(B) 2

(C) $\frac{\pi}{2}$

(D) $\pi-6$

Answer: (B) 2 · Official APSCHE final key

Q164 AP EAMCET 2010 · 30 May · Offline MCQ

$$\begin{vmatrix}x & x^2 & 1+x^3\\ y & y^2 & 1+y^3\\ z & z^2 & 1+z^3\end{vmatrix}=0, x\neq y\neq z\Rightarrow 1+xyz=$$

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(A) 0
(B) -1
(C) 1
(D) 2

Answer: (A) 0 · Official APSCHE final key

Q165 AP EAMCET 2010 · 30 May · Offline MCQ

If the system of equations :
$(k+1)^3x + (k+2)^3y = (k+3)^3$
$(k+1)x + (k+2)y = k+3$
$x + y = 1$
is consistent, then the value of k is :

(A) 2
(B) -2
(C) -1
(D) 1

Answer: (B) -2 · Official APSCHE final key

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