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MATHEMATICS · EAPCET (EAMCET)

Matrices

Previous Year Questions with answers

373 questions · **145** papers · **2010–2026** · newest paper first

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What is in this PDF: every Matrices 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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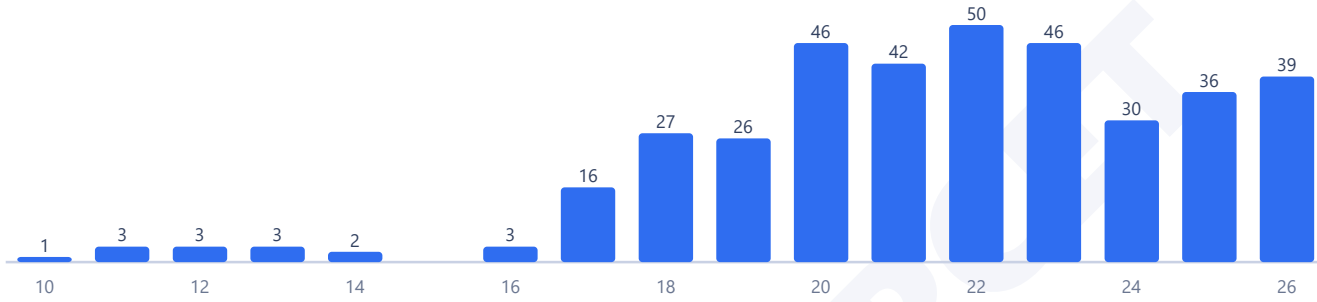
Chapter at a glance

3.3%	373	75 of 77	373 / 0
of Mathematics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Falling: 2.3 questions per paper in 2024–2026 against 3.1 in 2022–2023.

Questions per year



Counts are the questions we hold: 373 in 145 papers. No question in this chapter was found repeated across papers.

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

Systems of Linear Equations	130
Matrix Algebra	125
Inverse & Adjoint	118

How often it comes up

Matrices constitutes an essential linear algebra topic that consistently delivers multiple questions per test session. Across the full 2010 through 2026 testing history, Matrices yielded 373 questions across 149 evaluated exam papers, appearing in 145 sittings to maintain an average of 2.5 questions per paper and a 3.1 percent subject share. In contemporary examinations from 2022 to 2026, the chapter accounted for 201 questions across 77 sittings (present in 75 papers, yielding 2.6 questions per paper and a 3.3 percent subject share). This places Matrices at rank 16 of 29 mathematics chapters.

The chapter appears every year, though it missed two papers out of 77 in the recent testing period. Across the three most recent calendar cycles from 2024 to 2026, question setters included 105 questions across 46 papers (appearing in 44 papers, averaging 2.3 questions per test and a 2.9 percent share). During the older examination timeframe from 2010 to 2021, the chapter contributed 172 questions across 72 sittings (present in 70 papers, averaging 2.4 per test and a 3.0 percent share). Evaluating the historical trajectory, 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. Across the two regional boards between 2022 and 2026, Andhra Pradesh contributed 117 questions across 48 papers (46 papers with questions, 2.4 per test, 3.0 percent share), while Telangana contributed 84 questions across 29 papers (present in all 29 papers, 2.9 per test, 3.6 percent share).

Most-asked topics

The chapter divides evenly across three fundamental areas of linear algebra:

- **Matrix Algebra**: Accounting for 125 total questions, with 69 set in recent examinations (tested through 2026). Coverage spans matrix multiplication, powers of nilpotent and idempotent matrices, symmetric and skew-symmetric decompositions, transpose properties, orthogonal matrices, and trace calculations.

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- **Inverse & Adjoint**: Comprising 118 total questions, with 68 emerging in the recent timeframe (last asked in 2026). Key concepts include adjoint determinant formulas, inverse calculation via cofactors, Cayley-Hamilton applications, and nested adjoint identities.
- **Systems of Linear Equations**: Delivering 130 total questions, with 64 appearing in recent papers (last tested in 2026). Problems focus on consistency of non-homogeneous systems, Cramer rule, matrix inversion method, Gaussian elimination, rank determination, and finding parameter values for unique, infinite, or no solutions.

What the questions look like

Examiners test algebraic manipulations of square matrices and parameter conditions for linear system consistency.

A very frequent problem presents a three-by-three system of linear equations containing unknown parameters, asking students to determine the parameter relationships that result in infinitely many solutions or cause the system to become inconsistent. Another recurring question type features powers of a matrix with a recognizable pattern, such as upper triangular matrices with ones along the main diagonal, asking candidates to sum all elements across twelve power iterations. Questions on matrix inverses often involve nested adjoints, requiring candidates to simplify expressions using standard determinant power formulas rather than explicitly calculating matrix entries.

How to practise it

Master structural matrix identities and properties of special matrices. Learn to express any square matrix as the sum of a symmetric component and a skew-symmetric component. Understand the trace operator: trace is linear, invariant under transposition, and satisfies cyclic invariance for matrix products.

Next, memorize adjoint and inverse formulas for an n-by-n square matrix A. The determinant of adj A equals det A raised to the power n minus one, while adj of adj A equals det A raised to the power n minus two times A. For solving systems of three linear equations in three variables, learn to check consistency rapidly using matrix rank: the system has a unique solution if the rank of the coefficient matrix equals the rank of the augmented matrix and equals three; infinitely many solutions if the ranks are equal but less than three; and no solution if the rank of the coefficient matrix is strictly less than the rank of the augmented matrix.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If $A=\begin{bmatrix} c & -a & b \\ a & b & -c \\ -b & c & a \end{bmatrix}$, $B=\begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 0 \end{bmatrix}$ and $AB=\begin{bmatrix} 4 & 4 & -2 \\ 1 & 1 & 10 \\ -1 & 5 & -4 \end{bmatrix}$, then $a^2+b^2+c^2=$

(A) 14

(B) 17

(C) 11

(D) 19

Answer: (A) 14 · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If $A=\begin{bmatrix} 2 & -3 & 1 \\ -3 & 1 & -2 \\ 1 & -2 & 3 \end{bmatrix}$, then $Adj(A)=$

(A) $\begin{bmatrix} 1 & -7 & 5 \\ -7 & 5 & -1 \\ 5 & -1 & 7 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & 7 & -5 \\ 7 & 5 & 1 \\ -5 & 1 & 7 \end{bmatrix}$

(C) $\begin{bmatrix} -1 & 7 & 5 \\ 7 & 5 & 1 \\ 5 & 1 & -7 \end{bmatrix}$

(D) $\begin{bmatrix} -1 & 7 & -5 \\ 7 & -5 & 1 \\ -5 & 1 & -7 \end{bmatrix}$

Answer: (C) $\begin{bmatrix} -1 & 7 & 5 \\ 7 & 5 & 1 \\ 5 & 1 & -7 \end{bmatrix}$ · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 2 MCQ

A, B are 3rd order non-singular square matrices and K is a real number. Which of the following is true?

(A) $Adj(AB)=(Adj\ B)(Adj\ A)$ and $adj(A^{-1})\neq(adj\ A)^{-1}$

(B) $Adj(KA)=K\ Adj(A)$ and $|KA|=K^3|A|$

(C) $|B^{-1}AB|=|A|$ and $(A+B)^2=A^2+2AB+B^2$

(D) $(adj\ A)^{-1}=\dfrac{A}{|A|}$ and $(AB)^{-1}=B^{-1}A^{-1}$

Answer: (D) $(adj\ A)^{-1}=\dfrac{A}{|A|}$ **and** $(AB)^{-1}=B^{-1}A^{-1}$ · The council's preliminary key

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Q4 AP EAPCET 2026 · 18 May · Shift 2 MCQ

The augmented matrix of a nonhomogeneous system of equations $AX = B$, $[A\ B]$ is reduced to the following form after applying a series of elementary row transformations

$$\begin{bmatrix} 1 & 1 & 1 & 5 \\ 0 & 0 & -3 & 4 \\ 0 & 0 & \mu+1 & \lambda^2-2\lambda+1 \end{bmatrix}$$

, Then

(A) Only for $\mu \neq -1$, $AX = B$ has unique solution

(B) Only for $\mu = -1$ and $\lambda = 1$, $AX = B$ has infinite number of solutions

(C) For any μ and for any λ, $AX = B$ has infinite number of solutions

(D) For all positive values of μ, $AX = B$ has no solution

Answer: (D) For all positive values of μ, $AX = B$ has no solution · The council's preliminary key

Q5 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If $A = \begin{bmatrix} 1 & -2 & 2 \\ 2 & 1 & -2 \\ 2 & K & 4 \end{bmatrix}, B = \begin{bmatrix} 2 & 4 & 3 \\ 3 & 4 & 5 \\ 1 & 2 & 2 \end{bmatrix}$ and $Rank(A) = 2$, then $K + Rank(B) =$

(A) 1

(B) 0

(C) -1

(D) -2

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

Q6 AP EAPCET 2026 · 15 May · Shift 1 MCQ

For a 3×3 non singular matrix A, if $AdJ(AdJ(AdJ(AdJ(A)))) = |A|^n A$, then $n =$

(A) 3

(B) 4

(C) 8

(D) 5

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

Q7 AP EAPCET 2026 · 15 May · Shift 1 MCQ

On a matrix A when three elementary operations namely interchange of R_1 and R_2, $R_2 \to R_2 - 2R_1$, $R_3 \to R_3 - 3R_1$ are applied successively, A is transformed to $\begin{bmatrix} 1 & 3 & 4 \\ 2 & 1 & 5 \\ 6 & 1 & 2 \end{bmatrix}$. Then $Tr(A) =$

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(A) 12
(B) 21
(C) 4
(D) 20

Answer: (B) 21 · The council's preliminary key

Q8 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If the two systems of equations
$x+y-2z=0,\ 4x+4y-8z=0,\ 3x+3y-6z=0$ and
$x+y+z=3,\ 2x+2y-z=\lambda,\ x+y-\mu z=1$ have the same set of solutions, then $\lambda+\mu=$

(A) 0
(B) -5
(C) 2
(D) 4

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

Q9 AP EAPCET 2026 · 15 May · Shift 1 MCQ

The number of skew symmetric matrices of order 3×3 that can be formed by using all the elements $0, \pm a, \pm b, \pm c$ is

(A) 36
(B) 24
(C) 72
(D) 48

Answer: (D) 48 · The council's preliminary key

Q10 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If the system of equations $x+y+z=6$, $x+2y+3z=10$, $3x+2y+\lambda z=\mu$ has more than two solutions, then $\mu^2-\lambda^2$ is equal to

(A) 135
(B) 168
(C) 195
(D) 221

Answer: (C) 195 · The council's preliminary key

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Q11 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If $A=\begin{bmatrix} o & 2q & r \\ p & q & -r \\ p & -q & r \end{bmatrix}$ and $AA^T=I_3$, then

(A) $|p|=|q||r|$

(B) $|r|=2|p||q|$

(C) $|q|=|p||r|$

(D) $|p|+|q|=|r|$

Options (3) or (2) were accepted. More than one answer was accepted. · The council's preliminary key

Q12 AP EAPCET 2026 · 14 May · Shift 1 MCQ

Let S be a symmetric matrix obtained from $A=\begin{bmatrix} 1 & 2 & -3 \\ 2 & -2 & 1 \\ 3 & 1 & -1 \end{bmatrix}$ and T be a skew – symmetric matrix obtained from $B=\begin{bmatrix} 4 & 2 & 0 \\ 1 & -1 & 3 \\ 0 & 2 & -3 \end{bmatrix}$. If trace of $S=-4$ and the non-zero elements of T are $-1,1$, then $S+T=$

(A) $\begin{bmatrix} 2 & 5 & 0 \\ 3 & -4 & 3 \\ 0 & 1 & -2 \end{bmatrix}$

(B) $\begin{bmatrix} 2 & 5 & 0 \\ 3 & 3 & 3 \\ 0 & 1 & 2 \end{bmatrix}$

(C) $\begin{bmatrix} 2 & 5 & 0 \\ 3 & -3 & 3 \\ 0 & 1 & -2 \end{bmatrix}$

(D) $\begin{bmatrix} 2 & -5 & 0 \\ 3 & -3 & 3 \\ 0 & 1 & -2 \end{bmatrix}$

Answer: (A) $\begin{bmatrix} 2 & 5 & 0 \\ 3 & -4 & 3 \\ 0 & 1 & -2 \end{bmatrix}$ · The council's preliminary key

Q13 AP EAPCET 2026 · 14 May · Shift 1 MCQ

$A=\begin{bmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{bmatrix}$ is a matrix such that trace of $A=18$ and $\det(A)=96$. If $a,b,c\in N$ and $ab=6$, then $ab+bc+ca=$

(A) 36
(B) 26
(C) 48
(D) 24

Answer: (B) 26 · The council's preliminary key

Q14 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If $x=\alpha, y=\beta, z=\gamma$ satisfy the equations $3x+y+2z+2=0$, $2x-3y+z-7=0$, $x-4y+3z-1=0$ simultaneously, then $\alpha^3-\beta^3=$

(A) 19
(B) -35
(C) 0
(D) 16

Answer: (D) 16 · The council's preliminary key

Q15 AP EAPCET 2026 · 14 May · Shift 2 MCQ

$$\begin{bmatrix} 1 & -\tan\frac{\theta}{2} \\ \tan\frac{\theta}{2} & 1 \end{bmatrix}\begin{bmatrix} 1 & \tan\frac{\theta}{2} \\ -\tan\frac{\theta}{2} & 1 \end{bmatrix}^{-1} =$$

(A) $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$
(B) $\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$
(C) $\begin{bmatrix} \cos\frac{\theta}{2} & -\sin\frac{\theta}{2} \\ \sin\frac{\theta}{2} & \cos\frac{\theta}{2} \end{bmatrix}$
(D) $\begin{bmatrix} \sin\frac{\theta}{2} & \cos\frac{\theta}{2} \\ -\cos\frac{\theta}{2} & -\sin\frac{\theta}{2} \end{bmatrix}$

Answer: (A) $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ · The council's preliminary key

Q16 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If $A=\begin{bmatrix} 2 & 3 & 3 \\ 3 & 2 & 3 \\ 3 & 3 & 2 \end{bmatrix}$, then $A^2-8I=$

(A) 0
(B) $8A$
(C) $7A$
(D) $5A$

Answer: (C) $7A$ · The council's preliminary key

Q17 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If $A = \begin{bmatrix} 2 & 3 & 1 \\ 3 & 1 & 2 \\ 1 & 2 & 3 \end{bmatrix}$, then Trace of $(A^{-1}) =$

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

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

Q18 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If $P = B + C = \begin{bmatrix} 2 & 5 & 0 \\ 5 & 2 & 3 \\ 0 & 3 & 12 \end{bmatrix}$ and $Q = B - C = \begin{bmatrix} 0 & -1 & 2 \\ 1 & 0 & 1 \\ -2 & -1 & 0 \end{bmatrix}$, then $\mathrm{Tr}\,(BC) =$

(A) 46
(B) 58
(C) 62
(D) 68

Answer: (B) 58 · The council's preliminary key

Q19 AP EAPCET 2026 · 12 May · Shift 1 MCQ

A is a 4×4 matrix. By applying a few elementary transformations on A, if we get the matrix $\begin{pmatrix} 2 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 3 & \frac{3}{2} & 0 & 0 \end{pmatrix}$, which is equivalent to A, then rank of A is

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

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

Q20 AP EAPCET 2026 · 12 May · Shift 2 MCQ

If $A = \begin{bmatrix} a^2 & ab & ac \\ ab & b^2 & bc \\ ac & bc & c^2 \end{bmatrix}$ and $a^2 + b^2 + c^2 = 1$, then $A^2 =$

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(A) A

(B) $2A$

(C) $3A$

(D) $4A$

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

Q21 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $A = \begin{bmatrix} \frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix}$, then $A^{10} =$

(A) $-A$

(B) A

(C) A^2

(D) $-A^2$

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

Q22 TS EAPCET 2026 · 11 May · Shift 1 MCQ

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

(A) A^{-1}

(B) A

(C) I_3

(D) A^T

Answer: (C) I_3 · The council's preliminary key

Q23 TS EAPCET 2026 · 11 May · Shift 1 MCQ

The rank of the matrix $\begin{bmatrix} -4 & -1 & 1 & 4 \\ -3 & 0 & 2 & 3 \\ -2 & -1 & 0 & -4 \end{bmatrix}$ is

(A) 0

(B) 1

(C) 2

(D) 3

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

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Q24 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If $A = \text{Adj}\left(-2\left(\text{Adj}\left(P^{-1}\right)\right)\right)$ and $P = \begin{bmatrix} 1 & 2 & 1 \\ 1 & 0 & 1 \\ 0 & 1 & 2 \end{bmatrix}$, then $|A| =$

(A) $\frac{-1}{4}$
(B) $\frac{1}{4}$
(C) $\frac{3}{4}$
(D) $\frac{2}{3}$

Answer: (B) $\frac{1}{4}$ · The council's preliminary key

Q25 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If $A = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$, $B = \begin{bmatrix} x & y & z \\ l & m & n \\ p & q & r \end{bmatrix}$ and $(A^2B + A^4B)^{-1} = \frac{1}{2}\begin{bmatrix} 1 & 2 & -1 \\ 0 & 1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$, then $xyz - lmn - pqr =$

(A) $\frac{1}{6^3}(37)$
(B) $\frac{1}{2^3}(45)$
(C) 1
(D) 0

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

Q26 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If the system of equations $x - 2y + z = -4$, $6x + y + kz = 15$ and $39x - 13y + hz = 39$ has infinitely many solutions then the locus of the point (h, k) is a straight line. The X-intercept of that line is

(A) 39
(B) 12
(C) 9
(D) 13

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

Q27 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If $A = \begin{bmatrix} \alpha & 3 & 1 \\ 2 & \beta & 6 \\ -2 & -1 & \gamma \end{bmatrix}$ and $AA^T = \begin{bmatrix} 35 & 28 & -13 \\ 28 & 56 & -8 \\ -13 & -8 & 5 \end{bmatrix}$, then Trace of $A =$

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(A) 12
(B) 14
(C) 9
(D) 11

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

Q28 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If $a, b, c \in \mathbb{R}$, $a < b < c$, $A = \begin{bmatrix} -c & 0 & c \\ 0 & -b & b \\ a & a & 0 \end{bmatrix}$, $12A^{-1} = \begin{bmatrix} -b & c & bc \\ b & -c & bc \\ b & c & bc \end{bmatrix}$ and Trace of $A = -5$, then $a^2 + b^2 + c^2 =$

(A) 29
(B) 21
(C) 26
(D) 14

Answer: (D) 14 · The council's preliminary key

Q29 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If the system of linear equations $x + y + z = 1$, $2x + 2y + 3z = 6$, $x + 4y + 9z = 3$ has a unique solution $x = \alpha$, $y = \beta$, $z = \gamma$ then the value of β is

(A) 3
(B) 6
(C) -10
(D) -4

Answer: (C) -10 · The council's preliminary key

Q30 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If α is a real root of the equation $x^3 - 2x^2 - 2x - 3 = 0$ and $A = \begin{bmatrix} 1 & 2 & \alpha \\ 2 & \alpha & 1 \\ \alpha & 1 & 2 \end{bmatrix}$, then $A^2 - A =$

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(A) $\begin{bmatrix}15 & 13 & 14\\13 & 17 & 12\\14 & 12 & 16\end{bmatrix}$

(B) $\begin{bmatrix}17 & 15 & 13\\15 & 14 & 12\\13 & 12 & 11\end{bmatrix}$

(C) $\begin{bmatrix}13 & 9 & 8\\9 & 11 & 10\\8 & 10 & 12\end{bmatrix}$

(D) $\begin{bmatrix}11 & 7 & 5\\7 & 9 & 3\\5 & 3 & 7\end{bmatrix}$

Answer: (C) $\begin{bmatrix}13 & 9 & 8\\9 & 11 & 10\\8 & 10 & 12\end{bmatrix}$ · The council's preliminary key

Q31 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If $A=\begin{bmatrix}1 & 2 & -1\\-1 & 1 & 2\\2 & -1 & 1\end{bmatrix}$, then $(\text{Adj } A)(\text{Adj}(\text{Adj } A))=$

(A) $196A^2$

(B) $14(\text{Adj } A)$

(C) $14A$

(D) $196I$

Answer: (D) $196I$ · The council's preliminary key

Q32 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If the system of linear equations $x+y-z=\lambda$, $2x-y+\mu z=2$ and $x-y+3z=1$ is inconsistent, then

(A) $\mu=4,\lambda=1$

(B) $\mu\neq 4,\lambda=1$

(C) $\mu=4,\lambda\neq 1$

(D) $\mu=1,\lambda\neq 4$

Answer: (C) $\mu=4,\lambda\neq 1$ · The council's preliminary key

Q33 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If $A=\begin{bmatrix}\cos\alpha & 0 & \sin\alpha\\0 & 1 & 0\\-\sin\alpha & 0 & \cos\alpha\end{bmatrix}$ and $A^2=A^T$ for one value of $\alpha\in(0,\pi)$, then $A^3=$

(A) I

(B) A

(C) $\begin{bmatrix} 3 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 3 \end{bmatrix}$

(D) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

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

Q34 TS EAPCET 2026 · 9 May · Shift 1 MCQ

Let A be a 3×3 matrix such that $\det(A) = -1$. If $B^{-1} = Adj\left(A\, Adj\left(A^2\right)\right)$, then $\det((\det A)B) =$

(A) $|A|$

(B) $|B|$

(C) $|A + B|$

(D) $|A - B|$

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

Q35 TS EAPCET 2026 · 9 May · Shift 1 MCQ

Consider the system of linear equations (L): $2x - y - z = -3$, $x + 2y + z = 4$ and $3x + y + kz = 3$. Let $k \in N$ and $1 \leq k \leq 2026$.

A = {k / The system of equations 'L' has no solution}

B = {k / The system of equations 'L' has unique solution}

C = {k / The system of equations 'L' has infinite solutions}

Then $n(A) + n(B) + n(C) =$

(A) 2027

(B) 2026

(C) 2029

(D) 2028

Answer: (B) 2026 · The council's preliminary key

Q36 TS EAPCET 2026 · 9 May · Shift 1 MCQ

Let A be a 3×3 matrix. If $A \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$; $A \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix}$; $A \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}$ then the rank of $(A - I)$ is

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

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

Q37 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If $A=\begin{bmatrix}1 & 1\\ 0 & 1\end{bmatrix}$ and $S=A+A^2+A^3+\ldots+A^{12}$, then the sum of all the elements of the matrix S is

(A) 104
(B) 96
(C) 102
(D) 81

Answer: (C) 102 · The council's preliminary key

Q38 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If $A=\begin{bmatrix}0 & \alpha & \beta\\ \beta & \alpha & 0\\ \alpha & 0 & \beta\end{bmatrix}$ where $\beta>\alpha>0$ and $AA^T=\begin{bmatrix}25 & a & b\\ a & 25 & 12\\ b & a & 25\end{bmatrix}$, then $a+b+\alpha-\beta=$

(A) 24
(B) 26
(C) 25
(D) 27

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

Q39 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If the system of equations $ax+y-2z=3$, $2x-y+3z=b$, $x+2y-z=3$ has infinitely many solutions, then $3a-2b=$

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

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

Q40 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If the system of equations $2x+py+6z=8$, $x+2y+qz=5$ and $x+y+3z=4$ has infinitely many solutions, then $p=$

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(A) -1

(B) 2

(C) 3

(D) -3

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

Q41 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If $A=\begin{bmatrix}-1 & x & -3\\ 2 & 4 & z\\ y & 5 & -6\end{bmatrix}$ is a symmetric matrix and $B=\begin{bmatrix}0 & 2 & q\\ p & 0 & -4\\ -3 & r & s\end{bmatrix}$ is a skew symmetric matrix, then $|A|+|B|-|AB|=$

(A) $xyz+pqr$

(B) $xyz+q+r$

(C) $\dfrac{xyz}{pq}$

(D) $xyz+pq+rs$

Answer: (B) $xyz+q+r$ · The council's preliminary key

Q42 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If the inverse of $\begin{bmatrix}-x & 14x & 7x\\ 0 & 1 & 0\\ x & -4x & -2x\end{bmatrix}$ is $\begin{bmatrix}2 & 0 & 7\\ 0 & 1 & 0\\ 1 & -2 & 1\end{bmatrix}$, then $\begin{vmatrix}x & x+1 & x+2\\ x+1 & x+2 & x+3\\ x+2 & x+3 & x+4\end{vmatrix}=$

(A) $\frac{x}{5}$

(B) $x-5$

(C) $5x-1$

(D) $x+5$

Answer: (C) $5x-1$ · The council's preliminary key

Q43 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If the system of equations $2x+3y-3z=3,\ x+2y+\alpha z=1,\ 2x-y+z=\beta$ has infinitely many solutions, then $\frac{\alpha}{\beta}-\frac{\beta}{\alpha}=$

(A) $\frac{53}{14}$

(B) $\frac{45}{14}$

(C) $-\frac{53}{14}$

(D) $-\frac{45}{14}$

Answer: (B) $\frac{45}{14}$ · The council's preliminary key

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Q44 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If B is the inverse of a third order matrix A and det B $= k$, then $(\text{adj}(\text{adj } A))^{-1} =$

(A) kB
(B) $\frac{1}{k}B$
(C) kB^{-1}
(D) $B + kI$

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

Q45 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If $A = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ and α, β, γ are the roots of the equation represented by $|A - xI| = 0$, then $\alpha^2 + \beta^2 + \gamma^2 =$

(A) 50
(B) 29
(C) 17
(D) 27

Answer: (D) 27 · The council's preliminary key

Q46 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If the values of x, y and z which satisfy the equations $2x - 3y + 2z + 15 = 0$, $3x + y - z + 2 = 0$ and $x - 3y - 3z + 8 = 0$ simultaneously are α, β and γ respectively, then

(A) $\beta + \gamma = \alpha$
(B) $\alpha + \beta = 2\gamma$
(C) $2\alpha + \beta = \gamma$
(D) $2\beta + \gamma = 2\alpha$

Answer: (C) $2\alpha + \beta = \gamma$ · The council's preliminary key

Q47 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If a is the determinant of the adjoint of the matrix $\begin{bmatrix} 1 & 1 & 2 \\ 1 & 2 & 3 \\ 2 & 3 & 3 \end{bmatrix}$ and b is the determinant of the inverse of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 4 & -3 & -1 \\ 2 & 1 & -4 \end{bmatrix}$ then $\frac{b+1}{18b} =$

(A) a
(B) $10a$
(C) $2+a$
(D) $2a$

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

Q48 AP EAPCET 2025 · 24 May · Shift 1 MCQ

Consider two systems of 3 linear equations in 3 unknowns $AX = B$ and $CX = D$. If $AX = B$ has unique solution D and $CX = D$ has unique solution B, then the solution of $(A - C^{-1})X = O$ is

(A) B
(B) D
(C) $B + D$
(D) $B - D$

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

Q49 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & 2 & x \\ 4 & -1 & 7 \\ 2 & 4 & -6 \end{bmatrix}$ and the rank of A is 2, then the value of x is equal to

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

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

Q50 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If $P = \begin{bmatrix} 1 & \alpha & 3 \\ 1 & 3 & 3 \\ 2 & 4 & 4 \end{bmatrix}$ is the adjoint of a matrix A and det A = 4, then the value of α is

(A) 3
(B) 22
(C) 11
(D) 4

Answer: (C) 11 · The council's preliminary key

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Q51 AP EAPCET 2025 · 23 May · Shift 2 MCQ

The rank of the matrix $\begin{bmatrix} 2 & -3 & 4 & 0 \\ 5 & -4 & 2 & 1 \\ 1 & -3 & 5 & -4 \end{bmatrix}$ is

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

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

Q52 AP EAPCET 2025 · 22 May · Shift 1 MCQ

The values of p and q so that the system of equations $2x + py + 6z = 8$, $x + 2y + qz = 5$ and $x + y + 3z = 4$ may have no solution are

(A) $p \neq 2, q = 3$
(B) $p \neq 2, q \neq 3$
(C) $p = 2, q = \frac{15}{4}$
(D) $p = 2, q = 3$

Answer: (A) $p \neq 2, q = 3$ · The council's preliminary key

Q53 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 3 & 5 \\ 2 & 1 & 6 \end{bmatrix}$ and $|\text{adj}\,(\text{adj}\,A)|(\text{adj}\,A)^{-1} = kA$, then $k =$

(A) 1296
(B) 216
(C) 36
(D) 432

Answer: (B) 216 · The council's preliminary key

Q54 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If the values $x = \alpha$, $y = \beta$, $z = \gamma$ satisfy all the 3 equations $x + 2y + 3z = 4$, $3x + y + z = 3$ and $x + 3y + 3z = 2$, then $3\alpha + \gamma =$

(A) β
(B) 2β
(C) $1-2\beta$
(D) $2\beta+1$

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

Q55 AP EAPCET 2025 · 22 May · Shift 2 MCQ

The number of solutions of the system of equations $2x+y-z=7$, $x-3y+2z=1$, $x+4y-3z=5$ is

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

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

Q56 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If A and B are both 3×3 matrices, then which of the following statements are true ?

(i) $AB=0\Rightarrow A=0$ or $B=0$

(ii) $AB=I_3\Rightarrow A^{-1}=B$

(iii) $(A-B)^2=A^2-2AB+B^2$

(A) (i) is false and (ii), (iii) are true
(B) (ii) is true and (i), (iii) are false
(C) (i) and (ii) are true, (iii) is false
(D) All are true

Answer: (B) (ii) is true and (i), (iii) are false · The council's preliminary key

Q57 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If $A=\begin{bmatrix}1 & -1 & 2\\ -2 & 3 & -3\\ 4 & -4 & 5\end{bmatrix}$ is the given matrix and A^T represents the transpose of A, then $AA^T-A-A^T=$

(A) $\begin{bmatrix} 4 & 8 & 12 \\ 8 & 16 & -28 \\ 12 & -28 & 47 \end{bmatrix}$

(B) $\begin{bmatrix} 4 & -8 & 12 \\ -8 & 16 & -28 \\ 12 & -28 & 47 \end{bmatrix}$

(C) $\begin{bmatrix} 4 & -8 & 12 \\ -8 & 16 & 28 \\ 12 & 28 & 47 \end{bmatrix}$

(D) $\begin{bmatrix} 4 & -8 & -12 \\ -8 & 16 & -28 \\ -12 & -28 & 47 \end{bmatrix}$

Answer: (B) $\begin{bmatrix} 4 & -8 & 12 \\ -8 & 16 & -28 \\ 12 & -28 & 47 \end{bmatrix}$ · The council's preliminary key

Q58 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If $A = \begin{bmatrix} x & 2 & 1 \\ -2 & y & 0 \\ 2 & 0 & -1 \end{bmatrix}$, x and y are non-zero real numbers, trace of $A = 0$ and determinant of $A = -6$, then the minor of the element 1 of A is

(A) -4

(B) 4

(C) 2

(D) -2

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

Q59 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If $A = \begin{bmatrix} 1 & 2 & -2 \\ 2 & -1 & 2 \\ -1 & 1 & -2 \end{bmatrix}$, then $A + 2A^{-1} =$

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(A) $\begin{bmatrix}1 & 4 & 0\\4 & -5 & -4\\0 & -2 & -7\end{bmatrix}$

(B) $\begin{bmatrix}0 & 2 & 2\\2 & -4 & -6\\2 & -3 & -5\end{bmatrix}$

(C) $\begin{bmatrix}0 & 2 & 1\\2 & -4 & -3\\2 & -6 & -5\end{bmatrix}$

(D) $\begin{bmatrix}1 & 4 & -1\\4 & -5 & -1\\1 & -5 & -7\end{bmatrix}$

Answer: (A) $\begin{bmatrix}1 & 4 & 0\\4 & -5 & -4\\0 & -2 & -7\end{bmatrix}$ · The council's preliminary key

Q60 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If $A=\begin{bmatrix}a & b & c\\d & e & f\\l & m & n\end{bmatrix}$ is a matrix such that $|A|>0$ and $\text{Adj } A=\begin{bmatrix}0 & 4 & -6\\10 & 8 & 0\\2 & 4 & -4\end{bmatrix}$, then $\frac{cd}{fb}+\frac{ln}{em}=$

(A) $2a$

(B) $a+m$

(C) $a+b$

(D) a

Answer: (B) $a+m$ · The council's preliminary key

Q61 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If $x=\alpha$, $y=\beta$, $z=\gamma$ is the solution of the system of equations $2x+3y+z=-1$, $3x+y+z=4$, $x-3y-2z=1$, then the value of β is

(A) -2

(B) -1

(C) 2

(D) 1

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

Q62 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If $A=\begin{bmatrix}1 & 2 & 2\\2 & 1 & 1\\1 & 2 & 1\end{bmatrix}$, then $|\text{Adj}(A^2)|=$

(A) 9
(B) 27
(C) 729
(D) 81

Answer: (D) 81 · The council's preliminary key

Q63 TS EAPCET 2025 · 4 May · Shift 2 MCQ

A is a 3×3 matrix satisfying $\mathrm{A}^3 - 5\mathrm{A}^2 + 7\mathrm{A} + \mathrm{I} = 0$. If $\mathrm{A}^5 - 6\mathrm{A}^4 + 12\mathrm{A}^3 - 6\mathrm{A}^2 + 2\mathrm{A} + 2\mathrm{I} = l\mathrm{A} + m\mathrm{I}$, then $l + m =$

(A) 5
(B) -1
(C) 4
(D) 2

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

Q64 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & x & 1 \end{bmatrix}$, $A^{-1} = \frac{1}{2}\begin{bmatrix} 1 & -1 & 1 \\ -8 & 6 & 2y \\ 5 & -3 & 1 \end{bmatrix}$ then the point (x, y) lies on the curve represented by the equation

(A) $y = 3x^2 - 5x - 1$
(B) $y = \log_{2/5}(2^x + 2^{-x})$
(C) $y = \dfrac{e^x + 1}{e^x - 1}$
(D) $3x^2y - 5xy + 12 = 0$

Answer: (B) $y = \log_{2/5}(2^x + 2^{-x})$ · The council's preliminary key

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Q65 TS EAPCET 2025 · 4 May · Shift 2 MCQ

Consider a homogeneous system of three linear equations in three unknowns represented by $AX = O$. If $X = \begin{bmatrix} l \\ m \\ 0 \end{bmatrix}$, $l \neq 0$, $m \neq 0$, $l, m \in \mathbb{R}$ represents an infinite number of solutions of this system, then rank of A is

(A) 3
(B) 2
(C) 1
(D) does not exist

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

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Q66 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If the system of simultaneous linear equations $x + \lambda y - 2z = 1$, $x - y + \lambda z = 2$ and $x - 2y + 3z = 3$ is inconsistent for $\lambda = \lambda_1$ and λ_2, then $\lambda_1 + \lambda_2 =$

(A) 5
(B) $\sqrt{5}$
(C) 1
(D) -1

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

Q67 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, then $\text{Adj}(\text{Adj}(\text{Adj}\, A)) =$

(A) A
(B) A^{-1}
(C) $|A|A^{-1}$
(D) $\dfrac{A^{-1}}{|A|}$

Answer: (C) $|A|A^{-1}$ · The council's preliminary key

Q68 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If the system of simultaneous linear equations $x - 2y + z = 0,\ 2x + 3y + z = 6$ and $x + 2y + pz = q$ has infinitely many solutions, then

(A) $p + q = 4$
(B) $pq = \frac{48}{49}$
(C) $q - p = 3$
(D) $\frac{p}{q} = 4$

Answer: (C) $q - p = 3$ · The council's preliminary key

Q69 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 1 & 1 \\ 1 & 3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 & 4 \\ 3 & 2 & 2 \\ 2 & 4 & 2 \end{bmatrix}$, then $\sqrt{|\text{Adj}(AB)|} =$

(A) 176
(B) 208
(C) 198
(D) 234

Answer: (C) 198 · The council's preliminary key

Q70 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If $A=\begin{bmatrix}1 & 5 & 2\\ 4 & 1 & 3\\ 2 & 6 & 3\end{bmatrix}$, then $\left|(\text{Adj } A)^{-1}\right| =$

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

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

Q71 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If the augmented matrix corresponding to the system of equations $x+y-z=1$, $2x+4y-z=0$ and $3x+4y+5z=18$ is transformed to

$$\begin{bmatrix}1 & a & 0 & -1\\ 0 & 2 & 1 & b\\ 0 & 0 & c & 32\end{bmatrix}$$

, then $\sqrt{a+b+c} =$

(A) 1
(B) 4
(C) 9
(D) 16

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

Q72 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If $A=\begin{bmatrix}1 & -3 & -5\\ -2 & 4 & -6\\ 7 & -11 & 13\end{bmatrix}$, then $\sqrt{|\text{Adj } A|} =$

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(A) 64
(B) 16
(C) 36
(D) 216

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

Q73 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If $A+2B=\begin{bmatrix}1 & 2 & 0\\ 6 & -3 & 3\\ -5 & 3 & 1\end{bmatrix}$ and $2A-B=\begin{bmatrix}2 & -1 & 5\\ 2 & -1 & 6\\ 0 & 1 & 2\end{bmatrix}$ then $\text{tr}(A)-\text{tr}(B)=$

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

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

Q74 TS EAPCET 2025 · 2 May · Shift 2 MCQ

A, C are 3×3 matrices. B, D are 3×1 matrices. If $AX=B$ has unique solution and $CX=D$ has infinite number of solutions, then

(A) rank of $[A:D]$ = rank of $[C:B]$
(B) rank of A = rank of C
(C) rank of $[A:B]$ < rank of $[B:D]$
(D) rank of $[A:D]\geq$ rank of $[C:B]$

Answer: (D) rank of $[A:D]\geq$ rank of $[C:B]$ · The council's preliminary key

Q75 TS EAPCET 2025 · 2 May · Shift 2 MCQ

A and B are two non square matrices. If $P=A+B$, $Q=A^TB$, $R=AB^T$, then the matrices whose order is equal to the order of A are

(A) PQ and QR
(B) RQ and QP
(C) PQ and RP
(D) PQR and RPQ

Answer: (C) PQ and RP · The council's preliminary key

Q76 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If $A=\begin{bmatrix}83 & 74 & 41\\ 93 & 96 & 31\\ 24 & 15 & 79\end{bmatrix}$, then $\det(A-A^T)=$

(A) 0
(B) -7851
(C) 2442
(D) 1

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

Q77 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If the system of equations $a_1x + b_1y + c_1z = 0$, $a_2x + b_2y + c_2z = 0$, $a_3x + b_3y + c_3z = 0$ has only trivial solution, then the rank of $\begin{bmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{bmatrix}$ is

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

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

Q78 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If the set of equations $x + 2y + 3z = 6, x + 3y + 5z = 9, 2x + 5y + az = b$ has unique solution, then

(A) $a = 8, b = 15$
(B) $a \neq 8, b \in R$
(C) $a = 8, b \neq 15$
(D) $a \neq 15, b = 8$

Answer: (B) $a \neq 8, b \in R$ · The council's preliminary key

Q79 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If P and Q are two 3×3 matrices such that $|PQ| = 1$ and $|P| = 9$, then the determinant of adjoint of the matrix $P.Adj\ 3Q$ is

(A) 9^4
(B) $\frac{1}{9^4}$
(C) 9^2
(D) $\frac{1}{9^2}$

Answer: (A) 9^4 · The council's preliminary key

Q80 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If $A = \begin{bmatrix} a & 1 & 2 \\ 1 & 2 & b \\ c & 1 & 3 \end{bmatrix}$ and $\text{Adj}\ A = \begin{bmatrix} 7 & -1 & -5 \\ -3 & 9 & 5 \\ 1 & -3 & 5 \end{bmatrix}$ then $a^2 + b^2 + c^2 =$

(A) 10
(B) 14
(C) 11
(D) 29

Answer: (A) 10 · The council's preliminary key

Q81 AP EAPCET 2024 · 22 May · Shift 2 MCQ

$A = \begin{bmatrix} 0 & 1 & 2 \\ 2 & 3 & 0 \\ 4 & 0 & 3 \end{bmatrix}$ and B is a matrix such that AB = BA. If AB is not an identity matrix, then the matrix that can be taken as B is

(A) $\begin{bmatrix} -9 & -3 & 6 \\ -6 & 8 & -4 \\ 12 & -4 & -2 \end{bmatrix}$
(B) $\begin{bmatrix} 9 & -3 & 6 \\ -6 & 8 & -4 \\ -12 & -4 & 2 \end{bmatrix}$
(C) $\begin{bmatrix} 9 & -3 & -6 \\ -6 & 8 & -4 \\ -12 & 4 & -2 \end{bmatrix}$
(D) $\begin{bmatrix} 9 & -3 & -6 \\ -6 & -8 & 4 \\ -12 & 4 & -2 \end{bmatrix}$

Answer: (D) $\begin{bmatrix} 9 & -3 & -6 \\ -6 & -8 & 4 \\ -12 & 4 & -2 \end{bmatrix}$ · The council's preliminary key

Q82 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The system of linear equations $x + 2y + z = -3,\ 3x + 3y - 2z = -1,\ 2x + 7y + 7z = -4$ has

(A) infinite number of solutions
(B) no solution
(C) unique solution
(D) finite number of solutions

Answer: (B) no solution · The council's preliminary key

Q83 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If $A = \begin{bmatrix} 2 & 3 & 4 \\ 1 & k & 2 \\ 4 & 1 & 5 \end{bmatrix}$ is singular matrix, then the quadratic equation having the roots k and $\frac{1}{k}$ is

(A) $6x^2 + 13x + 6 = 0$
(B) $12x^2 - 25x + 12 = 0$
(C) $6x^2 - 13x + 6 = 0$
(D) $2x^2 - 5x + 2 = 0$

Answer: (C) $6x^2 - 13x + 6 = 0$ · The council's preliminary key

Q84 AP EAPCET 2024 · 21 May · Shift 1 MCQ

Let A be a 4×4 matrix and P be its adjoint matrix. If $|P| = \left|\frac{A}{2}\right|$, then $|A^{-1}| =$

(A) $\pm\frac{1}{4}$
(B) ± 8
(C) ± 2
(D) ± 4

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

Q85 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The system $x + 2y + 3z = 4, 4x + 5y + 3z = 5, 3x + 4y + 3z = \lambda$ is consistent and $3\lambda = n + 100$, then $n =$

(A) -42
(B) -86
(C) 16
(D) -24

Answer: (B) -86 · The council's preliminary key

Q86 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If $3A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ a & 2 & b \end{bmatrix}$ and $AA^T = I$, then $\frac{a}{b} + \frac{b}{a} =$

(A) $-\frac{5}{2}$
(B) $\frac{13}{6}$
(C) $-\frac{13}{6}$
(D) $\frac{5}{2}$

Answer: (D) $\frac{5}{2}$ · The council's preliminary key

Q87 AP EAPCET 2024 · 21 May · Shift 2 MCQ

Assertion (A): If B is a 3×3 matrix and $|B| = 6$, then $|Adj(B)| = 36$

Reason (R): If B is a square matrix of order n, then $|Adj(B)| = |B|^n$

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(A) Both (A) and (R) are true and (R) is the correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

Answer: (C) (A) is true but (R) is false · The council's preliminary key

Q88 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 1 & 3 \\ 3 & 2 & 4 \end{bmatrix}$, then $A^2 - 5A + 6I =$

(A) $\begin{bmatrix} 8 & 4 & 0 \\ 3 & 8 & 4 \\ 4 & 0 & 12 \end{bmatrix}$

(B) $\begin{bmatrix} 8 & 4 & 0 \\ 3 & 6 & 4 \\ 4 & 0 & 14 \end{bmatrix}$

(C) $\begin{bmatrix} 8 & 6 & 0 \\ 3 & 8 & 4 \\ 2 & 0 & 14 \end{bmatrix}$

(D) $\begin{bmatrix} 8 & 4 & 0 \\ 3 & 8 & 4 \\ 4 & 0 & 14 \end{bmatrix}$

Answer: (D) $\begin{bmatrix} 8 & 4 & 0 \\ 3 & 8 & 4 \\ 4 & 0 & 14 \end{bmatrix}$ · The council's preliminary key

Q89 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If the solution of the system of simultaneous linear equations $x + y - z = 6, 3x + 2y - z = 5$ and $2x - y - 2z + 3 = 0$ is $x = \alpha, y = \beta, z = \gamma$, then $\alpha + \beta =$

(A) -7

(B) 2

(C) 1

(D) -2

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

Q90 AP EAPCET 2024 · 20 May · Shift 2 MCQ

Let A, B, C, D and E be $n \times n$ matrices, each with non – zero determinant. If ABCDE = I, then C^{-1} =

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(A) $E^{-1}D^{-1}B^{-1}A^{-1}$
(B) DEAB
(C) $A^{-1}B^{-1}D^{-1}E^{-1}$
(D) ABDE

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

Q91 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If $A = [a_{ij}]$, $1 \le i, j \le n$ with $n \ge 2$ and $a_{ij} = i + j$ is a matrix, then the rank of A is

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

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

Q92 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If $A = \begin{bmatrix} 1 & 2 \\ -2 & -5 \end{bmatrix}$ and $\alpha A^2 + \beta A = 2I$ for some $\alpha, \beta \in \mathbb{R}$ then $\alpha + \beta =$

(A) 7
(B) 10
(C) 12
(D) 5

Answer: (B) 10 · The council's preliminary key

Q93 AP EAPCET 2024 · 19 May · Shift 2 MCQ

The system of equations $x + 2y + 3z = 6,\ x + 3y + 5z = 9,\ 2x + 5y + az = 12$ has no solution when $a =$

(A) 5
(B) 6
(C) 7
(D) 8

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

Q94 TS EAPCET 2024 · 11 May · Shift 1 MCQ

$A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} x & y \\ 1 & 2 \end{bmatrix}$ are two matrices such that $(A + B)(A - B) = A^2 - B^2$. If $C = \begin{bmatrix} x & 2 \\ 1 & y \end{bmatrix}$ then Trace$(C) =$

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(A) 3
(B) 5
(C) 7
(D) 9

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

Q95 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If A is a non singular matrix, then $\mathrm{Adj}(A^{-1}) =$

(A) $(\mathrm{Adj}\ A)^{-1}$
(B) $\frac{1}{|A|}A^{-1}$
(C) $|A|A^{-1}$
(D) $|A|A$

Answer: (A) $(\mathrm{Adj}\ A)^{-1}$ · The council's preliminary key

Q96 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If $\mathrm{A} = \begin{bmatrix} x & y & y \\ y & x & y \\ y & y & x \end{bmatrix}$ is a matrix such that $5\mathrm{A}^{-1} = \begin{bmatrix} -3 & 2 & 2 \\ 2 & -3 & 2 \\ 2 & 2 & -3 \end{bmatrix}$ then $\mathrm{A}^2 - 4\mathrm{A} =$

(A) $5\mathrm{A}^{-1}$
(B) $5\mathrm{I}$
(C) 0
(D) I

Answer: (B) $5\mathrm{I}$ · The council's preliminary key

Q97 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If $A = \begin{bmatrix} 9 & 3 & 0 \\ 1 & 5 & 8 \\ 7 & 6 & 2 \end{bmatrix}$ and $AA^T - A^2 = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$, then $\sum_{\substack{1\le i\le 3 \\ 1\le j\le 3}} a_{ij} =$

(A) 35
(B) 0
(C) 33
(D) 1

Answer: (A) 35 · The council's preliminary key

Q98 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The system of equations $x + 3y + 7 = 0$, $3x + 10y - 3z + 18 = 0$ and $3y - 9z + 2 = 0$ has

(A) unique solution
(B) infinitely many solutions
(C) no solution
(D) finite number of solutions

Answer: (C) no solution · The council's preliminary key

Q99 TS EAPCET 2024 · 10 May · Shift 2 MCQ

If $|Adj\ \mathrm{A}| = x$ and $|Adj\ B| = y$ then $\left|(Adj(\mathrm{AB}))^{-1}\right| =$

(A) $\frac{1}{x} + \frac{1}{y}$
(B) xy
(C) $\frac{1}{xy}$
(D) $x + y$

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

Q100 TS EAPCET 2024 · 9 May · Shift 1 MCQ

A, B, C, D are square matrices such that $A + B$ is symmetric, $A - B$ is skew-symmetric and D is the transpose of C. If $A = \begin{bmatrix} -1 & 2 & 3 \\ 4 & 3 & -2 \\ 3 & -4 & 5 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & 1 & -2 \\ 2 & -1 & 0 \\ 0 & 2 & 1 \end{bmatrix}$, then the matrix $B + D =$

(A) $\begin{bmatrix} -1 & 6 & 3 \\ 6 & 2 & -2 \\ 3 & -2 & 6 \end{bmatrix}$
(B) $\begin{bmatrix} -1 & 6 & 3 \\ 3 & 2 & -2 \\ 1 & -2 & 6 \end{bmatrix}$
(C) $\begin{bmatrix} 3 & 2 & -2 \\ 2 & 6 & 3 \\ -2 & 3 & 2 \end{bmatrix}$
(D) $\begin{bmatrix} 1 & -2 & 6 \\ -2 & 3 & 2 \\ 6 & 2 & 1 \end{bmatrix}$

Answer: (B) $\begin{bmatrix} -1 & 6 & 3 \\ 3 & 2 & -2 \\ 1 & -2 & 6 \end{bmatrix}$ · The council's preliminary key

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Q101 TS EAPCET 2024 · 9 May · Shift 1 MCQ

If A is square matrix and $A^2 + I = 2A$, then $A^9 =$

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(A) $8A^2 - 7I$
(B) $9A + 8I$
(C) $9A - 8I$
(D) $8A^2 + 7I$

Answer: (C) $9A - 8I$ · The council's preliminary key

Q102 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The system of simultaneous linear equations $x - 2y + 3z = 4$, $3x + y - 2z = 7$, $2x + 3y + z = 6$ has

(A) infinitely many solutions
(B) no solution
(C) unique solution having $z = 2$
(D) unique solution having $z = \frac{1}{2}$

Answer: (D) unique solution having $z = \frac{1}{2}$ · The council's preliminary key

Q103 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If $A = \begin{vmatrix} 1 & 2 & 2 \\ 3 & 2 & 3 \\ 1 & 1 & 2 \end{vmatrix}$ and $A^{-1} = \begin{vmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{vmatrix}$, then $\sum_{\substack{1 \le i \le 3 \\ 1 \le j \le 3}} a_{ij} =$

(A) $\frac{2}{3}$
(B) $\frac{1}{3}$
(C) 1
(D) 17

Answer: (B) $\frac{1}{3}$ · The council's preliminary key

Q104 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If $AX = D$ represents the system of linear equations $3x - 4y + 7z + 6 = 0$, $5x + 2y - 4z + 9 = 0$ and $8x - 6y - z + 5 = 0$, then

(A) Rank (A) = Rank $([AD])$ = 1
(B) Rank (A) = Rank $([AD])$ = 2
(C) Rank (A) = Rank $([AD])$ = 3
(D) Rank $(A) \neq$ Rank $([AD])$

Answer: (C) Rank (A) = Rank $([AD])$ = 3 · The council's preliminary key

Q105 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If $(x, y, z) = (\alpha, \beta, \gamma)$ is the unique solution of the system of simultaneous linear equations $3x - 4y + z + 7 = 0$, $2x + 3y - z = 10$, $x - 2y - 3z = 3$, then $\alpha =$

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

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

Q106 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The number of ordered pairs (x, y) for which $A = \begin{pmatrix} 1 & 2 & 1 \\ 2 & 2 & x \\ y & 1 & 2 \end{pmatrix}$ is a singular and symmetric matrix is

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

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

Q107 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If $A = \begin{bmatrix} 2 & 1 & 3 & -1 \\ 1 & -2 & 2 & -3 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 1 & 0 & 3 \\ 1 & -1 & 2 & 3 \end{bmatrix}$ and $2A + 3B - 5C = O$, then $C =$

(A) $\begin{bmatrix} 2 & 1 & 6/5 & 7/5 \\ 1 & 7/5 & 2 & 3/5 \end{bmatrix}$
(B) $\begin{bmatrix} -2 & 1 & 6/5 & 7/5 \\ 1 & -7/5 & 2 & 3/5 \end{bmatrix}$
(C) $\begin{bmatrix} -2 & 1 & 6/5 & 7/5 \\ 1 & 7/5 & 2 & 3/5 \end{bmatrix}$
(D) $\begin{bmatrix} 2 & 1 & 6/5 & 7/5 \\ 1 & -7/5 & 2 & 3/5 \end{bmatrix}$

Answer: (D) $\begin{bmatrix} 2 & 1 & 6/5 & 7/5 \\ 1 & -7/5 & 2 & 3/5 \end{bmatrix}$ · The council's preliminary key

Q108 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The rank of the matrix $\begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & -2 \\ 1 & -1 & 4 \\ 2 & 2 & 8 \end{bmatrix}$ is

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

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

Q109 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If $\begin{pmatrix}\alpha\\ \beta\\ \gamma\end{pmatrix}=\begin{pmatrix}\cos\theta & -\sin\theta & 0\\ \sin\theta & \cos\theta & 0\\ 0 & 0 & 1\end{pmatrix}\begin{pmatrix}x\\ y\\ z\end{pmatrix}$, then $\frac{x^2+y^2+z^2}{\gamma}=$

(A) $\frac{\alpha^2+\beta^2+\gamma^2}{z}$

(B) 0

(C) $\alpha\beta+\beta\gamma+\gamma\alpha$

(D) $1+\alpha^2+\beta^2+\gamma^2$

Answer: (A) $\frac{\alpha^2+\beta^2+\gamma^2}{z}$ · The council's preliminary key

Q110 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If $A=\begin{pmatrix}1 & 5 & 3\\ 2 & 4 & 0\\ 3 & -1 & -5\end{pmatrix}$, $B=\begin{pmatrix}-1\\ -2\\ 4\end{pmatrix}$ and $[x\ y\ z]A^T=B^T$, then $x+y+z=$

(A) 4

(B) -2

(C) 6

(D) 3

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

Q111 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If A and B are non-singular matrices and $\det(AB)=(\det A)(\det B)$, then $((\det A)(\det B))B^{-1}A^{-1}=$

(A) $\text{Adj}(BA)$

(B) $\text{Adj}(A)+\text{Adj}(B)$

(C) $\text{Adj}(AB)$

(D) $(\text{Adj}\,B)(\text{Adj}\,A)$

Answer: (C) $\text{Adj}(AB)$ · The council's preliminary key

Q112 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $A=\begin{bmatrix}2 & 0 & -3\\ 4 & 3 & 1\\ -5 & 7 & 2\end{bmatrix}$ is expressed as a sum of a symmetric matrix P and skew symmetric matrix Q, then $P^T-Q^T=$

(A) $\begin{bmatrix} 8 & -16 & -4 \\ 2 & 8 & 7 \\ 6 & 14 & -16 \end{bmatrix}$

(B) $\begin{bmatrix} 2 & 0 & -3 \\ 4 & 3 & 1 \\ -5 & 7 & 2 \end{bmatrix}$

(C) $\begin{bmatrix} 2 & 4 & -5 \\ 0 & 3 & 7 \\ -3 & 1 & 2 \end{bmatrix}$

(D) $\begin{bmatrix} 1 & 0 & -3/2 \\ 2 & 3/2 & 1/2 \\ -5/2 & 7/2 & 1 \end{bmatrix}$

Answer: (B) $\begin{bmatrix} 2 & 0 & -3 \\ 4 & 3 & 1 \\ -5 & 7 & 2 \end{bmatrix}$ · The council's preliminary key

Q113 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $A+2B=\begin{pmatrix} 1 & 2 & 0 \\ 6 & -3 & 3 \\ -5 & 3 & 1 \end{pmatrix}$ and $2A-B=\begin{pmatrix} 2 & -1 & 5 \\ 2 & -1 & 6 \\ 0 & 1 & 2 \end{pmatrix}$, then $\mathrm{Tr}[A]-\mathrm{Tr}[B]=$

(A) 1

(B) 2

(C) 3

(D) 4

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

Q114 AP EAPCET 2023 · 18 May · Shift 2 MCQ

The sum of the distinct values of x for which the matrix $A=\begin{bmatrix} 1 & 1 & x \\ 1 & x & 1 \\ x & 1 & 1 \end{bmatrix}$ has no inverse, is

(A) 4

(B) 3

(C) 2

(D) -1

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

Q115 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If $A=\begin{bmatrix} 1 & 1 & 3 \\ 5 & 2 & 6 \\ -2 & -1 & -3 \end{bmatrix}$, then $A+A^3+A^4+A^5+3I=$

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(A) $\begin{bmatrix} 4 & 2 & 1 \\ 2 & 5 & 6 \\ -3 & 2 & 3 \end{bmatrix}$

(B) $\begin{bmatrix} 4 & 1 & 3 \\ 5 & 5 & 6 \\ -2 & -1 & 0 \end{bmatrix}$

(C) $\begin{bmatrix} 3 & 1 & 4 \\ 3 & 1 & -2 \\ -1 & 2 & -1 \end{bmatrix}$

(D) $\begin{bmatrix} 4 & 1 & 3 \\ 2 & 3 & 5 \\ -3 & -2 & -3 \end{bmatrix}$

Answer: (B) $\begin{bmatrix} 4 & 1 & 3 \\ 5 & 5 & 6 \\ -2 & -1 & 0 \end{bmatrix}$ · The council's preliminary key

Q116 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If the solution for the system of equations $x + 2y - z = 3,\ 3x - y + 2z = 1$ and $2x - 2y + 3z = 2$ is (α, β, γ), then $\alpha^2 + \beta^2 + \gamma^2 =$

(A) 33

(B) 5

(C) 17

(D) 14

Answer: (A) 33 · The council's preliminary key

Q117 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If $\begin{bmatrix} x & 4 & -1 \end{bmatrix} \begin{bmatrix} 2 & 1 & 0 \\ 1 & 0 & 2 \\ 0 & 2 & 4 \end{bmatrix} \begin{bmatrix} x \\ 4 \\ -1 \end{bmatrix} = 0$, then $x =$

(A) $-1 + \sqrt{6}$

(B) $8 \pm \sqrt{5}$

(C) $-2 \pm \sqrt{10}$

(D) $3 \pm \sqrt{6}$

Answer: (C) $-2 \pm \sqrt{10}$ · The council's preliminary key

Q118 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If $A = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$, then $A^{-1} =$

(A) $A - 2A^2$
(B) $2A - A^2$
(C) $2A^2 + A$
(D) $2A + A^2$

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

Q119 AP EAPCET 2023 · 17 May · Shift 2 MCQ

The rank of the matrix $A = \begin{bmatrix} 1 & 1 & 1 & 3 \\ 2 & 2 & -1 & 3 \\ 1 & 1 & -1 & 1 \end{bmatrix}$ is

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

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

Q120 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If matrix $D_1 = \text{diag}(a, b, c)$, matrix $D_2 = \text{diag}(3, 3, 3)$ and A is a Skew symmetric matrix of 3rd order, then $\text{Tr}(D_1D_2A + D_1D_2 + D_1A + D_2A) - \text{Tr}(D_1 + D_2) =$

(A) $2a + 2b + 2c - 9$
(B) $3a + 3b + 3c - 9$
(C) $3a + 3b + 3c$
(D) $a^3 + b^3 + c^3$

Answer: (A) $2a + 2b + 2c - 9$ · The council's preliminary key

Q121 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If there exists a kth order non-singular sub matrix in a matrix P of order $m \times n$, then the rank (ρ) of P

(A) satisfies $k \leq \rho \leq m$
(B) satisfies $k < \rho < n$
(C) satisfies $k \leq \rho \leq \min\{m, n\}$
(D) is equal to $k + 1$

Answer: (C) satisfies $k \leq \rho \leq \min\{m, n\}$ · The council's preliminary key

Q122 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If $A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \end{bmatrix}$ and $B = \begin{bmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \end{bmatrix}$, then which one of the following is True?

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(A) $A^TBB^TA = B^TAA^TB$

(B) The orders of A^TBB^TA and B^TAA^TB are equal

(C) The orders of $A+B$, A^TB, BA^T are equal

(D) Rank of A and B are equal

Answer: (B) The orders of A^TBB^TA and B^TAA^TB are equal · The council's preliminary key

Q123 AP EAPCET 2023 · 16 May · Shift 1 MCQ

In a matrix A, if all the sub matrices of kth order are singular and there is one non-singular sub matrix of order r $(r < k)$, then the rank (ρ) of the matrix A

(A) satisfies $r \leq \rho < k$

(B) is equal to r

(C) is equal to $(k-1)$

(D) is equal to $(k+1)$

Answer: (A) satisfies $r \leq \rho < k$ · The council's preliminary key

Q124 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Let $A = \begin{pmatrix} -\cot\theta & \operatorname{cosec}\theta \\ \operatorname{cosec}\theta & -\cot\theta \end{pmatrix}$. If $A^{-1} = A$ at $\theta = \theta_1$ and $A^{-1} + A = O$ at $\theta = \theta_2$, then which one of the following is True?

(A) $\theta_1 = \frac{\pi}{2}$, $\theta_2 = \pi$

(B) $\theta_1 = \frac{\pi}{2}$, such θ_2 does not exist

(C) $\theta_1 = \frac{\pi}{4}$, $\theta_2 = \frac{\pi}{2}$

(D) such θ_1 does not exist, $\theta_2 = \pi$

Answer: (B) $\theta_1 = \frac{\pi}{2}$, such θ_2 does not exist · The council's preliminary key

Q125 AP EAPCET 2023 · 16 May · Shift 2 MCQ

A matrix whose elements a_{ij} are defined by $a_{ij} = \frac{1}{3}|i - 5j|$, $i, j = 1, 2, 3$ is

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(A) $\begin{bmatrix} 4 & 3 & \frac{14}{3} \\ 1 & \frac{8}{3} & 13 \\ \frac{2}{3} & \frac{7}{3} & 4 \end{bmatrix}$

(B) $\begin{bmatrix} \frac{4}{3} & 3 & \frac{14}{3} \\ 1 & \frac{8}{3} & \frac{13}{3} \\ \frac{2}{3} & \frac{7}{3} & 4 \end{bmatrix}$

(C) $\begin{bmatrix} \frac{4}{3} & 3 & \frac{10}{3} \\ 1 & \frac{8}{3} & \frac{13}{3} \\ 2 & 7 & 4 \end{bmatrix}$

(D) $\begin{bmatrix} 4 & 3 & 10 \\ 1 & 8 & 13 \\ 2 & 7 & 4 \end{bmatrix}$

Answer: (B) $\begin{bmatrix} \frac{4}{3} & 3 & \frac{14}{3} \\ 1 & \frac{8}{3} & \frac{13}{3} \\ \frac{2}{3} & \frac{7}{3} & 4 \end{bmatrix}$ · The council's preliminary key

Q126 AP EAPCET 2023 · 15 May · Shift 1 MCQ

Let $A = \begin{pmatrix} 0 \\ -6 \\ 8 \end{pmatrix}$, $B = \begin{pmatrix} 3 & 5 & -7 \\ 0 & -1 & 8 \\ 6 & -1 & 0 \end{pmatrix}$ and $X = \begin{pmatrix} x \\ y \\ z \end{pmatrix}$. If $D = [\alpha\ \beta\ \gamma]^T$ is the solution of $X^T B^T = A^T$, then $D^T A =$

(A) 0

(B) 4

(C) -2

(D) 6

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

Q127 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $S = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix}$ and $A = \frac{1}{2}\begin{bmatrix} b+c & c-a & b-a \\ c-b & c+a & a-b \\ b-c & a-c & a+b \end{bmatrix}$, then $SAS^{-1} =$

(A) $\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$

(B) $\frac{1}{2}\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$

(C) $2\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$

(D) $\begin{bmatrix} a & b & c \\ b & c & a \\ c & a & b \end{bmatrix}$

Answer: (A) $\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$ · The council's preliminary key

Q128 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $A = \begin{bmatrix} i & 0 \\ 0 & -i \end{bmatrix}$, $B = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$, then

(A) $A^2 + B^2 + C^2 = 3A^2B^2C^2$

(B) $A^2 + B^2 + C^2 = 3ABC$

(C) $A^2 + B^2 + C^2 = 3I$

(D) $A^2 + B^2 + C^2 = 2ABC$

Answer: (A) $A^2 + B^2 + C^2 = 3A^2B^2C^2$ · The council's preliminary key

Q129 AP EAPCET 2023 · 15 May · Shift 2 MCQ

Let $B = \begin{pmatrix} 2 & 6 & 4 \\ 1 & 0 & 1 \\ -1 & 1 & -1 \end{pmatrix}$ and $C = \begin{pmatrix} -1 & 0 & 1 \\ 1 & 1 & 3 \\ 2 & 0 & 2 \end{pmatrix}$. If a matrix A is such that $BAC = I$, then $A^{-1} =$

(A) $\begin{pmatrix} -3 & -5 & 5 \\ 0 & 9 & 14 \\ 2 & 2 & 6 \end{pmatrix}$

(B) $\begin{pmatrix} -3 & -5 & 5 \\ 0 & 0 & 9 \\ 2 & 14 & 16 \end{pmatrix}$

(C) $\begin{pmatrix} -3 & -5 & -6 \\ 0 & 9 & 2 \\ 2 & 14 & 6 \end{pmatrix}$

(D) $\begin{pmatrix} -3 & -5 & -5 \\ 0 & 9 & 2 \\ 2 & 14 & 6 \end{pmatrix}$

Answer: (D) $\begin{pmatrix} -3 & -5 & -5 \\ 0 & 9 & 2 \\ 2 & 14 & 6 \end{pmatrix}$ · The council's preliminary key

Q130 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If $\det(AB) = (\det A)(\det B)$ and A is a non-singular matrix of order 3×3, then $\det(\text{adj } A) =$

(A) $\det(A)$
(B) $(\det(A))^{-1}$
(C) $(\det(A))^{2}$
(D) $(\det(A))^{3}$

Answer: (C) $(\det(A))^{2}$ · The council's preliminary key

Q131 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If $A = \left\{ \begin{pmatrix} a & b \\ c & d \end{pmatrix} : a, b, c, d \in \{-1, 1\} \right\}$, then the number of singular matrices in A is

(A) 9
(B) 12
(C) 10
(D) 8

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

Q132 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If A is a square matrix of order 3, then $\left|\text{Adj}\left(\text{Adj } A^{2}\right)\right| =$

(A) $|A|^{2}$
(B) $|A|^{4}$
(C) $|A|^{8}$
(D) $|A|^{16}$

Answer: (C) $|A|^{8}$ · The council's preliminary key

Q133 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If A and B are two square matrices of the same order and $(AB + BA)^{T} + (AB - BA)^{T} = 2BA$ then

(A) A and B are both symmetric matrices but not skew-symmetric matrices
(B) A and B are both skew-symmetric matrices but not symmetric matrices
(C) A and B are neither symmetric nor skew-symmetric matrices
(D) A and B are any two non zero matrices

Options (1) or (2) were accepted. More than one answer was accepted. · Checked by our team

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Q134 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $\text{adj}\begin{bmatrix}1 & 0 & 2\\ -1 & 1 & -2\\ 0 & 2 & 1\end{bmatrix} = \begin{bmatrix}5 & m & -2\\ 1 & 1 & 0\\ -2 & -2 & n\end{bmatrix}$, then $m+n=$

(A) 2

(B) -3

(C) 5

(D) -5

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

Q135 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $A=\begin{bmatrix}0 & 3\\ 0 & 0\end{bmatrix}$ and $f(x)=x+x^2+x^3+\ldots..+x^{2023}$, then $f(A)+I=$

(A) $\begin{bmatrix}0 & 0\\ 0 & 0\end{bmatrix}$

(B) $\begin{bmatrix}1 & 3\\ 0 & 0\end{bmatrix}$

(C) $\begin{bmatrix}1 & 3\\ 0 & 1\end{bmatrix}$

(D) $\begin{bmatrix}1 & 3\\ 1 & 1\end{bmatrix}$

Answer: (C) $\begin{bmatrix}1 & 3\\ 0 & 1\end{bmatrix}$ · The council's preliminary key

Q136 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If $X_{4\times3}$, $Y_{4\times3}$ and $P_{2\times3}$ are the matrices then the order of the matrix $\left[P\left(X^TY\right)^{-1}P^T\right]^T$ is

(A) 4×3

(B) 3×4

(C) 3×3

(D) 2×2

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

Q137 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If $A=\begin{bmatrix}1 & 2\\ 3 & 5\end{bmatrix}$ and $\alpha,\beta\in\mathbb{R}$ are such that $\alpha A^2-\beta A=2I$, then $\alpha^2+\beta=$

(A) -8
(B) 16
(C) 12
(D) 20

Answer: (B) 16 · The council's preliminary key

Q138 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If the system of equations $x+y+z=5,\ x+2y+2z=6$ and $x+3y+\lambda z=\mu\ (\lambda,\mu\in\mathbb{R})$ is solvable by Matrix Inversion Method, then

(A) $\lambda\neq 3,\ \mu\in\mathbb{R}$
(B) $\lambda=3,\ \mu=0$
(C) $\lambda\neq 3,\ \mu\neq 5$
(D) $\lambda=3,\ \mu\in\mathbb{R}$

Answer: (A) $\lambda\neq 3,\ \mu\in\mathbb{R}$ · The council's preliminary key

Q139 TS EAMCET 2023 · 13 May · Shift 1 MCQ

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

(A) $A-B$
(B) $B-A$
(C) $A+B$
(D) B^2

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

Q140 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If $A=\begin{bmatrix}k&5&2\\2&-k&5\\5&2&-k\end{bmatrix}$ and $\det A=190$ then $\mathrm{Adj}A=$

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(A) $\begin{bmatrix} -1 & 19 & 31 \\ 31 & -19 & -11 \\ 19 & 19 & -19 \end{bmatrix}$

(B) $\begin{bmatrix} -1 & 31 & 19 \\ 19 & -19 & 19 \\ 31 & -11 & -19 \end{bmatrix}$

(C) $\begin{bmatrix} -1 & 19 & 31 \\ -31 & -19 & -11 \\ 19 & 19 & -19 \end{bmatrix}$

(D) $\begin{bmatrix} -1 & -31 & 19 \\ 19 & -19 & 19 \\ 31 & -11 & -19 \end{bmatrix}$

Answer: (A) $\begin{bmatrix} -1 & 19 & 31 \\ 31 & -19 & -11 \\ 19 & 19 & -19 \end{bmatrix}$ · The council's preliminary key

Q141 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If the unique solution of the simultaneous linear equations $3x - 2y + z = 5k$, $2x + 3y - 2z = -5k$, $x + 4y + 3z = k$ is $x = \alpha$, $y = \beta$, $z = 3$, then $k =$

(A) 1

(B) 2

(C) -1

(D) -2

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

Q142 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If $A = \begin{bmatrix} b & a & 0 \\ c & 0 & b \\ a & a & b \end{bmatrix}$ and $B = \begin{bmatrix} 0 & a & b \\ b & 0 & c \\ b & a & a \end{bmatrix}$ are two matrices such that $AB = \begin{bmatrix} 2 & 2 & 7 \\ 1 & 8 & 5 \\ 3 & 6 & 10 \end{bmatrix}$, then $a^2 + b^2 + c^2 =$

(A) 14

(B) 17

(C) 22

(D) 29

Answer: (A) 14 · The council's preliminary key

Q143 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If $A = \begin{bmatrix} 1 & a & 3 \\ b & 2 & c \\ 3 & d & 4 \end{bmatrix}$ is a symmetric matrix and $B = \begin{bmatrix} 0 & 5 & b \\ -5 & 0 & -7 \\ 6 & c & 0 \end{bmatrix}$ is a skew symmetric matrix, then AB =

(A) $\begin{bmatrix} 48 & 27 & 48 \\ 52 & 19 & 22 \\ -59 & 43 & -67 \end{bmatrix}$

(B) $\begin{bmatrix} 48 & 26 & 36 \\ 32 & 19 & 22 \\ -11 & 43 & -67 \end{bmatrix}$

(C) $\begin{bmatrix} 12 & 26 & 36 \\ 32 & 79 & 50 \\ -11 & 43 & -67 \end{bmatrix}$

(D) $\begin{bmatrix} 12 & 32 & 41 \\ 32 & 19 & 22 \\ -11 & 43 & -67 \end{bmatrix}$

Answer: (B) $\begin{bmatrix} 48 & 26 & 36 \\ 32 & 19 & 22 \\ -11 & 43 & -67 \end{bmatrix}$ · The council's preliminary key

Q144 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If the inverse of the matrix $A = \begin{bmatrix} -1 & -3 & -2 \\ 0 & 1 & 2 \\ 3 & 4 & 5 \end{bmatrix}$ is $A^{-1} = \begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix}$, then $a_1 + c_2 + b_3 =$

(A) -6

(B) $-\frac{2}{3}$

(C) $\frac{2}{3}$

(D) 6

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

Q145 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If $x = \alpha, y = \beta, z = \gamma$ is the unique solution of the system of linear equations $2x - 3y + 5z = 12$, $5x + 2y + 3z = 11$ and $x + 2y - 3z = -3$ then $2\alpha + 5\beta + 3\gamma =$

(A) 10

(B) 11

(C) 3

(D) 2

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

Q146 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If P is a non-singular matrix such that $I + P + P^2 + \ldots + P^n = O$ (O denotes the null matrix), then $P^{-1} =$

(A) P^n

(B) $-P^n$

(C) $-(1+P+\ldots+P^n)$

(D) $-(1+P+\ldots+P^{n-1})$

Options (1) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

Q147 TS EAMCET 2023 · 12 May · Shift 1 MCQ

P is a 3 x 3 square matrix and $\mathrm{Tr}(P) \neq 0$. If

$$\mathrm{Tr}\left(P-P^T\right)+\mathrm{Tr}\left(P+P^T\right)+\frac{\mathrm{Tr}(P)}{\mathrm{Tr}\left(P^T\right)}+\mathrm{Tr}(P)\times\mathrm{Tr}\left(P^T\right)=0$$

then $\mathrm{Tr}(P)=$

(A) 0

(B) -1

(C) 4

(D) 3

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

Q148 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If the system of equations $x+ky+3z=-2,\ 4x+3y+kz=14,\ 2x+y+2z=3$ can be solved by matrix inversion method then

(A) $k \neq 0$ and $\frac{9}{2}$

(B) $k=0$ or $\frac{9}{2}$

(C) $k \neq \frac{1}{2}$ and 2

(D) $k=\frac{1}{2}$ or 2

Answer: (A) $k \neq 0$ and $\frac{9}{2}$ · Checked by our team

Q149 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If A is a non-singular matrix such that $(A-2I)(A-3I)=O$, then $\frac{1}{5}A+\frac{6}{5}A^{-1}=$

(A) O

(B) I

(C) $2I$

(D) $3I$

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

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Q150 TS EAMCET 2023 · 12 May · Shift 2 MCQ

Let A be a matrix such that AB is a scalar matrix where $B = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$ and $\det(3A) = 27$. Then $3A^{-1} + A^2 =$

(A) $\begin{bmatrix} 4 & -6 \\ 0 & 2 \end{bmatrix}$

(B) $\begin{bmatrix} 9 & -4 \\ 0 & 3 \end{bmatrix}$

(C) $\begin{bmatrix} 10 & -6 \\ 0 & 2 \end{bmatrix}$

(D) $\begin{bmatrix} 10 & -6 \\ 0 & 4 \end{bmatrix}$

Answer: (D) $\begin{bmatrix} 10 & -6 \\ 0 & 4 \end{bmatrix}$ · The council's preliminary key

Q151 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If A is a symmetric matrix with real entries, then

(A) A^{-1} is symmetric, if it exists

(B) A^{-1} always exists and is symmetric

(C) A^{-1} is skew symmetric, if it exists

(D) A^{-1} always exists and is skew-symmetric

Answer: (A) A^{-1} **is symmetric, if it exists** · The council's preliminary key

Q152 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 3 & 2 \\ 3 & 4 & 5 \end{bmatrix}$ then $(A + A^T)(A - A^T) =$

(A) $4\begin{bmatrix} 3 & 2 & -3 \\ 3 & 0 & -3 \\ 3 & 2 & -3 \end{bmatrix}$

(B) $\begin{bmatrix} 12 & 8 & 12 \\ 12 & 0 & 12 \\ 12 & 8 & 12 \end{bmatrix}$

(C) $4\begin{bmatrix} 3 & -2 & -3 \\ 3 & 0 & -3 \\ 3 & -2 & -3 \end{bmatrix}$

(D) $\begin{bmatrix} -12 & 8 & 12 \\ -12 & 0 & 12 \\ -12 & 8 & 12 \end{bmatrix}$

Answer: (A) $4\begin{bmatrix} 3 & 2 & -3 \\ 3 & 0 & -3 \\ 3 & 2 & -3 \end{bmatrix}$ · The council's preliminary key

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Q153 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Let $A = \begin{pmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & 1 & 2 \end{pmatrix}$. If $A^{-1} = \alpha A^2 + \beta A + \gamma I$, where α, β, γ are real numbers and I is a 3×3 identity matrix, then $17\alpha + 5\beta + \gamma =$

(A) -1
(B) $\frac{-1}{3}$
(C) $\frac{2}{3}$
(D) 3

Answer: (B) $\frac{-1}{3}$ · The council's preliminary key

Q154 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

For a system of simultaneous linear equations, if $AX = \begin{bmatrix} 1 \\ 1 \\ 2 \end{bmatrix}$, Adj $A = \begin{bmatrix} 1 & -1 & -1 \\ 1 & 1 & -1 \\ 1 & 1 & 1 \end{bmatrix}$ and det $A > 0$, then $X =$

(A) $\begin{bmatrix} -1 \\ 0 \\ 2 \end{bmatrix}$
(B) $\begin{bmatrix} 1 \\ 1 \\ 2 \end{bmatrix}$
(C) $\begin{bmatrix} 0 \\ -1 \\ -1 \end{bmatrix}$
(D) $\begin{bmatrix} 2 \\ 1 \\ 1 \end{bmatrix}$

Answer: (A) $\begin{bmatrix} -1 \\ 0 \\ 2 \end{bmatrix}$ · The council's preliminary key

Q155 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If A is a 2×2 matrix such that $\det A = -21$ and trace of A^3 is 2024, then the trace of A is

(A) 6
(B) 11
(C) 12
(D) 13

Answer: (B) 11 · The council's preliminary key

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Q156 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If $\begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$ is a skew symmetric matrix and b, c, f are non-zero real numbers then $\frac{b}{c} =$

(A) $\frac{dh}{fg}$

(B) $\frac{df}{gh}$

(C) $\frac{-df}{gh}$

(D) $\frac{-dh}{fg}$

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

Q157 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If $\begin{bmatrix} 0 & 2 & a \\ b & 0 & 4 \\ -3 & c & 0 \end{bmatrix}$ is a skew-symmetric matrix, then $\begin{bmatrix} a & b \\ b & a \end{bmatrix}\begin{bmatrix} b & c \\ c & b \end{bmatrix} =$

(A) $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 2 & -8 \\ -8 & 2 \end{bmatrix}$

(D) $\begin{bmatrix} 2 & 8 \\ 8 & 2 \end{bmatrix}$

Answer: (C) $\begin{bmatrix} 2 & -8 \\ -8 & 2 \end{bmatrix}$ · The council's preliminary key

Q158 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If $\begin{bmatrix} -1 & 2 & b \\ a & 5 & 6 \\ 3 & c & 7 \end{bmatrix}$ is a symmetric matrix, then $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix} =$

(A) 0

(B) -121

(C) 143

(D) -143

Answer: (D) -143 · The council's preliminary key

Q159 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If the matrix $\mathrm{A} = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ satisfies the matrix equation $\mathrm{A}^2 - 4\mathrm{A} - 5\mathrm{I} = 0$, then $\mathrm{A}^{-1} =$

(A) $\frac{1}{5}\begin{bmatrix}-3 & 2 & 2\\ -2 & 3 & -2\\ 2 & 2 & -3\end{bmatrix}$

(B) $\frac{1}{5}\begin{bmatrix}-3 & 2 & 2\\ 2 & -3 & 2\\ 2 & 2 & -3\end{bmatrix}$

(C) $\frac{1}{5}\begin{bmatrix}-3 & 2 & 2\\ 2 & -3 & 2\\ -2 & -2 & 3\end{bmatrix}$

(D) $\frac{1}{5}\begin{bmatrix}-3 & 2 & 2\\ 2 & -3 & 2\\ 2 & 2 & 3\end{bmatrix}$

Answer: (B) $\frac{1}{5}\begin{bmatrix}-3 & 2 & 2\\ 2 & -3 & 2\\ 2 & 2 & -3\end{bmatrix}$ · The council's preliminary key

Q160 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

Consider the simultaneous linear equations $\mathrm{AX} = \mathrm{B}$ and $\mathrm{AY} = \mathrm{Q}$. If A is an invertible matrix and B is the unique solution of $\mathrm{AY} = \mathrm{Q}$, then the solution of $\mathrm{AX} = \mathrm{B}$ is

(A) $\mathrm{A}^{-1}(\mathrm{B} + \mathrm{Q})$

(B) $(\mathrm{A}^{-1})^2\mathrm{B}$

(C) $\mathrm{A}^{-1}\mathrm{BQ}$

(D) $(\mathrm{A}^{-1})^2\mathrm{Q}$

Answer: (D) $(\mathrm{A}^{-1})^2\mathrm{Q}$ · The council's preliminary key

Q161 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Let $A = \begin{pmatrix}0 & 1\\ 1 & k\end{pmatrix}$, $k \in \mathbb{R}$ and $A^3 = \begin{pmatrix}a & b\\ c & d\end{pmatrix}$. If $d = 228$, then $b + c =$

(A) 52

(B) 74

(C) 2

(D) 100

Answer: (B) 74 · The council's preliminary key

Q162 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Let $A = \begin{bmatrix}0 & 0 & -1\\ 0 & -1 & 0\\ -1 & 0 & 0\end{bmatrix}$, $B = \begin{bmatrix}0 & 1 & 0\\ 1 & 0 & 0\\ 0 & 0 & 1\end{bmatrix}$ then $\left(A^{-1}B\right)^{-1} + \left(AB^{-1}\right)^{-1} =$

(A) $\begin{bmatrix}1 & 0 & 0\\ 0 & -2 & 0\\ 0 & 0 & 2\end{bmatrix}$

(B) $\begin{bmatrix}0 & -2 & 0\\ 0 & 0 & -2\\ -2 & 0 & 0\end{bmatrix}$

(C) $\begin{bmatrix}-2 & 0 & 0\\ 0 & 0 & -2\\ 0 & -2 & 0\end{bmatrix}$

(D) $\begin{bmatrix}0 & 0 & -2\\ -2 & 0 & 0\\ 0 & -2 & 0\end{bmatrix}$

Answer: (B) $\begin{bmatrix}0 & -2 & 0\\ 0 & 0 & -2\\ -2 & 0 & 0\end{bmatrix}$ · The council's preliminary key

Q163 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Let α, β, γ be real numbers. If $\begin{pmatrix}7 & 5 & \alpha\\ \beta & 2 & 11\\ 3 & \gamma & 1\end{pmatrix}\begin{pmatrix}1\\ 3\\ 2\end{pmatrix} = \begin{pmatrix}\alpha+\beta\\ -2\alpha+\beta-2\gamma\\ \alpha+2\beta+3\gamma\end{pmatrix}$ then $100 + \frac{2\alpha+11\beta}{\gamma} =$

(A) 27

(B) -25

(C) 225

(D) -227

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

Q164 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Let $A = \begin{bmatrix}a & 3 & 5\\ 5 & -1 & 3\\ 2 & 3 & -4\end{bmatrix}$ and $B = \begin{bmatrix}b & 1 & 4\\ 4 & c & 1\\ -3 & 1 & d\end{bmatrix}$. If the trace of A is -4 and $AB = \begin{bmatrix}-1 & 0 & 17\\ -3 & 10 & 25\\ 28 & -8 & 3\end{bmatrix}$ then $a+b+c+d =$

(A) 7

(B) -1

(C) 3

(D) 1

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

Q165 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Let α, β, γ be real numbers. If $A = \begin{pmatrix} 7 & 3 & \alpha \\ \beta & 1 & -11 \\ -5 & \gamma & 19 \end{pmatrix}$ is a 3×3 matrix satisfying $A \begin{pmatrix} 5 \\ -13 \\ 11 \end{pmatrix} = \begin{pmatrix} -290 \\ -119 \\ 210 \end{pmatrix}$, then $(\text{adj } A)^{-1} + \text{adj } A^{-1} =$

(A) A

(B) $-A$

(C) $2A$

(D) $-2A$

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

Q166 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If $(\alpha\ \beta\ \gamma) \begin{pmatrix} 1 & 2 & 3 \\ 2 & 3 & -5 \\ 1 & 2 & 5 \end{pmatrix} = (3\ \ 5\ \ 2)$ then $\alpha^3 + \beta^3 + \gamma^3 =$

(A) 8

(B) -6

(C) 6

(D) -10

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

Q167 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If $A + B = \begin{bmatrix} 2 & 1 & 2 \\ 1 & 2 & 0 \\ 0 & 2 & 2 \end{bmatrix}$, $AB = \begin{bmatrix} 1 & 2 & 2 \\ 1 & 1 & 0 \\ 1 & 2 & 1 \end{bmatrix}$ then $A^2 + B(A + B) =$

(A) $\begin{bmatrix} 4 & 6 & 6 \\ 3 & 4 & 2 \\ 1 & 6 & 3 \end{bmatrix}$

(B) $\begin{bmatrix} 4 & 9 & 6 \\ 3 & 3 & 2 \\ 4 & 7 & 4 \end{bmatrix}$

(C) $\begin{bmatrix} 6 & 10 & 8 \\ 4 & 5 & 2 \\ 4 & 9 & 6 \end{bmatrix}$

(D) $\begin{bmatrix} 3 & 4 & 4 \\ 2 & 3 & 2 \\ 0 & 4 & 2 \end{bmatrix}$

Answer: (A) $\begin{bmatrix} 4 & 6 & 6 \\ 3 & 4 & 2 \\ 1 & 6 & 3 \end{bmatrix}$ · The council's preliminary key

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Q168 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If A is a 3×3 matrix and $|A| = \frac{1}{2}$ then $\left|A^{-1}(\mathrm{Adj}(\mathrm{Adj}A))\right|^{-1} =$

(A) 8
(B) $\frac{1}{8}$
(C) $\frac{1}{2}$
(D) 2

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

Q169 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

Let $A = (a_{ij})$ be an $n \times n$ matrix defined by $a_{ij} = \begin{cases} k^i, & \forall i = j \\ 0, & \text{otherwise} \end{cases}$. If $m =$ trace of A and $\lim_{k \to 1} \frac{n-m}{1-k} = 171$ then the value of n is

(A) 18
(B) 23
(C) 35
(D) 42

Answer: (A) 18 · The council's preliminary key

Q170 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

If the system of simultaneous linear equations $x + y + z = \lambda$, $5x - y + \mu z = 10$ and $2x + 3y - z = 6$ has unique solution, then

(A) $\mu = 23$ and $\lambda \in R$
(B) $\mu \in R$ and $\lambda \neq 23$
(C) $\mu \neq 23$ and $\lambda \in R$
(D) $\mu = 23$ and $\lambda = 16$

Answer: (C) $\mu \neq 23$ and $\lambda \in R$ · The council's preliminary key

Q171 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & -3 & 2 \\ -2 & 1 & 3 \\ 3 & 2 & -1 \end{bmatrix}$ then $A^2 \operatorname{Adj} A =$

(A) $21A$
(B) $-42A$
(C) $7A^{-1}$
(D) $14(\operatorname{Adj} A)$

Answer: (B) $-42A$ · The council's preliminary key

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Q172 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

If $A=\begin{bmatrix}0 & 1 & 2 & 3 & 4\\ 0 & 2 & 4 & 8 & 12\\ 0 & 0 & 0 & 4 & 8\end{bmatrix}$, then the rank of A is

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

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

Q173 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The set of values of k for which the system of simultaneous equations $x+y+kz=1$, $2x+2y=3$ and $x+2y+2kz=k$ has no real solution is

(A) $\{0\}$
(B) $\mathbf{R}-\{0\}$
(C) $\{2\}$
(D) $\{-1,0,1\}$

Answer: (A) $\{0\}$ · The council's preliminary key

Q174 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If A and B are $n\times n$ square matrices such that $(2A+B)^2+(A-3B)^2=5A^2-2AB+10B^2$ then, $ABAB=$

(A) $\frac{1}{2}\left[(A-B)^2+(A+B)^2\right]$
(B) $4AB$
(C) $\frac{1}{2}\left[(A+B)^2-(A-B)^2\right]$
(D) A^2B^2

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

Q175 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If $\begin{pmatrix}5 & a & -7\\ b & -7 & c\\ -7 & d & -1\end{pmatrix}$ is the adjoint of the matrix $\begin{pmatrix}1 & 2 & 3\\ 2 & 3 & 1\\ 3 & 1 & 2\end{pmatrix}$, then $a+b+c+d=$

(A) 8
(B) 10
(C) 0
(D) 2

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

Q176 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

The rank of the matrix $A = \begin{bmatrix} 1 & -1 & 0 & -2 \\ -4 & 4 & 0 & 8 \\ -2 & 1 & 2 & 4 \end{bmatrix}$ is

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

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

Q177 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If $A = \begin{bmatrix} 1 & 1 & a+1 \\ 1 & a+1 & 1 \\ a+1 & 1 & 1 \end{bmatrix}$ is not an invertible matrix, then the sum of all the values of a is

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

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

Q178 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

If the system of simultaneous linear equations $x + y - z = 6$, $3x - y + z = 2$ and $x + ky + z = -8$ has a unique solution $x = 2$, $y = \beta$, $z = \gamma$ then the value of k satisfies the following quadratic equation

(A) $x^2 - 5x + 6 = 0$
(B) $x^2 + x - 6 = 0$
(C) $x^2 - x - 6 = 0$
(D) $x^2 + x - 2 = 0$

Answer: (B) $x^2 + x - 6 = 0$ · The council's preliminary key

Q179 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

Let $A=\begin{bmatrix}1 & 2\\ -2 & 1\end{bmatrix}$ and $B^{-1}=\begin{bmatrix}1 & 1\\ 0 & 2\end{bmatrix}$. If $(AB^{-1})^{-1}=\begin{bmatrix}a & b\\ c & d\end{bmatrix}$, then $2b+5c+10d=$

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

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

Q180 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

Let $A=\begin{bmatrix}n & 0 & 0\\ 0 & n & 0\\ 0 & 0 & n\end{bmatrix}$ and $B=\begin{bmatrix}0 & 0 & n\\ 0 & n & 0\\ n & 0 & 0\end{bmatrix}$. Then $A^2+B^2+AB=$

(A) $n(nI+nB+B)$
(B) $n(2nI+B)$
(C) $n^2(2I+B)$
(D) $n(nI+nA+B)$

Answer: (B) $n(2nI+B)$ · The council's preliminary key

Q181 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

Let $A=\begin{bmatrix}b^2+c^2 & a^2 & a^2\\ b^2 & c^2+a^2 & b^2\\ c^2 & c^2 & a^2+b^2\end{bmatrix}$. If $a=\sin\pi/6$, $b=\cos\pi/4$ and $c=\cot\pi/2$ then A is

(A) Symmetric matrix
(B) Skew-Symmetric matrix
(C) Singular matrix
(D) Non-singular matrix

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

Q182 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If a matrix A satisfies the equation $A^3-6A^2+11A-6I=0$, then A^{-1} can be

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

Answer: (D) $\frac{1}{3}I$ · The council's preliminary key

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Q183 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

The rank of the matrix $A = \begin{bmatrix} 2 & 1 & 2 \\ 1 & 0 & 1 \\ 4 & 1 & 4 \end{bmatrix}$ is

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

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

Q184 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If $A = \begin{bmatrix} 1 & -2 & 2 \\ 2 & -6 & 5 \\ 5 & 0 & 4 \end{bmatrix}$ then Adj A =

(A) $\begin{bmatrix} -24 & 8 & 2 \\ 17 & -6 & -1 \\ 30 & -10 & 2 \end{bmatrix}$
(B) $\begin{bmatrix} -24 & 8 & 2 \\ 17 & -6 & 1 \\ -30 & 10 & -2 \end{bmatrix}$
(C) $\begin{bmatrix} -24 & 8 & 2 \\ 17 & -6 & -1 \\ 30 & -10 & -2 \end{bmatrix}$
(D) $\begin{bmatrix} 24 & -8 & 2 \\ -17 & -6 & 1 \\ 30 & -10 & -2 \end{bmatrix}$

Answer: (C) $\begin{bmatrix} -24 & 8 & 2 \\ 17 & -6 & -1 \\ 30 & -10 & -2 \end{bmatrix}$ · The council's preliminary key

Q185 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If $A = \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} x & 0 \\ 0 & y \end{bmatrix}$, $x, y \in N$, then

(A) There is exactly one such matrix B such that $AB = I$
(B) There is no matrix B such that $AB = BA$
(C) There exist only a finite number of matrices B such that $AB = BA$
(D) There exist infinite number of matrices B such that $AB = BA$

Answer: (D) There exist infinite number of matrices B such that $AB = BA$ · The council's preliminary key

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Q186 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If A and B are symmetric matrices of same order such that $AB + BA = X$ and $AB - BA = Y$, then $(XY)^T =$

(A) XY
(B) X^TY^T
(C) $-YX$
(D) $-Y^TX^T$

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

Q187 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If the ranks of the matrices $A = \begin{bmatrix} 1 & 0 & 1 \\ 2 & 1 & 2 \\ 1 & 0 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 6 & -8 \end{bmatrix}$ are r_1 and r_2 respectively then $r_1 - r_2 =$

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

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

Q188 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 7 & 9 \\ 2 & 3 & 7 \end{bmatrix}$ then $\text{Tr}\,(A^2 - A) =$

(A) 0
(B) -12
(C) 152
(D) 125

Answer: (C) 152 · The council's preliminary key

Q189 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

If the system of simultaneous linear equations $3x - 4y + kz + 13 = 0$, $x + 2y - z - 9 = 0$ and $kx - y + 3z + 7 = 0$ has a unique solution $x = \alpha$, $y = \beta$, $z = \gamma$ for $k \neq m$ and $2\beta - \gamma = 8$ then $\alpha + m =$

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(A) 10
(B) 8
(C) 5
(D) 9

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

Q190 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

If $A = \begin{bmatrix} \sin\alpha & -\cos\alpha \\ \cos\alpha & \sin\alpha \end{bmatrix}$ and $A + A^{-1} = I$, then $\alpha =$

(A) 0
(B) $\frac{\pi}{3}$
(C) $\frac{\pi}{6}$
(D) $\frac{\pi}{4}$

Answer: (C) $\frac{\pi}{6}$ · The council's preliminary key

Q191 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

Let $A = \begin{bmatrix} 1 & 0 & -1 & -3 \\ 0 & 1 & 1 & k-1 \\ 0 & 0 & k-1 & 1 \end{bmatrix}$ and $k \in \mathbf{R}$. Then the value of k, if exists, for which the rank of A is 2, is

(A) 1
(B) Does not exist
(C) $1/3$
(D) $1, 1/3$

Answer: (B) Does not exist · The council's preliminary key

Q192 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

If $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$, then AA^T is a

(A) Symmetric matrix
(B) Skew- Symmetric matrix
(C) Singular matrix
(D) Inverse of A

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

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Q193 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

If $AX = D$ represents the system of simultaneous linear equations $x + y + z = 6$, $5x - y + 2z = 3$ and $2x + y - z = -5$ then $(\text{Adj } A)D =$

(A) $\begin{bmatrix} 8 \\ -16 \\ 40 \end{bmatrix}$

(B) $\begin{bmatrix} 32 \\ 64 \\ -160 \end{bmatrix}$

(C) $\begin{bmatrix} -16 \\ 32 \\ 80 \end{bmatrix}$

(D) $\begin{bmatrix} 12 \\ 24 \\ 60 \end{bmatrix}$

Answer: (C) $\begin{bmatrix} -16 \\ 32 \\ 80 \end{bmatrix}$ · The council's preliminary key

Q194 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$ then $\det(A^6 + B^6) =$

(A) -68

(B) -106

(C) 665

(D) 720

Answer: (B) -106 · The council's preliminary key

Q195 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Let $G(x) = \begin{bmatrix} \cos x & -\sin x & 0 \\ \sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}$. If $x + y = 0$, then $G(x)\,G(y) =$

(A) Null Matrix

(B) Skew Symmetric Matrix

(C) Identity Matrix

(D) Symmetric Matrix

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

Q196 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If $A = \begin{bmatrix} x & 0 \\ 1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 0 \\ 7 & 1 \end{bmatrix}$ and $A^3 = B$, then $x =$

(A) -2 or 3

(B) -2

(C) 2 or -3

(D) 2

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

Q197 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 1 & -1 \\ -1 & 2 & 3 & 5 \\ 0 & 1 & k & k \end{bmatrix}$ is 2 and k is a real number, then k is a root of the following quadratic equation

(A) $x^2 + 3x + 2 = 0$

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

(C) $x^2 + x - 6 = 0$

(D) $x^2 - x - 6 = 0$

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

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Q198 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If the solution of the system of simultaneous equations $\frac{1}{x} + \frac{2}{y} - \frac{3}{z} - 1 = 0$, $\frac{2}{x} - \frac{4}{y} + \frac{3}{z} - 1 = 0$ and $\frac{3}{x} + \frac{6}{y} - \frac{6}{z} - 4 = 0$ is $x = \alpha, y = \beta, z = \gamma$ then $\alpha^2 + \gamma^2 =$

(A) 5β

(B) β^2

(C) 3β

(D) $2\beta^2$

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

Q199 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

If $A = \frac{1}{7}\begin{bmatrix} 3 & -2 & 6 \\ -6 & -3 & 2 \\ -2 & 6 & 3 \end{bmatrix}$, then

(A) $A^{-1} = A$

(B) $A^{-1} = A^T$

(C) A^{-1} does not exist

(D) $A^{-1} = -A$

Answer: (B) $A^{-1} = A^T$ · The council's preliminary key

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Q200 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If $A=\begin{bmatrix}2 & -3\\ -4 & 1\end{bmatrix}$, then $(A^T)^2+(12A)^T=$

(A) $5\begin{bmatrix}8 & 12\\ -9 & 5\end{bmatrix}$

(B) $5\begin{bmatrix}8 & -9\\ -12 & 5\end{bmatrix}$

(C) $\begin{bmatrix}40 & -45\\ 60 & 25\end{bmatrix}$

(D) $\begin{bmatrix}40 & -60\\ -45 & 25\end{bmatrix}$

Answer: (D) $\begin{bmatrix}40 & -60\\ -45 & 25\end{bmatrix}$ · The council's preliminary key

Q201 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If $A=\begin{bmatrix}1 & 0 & 0\\ a & -1 & 0\\ b & c & 1\end{bmatrix}$ is such that $A^2=I$, then

(A) $b=\frac{ac}{2}$

(B) $b=-\frac{ac}{2}$

(C) $b=\frac{a+c}{2}$

(D) $b=\sqrt{ac}$

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

Q202 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $A=\begin{bmatrix}-1 & -2 & -2\\ 2 & 1 & -2\\ 2 & -2 & 1\end{bmatrix}$ then $\text{adj}(A)=?$

(A) $2A^T$

(B) A^T

(C) $3A^T$

(D) $4A^T$

Answer: (C) $3A^T$ · The council's preliminary key

Q203 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $A=\begin{bmatrix}1 & 1 & 1\\ 0 & 1 & 1\\ 0 & 0 & 1\end{bmatrix}$, $B=\begin{bmatrix}\frac{\sqrt{3}-1}{2\sqrt{2}} & \frac{-(\sqrt{3}+1)}{2\sqrt{2}} & 0\\ \frac{\sqrt{3}+1}{2\sqrt{2}} & \frac{\sqrt{3}-1}{2\sqrt{2}} & 0\\ 0 & 0 & 1\end{bmatrix}$ then $(BB^TA)^{10}=$

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(A) $\begin{bmatrix}1 & 10 & 10\\0 & 10 & 10\\0 & 0 & 1\end{bmatrix}$

(B) $\begin{bmatrix}1 & 10 & 55\\0 & 10 & 10\\0 & 0 & 1\end{bmatrix}$

(C) $\begin{bmatrix}1 & 10 & 55\\0 & 1 & 10\\0 & 0 & 1\end{bmatrix}$

(D) $\begin{bmatrix}1 & 10 & 55\\0 & 1 & 1\\0 & 0 & 1\end{bmatrix}$

Answer: (C) $\begin{bmatrix}1 & 10 & 55\\0 & 1 & 10\\0 & 0 & 1\end{bmatrix}$ · The council's preliminary key

Q204 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

Let A be a square-matrix. The matrix AA^T is always a _____

(A) Skew - symmetric matrix

(B) symmetric matrix

(C) symmetric & skew - symmetric matrix

(D) Zero matrix

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

Q205 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If A is a matrix $\begin{bmatrix}1 & 0\\1 & 1\end{bmatrix}$, then $A^n = \begin{bmatrix}1 & 0\\n & 1\end{bmatrix}, \forall n \in N$

(A) not true for $n = 3$

(B) not true for $n = 2$

(C) true for $n = 3$

(D) not true for $n = 1$

Answer: (C) true for $n = 3$ · The council's preliminary key

Q206 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

The system of equations $x + 2y = 3,\ 3x + 6y = a - 2$ has no solution

(A) If $a = 11$

(B) If $a \neq -9$

(C) If $a \neq 9$

(D) If $a \neq 11$

Answer: (D) If $a \neq 11$ · The council's preliminary key

Q207 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Which of the following matrix has rank 3?

(A) $\begin{bmatrix} 10 & 11 & 12 \\ 11 & 12 & 13 \\ 12 & 13 & 14 \end{bmatrix}$

(B) $\begin{bmatrix} 0 & -51 & 101 \\ 51 & 0 & -581 \\ -101 & 581 & 0 \end{bmatrix}$

(C) $\begin{bmatrix} 0 & 1 & 2 \\ -1 & 0 & 5 \\ -2 & 7 & 0 \end{bmatrix}$

(D) $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}$

Answer: (C) $\begin{bmatrix} 0 & 1 & 2 \\ -1 & 0 & 5 \\ -2 & 7 & 0 \end{bmatrix}$ · The council's preliminary key

Q208 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If ω is a complex cube root of unity and $A = \begin{bmatrix} \omega & 0 \\ 0 & \omega \end{bmatrix}$ then $A^{50} =$

(A) $\omega^2 A$

(B) ωA

(C) A

(D) 0

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

Q209 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If a square matrix A is such that $\left(A^T - \frac{1}{2}I\right)\left(A - \frac{1}{2}I\right) = \left(A^T + \frac{1}{2}I\right)\left(A + \frac{1}{2}I\right) = I$, where I is a unit matrix, then A is

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(A) Symmetric matrix

(B) Equal to $\frac{3}{4}I$

(C) Skew - symmetric matrix

(D) equal to $\frac{-3}{4}I$

Answer: (C) Skew - symmetric matrix · The council's preliminary key

Q210 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The system of equations $2x + 6y = -11,\ 6x + 20y - 6z = -3,\ 6y - 18z = -1$ are _____

(A) Inconsistent

(B) Consistent with unique solution

(C) Consistent with countable infinite many solutions

(D) Consistent with infinitely many solutions

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

Q211 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Let $A = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 3 & 4 \end{bmatrix}, B = \begin{bmatrix} 4 & 0 & -3 \\ -1 & -2 & -3 \end{bmatrix}, C = \begin{bmatrix} 2 & -3 & 0 & 1 \\ 5 & -1 & -4 & 2 \\ -1 & 0 & 0 & 3 \end{bmatrix}$. what is $A^TB =$?

(A) $\begin{bmatrix} 4 & 0 & -3 \\ -7 & -6 & -6 \\ 4 & -8 & -18 \end{bmatrix}$

(B) A^TB is not defined

(C) $\begin{bmatrix} 4 & -7 & 4 \\ 0 & -6 & -8 \\ -3 & 12 & 6 \end{bmatrix}$

(D) $A^TB = 0$

Answer: (A) $\begin{bmatrix} 4 & 0 & -3 \\ -7 & -6 & -6 \\ 4 & -8 & -18 \end{bmatrix}$ · The council's preliminary key

Q212 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Which of the following matrices is not a square-matrix?

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

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

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Q213 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

If A is a non-singular matrix such that $A \cdot A^T = A^T \cdot A$ and $B = A^{-1} \cdot A^T$ then

(A) $A \cdot B^T = I$
(B) $B \cdot B^T = I$
(C) $A^T \cdot B^T = I$
(D) $B^{-1} \cdot B^T = I$

Answer: (B) $B \cdot B^T = I$ · The council's preliminary key

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Q214 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Let A be a 2×2 matrix with real entries. Let I be the 2×2 identity matrix. $Tr(A)$ denotes the sum of diagonal entries of A. Assume that $A^2 = I$.
Statement I: If $A \neq I$ and $A \neq -I$ then $\det A = -1$
Statement II: If $A \neq I$ and $A \neq -I$ then $Tr\, A \neq 0$

(A) Statement I is true, statement II is true; statement II is a correct explanation for statement I
(B) Statement I is true, statement II is true; statement II is not a correct explanation for statement I
(C) Statement I is true, statement II is false
(D) Statement I is false, statement II is true

Answer: (C) Statement I is true, statement II is false · The council's preliminary key

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Q215 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

The sum of two lower triangular matrices is always _____

(A) an upper triangular matrix
(B) an lower triangular matrix
(C) a diagonal matrix
(D) a scalar matrix

Answer: (B) an lower triangular matrix · The council's preliminary key

Q216 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

What is the rank of the matrix $\begin{bmatrix}1 & 1 & 1\\1 & 1 & 1\\1 & 1 & 1\end{bmatrix} = ?$

(A) 2

(B) 1

(C) 3

(D) 0

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

Q217 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

$\begin{bmatrix}1 & 2 & 3\\-1 & 1 & 2\\3 & 0 & 2\end{bmatrix}\begin{vmatrix}2022 & 2024\\2021 & 2023\end{vmatrix} =$

(A) $\begin{bmatrix}8 & 4 & 11\\4 & -1 & 3\\9 & 6 & 13\end{bmatrix}$

(B) $\begin{bmatrix}8 & 4 & 13\\4 & -1 & 3\\9 & 6 & 12\end{bmatrix}$

(C) $\begin{bmatrix}8 & 4 & 13\\4 & -1 & 3\\9 & 6 & 13\end{bmatrix}$

(D) $\begin{bmatrix}8 & 4 & 11\\4 & 1 & 13\\9 & 6 & 13\end{bmatrix}$

Answer: (C) $\begin{bmatrix}8 & 4 & 13\\4 & -1 & 3\\9 & 6 & 13\end{bmatrix}$ · The council's preliminary key

Q218 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Let $A = \begin{bmatrix}2 & -5\\3 & 1\end{bmatrix}$ what is $f(A) = ?$ where $f(x) = x^3 - 2x^2 - 5.$

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(A) $\begin{bmatrix}-50 & 70\\ 42 & 36\end{bmatrix}$

(B) $\begin{bmatrix}-50 & 70\\ 42 & -36\end{bmatrix}$

(C) $\begin{bmatrix}-50 & 70\\ -42 & -36\end{bmatrix}$

(D) $\begin{bmatrix}-50 & 70\\ -42 & 36\end{bmatrix}$

Answer: (C) $\begin{bmatrix}-50 & 70\\ -42 & -36\end{bmatrix}$ · The council's preliminary key

Q219 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

What are the values of (x, y, z, t) where $3\begin{bmatrix}x & y\\ z & t\end{bmatrix} = \begin{bmatrix}x & 6\\ -1 & 2t\end{bmatrix} + \begin{bmatrix}4 & x+y\\ z+t & 3\end{bmatrix} = ?$

(A) $(2, 4, 3, 1)$

(B) $(2, 4, 1, 3)$

(C) $(1, 3, 2, 4)$

(D) $(1, 3, 4, 2)$

Answer: (B) $(2, 4, 1, 3)$ · The council's preliminary key

Q220 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Let $X = \begin{bmatrix}1 & -1\\ 1 & 1\end{bmatrix}$. Let Y be a 2×2 real matrix satisfying the condition $XY = YX$. Then the smallest possible value of $\det(Y)$ is _____

(A) 0

(B) -2

(C) -1

(D) $\frac{1}{2}$

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

Q221 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

The trace of the matrix $A = \begin{bmatrix}1 & -5 & 7\\ 0 & 7 & 9\\ 11 & 8 & 9\end{bmatrix}$ is

(A) 17

(B) 25

(C) 3

(D) 12

Answer: (A) 17 · The council's preliminary key

Q222 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If $\begin{bmatrix} 1 & -\tan\theta \\ \tan\theta & 1 \end{bmatrix}\begin{bmatrix} 1 & \tan\theta \\ -\tan\theta & 1 \end{bmatrix}^{-1} = \begin{bmatrix} a & -b \\ b & a \end{bmatrix}$ then

(A) $a = 1, b = 1$

(B) $a = \sin 2\theta, b = \cos 2\theta$

(C) $a = \cos 2\theta, b = \sin 2\theta$

(D) $a = 0, b = 0$

Answer: (C) $a = \cos 2\theta, b = \sin 2\theta$ · The council's preliminary key

Q223 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If $Z_1 = 2 + 3i,\ Z_2 = 3 + 2i$ where $i = \sqrt{-1}$ then $\begin{bmatrix} Z_1 & Z_2 \\ -\overline{Z_2} & \overline{Z_1} \end{bmatrix}\begin{bmatrix} \overline{Z_1} & -Z_2 \\ \overline{Z_2} & Z_1 \end{bmatrix} =$

(A) $13I$

(B) I

(C) $26I$

(D) Zero matrix

Answer: (C) $26I$ · The council's preliminary key

Q224 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $A = \begin{bmatrix} \sqrt{2020} & \sqrt{2021} & \sqrt{2021} & \sqrt{2023} \\ \sqrt{4040} & \sqrt{4042} & \sqrt{4044} & \sqrt{4046} \\ \sqrt{6060} & \sqrt{6063} & \sqrt{6066} & \sqrt{6069} \\ \sqrt{8080} & \sqrt{8084} & \sqrt{8088} & \sqrt{8092} \end{bmatrix}$ then the rank of A is

(A) 1

(B) 2

(C) 3

(D) 4

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

Q225 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

Let A be a $n \times n$ matrix such that A is upper-triangular. Then $adj(A) =$

(A) lower triangular matrix

(B) upper triangular matrix

(C) diagonal matrix

(D) scalar matrix

Answer: (B) upper triangular matrix · The council's preliminary key

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Q226 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Let a, b be non zero real numbers such that $ab = 5/2$ and given $A = \begin{bmatrix} a & -b \\ b & a \end{bmatrix}$ and $AA^T = 20\,I$ (I is a unit matrix), then the equation whose roots are a and b is

(A) $x^2 \mp 10x + 5 = 0$

(B) $2x^2 \pm 10x + 5 = 0$

(C) $x^2 - 5x + \frac{5}{2} = 0$

(D) $x^2 - 25x + \frac{5}{2} = 0$

Answer: (B) $2x^2 \pm 10x + 5 = 0$ · The council's preliminary key

Q227 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$, $10B = \begin{bmatrix} 4 & 2 & 2 \\ -5 & 0 & \alpha \\ 1 & -2 & 3 \end{bmatrix}$ and $B = A^{-1}$ then the value of α is

(A) 2

(B) 0

(C) 5

(D) 4

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

Q228 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The rank of the matrix $\begin{bmatrix} 4 & 2 & (1-x) \\ 5 & k & 1 \\ 6 & 3 & (1+x) \end{bmatrix}$ is 1, then

(A) $k = \frac{5}{2},\ x = \frac{1}{5}$

(B) $k = \frac{5}{2},\ x \neq \frac{1}{5}$

(C) $k = \frac{1}{5},\ x = \frac{5}{2}$

(D) $k \neq \frac{5}{2},\ x = \frac{1}{5}$

Answer: (A) $k = \frac{5}{2},\ x = \frac{1}{5}$ · The council's preliminary key

Q229 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Let A, B, C, D be square real matrices such that $C^T = DAB$, $D^T = ABC$, $S = ABCD$ then S^2 is equal to

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(A) S

(B) BCD

(C) S^T

(D) $(S^T)^2 = (S^2)^T$

Answer: (D) $(S^T)^2 = (S^2)^T$ · The council's preliminary key

Q230 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

$A = \begin{bmatrix} a^2 & 15 & 31 \\ 12 & b^2 & 41 \\ 35 & 61 & c^2 \end{bmatrix}$ and $B = \begin{bmatrix} 2a & 3 & 5 \\ 2 & 2b & 8 \\ 1 & 4 & 2c-3 \end{bmatrix}$ are two matrices such that the sum of the principal diagonal elements of both A and B are equal, then the product of the principal diagonal elements of B is _____

(A) 4

(B) 0

(C) -4

(D) -12

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

Q231 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

If $P = \begin{pmatrix} 1 & \alpha & 3 \\ 1 & 3 & 3 \\ 2 & 4 & 4 \end{pmatrix}$ is the adjoint of a 3×3 matrix A and det(A) $= 4$, then $\alpha =$

(A) 22

(B) 11

(C) 3

(D) 4

Answer: (B) 11 · The council's preliminary key

Q232 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

If the system of equations $x + y + z = 1$, $x + 2y + 4z = K$, $x + 4y + 10z = K^2$ is consistent then $K =$

(A) $1, -2$

(B) $-1, 2$

(C) $1, 2$

(D) $-1, -2$

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

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Q233 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

A and B are two 3×3 non-singular matrices such that $\text{adj } A = |A|B$. If $\text{tr}(X)$ denotes the trace of a square matrix X and $C = \begin{bmatrix} 4 & 4 & 7 \\ 3 & -2 & 5 \\ -2 & 3 & 6 \end{bmatrix}$ then, $\sum_{k=1}^{\infty} \text{tr}\left(\frac{1}{3^k}(AB)^k C\right) =$

(A) 12
(B) 4
(C) 81
(D) ∞ (infinite)

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

Q234 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Let $A = \begin{bmatrix} 1 & -4 & 7 \\ 0 & 3 & -5 \\ -2 & 5 & -9 \end{bmatrix}$, $B = \begin{bmatrix} a \\ -b \\ -c \end{bmatrix}$. If A and $[A : B]$ have same rank, then

(A) $2a + b + c = 0$
(B) $a = \frac{b+c}{2}$
(C) $b = \frac{a+c}{2}$
(D) $c = \frac{a+b}{2}$

Answer: (B) $a = \frac{b+c}{2}$ · The council's preliminary key

Q235 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

In matrix notation, if the system of equations $\begin{bmatrix} 1 \\ -1 \\ 2 \end{bmatrix} \begin{bmatrix} 1 & -1 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 5 \\ -5 \\ 10 \end{bmatrix}$ has infinite number of solutions, then all these solutions lie on

(A) a line on XY plane
(B) a plane not parallel to any of the coordinate planes
(C) the YZ plane
(D) the ZX plane

Answer: (B) a plane not parallel to any of the coordinate planes · The council's preliminary key

Q236 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

If $A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{pmatrix}$, then adj(adjA) is equal to

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(A) A

(B) $36A$

(C) $6A$

(D) $\frac{1}{6}A$

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

Q237 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & -1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ then $A^5 =$

(A) A

(B) Identity Matrix

(C) Null Matrix

(D) A^{-1}

Answer: (D) A^{-1} · The council's preliminary key

Q238 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

Let $B = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$ and A be a 2×2 matrix satisfying $(A^T)^{-1} = A$. If $X = ABA^T$, then $A^T X^{2021} A =$

(A) $\begin{bmatrix} 1 & 2^{2021} \\ 0 & 1 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & 2021 \\ 0 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

(D) $\begin{bmatrix} 1 & 4042 \\ 0 & 1 \end{bmatrix}$

Answer: (D) $\begin{bmatrix} 1 & 4042 \\ 0 & 1 \end{bmatrix}$ · The council's preliminary key

Q239 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

If A is a 3×3 matrix such that $|A| = 27$, $\text{Adj } A = kA^T$, then $k^2 - 3k + 5 =$

(A) 5

(B) 3

(C) 0

(D) 2

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

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Q240 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

If the system of equations $2x + 9y + 5z = 8$, $2x + 3y - z = -4$, $x - 2z = -5$ have infinite number of solutions $x = -5 + at$, $y = 2 + bt$, $z = ct$, $t \in \mathbb{R}$ then a, b, c respectively are

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

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

Q241 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If the system of equations $3x - 2y + z = 0$, $\lambda x - 14y + 15z = 0$, $x + 2y - 3z = 0$ has a solution other than $x = y = z = 0$, then $\lambda =$

(A) 1
(B) 2
(C) 3
(D) 5

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

Q242 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If $x = \alpha,\ y = \beta,\ z = \gamma$ is the unique solution of the system of equations $5x - 7y + 3z = 0$, $7x + 10y - 8z = 3$ and $2x + 3y - 4z + 4 = 0$, then $\beta =$

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

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

Q243 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

A and C lie in $\left[0, \frac{\pi}{2}\right)$ and B lies in $[0, 2\pi]$. If $\tan A + 3\cos B + 6\sin C = 1$; $3\tan A + \cos B + 4\sin C = 4$; $5\tan A + 3\cos B - 8\sin C = -2$, then $B - 2A - C =$

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

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

Q244 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

The system of equations $2x + y - 5 = 0$, $x - 2y + 1 = 0$ and $2x - 14y - a = 0$ is consistent. Then, a is equal to

(A) 11
(B) 12
(C) 16
(D) -16

Answer: (D) -16 · The council's preliminary key

Q245 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

Let $M = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ and I be the identity matrix of order 3. Then $M^2 - 4M =$

(A) $5I$
(B) $3I$
(C) $2I$
(D) I

Answer: (A) $5I$ · The council's preliminary key

Q246 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ and $A^3 = \begin{bmatrix} \cos 3\theta & m \\ n & \cos 3\theta \end{bmatrix}$, the values of m and n respectively are

(A) $-\sin 3\theta,\ \cos 3\theta$
(B) $\sin 3\theta,\ -\cos 3\theta$
(C) $-\sin 3\theta,\ \sin 3\theta$
(D) $\sin 3\theta,\ -\sin 3\theta$

Answer: (D) $\sin 3\theta,\ -\sin 3\theta$ · The council's preliminary key

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Q247 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

Let ω be a complex cube root of unity with $\omega \neq 1$ and $P = [p_{ij}]$ be a 2×2 matrix with $p_{ij} = \omega^{i+j}$. For $P^2 \neq 0$ if $P^k = P$, then k is equal to

(A) 57
(B) 54
(C) 58
(D) 56

Answer: (A) 57 · The council's preliminary key

Q248 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

Evaluate $A^2 + 2I$ if $A = \begin{bmatrix} 1 & 0 \\ 1 & 2 \end{bmatrix}$

(A) $2A$
(B) $3A$
(C) $4A$
(D) $5A$

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

Q249 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

Find the rank of the matrix $\begin{bmatrix} 1 & 4 & -1 \\ 2 & 3 & 0 \\ 0 & 1 & 2 \end{bmatrix}$

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

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

Q250 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

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

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(A) $\begin{bmatrix}74 & 39 & 28\\29 & 16 & 11\\11 & 2 & 5\end{bmatrix}$

(B) $\begin{bmatrix}63 & 39 & 20\\29 & 16 & 11\\10 & 2 & 5\end{bmatrix}$

(C) $\begin{bmatrix}64 & 39 & 27\\28 & 15 & 11\\11 & 2 & 5\end{bmatrix}$

(D) $\begin{bmatrix}61 & 39 & 28\\29 & 16 & 11\\11 & 0 & 5\end{bmatrix}$

Answer: (A) $\begin{bmatrix}74 & 39 & 28\\29 & 16 & 11\\11 & 2 & 5\end{bmatrix}$ · The council's preliminary key

Q251 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Let $A=\begin{bmatrix}2 & -1 & 3\\1 & 1 & -1\\0 & 0 & 1\end{bmatrix}$ and $D=\begin{bmatrix}0\\1\\0\end{bmatrix}$. The system $AX=D$ has _____

(A) No solution

(B) A unique solution

(C) More than one but finite solutions

(D) Infinitely many solutions

Answer: (B) A unique solution · The council's preliminary key

Q252 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Let A be a square matrix of order 3. Choose the correct option regarding the following statements:

1) There exists a matrix B of order 3 such that $AB=I_3$

2) There exists a matrix C of order 3 such that $CA=I_3$

3) A is invertible

(A) Only 3 implies 1 and 2

(B) 1,2 and 3 are equivalent statements

(C) In 1 and 2, B can be different from C

(D) None of the options are correct

Answer: (B) 1,2 and 3 are equivalent statements · The council's preliminary key

Q253 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Let M and N be two invertible square matrices over $\mathbf{R}$ of order 2 such that N is diagonal. Then MNM^{-1} is diagonal _____

(A) For all M

(B) Only when M is a scalar matrix

(C) For all diagonal matrices M

(D) M must be a null matrix

Answer: (C) For all diagonal matrices M · The council's preliminary key

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Q254 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Let $a, b \in \mathbf{R} - \{0\}$, and I_2 be the identity matrix of order 2. Then the rank of the (block) matrix $\begin{bmatrix} aI_2 & bI_2 \\ aI_2 & bI_2 \end{bmatrix}$ is

(A) 2

(B) 1

(C) 4

(D) 3

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

Q255 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

If $\begin{bmatrix} 1 & -1 & x \\ 1 & x & 1 \\ x & -1 & 1 \end{bmatrix}$ has no inverse, then the real value of x is

(A) 2

(B) 3

(C) 0

(D) 1

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

Q256 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Determinant of skew-symmetric matrix of order "three" is always

(A) 0

(B) 1

(C) Depends on elements

(D) -1

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

Q257 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

If $A = \begin{bmatrix} 3 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 4 \end{bmatrix}$ and $B = A^3$, then $B^{-1} =$

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(A) $\begin{bmatrix} -3 & 0 & 0 \\ 0 & -5 & 0 \\ 0 & 0 & -4 \end{bmatrix}$

(B) $\begin{bmatrix} -27 & 0 & 0 \\ 0 & -125 & 0 \\ 0 & 0 & -64 \end{bmatrix}$

(C) $\begin{bmatrix} \frac{1}{27} & 0 & 0 \\ 0 & \frac{1}{125} & 0 \\ 0 & 0 & \frac{1}{64} \end{bmatrix}$

(D) $\begin{bmatrix} \frac{-1}{27} & 0 & 0 \\ 0 & \frac{-1}{125} & 0 \\ 0 & 0 & \frac{-1}{64} \end{bmatrix}$

Answer: (C) $\begin{bmatrix} \frac{1}{27} & 0 & 0 \\ 0 & \frac{1}{125} & 0 \\ 0 & 0 & \frac{1}{64} \end{bmatrix}$ · The council's preliminary key

Q258 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Which of the following is false?

1) If A is a skew symmetric matrix of order 5×5, then the rank of A is less than 5

2) If P is a nonzero column matrix and Q is a non-zero row matrix, then the rank of PQ is 1

3) Rank of $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 5 & 6 & 7 \end{bmatrix}$ is 2

4) If the lines $a_r x + b_r y + c_r = 0$ $(r = 1, 2, 3)$ are distinct and intersect at a point, then rank of $\begin{bmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{bmatrix}$ is 3

(A) 1

(B) 2

(C) 3

(D) 4

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

Q259 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Choose the correct option about the matrices given below

$A = \begin{bmatrix} \cos\frac{\pi}{4} & \sin\frac{\pi}{4} & 0 \\ -\sin\frac{\pi}{4} & \cos\frac{\pi}{4} & 0 \\ 0 & 0 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\frac{\pi}{3} & \sin\frac{\pi}{3} \\ 0 & -\sin\frac{\pi}{3} & \cos\frac{\pi}{3} \end{bmatrix}$

$C = \begin{bmatrix} \cos\frac{\pi}{6} & 0 & \sin\frac{\pi}{6} \\ 0 & 1 & 0 \\ -\sin\frac{\pi}{6} & \cos\frac{\pi}{6} & 0 \end{bmatrix}$, $D = \begin{bmatrix} \cos\frac{\pi}{2} & \sin\frac{\pi}{2} & 0 \\ -\sin\frac{\pi}{2} & \cos\frac{\pi}{2} & 0 \\ 0 & 0 & 1 \end{bmatrix}$

(A) $A^{2020} = I$

(B) $B^{2020} = I$

(C) $D^{2019} = I$

(D) $B^{2022} = I$

Answer: (D) $B^{2022} = I$ · The council's preliminary key

Q260 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

If $A = \begin{bmatrix} a+ib & c+id \\ -c+id & a-ib \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} a+ib & -c-id \\ -c+id & a-ib \end{bmatrix}$. Find $(a^2+b^2+c^2+d^2)$

(A) 1

(B) -1

(C) i

(D) $-i$

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

Q261 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Let $M = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ and $N = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix}$. Then $NM^{10}N^{-1} =$

(A) $\begin{bmatrix} 1 & 5 \\ 0 & 1 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & -5 \\ 0 & 1 \end{bmatrix}$

(C) $\begin{bmatrix} 1 & -10 \\ 0 & 1 \end{bmatrix}$

(D) $\begin{bmatrix} 1 & 10 \\ 0 & 1 \end{bmatrix}$

Answer: (A) $\begin{bmatrix} 1 & 5 \\ 0 & 1 \end{bmatrix}$ · The council's preliminary key

Q262 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If A is a Skew-symmetric matrix then (given $n \in N$):
(i) A^{2n} is Skew-symmetric matrix
(ii) A^{2n+1} is Skew-symmetric matrix

(A) (i) is True, (ii) is False

(B) Both (i) & (ii) are True

(C) Both (i) & (ii) are False

(D) (i) is False, (ii) is True

Answer: (D) (i) is False, (ii) is True · Checked by our team

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Q263 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

The rank of $\begin{bmatrix} 2 & 1 & 1 \\ 0 & 3 & -1 \\ 1 & -1 & 1 \end{bmatrix}$ is _____

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

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

Q264 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If Q is the inverse of A, when $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$ and $10 \times Q = \begin{bmatrix} 4 & 2 & 2 \\ -5 & 0 & x \\ 1 & -2 & 3 \end{bmatrix}$, find $x =$

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

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

Q265 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The matrix $A = \begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ \frac{-1}{\sqrt{2}} & \frac{-1}{\sqrt{2}} \end{bmatrix}$ is _____

(A) Unitary
(B) Orthogonal
(C) Nilpotent
(D) Involutory

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

Q266 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If P and Q are square matrices such that $P^{2006} = 0$ and $PQ = P + Q$ then $\det(Q)$ will be

(A) 0
(B) 1 only
(C) -1 only
(D) ± 1

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

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Q267 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

If P and Q are two non-zero square matrices of the same order such that the product $PQ = 0$, then _____

(A) Exactly one of them must be singular
(B) Both P & Q must be singular
(C) Both P & Q must be non-singular
(D) None of the options are correct

Answer: (B) Both P & Q must be singular · Checked by our team

Q268 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Let M and N be two matrices over $\mathbf{R}$ of order 2. Then $MN = NM$ if _____

(A) One of M and N is a diagonal matrix
(B) Both M and N are diagonal matrices
(C) Both M and N are invertible matrices
(D) None of these options are true in general

Answer: (B) Both M and N are diagonal matrices · The council's preliminary key

Q269 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Product of all real values of 'b' such that there is no solution to the system of equations $2x + 5y + z = 19$, $-4x + by + 6z = -42$, $-3y - bz = 81$ is _____

(A) -30
(B) -48
(C) -24
(D) -18

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

Q270 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

For $M = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$ and for any $n \in N$ the matrix $M^{n+1} - M^n =$

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(A) $\begin{bmatrix}2 & 4\\ 1 & -2\end{bmatrix}$

(B) $\begin{bmatrix}2 & -4\\ 1 & -2\end{bmatrix}$

(C) $\begin{bmatrix}2 & -4\\ 1 & 2\end{bmatrix}$

(D) $\begin{bmatrix}2 & 4\\ 1 & 2\end{bmatrix}$

Answer: (B) $\begin{bmatrix}2 & -4\\ 1 & -2\end{bmatrix}$ · The council's preliminary key

Q271 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

For a square matrix B of order 3, if $B^T = B^{-1}$ and $|B| = 1$, then $|B - I| =$

(A) 1

(B) -1

(C) $2|B|$

(D) $|B^T| - 1$

Answer: (D) $|B^T| - 1$ · Official TGCHE final key

Q272 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

For $\alpha, \beta \in [0, 2\pi]$ and $\gamma \in [0, \pi)$ consider the system of equations

$2\sin\alpha - \cos\beta + 3\tan\gamma = 3$

$4\sin\alpha + 2\cos\beta - 2\tan\gamma = 2$

$6\sin\alpha - 3\cos\beta + \tan\gamma = 9.$

then, which one of the following is TRUE?

(A) $2\alpha - \beta - \gamma = 0$

(B) $2\alpha + \beta + \gamma = 0$

(C) $\alpha - 2\beta - \gamma = 0$

(D) $\alpha + 2\beta - \gamma = 0$

Answer: (A) $2\alpha - \beta - \gamma = 0$ · Official TGCHE final key

Q273 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

The rank of $A = \begin{bmatrix}1 & x & x+1\\ 2x & x^2 - x & x^2 + x\\ 3x(x-1) & x(x^2 - 3x + 2) & x(x^2 - 1)\end{bmatrix}$ is

(A) 3; for all $x \in \mathbb{R}$

(B) 2; only for $x = -1$

(C) 2; for all x except 0 and -1

(D) 3; only for $x = 0$

Answer: (C) 2; for all x except 0 and -1 · Official TGCHE final key

Q274 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Let $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & x \end{bmatrix}$ and $A^2 = A$. If r is the rank of A, then $r + x =$

(A) -3

(B) 2

(C) 1

(D) -1

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

Q275 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

Let $[A]_{3\times3}$ be a non-singular matrix such that $A^{-1} = \frac{1}{3}(A^2 - 5A + 7I)$ Then $17A^8 - 85A^7 + 119A^6 - 51A^5 - 19A^4 + 95A^3 - 133A^2 + 58A + I =$

(A) 0

(B) A

(C) $A + I$

(D) $A^2 + A + I$

Answer: (C) $A + I$ · Official TGCHE final key

Q276 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

If $\begin{bmatrix} 2 & 1 & 1 \\ 0 & 3 & -1 \\ 1 & -1 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}$, then $\begin{bmatrix} x \\ y \\ z \end{bmatrix} =$

(A) $\begin{bmatrix}1\\1\\0\end{bmatrix}+K\begin{bmatrix}3\\1\\-2\end{bmatrix}, K\in\mathbb{R}$

(B) $\begin{bmatrix}1\\1\\0\end{bmatrix}+K\begin{bmatrix}1\\-2\\3\end{bmatrix}, K\in\mathbb{R}$

(C) $\begin{bmatrix}1\\1\\0\end{bmatrix}+K\begin{bmatrix}-2\\1\\3\end{bmatrix}, K\in\mathbb{R}$

(D) $\begin{bmatrix}1\\0\\-1\end{bmatrix}+K\begin{bmatrix}-2\\1\\3\end{bmatrix}, K\in\mathbb{R}$

Answer: (D) $\begin{bmatrix}1\\0\\-1\end{bmatrix}+K\begin{bmatrix}-2\\1\\3\end{bmatrix}, K\in\mathbb{R}$ · Official TGCHE final key

Q277 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

Let I be a unit matrix of order 6. Let $A=(a_{ij})$ be a square matrix of order 6 such that $a_{ij}=\begin{cases}1, & \text{if } i+j=7\\0, & \text{if } i+j\neq 7\end{cases}$ then $(A(\text{adj } A)A^{-1})A^2=$

(A) I

(B) A

(C) $-A$

(D) $-I$

Answer: (C) $-A$ · Checked by our team

Q278 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

Let $a,b,c\notin\{0,1\}$. If the system of equations

$\Pi_1\equiv x+ay+az=0$

$\Pi_2\equiv bx+y+bz=0$

$\Pi_3\equiv cx+cy+z=0$

has a non-trivial solution, then the system of equations $\Pi_1=a$, $\Pi_2=b$, $\Pi_3=c$ has

(A) unique solution

(B) infinite number of solutions

(C) no solution

(D) unique solution only when $a=b=c$

Answer: (C) no solution · Checked by our team

Q279 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

A is a singular matrix of order five. B is another matrix having the rank $\rho(B)$ equal to the rank $\rho(A)$ and B has a non zero minor of order 3. Then which one of the following is true?

(A) B is a 4×4 matrix

(B) $\rho(A) = \rho(B) = 4$, irrespective of the order of B

(C) $\rho(A) = \rho(B) = 3$, when all the fourth order minors of A are zero

(D) $|B| = 0$

Answer: (C) $\rho(A) = \rho(B) = 3$, **when all the fourth order minors of A are zero** · Official TGCHE final key

Q280 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

If A, B are two non singular matrices of order 3, $|B| = k$, a positive integer, then match the items of list - I with the items of list - II

List -I

A) $|k^{-1}A^{-1}|$

B) $|\text{Adj}(A^{-1})|$

C) $BAB^{-1} = I \Rightarrow BA^kB^{-1} =$

D) $\text{Adj}(\text{Adj}(A^{-1})) =$

List -II

I) $BA^k + A^kB$

II) $\frac{B\,\text{Adj}(B)}{|B|}$

III) $\frac{1}{|B|^3|A|}$

IV) $\frac{1}{|A|}(A^{-1})$

V) $\frac{1}{|A|^2}$

The correct match is

(A) A-III, B-V, C-II, D-IV

(B) A-III, B-IV, C-I, D-II

(C) A-I, B-V, C-II, D-IV

(D) A-III, B-IV, C-II, D-I

Answer: (A) A-III, B-V, C-II, D-IV · Official TGCHE final key

Q281 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

All the real values of p, q so that the system of equations

$2x + py + 6z = 8$

$x + 2y + qz = 5$

$x + y + 3z = 4$

may have no solution are

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(A) $p = 2,\ q \neq 3$

(B) $p = 2,\ q = \dfrac{15}{2}$

(C) $p \neq 2,\ q = 3$

(D) $p = 3,\ q = \dfrac{15}{4}$

Answer: (C) $p \neq 2,\ q = 3$ · Official TGCHE final key

Q282 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

Let $A = \begin{bmatrix} 1 & 4 & 2 \\ 2 & -1 & 4 \\ -3 & 7 & -6 \end{bmatrix}$ and $B = [b_{ij}]_{3\times 3}$ with $b_{11} = 2$, $b_{13} = -2$, $b_{12} = 0$ is such that $AB = \begin{bmatrix} 2 & 14 & -4 \\ 4 & 1 & -8 \\ -6 & 15 & 12 \end{bmatrix}$, then $|B| + \text{trace}(B) =$

(A) -2

(B) 10

(C) -8

(D) 6

Answer: (A) -2 · Official TGCHE final key

Q283 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

A is a $m \times n$ matrix of rank 4. If A contains an mth order non singular sub matrix and $A^T A$ is a 7×7 matrix, then the number of rows of A is

(A) 5

(B) 6

(C) 7

(D) 4

Answer: (D) 4 · Official TGCHE final key

Q284 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If A is a 3×3 matrix and the matrix obtained by replacing the elements of A with their corresponding cofactors is $\begin{vmatrix} 1 & -2 & 1 \\ 4 & -5 & -2 \\ -2 & 4 & 1 \end{vmatrix}$, then a possible value of the determinant of A is

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(A) 4

(B) 3

(C) 2

(D) 1

Answer: (B) 3 · Official TGCHE final key

Q285 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

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

(A) A^2

(B) $2A$

(C) A^3

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

Answer: (A) A^2 · Official TGCHE final key

Q286 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

The equations $x + y + z = 3$, $x + 2y + 2z = 6$ and $x + ay + 3z = b$ have

(A) No solution when $a \neq 3$, b is any value

(B) Infinite number of solutions when $b \neq 9$

(C) Unique solution when $a \neq 3$, b is any value

(D) Unique solution when $a = 3$ and $b \neq 9$

Answer: (C) Unique solution when $a \neq 3$, b is any value · Official TGCHE final key

Q287 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

Let B, C be $n \times n$ matrices such that $A = B + C$, $BC = CB$ and C^2 is a null matrix. Then, $B^{2020}[B + (2021)C] =$

(A) A^{2020}

(B) null zero matrix of order $n \times n$

(C) A^{2021}

(D) B^{2021}

Answer: (C) A^{2021} · Official TGCHE final key

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Q288 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

If the system of equations $\begin{bmatrix}\alpha & -1 & -1\\ 1 & -\alpha & -1\\ 1 & -1 & -\alpha\end{bmatrix}\begin{bmatrix}x\\ y\\ z\end{bmatrix}=\begin{bmatrix}\alpha-1\\ \alpha-1\\ \alpha-1\end{bmatrix}$ is inconsistent, then $\alpha=$

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

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

Q289 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

For the system S of linear equations $x+y+z=3,\ 2x+2y-z=3,\ x+y+\lambda z=1$ the incorrect option among the following statements is

(A) S has infinitely many solutions, if $\lambda=-1$
(B) S has no solution, if $\lambda=-2$
(C) S has no unique solution for any real λ
(D) S is consistent for all $\lambda\in\mathbb{R}$

Answer: (D) S is consistent for all $\lambda\in\mathbb{R}$ · Official TGCHE final key

Q290 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If M and N are square matrices of order 3, then which one of the following statements is not true?

(A) For all symmetric matrices M and N, $MN-NM$ is skew symmetric
(B) N^TMN is symmetric or skew symmetric according as M is symmetric or skew symmetric
(C) For all symmetric matrices M and N, matrix MN is symmetric
(D) For any two matrices M and N, Adj (MN) and Adj (NM) need not be equal

Answer: (C) For all symmetric matrices M and N, matrix MN **is symmetric** · Official TGCHE final key

Q291 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If $A=\begin{bmatrix}0 & 5\\ 0 & 0\end{bmatrix}$ and $f(x)=x+x^2+\ldots+x^{2018}$, then $f(A)+I=$

(A) $\begin{bmatrix}0 & 0\\0 & 0\end{bmatrix}$

(B) $\begin{bmatrix}1 & 5\\0 & 0\end{bmatrix}$

(C) $\begin{bmatrix}0 & 5\\1 & 1\end{bmatrix}$

(D) $\begin{bmatrix}1 & 5\\0 & 1\end{bmatrix}$

Answer: (D) $\begin{bmatrix}1 & 5\\0 & 1\end{bmatrix}$ · Official TGCHE final key

Q292 TS EAMCET 2019 · 4 May · Shift 1 MCQ

For what values of 'a', the system of equations $x+y+z=1,\ 2x+3y+2z=2,\ ax+ay+2az=4$ will have a unique solution?

(A) For $a=0$ only

(B) For all $a \in \mathrm{R}-\{0\}$

(C) For all $a \in \mathrm{Q}$

(D) For all $a \notin \mathrm{N}$

Answer: (B) For all $a \in \mathrm{R}-\{0\}$ · Official TGCHE final key

Q293 TS EAMCET 2019 · 4 May · Shift 2 MCQ

The rank of the matrix $\begin{bmatrix}3 & 5 & -1 & 4\\2 & 1 & 3 & -2\\8 & 11 & 1 & 6\\-7 & -14 & 6 & -14\end{bmatrix}$ is

(A) 1

(B) 2

(C) 3

(D) 4

Answer: (B) 2 · Official TGCHE final key

Q294 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If $A=\begin{bmatrix}1 & 2 & 3\\1 & 3 & 5\\2 & 1 & 6\end{bmatrix}$, then $(\mathrm{Adj}\,(\mathrm{Adj}\,A))^{-1}=$

(A) $\frac{1}{6}\begin{bmatrix}8 & -6 & 3\\ 5 & 1 & -2\\ -5 & 3 & 1\end{bmatrix}$

(B) $\frac{1}{6}\begin{bmatrix}13 & -9 & 1\\ 4 & 0 & -2\\ -5 & 3 & 1\end{bmatrix}$

(C) $\frac{1}{36}\begin{bmatrix}13 & -9 & 1\\ 4 & 0 & -2\\ -5 & 3 & 1\end{bmatrix}$

(D) $\frac{1}{12}\begin{bmatrix}4 & -3 & 2\\ 3 & 4 & 2\\ -5 & 2 & 1\end{bmatrix}$

Answer: (C) $\frac{1}{36}\begin{bmatrix}13 & -9 & 1\\ 4 & 0 & -2\\ -5 & 3 & 1\end{bmatrix}$ · Official TGCHE final key

Q295 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Let $AX = D$ be a system of three linear non homogeneous equations. If $|A| = 0$ and $\text{rank}(A) = \text{rank}([AD]) = \alpha$, then

(A) $AX = D$ will have infinite number of solutions when $\alpha = 3$.

(B) $AX = D$ will have unique solution when $\alpha < 3$.

(C) $AX = D$ will have infinite number of solutions when $\alpha < 3$.

(D) $AX = D$ will have no solution when $\alpha < 3$.

Answer: (C) $AX = D$ **will have infinite number of solutions when** $\alpha < 3$. · Official TGCHE final key

Q296 TS EAMCET 2019 · 3 May · Shift 2 MCQ

Suppose $n > 1$ and A is a $n \times n$ non singular matrix such that $|\text{Adj } A| = |\text{Adj } (\text{Adj } A)|$. Then the matrix whose rank is n, is

(A) $\begin{bmatrix}1 & 2 & 3\\ 4 & 5 & 6\\ 6 & 7 & 8\end{bmatrix}$

(B) $\begin{bmatrix}2 & 2 & 2\\ 2 & 2 & 2\\ 2 & 2 & 2\end{bmatrix}$

(C) $\begin{bmatrix}1 & 2 & 0 & -1\\ 3 & 4 & 1 & 2\\ -2 & 3 & 2 & 5\end{bmatrix}$

(D) $\begin{bmatrix}1 & 4 & -1\\ 2 & 3 & 0\\ 0 & 1 & 2\end{bmatrix}$

Answer: (A) $\begin{bmatrix}1 & 2 & 3\\ 4 & 5 & 6\\ 6 & 7 & 8\end{bmatrix}$ · Official TGCHE final key

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Q297 TS EAMCET 2019 · 3 May · Shift 2 MCQ

Consider the following system of equations in matrix form

$$\begin{pmatrix}1\\2\\\lambda\end{pmatrix}\begin{pmatrix}1 & 2 & \lambda\end{pmatrix}\begin{pmatrix}x\\y\\z\end{pmatrix}=\mathrm{O}$$

Then which one of the following statements is true?

(A) $\forall\lambda\in(-\infty,\infty)$, the given system has non trivial solution

(B) $\forall\lambda\in(-\infty,\infty)$, the given system has only trivial solution

(C) For $\lambda\neq 0$, the given system does not have any solution

(D) For $\lambda=0$, the given system is inconsistent

Answer: (A) $\forall\lambda\in(-\infty,\infty)$, **the given system has non trivial solution** · Official TGCHE final key

Q298 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If A is a 3×3 matrix and $|A|=2$, then $|\mathrm{Adj}(\mathrm{Adj}A)|\,\mathrm{Adj}(\mathrm{Adj}A)=$

(A) $32A$

(B) $64A$

(C) $16A$

(D) $8A$

Answer: (A) $32A$ · Official APSCHE final key

Q299 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If $x=\alpha,\ y=\beta,\ z=\gamma$ is the solution, for the system of equations $2x-y+8z=13$, $3x+4y+5z=18$, $5x-2y+7z=20$, then $\alpha\beta+\beta\gamma+\gamma\alpha=$

(A) 1

(B) 0

(C) 7

(D) -3

Answer: (C) 7 · Official APSCHE final key

Q300 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If $A=\begin{bmatrix}1 & 0 & -2\\-2 & -1 & 2\\3 & 4 & 1\end{bmatrix}$ then $A^{-1}=$

(A) $A^2 - 2A - 4I$

(B) $A^2 - A - 3I$

(C) $\frac{1}{2}\left[A^2 + A + 2I\right]$

(D) $A^2 + A - 2I$

Answer: (B) $A^2 - A - 3I$ · Official APSCHE final key

Q301 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If the system of simultaneous linear equations $x + y + z = a,\ x - y + bz = 2,\ 2x + 3y - z = 1$ has infinitely many solutions, then $b - 5a =$

(A) $\frac{4}{5}$

(B) 3

(C) 7

(D) -3

Answer: (B) 3 · Official APSCHE final key

Q302 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

Let $A = \begin{bmatrix} 7 & 5 \\ 4 & 8 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 3 \\ 7 & 5 \end{bmatrix}$ and $C = \begin{bmatrix} -5 & 3 \\ 7 & -4 \end{bmatrix}$. If $\mathrm{Tr}(S)$ denotes the trace of a square matrix S then $\sum_{k=0}^{\infty} \frac{1}{3^k} \mathrm{Tr}\{A(BC)^k\} =$

(A) $\frac{45}{2}$

(B) 36

(C) $\frac{81}{2}$

(D) 9

Answer: (A) $\frac{45}{2}$ · Official APSCHE final key

Q303 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If the inverse of the matrix $A = \begin{bmatrix} 3 & 4 & 5 \\ 2 & -1 & 8 \\ 5 & -2 & 7 \end{bmatrix}$ is B then $B^T =$

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(A) $\frac{1}{136}\begin{bmatrix} 9 & 26 & 1 \\ -38 & -4 & 26 \\ 37 & -14 & -11 \end{bmatrix}$

(B) $\frac{1}{136}\begin{bmatrix} 9 & -38 & 37 \\ 26 & -4 & -14 \\ 1 & 26 & -11 \end{bmatrix}$

(C) $\frac{1}{136}\begin{bmatrix} 9 & 26 & 1 \\ 37 & -14 & -11 \\ -38 & -4 & 26 \end{bmatrix}$

(D) $\frac{1}{136}\begin{bmatrix} 9 & 1 & 26 \\ -38 & 26 & -4 \\ 37 & -11 & -14 \end{bmatrix}$

Answer: (A) $\frac{1}{136}\begin{bmatrix} 9 & 26 & 1 \\ -38 & -4 & 26 \\ 37 & -14 & -11 \end{bmatrix}$ · Official APSCHE final key

Q304 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If $x = \alpha$, $y = \beta$, $z = \gamma$ is the solution of the system of equations $x + y + z = 4$, $2x - y + 3z = 9$, $3x + y + 2z = 8$, then $4\alpha + 2\beta + 3\gamma =$

(A) 0

(B) 1

(C) 12

(D) 19

Answer: (C) 12 · Official APSCHE final key

Q305 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If k is one of the roots of the equation $x^2 - 25x + 24 = 0$ such that $A = \begin{bmatrix} 1 & 2 & 1 \backslash 3 & 2 & 3 \backslash 1 & 1 & k \end{bmatrix}$ is a non-singular matrix, then $A^{-1} =$

(A) $-\frac{1}{46}\begin{bmatrix} 90 & -94 & 8 \backslash -138 & 46 & 0 \backslash 2 & 2 & -8 \end{bmatrix}$

(B) $-\frac{1}{92}\begin{bmatrix} 45 & -47 & 4 \backslash -69 & 23 & 0 \backslash 1 & 1 & -4 \end{bmatrix}$

(C) $-\frac{1}{46}\begin{bmatrix} 45 & -47 & 4 \backslash -69 & 23 & 0 \backslash 1 & 1 & -4 \end{bmatrix}$

(D) $-\frac{1}{92}\begin{bmatrix} 90 & -94 & 8 \backslash -138 & 46 & 0 \backslash 2 & 2 & -8 \end{bmatrix}$

Answer: (B) $-\frac{1}{92}\begin{bmatrix} 45 & -47 & 4 \backslash -69 & 23 & 0 \backslash 1 & 1 & -4 \end{bmatrix}$ · Official APSCHE final key

Q306 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

A value of b for which the rank of the matrix $A = \begin{bmatrix} 1 & 1 & -1 & 0 \\ 4 & 4 & -3 & 1 \\ b & 2 & 2 & 2 \\ 9 & 9 & b & 3 \end{bmatrix}$ is 3, is

(A) -2

(B) -4

(C) -6

(D) 3

Answer: (C) -6 · Official APSCHE final key

Q307 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

If $A = \begin{bmatrix} p & q & r \\ r & p & q \\ q & r & p \end{bmatrix}$ and $A\,A^T = I$ then, $p^3 + q^3 + r^3 =$

(A) ± 1

(B) pqr

(C) $3pqr$

(D) $3pqr \pm 1$

Answer: (D) $3pqr \pm 1$ · Official APSCHE final key

Q308 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Match the items of List - I with the items of List - II and choose the correct option

List - I

A) If A is a non singular matrix of order 3 and $|A| = a$, then $\left|\left(\text{adj } A^{-1}\right)^{-1}\right| =$

B) A is a non singular matrix of order 3 and B is any matrix of order 3 such that $AB = O$, then B is

C) $\begin{vmatrix} 1 & x & x^2 \\ \cos(a-b)y & \cos ay & \cos(a+b)y \\ \sin(a-b)y & \sin ay & \sin(a+b)y \end{vmatrix}$ does not depend on

D) A is a square matrix of order 3 and $B = A - A^T$, then $|B|$ is

List - II

I) null matrix

II) a^2

III) b

IV) a

V) 0

The correct answer is

(A) A-II, B-IV, C-III, D-I

(B) A-III, B-I, C-IV, D-V

(C) A-II, B-V, C-III, D-I

(D) A-II, B-I, C-IV, D-V

Answer: (D) A-II, B-I, C-IV, D-V · Official APSCHE final key

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Q309 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

The solution of the linear system of equations $\begin{bmatrix}2 & 2 & 3\\7 & 1 & 1\\0 & 6 & 5\end{bmatrix}\begin{bmatrix}x\\y\\z\end{bmatrix}=\begin{bmatrix}3y+11\\6z-1\\5y+11\end{bmatrix}+\begin{bmatrix}x\\x\\4z\end{bmatrix}+\begin{bmatrix}z\\3x\\4y\end{bmatrix}$ is

(A) $x=4, y=-3, z=2$

(B) $x=2, y=1, z=1$

(C) $x=1, y=-1, z=2$

(D) $x=2, y=-4, z=3$

Answer: (A) $x=4, y=-3, z=2$ · Official APSCHE final key

Q310 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If $A=\begin{bmatrix}1 & 0\\0 & -1\end{bmatrix}$, $P=\begin{bmatrix}1 & 1\\0 & 1\end{bmatrix}$ and $X=APA^T$ then $A^TX^{50}A=$

(A) $\begin{bmatrix}0 & 1\\1 & 0\end{bmatrix}$

(B) $\begin{bmatrix}2 & 1\\0 & -1\end{bmatrix}$

(C) $\begin{bmatrix}25 & 1\\1 & -25\end{bmatrix}$

(D) $\begin{bmatrix}1 & 50\\0 & 1\end{bmatrix}$

Answer: (D) $\begin{bmatrix}1 & 50\\0 & 1\end{bmatrix}$ · Official APSCHE final key

Q311 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If $[x]$ is the greatest integer less than or equal to x and $|x|$ is the modulus of x, then the system of three equations $2x+3|y|+5[z]=0,\ x+|y|-2[z]=4,\ x+|y|+[z]=1$ has

(A) a unique solution

(B) finitely many solutions

(C) infinitely many solutions

(D) no solution

Answer: (C) infinitely many solutions · Official APSCHE final key

Q312 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

Investigate the values of λ and μ for the system $x+2y+3z=6,\ x+3y+5z=9,\ 2x+5y+\lambda z=\mu$ and match the values in List - I with the items in List - II.

List - I

A) $\lambda=8,\ \mu\neq 15$

B) $\lambda\neq 8,\ \mu\in R$

C) $\lambda=8,\ \mu=15$

List - II
I) Infinitely many solutions
II) No solution
III) Unique solution
The correct match is

(A) A-I, B-II, C-III
(B) A-II, B-III, C-I
(C) A-III, B-I, C-II
(D) A-III, B-II, C-I

Answer: (B) A-II, B-III, C-I · Official APSCHE final key

Q313 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

The sum of the values of x so that the matrix $\begin{pmatrix}2 & 2 & 1\\1 & 3 & 1\\1 & 2 & 2\end{pmatrix} - x\begin{pmatrix}1 & 0 & 0\\0 & 1 & 0\\0 & 0 & 1\end{pmatrix}$ is singular, is

(A) 3
(B) 5
(C) 7
(D) 9

Answer: (C) 7 · Official APSCHE final key

Q314 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

If $A = \begin{bmatrix}\cos\alpha & -\sin\alpha & 0\\ \sin\alpha & \cos\alpha & 0\\ 0 & 0 & 1\end{bmatrix}$, then $(\text{Adj } A)^{-1} =$

(A) $A + I$
(B) $A - I$
(C) A
(D) $\text{Adj}\,(A^{-1})$

Options (3) or (4) were accepted. More than one answer was accepted. · Official APSCHE final key

Q315 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

If $abc \neq 0$ and the system of equations $x + 7ay + 2az = 0$, $x + 6by + 2bz = 0$, $x + 5cy + 2cz = 0$ has a non-trivial solution, then a, b, c are in

(A) Harmonic progression
(B) Geometric progression
(C) Arithmetic progression
(D) Arithmetico-geometric progression

Answer: (A) Harmonic progression · Official APSCHE final key

Q316 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If $A=\begin{bmatrix}1 & 1\\ 0 & 1\end{bmatrix}$ and $I=\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$, then for all $n \in N$

(A) $A^n = nA$
(B) $A^n = nA + (n-1)I$
(C) $A^n = (n-1)A - nI$
(D) $A^n = nA - (n-1)I$

Answer: (D) $A^n = nA - (n-1)I$ · The council's preliminary key

Q317 TS EAMCET 2018 · 7 May · Shift 1 MCQ

The rank of the matrix $\begin{bmatrix}3 & 2 & 1 & -4\\ 2 & 3 & 0 & -1\\ 1 & -6 & 3 & -8\end{bmatrix}$ is

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

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

Q318 TS EAMCET 2018 · 7 May · Shift 1 MCQ

Let A, B, C be 3×3 non-singular matrices and I be the identity matrix of order three. $ABA = BA^2B$ and $A^3 = I$, then $AB^4 - B^4A =$

(A) $O_{3\times 3}$
(B) $\frac{I}{2}$
(C) I
(D) $2I$

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

Q319 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If the system of equations
$x + y + 2z = 3$

$x + 2y + 3z = 4$
$x + cy + 2cz = 5$
is inconsistent, then

(A) $c = 1$
(B) $c = 3$
(C) $c \in R$
(D) $c \neq 1$

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

Q320 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ then $(AA')' =$

(A) $\begin{bmatrix} 14 & 32 & 50 \\ 32 & 122 & 194 \\ 50 & 194 & 256 \end{bmatrix}$
(B) $\begin{bmatrix} 14 & 50 & 32 \\ 32 & 122 & 194 \\ 50 & 194 & 122 \end{bmatrix}$
(C) $\begin{bmatrix} 14 & 32 & 50 \\ 50 & 194 & 122 \\ 32 & 122 & 77 \end{bmatrix}$
(D) $\begin{bmatrix} 14 & 32 & 50 \\ 32 & 77 & 122 \\ 50 & 122 & 194 \end{bmatrix}$

Answer: (D) $\begin{bmatrix} 14 & 32 & 50 \\ 32 & 77 & 122 \\ 50 & 122 & 194 \end{bmatrix}$ · The council's preliminary key

Q321 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $x = a,\ y = b,\ z = c$ is the solution of the system of simultaneous linear equations $x + y + z = 4,\ x - y + z = 2,\ x + 2y + 2z = 1$ then $ab + bc + ca =$

(A) 0
(B) -25
(C) 1
(D) -4

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

Q322 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then $A^{-1} =$

(A) $4I - A$

(B) $A - 4I$

(C) $\frac{1}{5}(A - 4I)$

(D) $\frac{1}{5}(4I - A)$

Answer: (C) $\frac{1}{5}(A - 4I)$ · The council's preliminary key

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Q323 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If x, y are any two non-zero real numbers, $a_{ij} = xj + yi$, $A = (a_{ij})_{n\times n}$ and P, Q are two $n \times n$ matrices such that $A = xP + yQ$ then

(A) P is singular and Q is non-singular

(B) $P + Q$ is symmetric and $P - Q$ is skew symmetric

(C) Both $P + Q$ and $P - Q$ are singular

(D) Both $P + Q$ and $P - Q$ are non-singular

Answer: (B) $P + Q$ **is symmetric and** $P - Q$ **is skew symmetric** · The council's preliminary key

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Q324 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If the system $\begin{bmatrix}2 & 8\\3 & 7\end{bmatrix}\begin{bmatrix}a\\b\end{bmatrix} = k\begin{bmatrix}a\\b\end{bmatrix}$ has non trivial solution then the positive value of k and a solution of the system for that value of k are

(A) $9, \begin{bmatrix}3\\-8\end{bmatrix}$

(B) $10, \begin{bmatrix}-8\\3\end{bmatrix}$

(C) $6, \begin{bmatrix}-1\\-1\end{bmatrix}$

(D) $10, \begin{bmatrix}1\\1\end{bmatrix}$

Answer: (D) $10, \begin{bmatrix}1\\1\end{bmatrix}$ · The council's preliminary key

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Q325 TS EAMCET 2018 · 4 May · Shift 1 MCQ

Let $A = \begin{bmatrix}\frac{1}{6} & \frac{-1}{3} & \frac{-1}{6}\\ \frac{-1}{3} & \frac{2}{3} & \frac{1}{3}\\ \frac{-1}{6} & \frac{1}{3} & \frac{1}{6}\end{bmatrix}$. If $A^{2016l} + A^{2017m} + A^{2018n} = \frac{1}{\alpha}A$, for every $l, m, n \in N$, then the value of α is

(A) $\frac{1}{6}$
(B) $\frac{1}{3}$
(C) $\frac{1}{2}$
(D) $\frac{2}{3}$

Answer: (B) $\frac{1}{3}$ · The council's preliminary key

Q326 TS EAMCET 2018 · 4 May · Shift 1 MCQ

Let $l, m, n \in \mathbb{R}$ and $A = \begin{bmatrix} 1 & r & r^2 & l \\ r & r^2 & 1 & m \\ r^2 & 1 & r & n \end{bmatrix}$. Then the set of all real values of r for which the rank of A is 3, is

(A) $(0, \infty)$
(B) R
(C) $R - \{1\}$
(D) $R - \{0\}$

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

Q327 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The following system of equations
$x + y + z = 9$
$2x + 5y + 7z = 52$
$x + 7y + 11z = 77$
has

(A) no solution
(B) exactly 2 solutions
(C) only one solution
(D) infinitely many solutions

Answer: (D) infinitely many solutions · The council's preliminary key

Q328 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

Let matrix $A = \begin{bmatrix} 5 & -3 & 0 \\ -3 & 5 & 0 \\ 0 & 0 & 2 \end{bmatrix}$, X be a non zero matrix of order 3×1 and c be a real number. If $A^2X = cAX$, then the number of distinct values of c is

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

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

Q329 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

Let $1, \omega$ and ω^2 be the cube roots of unity. If S is the set of all non-singular matrices of the form $\begin{bmatrix} 1 & a & b \\ \omega & 1 & c \\ \omega^2 & \omega & 1 \end{bmatrix}$ where $a, b, c \in \{\omega, \omega^2\}$, then the number of elements in S is

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

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

Q330 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If P and Q are two invertible matrices of the same order, then Adj (QP) is equal to

(A) $|P||Q|P^{-1}Q^{-1}$
(B) $|P||Q|(PQ)^{-1}$
(C) $|P||Q|\text{Adj}(PQ)$
(D) $|P||Q|\text{Adj}(QP)$

Answer: (A) $|P||Q|P^{-1}Q^{-1}$ · The council's preliminary key

Q331 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

The values of t such that the matrix $\begin{pmatrix} 1 & 3 & 2 \\ 2 & 5 & t \\ 4 & 7-t & -6 \end{pmatrix}$ has no inverse, are

(A) $3, 2$
(B) $3, -2$
(C) $-3, 2$
(D) $-3, -2$

Answer: (C) $-3, 2$ · The council's preliminary key

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Q332 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If the point $P(\alpha, \beta, \gamma)$ lies on the plane $2x + y + z = 1$ and $\begin{bmatrix}\alpha & \beta & \gamma\end{bmatrix}\begin{bmatrix}1 & 9 & 1\\ 8 & 2 & 1\\ 7 & 3 & 1\end{bmatrix} = \begin{bmatrix}0 & 0 & 0\end{bmatrix}$, then $\alpha^2 + \beta^2 + \gamma^2 =$

(A) 34
(B) 43
(C) 68
(D) 86

Answer: (D) 86 · The council's preliminary key

Q333 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If the system of linear equations given by $x + y + z = 3,\ 2x + 2y - z = 3,\ x + y - z = 1$ is consistent and if (x_0, y_0, z_0) is a solution, then $2x_0 + 2y_0 + z_0 =$

(A) 0
(B) 5
(C) 7
(D) 6

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

Q334 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If $A = \begin{bmatrix}0 & -1\\ 1 & 0\end{bmatrix}$, then the incorrect option among the following is

(A) $A^3 - I = A(A - I)$
(B) $(A^3 + I) = A(A^3 - I)$
(C) $A^4 - I = A^2 + I$
(D) $A^2 + I = A(A^2 - I)$

Answer: (D) $A^2 + I = A(A^2 - I)$ · The council's preliminary key

Q335 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If $a \neq -1$, $b \neq -1$, $c \neq -1$ and the system of equations $x = a(y + z)$, $y = b(z + x)$, $z = c(x + y)$ has a non-trivial solution, then

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(A) $\frac{a}{a+1}+\frac{b}{b+1}+\frac{c}{c+1}=0$
(B) $\frac{a}{a+1}+\frac{b}{b+1}+\frac{c}{c+1}=1$
(C) $\frac{abc}{(a+1)(b+1)(c+1)}=1$
(D) $\frac{a+b+c}{(a+1)(b+1)(c+1)}=2$

Answer: (B) $\frac{a}{a+1}+\frac{b}{b+1}+\frac{c}{c+1}=1$ · The council's preliminary key

Q336 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

The rank of the following matrix A is

$$A=\begin{bmatrix}1 & -2 & 3 & -4\\ 2 & 9 & 4 & 5\\ 4 & 5 & 10 & -3\\ 1 & 11 & -1 & 9\end{bmatrix}$$

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

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

Q337 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

For the matrix $A=\begin{bmatrix}3 & -3 & 4\\ 2 & -3 & 4\\ 0 & -1 & 1\end{bmatrix}$, $A^{-1}=$

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

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

Q338 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $A=\begin{bmatrix}\frac{k}{2} & 0 & 0\\ 0 & \frac{l}{3} & 0\\ 0 & 0 & \frac{m}{4}\end{bmatrix}$ and $A^{-1}=\begin{bmatrix}\frac{1}{2} & 0 & 0\\ 0 & \frac{1}{3} & 0\\ 0 & 0 & \frac{1}{4}\end{bmatrix}$ then $k+l+m=$

(A) 1
(B) 9
(C) 14
(D) 29

Answer: (D) 29 · The council's preliminary key

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Q339 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If A and B are the two real values of k for which the system of equations $x+2y+z=1,\ x+3y+4z=k,\ x+5y+10z=k^2$ is consistent, then $A+B=$

(A) 3
(B) 4
(C) 5
(D) 7

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

Q340 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If A is a square matrix of order 3, and $A^2+A+2I=0$, then

(A) A can not be a skew-symmetric matrix
(B) $|A+I|=0$
(C) A is non singular and $A^{-1}=(A+I)^{-1}$
(D) $|A||A+I|=2$

Answer: (A) A can not be a skew-symmetric matrix · The council's preliminary key

Q341 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If A is a square matrix of order 3, then consider the following statements
I: If $|A|=0$ then $|\text{Adj } A|=0$
II: If $|A|\neq 0$, then $|A^{-1}|=|A|^{-1}$
Which of the above statements is/are true?

(A) Both I and II
(B) Neither I nor II
(C) I only
(D) II only

Answer: (A) Both I and II · The council's preliminary key

Q342 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

The system of equations $x-2y+3z=5$, $2x-2y+z=0$, $-x+2y-3z=6$ has

(A) infinitely many solutions
(B) exactly two solutions
(C) unique solution
(D) no solution

Answer: (D) no solution · The council's preliminary key

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Q343 TS EAMCET 2017 · 12 May · Offline MCQ

If $A=\begin{bmatrix}1 & 0 & 1\\ 0 & 2 & 0\\ 1 & -1 & 4\end{bmatrix}$, $A=B+C$, $B=B^T$ and $C=-C^T$, then $C=$

(A) $\begin{bmatrix}0 & 0.5 & 0\\ -0.5 & 0 & 0\\ 0 & 0 & 0\end{bmatrix}$

(B) $\begin{bmatrix}0 & 0 & 0\\ 0 & 0 & 0.5\\ 0 & -0.5 & 0\end{bmatrix}$

(C) $\begin{bmatrix}0 & -0.5 & 0.5\\ 0.5 & 0 & 0\\ -0.5 & 0 & 0\end{bmatrix}$

(D) $\begin{bmatrix}0 & 0.5 & 0\\ -0.5 & 0 & 0.5\\ 0 & -0.5 & 0\end{bmatrix}$

Answer: (B) $\begin{bmatrix}0 & 0 & 0\\ 0 & 0 & 0.5\\ 0 & -0.5 & 0\end{bmatrix}$ · The council's preliminary key

Q344 TS EAMCET 2017 · 12 May · Offline MCQ

If rank of $\begin{pmatrix}x & x & x\\ x & x^2 & x\\ x & x & x+1\end{pmatrix}$ is 1, then

(A) $x=0$ (or) $x=1$

(B) $x=1$

(C) $x=0$

(D) $x\neq 0$

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

Q345 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If a,b,c are non zero real numbers and if the equations $(a-1)x=y+z,\ (b-1)y=z+x,\ (c-1)z=x+y$ have a non-trivial solution, then $ab+bc+ca=$

(A) $a+b+c$

(B) abc

(C) 0

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

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

Q346 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If a system of three linear equations in three unknowns, which is in the matrix equation form of $AX = D$, is inconsistent, then $\frac{\text{rank of } A}{\text{rank of } AD}$ is

(A) Greater than or equal to one
(B) One
(C) Greater than one
(D) Less than one

Answer: (D) Less than one · The council's preliminary key

Q347 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

The values of λ and μ for which the system of equations $x + y + z = 6$, $x + 2y + 3z = 10$, $x + 2y + \lambda z = \mu$ has infinitely many solutions are

(A) $\lambda = 3, \mu = 7$
(B) $\lambda \neq 3, \mu = 10$
(C) $\lambda = 3, \mu = 10$
(D) $\lambda = 3, \mu \neq 10$

Answer: (C) $\lambda = 3, \mu = 10$ · The council's preliminary key

Q348 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If $A = \begin{bmatrix} -2 & 1 \\ 3 & 4 \end{bmatrix}$ and $A = P + Q$, where P is symmetric matrix and Q is Skew-Symmetric matrix; then Q is

(A) $\begin{bmatrix} 0 & -2 \\ 2 & 0 \end{bmatrix}$
(B) $\begin{bmatrix} 0 & 2 \\ -2 & 0 \end{bmatrix}$
(C) $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$
(D) $\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$

Answer: (C) $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$ · The council's preliminary key

Q349 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If P is a square matrix with $P^2 = P$ and if I is the unit matrix of the same order as of P then $(P + I)^4 =$

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(A) $I + 9P$
(B) $I + 11P$
(C) $I + 13P$
(D) $I + 15P$

Answer: (D) $I + 15P$ · The council's preliminary key

Q350 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ a & 2 & b \end{bmatrix}$ is a matrix satisfying the equation $AA^T = 9I$ where I is the identity matrix, then $a^2 + b^2 =$

(A) 0
(B) 2
(C) 5
(D) 10

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

Q351 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If A is a matrix of order 3 whose determinant is equal to 6, then $\det(\text{adj } A) =$

(A) 6
(B) 36
(C) 216
(D) 1

Answer: (B) 36 · The council's preliminary key

Q352 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If A and B are square matrices of order 3, then $\left|(A - A^T) + (B - B^T)\right| =$

(A) $2|A|$
(B) $2|B|$
(C) $2(|A| + |B|)$
(D) 0

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

Q353 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

The system of equations $x + y + z = 5$, $x + 2y + 3z = 9$ and $x + 3y + \lambda z = \mu$ has unique solution if

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(A) $\lambda = 5,\ \mu = 10$
(B) $\lambda = 5,\ \mu \neq 10$
(C) $\lambda \in \mathbb{R},\ \mu \neq 5$
(D) $\lambda \neq 5,\ \mu \in \mathbb{R}$

Answer: (D) $\lambda \neq 5,\ \mu \in \mathbb{R}$ · The council's preliminary key

Q354 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If $A = \begin{pmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{pmatrix}$ where $\theta = \frac{2\pi}{19}$ then $\mathrm{A}^{2017} =$

(A) A
(B) A^3
(C) A^5
(D) I

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

Q355 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If (α, β, γ) is the solution of the system of simultaneous linear equations given by $3x + 4y - 5z = -6,\ 2x + 3y - 4z + 7 = 0,\ 4x - 2y + z = 9$ then $\alpha + 3\beta - 2\gamma =$

(A) 4
(B) 2
(C) 3
(D) 8

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

Q356 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If A and B are two matrices given by $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 5 & 6 & 8 \end{pmatrix}$ and $B = \begin{pmatrix} 3 & 2 & 5 \\ 2 & 3 & 8 \\ 7 & 2 & 9 \end{pmatrix}$ then, the value of $|\mathrm{Adj}(AB)|$ is

(A) 24
(B) 24^2
(C) 24^3
(D) 65

Answer: (B) 24^2 · The council's preliminary key

Q357 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

The system of equations $x + y + z = 5,\ x + 2y + az = 9,\ x + 2y + z = b$ is inconsistent if

(A) $a = 1,\ b = 9$

(B) $a = 1,\ b \neq 9$

(C) $a \neq 1,\ b = 9$

(D) $a \neq 1,\ b \neq 9$

Answer: (B) $a = 1,\ b \neq 9$ · The council's preliminary key

Q358 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If $A = \begin{bmatrix} \cos\frac{2\pi}{33} & \sin\frac{2\pi}{33} \\ -\sin\frac{2\pi}{33} & \cos\frac{2\pi}{33} \end{bmatrix}$, then $A^{2017} =$

(A) A

(B) A^2

(C) A^4

(D) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

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

Q359 TS EAMCET 2016 · 15 May · Offline MCQ

Consider the system of equations

$ax + by + cz = 2$

$bx + cy + az = 2$

$cx + ay + bz = 2$

where a, b, c are real numbers such that $a + b + c = 0$. Then the system

(A) has two solutions

(B) is inconsistent

(C) has unique solution

(D) has infinitely many solutions

Answer: (B) is inconsistent · Official TGCHE final key

Q360 TS EAMCET 2016 · 15 May · Offline MCQ

Suppose A and B are two square matrices of same order. If A, B are symmetric matrices then $AB - BA$ is

(A) a symmetric matrix

(B) a skew symmetric matrix

(C) a scalar matrix

(D) a triangular matrix

Answer: (B) a skew symmetric matrix · Official TGCHE final key

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Q361 AP EAMCET 2016 · 29 Apr · Offline MCQ

The equations
$x - y + 2z = 4$
$3x + y + 4z = 6$
$x + y + z = 1$ have

(A) unique solution
(B) infinitely many solutions
(C) no solution
(D) two solutions

Answer: (B) infinitely many solutions · The council's preliminary key

Q362 AP EAMCET 2014 · 22 May · Offline MCQ

If a, b, c and d are real numbers such that $a^2 + b^2 + c^2 + d^2 = 1$ and if $A = \begin{bmatrix} a+ib & c+id \\ -c+id & a-ib \end{bmatrix}$ then $A^{-1} =$

(A) $\begin{bmatrix} a+ib & -c-id \\ c-id & a-ib \end{bmatrix}$
(B) $\begin{bmatrix} a-ib & c+id \\ -c+id & a+ib \end{bmatrix}$
(C) $\begin{bmatrix} a-ib & -c-id \\ c-id & a+ib \end{bmatrix}$
(D) $\begin{bmatrix} a+ib & c+id \\ c-id & a-ib \end{bmatrix}$

Answer: (C) $\begin{bmatrix} a-ib & -c-id \\ c-id & a+ib \end{bmatrix}$ · The council's preliminary key

Q363 AP EAMCET 2014 · 22 May · Offline MCQ

If the matrix $A = \begin{bmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & \alpha \end{bmatrix}$ is of rank 3, then $\alpha =$

(A) -5
(B) 5
(C) 4
(D) 1

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

Q364 AP EAMCET 2013 · 10 May · Offline MCQ

If I is the identity matrix of order 2 and $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$, then for $n \geq 1$, mathematical induction gives

(A) $A^n = nA - (n-1)I$
(B) $A^n = nA + (n-1)I$
(C) $A^n = 2^nA - (n+1)I$
(D) $A^n = 2^{n-1}A - (n-1)I$

Answer: (A) $A^n = nA - (n-1)I$ · The council's preliminary key

Q365 AP EAMCET 2013 · 10 May · Offline MCQ

If $A = \begin{bmatrix} -8 & 5 \\ 2 & 4 \end{bmatrix}$ satisfies the equation $x^2 + 4x - p = 0$, then $p =$

(A) 64
(B) 42
(C) 36
(D) 24

Answer: (B) 42 · The council's preliminary key

Q366 AP EAMCET 2013 · 10 May · Offline MCQ

The system of equations $3x + 2y + z = 6$, $3x + 4y + 3z = 14$, $6x + 10y + 8z = a$, has infinite number of solutions, if $a =$

(A) 8
(B) 12
(C) 24
(D) 36

Answer: (D) 36 · The council's preliminary key

Q367 AP EAMCET 2012 · 12 May · Offline MCQ

$A = \begin{bmatrix} i & -i \\ -i & i \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix} \Rightarrow A^8 =$

(A) 4 B
(B) 8 B
(C) 64 B
(D) 128 B

Answer: (D) 128 B · Official APSCHE final key

Q368 AP EAMCET 2012 · 12 May · Offline MCQ

Let $A = \begin{bmatrix} -1 & -2 & -3 \\ 3 & 4 & 5 \\ 4 & 5 & 6 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -2 \\ -1 & 2 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$. If a, b and c respectively denote the ranks of A, B and C then the correct order of these numbers is

(A) $a < b < c$

(B) $c < b < a$

(C) $b < a < c$

(D) $a < c < b$

Answer: (C) $b < a < c$ · Official APSCHE final key

Q369 AP EAMCET 2012 · 12 May · Offline MCQ

Given that $a\alpha^2 + 2b\alpha + c \neq 0$ and that the system of equations
$(a\alpha + b)x + ay + bz = 0$
$(b\alpha + c)x + by + cz = 0$
$(a\alpha + b)y + (b\alpha + c)z = 0$
has a non-trivial solution, then a, b, c lie in

(A) Arithmetic progression

(B) Geometric progression

(C) Harmonic progression

(D) Arithmetico-geometric progression

Answer: (B) Geometric progression · Official APSCHE final key

Q370 AP EAMCET 2011 · 8 May · Offline MCQ

$$A(\alpha, \beta) = \begin{pmatrix} \cos\alpha & \sin\alpha & 0 \\ -\sin\alpha & \cos\alpha & 0 \\ 0 & 0 & e^{\beta} \end{pmatrix} \Rightarrow [A(\alpha, \beta)]^{-1} =$$

(A) $A(-\alpha, \beta)$

(B) $A(-\alpha, -\beta)$

(C) $A(\alpha, -\beta)$

(D) $A(\alpha, \beta)$

Answer: (B) $A(-\alpha, -\beta)$ · The council's preliminary key

Q371 AP EAMCET 2011 · 8 May · Offline MCQ

If A is a matrix such that $\begin{pmatrix} 2 & 1 \\ 3 & 2 \end{pmatrix} A \begin{pmatrix} 1 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 1 \\ 0 & 0 \end{pmatrix}$ then $A =$

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(A) $\begin{pmatrix}1 & 1\\ 0 & 1\end{pmatrix}$

(B) $\begin{pmatrix}2 & 1\end{pmatrix}$

(C) $\begin{pmatrix}1 & 0\\ -1 & 1\end{pmatrix}$

(D) $\begin{pmatrix}2\\ -3\end{pmatrix}$

Answer: (D) $\begin{pmatrix}2\\ -3\end{pmatrix}$ · The council's preliminary key

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Q372 AP EAMCET 2011 · 8 May · Offline MCQ

$A=\begin{pmatrix}1 & 0 & 1\\ 0 & 1 & 1\\ 0 & 1 & 0\end{pmatrix} \Rightarrow A^2-2A=$

(A) A^{-1}

(B) $-A^{-1}$

(C) I

(D) $-I$

Answer: (B) $-A^{-1}$ · The council's preliminary key

Q373 AP EAMCET 2010 · 30 May · Offline MCQ

If A is a nonzero square matrix of order n with $\det(\mathrm{I}+\mathrm{A})\neq 0$ and $\mathrm{A}^3=\mathbf{0}$, where I, $\mathbf{0}$ are unit and null matrices of order $n\times n$ respectively then $(\mathrm{I}+\mathrm{A})^{-1}=$

(A) $\mathrm{I}-\mathrm{A}+\mathrm{A}^2$

(B) $\mathrm{I}+\mathrm{A}+\mathrm{A}^2$

(C) $\mathrm{I}+\mathrm{A}^{-1}$

(D) $\mathrm{I}+\mathrm{A}$

Answer: (A) $\mathrm{I}-\mathrm{A}+\mathrm{A}^2$ · Official APSCHE final key

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