EdLoop

EdLoop EAPCET

MATHEMATICS · EAPCET (EAMCET)

Vector Algebra

Previous Year Questions with answers

707 questions · **149** papers · **2010–2026** · newest paper first

Step-by-step solutions for every question: free in the EdLoop EAPCET app (Google Play) · pyq.edloop.in

What is in this PDF: every Vector Algebra 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.

Step-by-step solutions for every question are free in the EdLoop EAPCET app (Google Play) and on app.edloop.in. More chapters: pyq.edloop.in/free-pdfs/

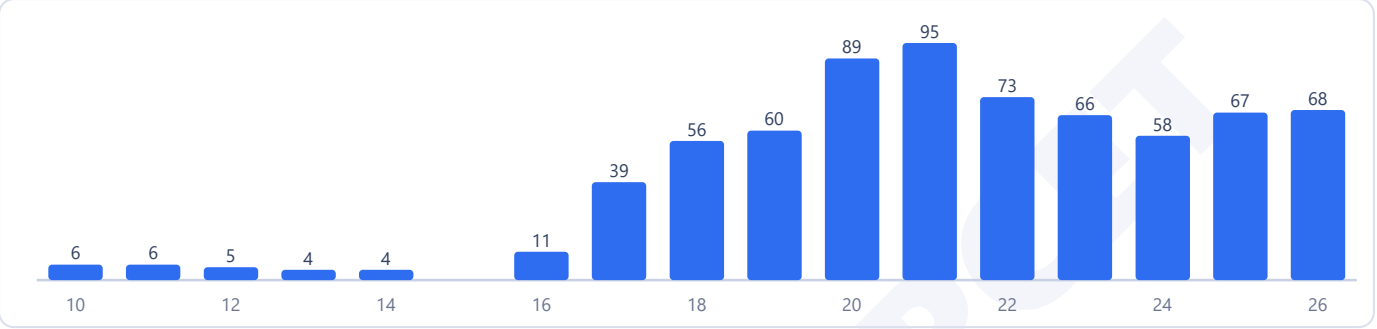
EdLoop EAPCET

Chapter at a glance

5.4%	707	77 of 77	707 / 0
of Mathematics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 4.2 questions per paper in 2024–2026 against 4.5 in 2022–2023.

Questions per year



Counts are the questions we hold: 707 in 149 papers. 13 questions in this chapter came back in more than one paper.

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

Basics	231
Triple Products	182
Dot Product	177
Cross Product	117

How often it comes up

Vector Algebra represents one of the heavyweight cornerstones of the EAPCET mathematics paper, holding rank 6 of 29 mathematics chapters. Spanning the comprehensive testing timeline from 2010 through 2026, the chapter delivered 707 questions across 149 evaluated exam papers, appearing in all 149 papers to average 4.7 questions per paper with a 5.9 percent subject share. In contemporary testing between 2022 and 2026, Vector Algebra was featured in all 77 sittings, supplying 332 questions (averaging 4.3 questions per paper and a 5.4 percent subject share).

Because it appears in every recent paper, every student facing an EAPCET examination shift encounters four to five vector problems. Over the recent three-year window from 2024 to 2026, the topic supplied 193 questions across 46 sittings (all 46 papers, averaging 4.2 questions per test and a 5.2 percent share). During the earlier timeframe from 2010 to 2021, the chapter contributed 375 questions across 72 sittings (all 72 papers, 5.2 per test, 6.5 percent share). Comparing early testing with the last three years shows the share is down, while comparing recent testing with the last three years shows the share is about the same. Across individual state boards between 2022 and 2026, Andhra Pradesh administered 210 questions across 48 papers (all 48 papers, 4.4 per test, 5.5 percent share), whereas Telangana set 122 questions across 29 papers (all 29 papers, 4.2 per test, 5.3 percent share).

Most-asked topics

Questions in Vector Algebra are distributed across four core computational domains:

- **Basics**: Accounting for 231 total questions, including 121 in recent examinations (tested through 2026). Concepts include linear combination of vectors, collinearity and coplanarity criteria, position vectors, section formula in internal and external division, angle bisector vectors, and centroid or circumcenter determinations.

- **Dot Product**: Yielding 177 total questions, with 91 appearing in modern tests (tested through 2026). Key themes involve scalar products, projection of one vector along or perpendicular to another, orthogonality conditions, work done, and determining angles between vectors.
- **Triple Products**: Supplying 182 total questions, with 67 set in recent tests (tested through 2026). Prominent areas include scalar triple product (box product) representing parallelopiped volume, coplanarity of three vectors (box product equals zero), vector triple product expansion (a cross (b cross c) equals (a dot c) b minus (a dot b) c), and vector quadruple products.
- **Cross Product**: Contributing 117 total questions, with 53 in recent papers (tested through 2026). Key problem types involve vector products, unit vectors perpendicular to two given vectors, area of triangles and parallelograms, moment of a force, and resolving Lagrange identity relations.

What the questions look like

Examiners emphasize algebraic manipulations of products, collinearity conditions, and vector equations involving unknowns.

A standard problem format gives two or three vectors containing unknown parameters and states that they are collinear or coplanar, requiring students to solve linear equations for those parameters. Another recurring template provides a vector equation such as a cross b equals c cross b and a dot c equals zero, asking to determine the magnitude or angle of an unknown vector. Candidates also encounter problems requiring the decomposition of a vector into components parallel and perpendicular to another vector.

How to practise it

Begin by establishing absolute fluency in product identities. Remember that the scalar product a dot b equals magnitude of a times magnitude of b times cos theta, which yields zero if and only if non-zero vectors are perpendicular. The projection of vector a on vector b is (a dot b) divided by the magnitude of b, and the vector projection along b is ((a dot b) divided by magnitude of b squared) multiplied by vector b. The component perpendicular to b is simply a minus its parallel projection.

For vector products, memorize the vector triple product expansion: a cross (b cross c) equals (a dot c) b minus (a dot b) c. Notice that the vector outside the parentheses dots with the remote vector in the inner product first. For scalar triple products, remember that cyclic permutations leave the value unchanged: [a b c] equals [b c a] equals [c a b], whereas swapping any two vectors flips the sign. Three vectors are coplanar if and only if their box product evaluates to zero.

EdLoop EAPCET

Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

The position vectors of the vertices A and B of a triangle ABC are $\bar{i}+3\bar{j}+4\bar{k}$ and $2\bar{i}+\bar{j}+2\bar{k}$ respectively. If $|\overline{AC}|=5$ and $angle\ A=\pi/3$, then $|\overline{BC}|=$

(A) $\sqrt{26}$
(B) $3\sqrt{19}$
(C) $3\sqrt{26}$
(D) $\sqrt{19}$

Answer: (D) $\sqrt{19}$ · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If $\bar{a}=\bar{i}-\bar{j}+2\bar{k}$, $\bar{b}=-\bar{i}+2\bar{j}$ and $\bar{c}$ are three vectors such that $\bar{a}+\bar{b}$ is parallel to $\bar{c}$ and $(\bar{c}+\bar{a}).(\bar{c}+\bar{b})=7$, then the vector $\bar{c}$ having minimum length is

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

Answer: (B) $\bar{j}+2\bar{k}$ · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If the vector components of a vector $\bar{a}$ along a vector $\bar{b}=4\bar{i}+5\bar{j}+3\bar{k}$ and perpendicular to $\bar{b}$ are respectively $\frac{7}{25}(4\bar{i}+5\bar{j}+3\bar{k})$ and $\frac{1}{25}(47\bar{i}-10\bar{j}-46\bar{k})$ then $|\bar{a}|^2=$

(A) 6
(B) 9
(C) 11
(D) 17

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

Q4 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If $\bar{c}$ and $(\bar{b}\times\bar{c})\times(\bar{c}\times\bar{a})$ are parallel vectors, then $[\bar{c}\times\bar{a}\quad\bar{a}\times\bar{b}\quad\bar{b}\times\bar{c}]=$

(A) 0

(B) $|\bar{c}|$

(C) $\left(\frac{|(\bar{b}\times\bar{c})\times(\bar{c}\times\bar{a})|}{|\bar{c}|}\right)^2$

(D) $\left(\frac{|\bar{b}\times\bar{c}|}{|\bar{c}\times\bar{a}|}\right)^2$

Answer: (C) $\left(\frac{|(\bar{b}\times\bar{c})\times(\bar{c}\times\bar{a})|}{|\bar{c}|}\right)^2$ · The council's preliminary key

Q5 AP EAPCET 2026 · 18 May · Shift 2 MCQ

O is the origin, $\overline{OP}$ and $\overline{OR}$ are vectors making angles 45° and 135° respectively with the positive direction of x-axis, $|\overline{OP}|=3$ and $|\overline{OR}|=4$. M is the midpoint of PQ in the rectangle OPQR. If $\overline{OM}$ meets the diagonal PR at T , then $\overline{OT}=$

(A) $\frac{1}{\sqrt{2}}(\bar{i}+\bar{j})$

(B) $\frac{2}{3}(\bar{i}+5\bar{j})$

(C) $\frac{\sqrt{2}}{3}(\bar{i}-5\bar{j})$

(D) $\frac{\sqrt{2}}{3}(\bar{i}+5\bar{j})$

Answer: (D) $\frac{\sqrt{2}}{3}(\bar{i}+5\bar{j})$ · The council's preliminary key

Q6 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If $\overline{a}=\bar{i}+\bar{j}+\overline{k}$, $\overline{a}.\overline{b}=1$ and $\overline{a}\times\overline{b}=\bar{j}-\overline{k}$, then $\overline{b}=$

(A) $\bar{i}-\bar{j}+\overline{k}$

(B) $2\bar{j}-\overline{k}$

(C) $\bar{i}$

(D) $2\bar{i}$

Answer: (C) $\bar{i}$ · The council's preliminary key

Q7 AP EAPCET 2026 · 18 May · Shift 2 MCQ

Let $\overline{a}=4\bar{i}+3\bar{j}$ and $\overline{b}$ be two vectors in XOY plane and let $\overline{a}$ be perpendicular to $\overline{b}$. Then a vector $\bar{c}$ in the same plane and having projections 1 and 2 respectively on $\overline{a}$ and $\overline{b}$ is

(A) $\bar{i}+2\bar{j}$

(B) $2\bar{i}+\bar{j}$

(C) $\bar{i}-2\bar{j}$

(D) $2\bar{i}-\bar{j}$

Answer: (D) $2\bar{i}-\bar{j}$ · The council's preliminary key

Q8 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If $A(1,0,1)$, $B(0,1,-1)$, $C(-1,1,0)$ are the vertices of a triangle ABC, then $\cos^2 A + \cos^2 B =$

(A) $\frac{1}{2\sqrt{3}}$
(B) $\frac{1}{3\sqrt{2}}$
(C) $\frac{5}{6}$
(D) $\frac{7}{9}$

Answer: (D) $\frac{7}{9}$ · The council's preliminary key

Q9 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If the median AD of ΔABC is bisected at the point E and BE is produced to meet the side AC at F. Then the vector $\overline{BF} =$

(A) $\frac{3}{2}\overline{EF}$
(B) $2\overline{EF}$
(C) $3\overline{EF}$
(D) $4\overline{EF}$

Answer: (D) $4\overline{EF}$ · The council's preliminary key

Q10 AP EAPCET 2026 · 15 May · Shift 1 MCQ

$OABCD$ is a pentagon in which the sides OA and CB are parallel and the sides OD and AB are parallel. If $\overline{OA} = \overline{a}$, $\overline{OD} = \overline{d}$, $\frac{OA}{CB} = 2$ and $\frac{OD}{AB} = \frac{1}{3}$, then $\overline{AD} + \overline{OC} + \overline{DC} =$

(A) $\overline{d} + \overline{a}$
(B) $5\overline{a} + 3\overline{d}$
(C) $6\overline{d}$
(D) $7\overline{a}$

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

Q11 AP EAPCET 2026 · 15 May · Shift 1 MCQ

Let $\overline{a} = x\,\overline{i} - 2\overline{j} + 3\overline{k}$, $\overline{b} = -2\overline{i} + x\overline{j} - \overline{k}$ and $\overline{c} = 7\overline{i} - 2\overline{j} + x\overline{k}$. If $x = x_0$ is the point of the local maxima of $f(x) = \overline{a} \cdot (\overline{b} \times \overline{c})$, then at $x = x_0$, $\overline{a} \cdot \overline{b} + \overline{b} \cdot \overline{c} + \overline{c} \cdot \overline{a} =$

(A) -30
(B) -22
(C) -4
(D) -14

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

EdLoop EAPCET

Q12 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If $\overline{V}=2\overline{i}+\overline{j}-\overline{k}$ and $\overline{W}=\overline{i}+3\overline{k}$ and $\overline{U}$ is a unit vector, then the maximum value of the scalar triple product $[\overline{U}\ \overline{V}\ \overline{W}]$ is

(A) -1
(B) $\sqrt{10}+\sqrt{6}$
(C) $\sqrt{59}$
(D) $\sqrt{60}$

Answer: (C) $\sqrt{59}$ · The council's preliminary key

Q13 AP EAPCET 2026 · 15 May · Shift 1 MCQ

$\overline{b}$ and $\overline{c}$ are non-collinear vectors and $\overline{a}$ is a vector such that $(\overline{c}.\overline{c})\overline{a}=\overline{c}$. If $\overline{a}\times(\overline{b}\times\overline{c})+(\overline{a}.\overline{b})\overline{b}=(4-2\beta-\sin\alpha)\overline{b}+(\beta^2-1)\overline{c}$, then the values of the scalars α and β are

(A) $\beta=2,\alpha=n\pi+\frac{\pi}{2},n\in z$
(B) $\beta=-1,\alpha=2n\pi+\frac{\pi}{4},n\in z$
(C) $\beta=1,\alpha=(2n+1)\frac{\pi}{2},n\in z$
(D) $\beta=1,\alpha=2n\pi+\frac{\pi}{2},n\in z$

Answer: (D) $\beta=1,\alpha=2n\pi+\frac{\pi}{2},n\in z$ · The council's preliminary key

Q14 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If $\overline{i}+\overline{j}-\overline{k}$, $7\overline{i}-2\overline{j}-3\overline{k}$ and $-5\overline{i}-2\overline{j}+5\overline{k}$ are the position vectors of the points A,B,C respectively, then the position vector of the point of intersection of the bisector of $\angle BAC$ and side BC is

(A) $\frac{1}{16}(27\overline{i}-32\overline{j}+2\overline{k})$
(B) $\frac{1}{4}(7\overline{i}-8\overline{j}+2\overline{k})$
(C) $\frac{1}{4}(7\overline{i}+8\overline{j}+2\overline{k})$
(D) $\frac{1}{16}(28\overline{i}-32\overline{j}+2\overline{k})$

Answer: (B) $\frac{1}{4}(7\overline{i}-8\overline{j}+2\overline{k})$ · The council's preliminary key

Q15 AP EAPCET 2026 · 15 May · Shift 2 MCQ

Let $\bar{a}$, $\bar{b}$ be two non-collinear vectors.
If $\bar{l}=(x+2y-3)\,\bar{a}+(2x-y+1)\,\bar{b}$ and $\bar{m}=(3x-y-2)\,\bar{a}+(x+3y+2)\,\bar{b}$ are two vectors such that $2\bar{l}=\bar{m}$, then $x+5y=$

(A) 4
(B) 6
(C) 9
(D) 8

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

Q16 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If $|\overline{a}| = 2k$, $|\overline{b}| = k$ and $|\overline{a} - \overline{b}|^2 = 20k^2 - |2\overline{a} + \overline{b}|^2$ then, $|\overline{a} \times \overline{b}| =$

(A) $\sqrt{3}\,k^2$
(B) k^2
(C) $\frac{k^2}{4}$
(D) $2k$

Answer: (A) $\sqrt{3}\,k^2$ · The council's preliminary key

Q17 AP EAPCET 2026 · 15 May · Shift 2 MCQ

Given that $\overline{a} = 2\overline{i} - \overline{j} + 2\overline{k}$, $\overline{b} = \overline{i} - 2\overline{j} + 2\overline{k}$, $\overline{c} = 2\overline{i} - 2\overline{j} - \overline{k}$. If $\overline{d}$ is a vector perpendicular to the plane of $\overline{a}$, $\overline{b}$ and $\overline{d} \cdot \overline{c} = 2$, then $|(\overline{d} - \overline{c}) \times (\overline{a} \times \overline{b})| =$

(A) 16
(B) $4\sqrt{2}$
(C) 8
(D) $8\sqrt{2}$

Answer: (B) $4\sqrt{2}$ · The council's preliminary key

Q18 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If $\overline{i} + 2\overline{j} + \overline{k}$, $\alpha\overline{i} + 3\overline{j} + 2\overline{k}$, $-\overline{i} + 4\overline{j} + \beta\overline{k}$ are the position vectors of three points A, B, C, then the position vector of a point which divides BC in the ratio $\alpha + 1 : \beta$ is

(A) $\left(\frac{-1}{4}, \frac{13}{4}, \frac{9}{4}\right)$
(B) $\left(\frac{-1}{3}, \frac{13}{3}, \frac{9}{3}\right)$
(C) $\left(\frac{5}{2}, \frac{7}{2}, \frac{6}{2}\right)$
(D) $\left(\frac{7}{3}, \frac{2}{3}, \frac{1}{3}\right)$

Answer: (A) $\left(\frac{-1}{4}, \frac{13}{4}, \frac{9}{4}\right)$ · The council's preliminary key

Q19 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If $\bar{a} = \bar{i} - \bar{j} + 3\bar{k}$ and $\bar{b} = 3\bar{i} - 5\bar{j} + 6\bar{k}$, then the magnitude of the projection of $2\bar{a} - \bar{b}$ on $\bar{a} + \bar{b}$ is

(A) $\frac{11\sqrt{2}}{\sqrt{10}}$
(B) $\frac{22}{\sqrt{10}}$
(C) $\frac{22}{\sqrt{133}}$
(D) $\frac{22}{\sqrt{5}}$

Answer: (C) $\frac{22}{\sqrt{133}}$ · The council's preliminary key

Q20 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If $\bar{a}=\bar{i}+\bar{j}+\bar{k}$, $\bar{b}=\bar{i}-\bar{j}+\bar{k}$ and $\bar{c}=\bar{i}+\bar{j}-\bar{k}$, then match the items of List-I with those of List-II

List-I	List-II
A $[\bar{a}\,\bar{b}\,\bar{c}]=$	I 4
B $\lvert\bar{a}+\bar{b}+\bar{c}\rvert^2=$	II 11
C Volume of the tetrahedron for which $\bar{a},\bar{b},\bar{c}$ are coterminus edges is	III $\frac{2}{3}$
D $\lvert(\bar{a}\times\bar{b})\times(\bar{a}\times\bar{c})\rvert=$	IV $4\sqrt{3}$
	V 12

The correct matching is

(A) A-I, B-II, C-III, D-V
(B) A-I, B-III, C-II, D-V
(C) A-I, B-II, C-V, D-IV
(D) A-I, B-II, C-III, D-IV

Answer: (D) A-I, B-II, C-III, D-IV · The council's preliminary key

Q21 AP EAPCET 2026 · 14 May · Shift 1 MCQ

Let $\bar{a}=3\bar{i}-\bar{j}-\bar{k}, \bar{b}=\bar{i}+\bar{j}-2\bar{k}$ and $\bar{c}=2\bar{i}+2\bar{j}+\bar{k}$. Let $\bar{d}$ be a vector such that $|\bar{d}|=\sqrt{2}$ units. If the vector $\bar{d}$ is coplanar with $\bar{a},\bar{b}$ and perpendicular to $\bar{c}$, then $\bar{d}=$

(A) $\pm\frac{1}{5}(3\bar{i}-5\bar{j}+4\bar{k})$
(B) $\pm\frac{1}{5}(-4\bar{i}+5\bar{j}-3\bar{k})$
(C) $\pm\frac{1}{5}(3\bar{i}+5\bar{j}-4\bar{k})$
(D) $\pm\frac{1}{5}(-3\bar{i}+5\bar{j}+4\bar{k})$

Answer: (A) $\pm\frac{1}{5}(3\bar{i}-5\bar{j}+4\bar{k})$ · The council's preliminary key

Q22 AP EAPCET 2026 · 14 May · Shift 2 MCQ

In ΔABC, if $\overline{AB}=2\bar{i}-\bar{j}+2\bar{k}$ and $\overline{AC}=3\bar{i}-3\bar{j}+4\bar{k}$, then that triangle ABC is

EdLoop EAPCET

(A) an equilateral triangle
(B) a right angled triangle
(C) an isosceles triangle
(D) a scalene triangle

Answer: (C) an isosceles triangle · The council's preliminary key

Q23 AP EAPCET 2026 · 14 May · Shift 2 MCQ

Let $\overline{OA} = \bar{i} + 2\bar{j} - 4\bar{k}$ and $\overline{OB} = 3\bar{i} - 4\bar{j} - 2\bar{k}$ be the position vectors of two points A and B. If a point C divides the line segment AB in the ratio 1:3 externally, then the position vector of a point which divides OC in the ratio 4:1 internally is

(A) $5(\bar{i} - \bar{j})$
(B) $\bar{i} - 4\bar{j} + 2\bar{k}$
(C) $4\bar{i} - 2\bar{j} + \bar{k}$
(D) $4(\bar{j} - \bar{k})$

Answer: (D) $4(\bar{j} - \bar{k})$ · The council's preliminary key

Q24 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If $\bar{a} = x\bar{i} + 2\bar{j} - \bar{k}$ $(x > 0)$ and $\bar{b} = 2\bar{i} - \bar{j} + 2\bar{k}$ are two vectors such that $|\bar{a} - 2\bar{b}| = |2\bar{a} + \bar{b}|$, then $x =$

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

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

Q25 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If the unit vector which is perpendicular to the normals drawn to the planes $\bar{r} \cdot (2\bar{i} + \bar{j} - \bar{k}) = 3$ and $\bar{r} \cdot (6\bar{i} + 3\bar{j} + 2\bar{k}) = 4$ is $x\bar{i} + y\bar{j} + z\bar{k}$, then $x + y + z =$

(A) $\pm\frac{3}{\sqrt{5}}$
(B) 0
(C) $\pm\frac{1}{\sqrt{5}}$
(D) ± 1

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

Q26 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If $A(0,1,-2), B(-1,2,-3), C(2,-3,4)$ and $D(3,4,5)$ are the vertices of a tetrahedron $ABCD$, then the volume of that tetrahedron is

(A) $\frac{16}{3}$
(B) 32
(C) $\frac{8}{3}$
(D) 16

Answer: (A) $\frac{16}{3}$ · The council's preliminary key

Q27 AP EAPCET 2026 · 13 May · Shift 1 MCQ

Assertion (A): If each of the angles A, B, C is not a multiple of π, then the vectors $\overline{r_1} = (\sec^2 A)\overline{i} + \overline{j} + \overline{k}$, $\overline{r_2} = \overline{i} + (\sec^2 B)\overline{j} + \overline{k}$, $\overline{r_3} = \overline{i} + \overline{j} + (\sec^2 C)\overline{k}$ are coplanar

Reason (R): The three vectors $\overline{a} = a_1\overline{i} + a_2\overline{j} + a_3\overline{k}$, $\overline{b} = b_1\overline{i} + b_2\overline{j} + b_3\overline{k}$ and $\overline{c} = c_1\overline{i} + c_2\overline{j} + c_3\overline{k}$ are coplanar $\Leftrightarrow \begin{vmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{vmatrix} = 0$

Which one of the following is true?

(A) (A) is true, (R) is true and (R) is a correct explanation of (A)
(B) (A) is true, (R) is true but (R) is not a correct explanation of (A)
(C) (A) is true but (R) is false
(D) (A) is false but (R) is true

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

Q28 AP EAPCET 2026 · 13 May · Shift 1 MCQ

$\overline{a}, \overline{b}$ and $\overline{c}$ are three non-zero vectors such that no two of them are collinear. If the vector $\overline{a} + \overline{b}$ is collinear with $\overline{c}$ and $\overline{b} + \overline{c}$ is collinear with $\overline{a}$, then $\overline{a} + \overline{b} + \overline{c} =$

(A) $\overline{a}$
(B) $\overline{b}$
(C) $\overline{c}$
(D) $\overline{0}$

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

Q29 AP EAPCET 2026 · 13 May · Shift 1 MCQ

Let $\overline{a} = 4\overline{i} - \overline{j} + \alpha\overline{k}$ and $\overline{b} = \overline{i} + \alpha\overline{j} - 4\overline{k}$ be two vectors. If α_1, α_2 $(\alpha_1 < \alpha_2)$ are two different values of α such that $(\overline{a}, \overline{b}) = \text{Cos}^{-1}\left(-\frac{2}{7}\right)$, then $\alpha_1 + 2\alpha_2 =$

(A) 15
(B) 24
(C) 33
(D) 52

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

Q30 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If $\overline{a}, \overline{b}, \overline{c}$ are 3 vectors such that $\overline{b} = 2\overline{i} - \overline{j}$, $\overline{c} = \overline{j} + 2\overline{k}$, $|\overline{a} + \overline{b}| = 3$, $|\overline{a} \times (\overline{b} \times \overline{c})| = 3\sqrt{2}$ and $(\overline{a}, \overline{b} \times \overline{c}) = \frac{\pi}{3}$ then $\overline{a} \cdot \overline{b} =$

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

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

Q31 AP EAPCET 2026 · 13 May · Shift 2 MCQ

$\overline{AB} = 2\overline{i} - 3\overline{j} + 7\overline{k}$, $\overline{AC} = \overline{i} - 6\overline{j} + 5\overline{k}$ are two sides of a triangle ABC, then $a^2 + b^2 + c^2 =$

(A) 138
(B) 125
(C) 156
(D) 143

Answer: (A) 138 · The council's preliminary key

Q32 AP EAPCET 2026 · 13 May · Shift 2 MCQ

Let $\overline{OA} = \overline{a}$, $\overline{OB} = \overline{b}$, $\overline{OC} = x\overline{a} + y\overline{b}$. If the point C lies inside the triangle OAB, then the values of x and y satisfying $x + y = 1$ are

(A) $x = \frac{1}{2}, y = \frac{1}{2}$ only
(B) all $x < 0, y > 0$
(C) all $x > 0, y > 0$
(D) all $x > 0, y < 0$

Answer: (C) all $x > 0, y > 0$ · The council's preliminary key

Q33 AP EAPCET 2026 · 13 May · Shift 2 MCQ

$\overline{a}, \overline{b}, \overline{c}$ are the three Coterminous edges of a tetrahedron such that $|\overline{a}| = \sqrt{10}$, $|\overline{b}| = 6$, $|\overline{c}| = 4$, $\overline{a} \cdot \overline{b} = 3\sqrt{10}$, $\overline{b} \cdot \overline{c} = 12$ and $\overline{c} \cdot \overline{a} = 2\sqrt{10}$. If the angle between the vector $\overline{c}$ and the vector perpendicular to the plane of $\overline{a}, \overline{b}$ is $\text{Cos}^{-1}\sqrt{\frac{2}{3}}$, then the volume of the tetrahedron is

(A) $4\sqrt{5}$
(B) $\frac{7\sqrt{5}}{6}$
(C) $3\sqrt{2}$
(D) $4\sqrt{3}$

Answer: (A) $4\sqrt{5}$ · The council's preliminary key

Q34 AP EAPCET 2026 · 13 May · Shift 2 MCQ

The vector of magnitude 2 lying in the plane of $\overline{a} = 2\overline{i} - \overline{j} + \overline{k}$ and $\overline{b} = \overline{i} + 3\overline{j} - 5\overline{k}$ and perpendicular to the vector $\overline{c} = \overline{i} + \overline{j} + \overline{k}$ is

(A) $\frac{\sqrt{2}}{\sqrt{61}}(4\overline{i} + 5\overline{j} - 9\overline{k})$
(B) $\frac{\sqrt{2}}{\sqrt{9}}(2\overline{i} + 3\overline{j} - 5\overline{k})$
(C) $\frac{\sqrt{2}}{\sqrt{31}}(\overline{i} + 5\overline{j} - 6\overline{k})$
(D) $\frac{\sqrt{2}}{\sqrt{13}}(-\overline{i} - 3\overline{j} + 4\overline{k})$

Answer: (A) $\frac{\sqrt{2}}{\sqrt{61}}(4\overline{i} + 5\overline{j} - 9\overline{k})$ · The council's preliminary key

Q35 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If π_1 is the plane having the vectors $\overline{a}, \overline{b}$ and π_2 is the plane having the vectors $\overline{c}, \overline{d}$, then a vector lying on both the planes π_1 and π_2 is

(A) $[a\ b\ d]\overline{c} - [\overline{b}\ \overline{c}\ \overline{d}]$
(B) $[a\ \overline{c}\ d]\overline{b} - [a\ \overline{b}\ c]\overline{d}$
(C) $[\overline{a}\ \overline{c}\ \overline{d}]\overline{b} + [\overline{a}\ \overline{b}\ \overline{d}]\overline{c}$
(D) $[\overline{a}\ \overline{b}\ \overline{d}]\overline{c} - [\overline{a}\ \overline{b}\ \overline{c}]\overline{d}$

Answer: (D) $[\overline{a}\ \overline{b}\ \overline{d}]\overline{c} - [\overline{a}\ \overline{b}\ \overline{c}]\overline{d}$ · The council's preliminary key

Q36 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If the vectors $-3\overline{i} + 4\overline{j} + \lambda\overline{k}$ and $\mu\overline{i} + 8\overline{j} + 6\overline{k}$ are collinear, then $\lambda - \mu =$

(A) 0
(B) -3
(C) 6
(D) 9

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

Q37 AP EAPCET 2026 · 12 May · Shift 1 MCQ

The position vectors of the points A, B and C with respect to the origin O are $\sqrt{3}\,i + \overline{j}$, $\overline{i} + \sqrt{3}\,\overline{j}$ and $\beta\,\overline{i} + (1-\beta)\,\overline{j}$ respectively. If the distance of 'C' from the bisector of the acute angle between OA and OB is $\frac{3}{\sqrt{2}}$, then the sum of the possible values of β is

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

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

Q38 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If $\bar{a}, \bar{b}, \bar{c}$ are non-coplanar unit vectors such that $\bar{a} \times (\bar{b} \times \bar{c}) = \frac{\bar{b} + \bar{c}}{\sqrt{2}}$, then the angle between $\bar{a}$ and $\bar{b}$ is

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

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

Q39 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If the vectors $\bar{A} = a\bar{i} + b\bar{j} + c\bar{k}$, $\bar{B} = d\bar{i} + 3\bar{j} + 4\bar{k}$, $\bar{C} = 3\bar{i} + \bar{j} - 2\bar{k}$ are such that $\bar{A} = \bar{B} + \bar{C}$ and form a triangle whose area is $5\sqrt{6}$ sq units, then the maximum value of $|a| + |b| + |c| + |d|$ is

(A) 25
(B) 27
(C) 30
(D) 33

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

Q40 AP EAPCET 2026 · 12 May · Shift 2 MCQ

Let $\overline{a} = 2\overline{i} + 2\overline{j} - \overline{k}$, $\overline{b} = \overline{i} - 2\overline{j} + \overline{k}$ be two vectors. If $\overline{l}$ is the component vector of $\overline{b}$ parallel to $\overline{a}$ and $\overline{m}$ is the component vector of $\overline{a}$ perpendicular to $\overline{b}$, then $3\overline{l} + 2\overline{m} =$

(A) $\overline{i} - 2\overline{j} + 2\overline{k}$
(B) $\overline{i} + 3\overline{j}$
(C) $3\overline{i}$
(D) $-\overline{j} + 2\overline{k}$

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

EdLoop EAPCET

Q41 AP EAPCET 2026 · 12 May · Shift 2 MCQ

In ΔABC, if $\overline{AB} = \bar{i} + \alpha\bar{j} + 2\bar{k}$, $\overline{BC} = \beta\bar{i} - 2\bar{j} + 3\bar{k}$ and $\overline{CA} = 2\bar{i} + 3\bar{j} - \gamma\bar{k}$, then the area of ΔABC is

(A) $\frac{1}{2}\sqrt{83}$
(B) $\frac{1}{2}\sqrt{107}$
(C) $\frac{1}{2}\sqrt{11}$
(D) $\frac{1}{2}\sqrt{22}$

Answer: (B) $\frac{1}{2}\sqrt{107}$ · The council's preliminary key

Q42 AP EAPCET 2026 · 12 May · Shift 2 MCQ

Let $\bar{a}$, $\bar{b}$, $\bar{c}$ be three non-zero vectors and no two of them are collinear. If $|\bar{a}| = 3$, $|\bar{b}| = 4\sqrt{3}$, $|\bar{c}| = 5$ and $\bar{a} \times (\bar{b} \times \bar{c}) = \frac{1}{2}|\bar{a}||\bar{c}|\bar{b}$, then $2|\bar{a} \times \bar{c}| - |\bar{a} \times \bar{b}| =$

(A) 3
(B) 5
(C) $3\sqrt{3}$
(D) $5\sqrt{3}$

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

Q43 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If the vector $\alpha\bar{i} + \beta\bar{j} + \bar{k}$ is along the bisector of the angle between the vectors $2\bar{i} - \bar{j} + 2\bar{k}$ and $\bar{i} + 2\bar{j} + 2\bar{k}$, then $2\alpha + 6\beta =$

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

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

Q44 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $\alpha\bar{i} - 6\bar{j} + 9\bar{k}$, $\bar{i} + 3\bar{j} + 5\bar{k}$ and $2\bar{i} + \beta\bar{j} + 7\bar{k}$ are the position vectors of three collinear points A, B, C respectively, then the ratio in which B divides AC is

(A) $2:1$ externally
(B) $1:2$ internally
(C) $1:2$ externally
(D) $2:1$ internally

Answer: (A) $2:1$ **externally** · The council's preliminary key

EdLoop EAPCET

Q45 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If A, B, C are the vertices of a triangle ABC, $AB = 2$, $BC = 3$ and $CA = 4$ then $\overline{AB} \cdot \overline{BC} + \overline{BC} \cdot \overline{CA} + \overline{CA} \cdot \overline{AB} =$

(A) 9
(B) $-\frac{29}{2}$
(C) $-\frac{25}{2}$
(D) 29

Answer: (B) $-\frac{29}{2}$ · The council's preliminary key

Q46 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $|\overline{a}| = 3$, $|\overline{b}| = 4$ and the angle between the vectors $\overline{a}$ and $\overline{b}$ is $\frac{\pi}{6}$, then $\left|\left(4\overline{a} + \overline{b}\right) \times \left(\overline{a} - 3\overline{b}\right)\right| =$

(A) 66
(B) $78\sqrt{3}$
(C) 78
(D) $66\sqrt{3}$

Answer: (C) 78 · The council's preliminary key

Q47 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $\bar{a} = 2\bar{i} + 3\mu\bar{j} - \bar{k}$, $\bar{b} = \mu\bar{i} - 2\bar{j} + 3\bar{k}$ and $\bar{c} = \bar{i} + 3\bar{j} - 2\mu\bar{k}$ are three vectors such that $\alpha\bar{a} + \beta\bar{b} + \gamma\bar{c} = \bar{0}$ only when $\alpha = \beta = \gamma = 0$, then the set of all real values of μ is

(A) $\mathrm{R} - \left\{9, 1, -\frac{7}{6}\right\}$
(B) $\mathrm{R} - \{1\}$
(C) $\mathrm{R} - \left\{1, -\frac{5}{3}\right\}$
(D) $\mathrm{R} - \{0\}$

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

Q48 TS EAPCET 2026 · 11 May · Shift 2 MCQ

$\bar{a}, \bar{b}, \bar{c}$ are the position vectors of three points A, B, C respectively. If $\angle ABC = \frac{\pi}{2}$, $\overline{AB} = \bar{i} + 4\bar{j} + (4 - \lambda)\bar{k}$, $\overline{AC} = (\lambda - 1)\bar{i} + 6\bar{j} + (2 - \lambda)\bar{k}$, then $\lambda =$

(A) 0
(B) $-\frac{1}{3}$
(C) $-\frac{3}{4}$
(D) $\frac{2}{3}$

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

Q49 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If $\overline{r}=2\overline{i}-\overline{j}+2\overline{k}$, $\overline{s}=3\overline{i}-3\overline{j}+3\overline{k}$, $\overline{t}=\overline{i}+2\overline{j}+\overline{k}$ are three vectors and $\overline{a}$ is a vector such that $\overline{s}\times\overline{a}=\overline{r}\times\overline{a}$ and $|\overline{t}\times\overline{a}|=\sqrt{128}$, then $|\overline{t}\cdot\overline{a}|=$

(A) 3
(B) 6
(C) 4
(D) 8

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

Q50 TS EAPCET 2026 · 11 May · Shift 2 MCQ

α,β,γ $(\alpha>\beta>\gamma)$ are roots of the equation $x^3-x^2-4x+4=0$. The volume of the parallelepiped whose coterminous edges are $\alpha\overline{i}+\beta\overline{j}+\gamma\overline{k}$, $\beta\overline{i}+\gamma\overline{j}+\alpha\overline{k}$, $\gamma\overline{i}+\alpha\overline{j}+\beta\overline{k}$ is

(A) 13
(B) 3
(C) $\frac{15}{6}$
(D) $\frac{13}{6}$

Answer: (A) 13 · The council's preliminary key

Q51 TS EAPCET 2026 · 10 May · Shift 1 MCQ

In a triangle ABC, if $\overline{AB}=\overline{i}-2\overline{j}+3\overline{k}$, $\overline{BC}=3\overline{i}+2\overline{j}-2\overline{k}$ then the triangle is

(A) obtuse angled triangle
(B) isosceles triangle
(C) isosceles right angled triangle
(D) equilateral triangle

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

---

Q52 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If $\overline{a}=\overline{i}+p\overline{j}-3\overline{k}$, $\overline{b}=2\overline{i}-3\overline{j}+q\overline{k}$, $\overline{c}=\overline{i}+2\overline{j}+2\overline{k}$ $(p<0,q>0)$ are three vectors such that the magnitude of projection of $\overline{a}$ on $\overline{c}$ is 3 and the magnitude of projection of $\overline{b}$ on $\overline{c}$ is 2, then the

magnitude of projection of $\overline{a}$ on $\overline{b}$ is

(A) $\frac{11}{\sqrt{38}}$
(B) $\frac{34}{\sqrt{38}}$
(C) $\frac{7}{\sqrt{38}}$
(D) $\frac{16}{\sqrt{38}}$

Answer: (C) $\frac{7}{\sqrt{38}}$ · The council's preliminary key

Q53 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If $\bar{a}$ is a vector perpendicular to the plane containing the vectors $2\bar{i}-\bar{j}+3\bar{k}$ and $-\bar{i}+3\bar{j}+2\bar{k}$, then the magnitude of the projection of the vector $3\bar{i}+2\bar{j}-\bar{k}$ on $\bar{a}$ is

(A) $\frac{24}{\sqrt{195}}$
(B) $\frac{42}{\sqrt{195}}$
(C) $2\sqrt{\frac{13}{15}}$
(D) $4\sqrt{\frac{13}{15}}$

Answer: (D) $4\sqrt{\frac{13}{15}}$ · The council's preliminary key

Q54 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If the vectors $\bar{a}=4\bar{i}+6\bar{j}+\lambda\bar{k}$, $\bar{b}=\bar{i}-2\lambda\bar{j}-3\bar{k}$ and $\bar{c}=4\lambda\bar{i}+\bar{j}-3\bar{k}$ are coplanar and $\lambda \in Z$, then $\bar{a}\cdot\bar{c}=$

(A) 3
(B) 13
(C) 25
(D) 32

Answer: (D) 32 · The council's preliminary key

Q55 TS EAPCET 2026 · 10 May · Shift 2 MCQ

Let $-\bar{i}+4\bar{j}-3\bar{k}$, $3\bar{i}+2\bar{j}-5\bar{k}$, $-3\bar{i}+8\bar{j}-5\bar{k}$ and $-3\bar{i}+2\bar{j}+\bar{k}$ be the position vectors of 4 coplanar points A, B, C, D respectively. If the position vector of the point of intersection of straight lines AB and CD is $x\bar{i}+y\bar{j}+z\bar{k}$, then $y-x=$

EdLoop EAPCET

(A) $2z$
(B) $-4z$
(C) z
(D) $-2z$

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

Q56 TS EAPCET 2026 · 10 May · Shift 2 MCQ

Let $\bar{a} = \bar{i} + 2\bar{j} + 2\bar{k}$, $\bar{b} = 2\bar{i} - \bar{j} + 2\bar{k}$ and $\bar{c} = 2\bar{i} + \bar{j} + 2\bar{k}$ be three vectors. $\bar{d}$ is a vector such that $\bar{d} \times \bar{a} = \bar{b} \times \bar{a}$, $\bar{d} \cdot \bar{c} = 8$. If $\bar{r} = 2\bar{i} + 2\bar{j} + \bar{k}$, then $\bar{d} \cdot \bar{r} =$

(A) 3
(B) 4
(C) 5
(D) 7

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

Q57 TS EAPCET 2026 · 10 May · Shift 2 MCQ

Let $\bar{a} = \bar{i} + \bar{j} + \bar{k}$ and $\bar{b} = \bar{i} - \bar{j} + \bar{k}$ be two vectors. $\bar{c}$ and $\bar{d}$ are two vectors such that $\bar{c}$ is perpendicular to $\bar{a}$; $\bar{d}$ is parallel to $\bar{a}$. If $\bar{b} = \bar{c} + \bar{d}$ then $(\bar{c} \times \bar{d})^2 =$

(A) $\frac{2}{9}$
(B) $\frac{8}{9}$
(C) $\frac{4}{3}$
(D) $\frac{2}{3}$

Answer: (B) $\frac{8}{9}$ · The council's preliminary key

Q58 TS EAPCET 2026 · 10 May · Shift 2 MCQ

Let $\bar{a} = \bar{i} + 2\bar{j} - 2\bar{k}$ and $\bar{b} = 6\bar{i} - 3\bar{j} + 2\bar{k}$ be two vectors. If $\bar{c}$ is a vector perpendicular to $\bar{a}$ and $\bar{c} \times \bar{b} = \bar{i} - 2\bar{j} - 6\bar{k}$, then the angle between the vectors $\bar{b}$ and $\bar{c}$ is

(A) $\frac{\pi}{3}$
(B) $\cos^{-1}\left(\frac{29}{21\sqrt{2}}\right)$
(C) $\frac{\pi}{4}$
(D) $\cos^{-1}\left(\frac{23}{21\sqrt{2}}\right)$

Answer: (B) $\cos^{-1}\left(\frac{29}{21\sqrt{2}}\right)$ · The council's preliminary key

Q59 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If $A = (1, 2, -3)$, $B = (2, 3, -1)$, $C = (3, 1, -2)$ are the vertices of a triangle ABC, then the area of triangle ABC is

EdLoop EAPCET

(A) $\frac{3\sqrt{3}}{2}$
(B) $\frac{2\sqrt{3}}{5}$
(C) $\frac{2\sqrt{5}}{3}$
(D) $\frac{3\sqrt{2}}{4}$

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

Q60 TS EAPCET 2026 · 9 May · Shift 1 MCQ

Let $\overline{OA} = \bar{i} + 2\bar{j} + 2\bar{k}$, $\overline{OB} = 3\bar{i} + 4\bar{k}$. If $x\bar{i} + y\bar{j} + z\bar{k}$ is the vector along the bisector of $\angle AOB$ and of length 2 units, then a possible value of $x + y + z$ is

(A) $\frac{4}{\sqrt{30}}$
(B) $\frac{46}{\sqrt{295}}$
(C) $\frac{\sqrt{30}}{\sqrt{295}}$
(D) $\frac{1}{15}$

Answer: (A) $\frac{4}{\sqrt{30}}$ · The council's preliminary key

Q61 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If $\overline{AB} = \bar{i} + \bar{j} - 2\bar{k}$, $\overline{CB} = 2\bar{i} - \bar{j} + \alpha\bar{k}$ $(\alpha \in Z)$ are two sides of a triangle ABC and the angle between these two sides is $\frac{\pi}{3}$, then the length of its third side is

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

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

Q62 TS EAPCET 2026 · 9 May · Shift 1 MCQ

$\bar{a}, \bar{b}, \bar{c}$ are non-coplanar vectors. If $\bar{x} = 2\bar{a} + 3\bar{b} + 4\bar{c}$, $\bar{y} = 3\bar{a} + 4\bar{b} + 5\bar{c}$, $\bar{z} = 4\bar{a} + 5\bar{b} + 6\bar{c}$, then $[\bar{x}\ \bar{y}\ \bar{z}] =$

(A) 0
(B) $9[\bar{a}\ \bar{b}\ \bar{c}]$
(C) $15[\bar{a}\ \bar{b}\ \bar{c}]$
(D) $12[\bar{a}\ \bar{b}\ \bar{c}]$

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

Q63 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If the area of the triangle formed by the points $(0,0,0)$, $(1,1,1)$ and $(t,2t,3t)$ is $\sqrt{6}$, then the sum of squares of all possible values of t is

(A) 13
(B) 5
(C) 20
(D) 8

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

Q64 TS EAPCET 2026 · 9 May · Shift 2 MCQ

Let $\bar{a}=\bar{i}+2\bar{j}+\bar{k}$ and $\bar{b}=2\bar{i}-\bar{j}+\bar{k}$ be two vectors. If the vector $\bar{r}=x\bar{i}+y\bar{j}+2\bar{k}$ is along the bisector of the angle between $\bar{a}$ and $\bar{b}$, then $|\bar{r}|=$

(A) $\sqrt{14}$
(B) $\sqrt{6}$
(C) 3
(D) 7

Answer: (A) $\sqrt{14}$ · The council's preliminary key

Q65 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If the points with position vectors $x\bar{i}+2\bar{j}+y\bar{k}$, $\bar{i}-2\bar{j}+2x\bar{k}$ and $2\bar{i}+3\bar{j}-\bar{k}$ are collinear, then $10x-25y=$

(A) -7
(B) 20
(C) 0
(D) 1

Answer: (B) 20 · The council's preliminary key

Q66 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If $\overline{a}=2\bar{i}-\bar{j}-3\overline{k}$, $\overline{b}=\bar{i}+3\bar{j}-2\overline{k}$, $\overline{c}=3\bar{i}-2\bar{j}+\overline{k}$ are three vectors and $\overline{a}+\lambda\overline{b}$ is a vector, for some particular real values of λ, such that the magnitude of the projection of $\overline{a}+\lambda\overline{b}$ on $\overline{c}$ is $\frac{10}{\sqrt{14}}$, then the sum of the squares of the magnitudes of all such vectors $\overline{a}+\lambda\overline{b}$ is

(A) 188
(B) 225
(C) 121
(D) 181

Answer: (A) 188 · The council's preliminary key

Q67 TS EAPCET 2026 · 9 May · Shift 2 MCQ

Let $\bar{a} = \bar{i} - 2\bar{j} + 2\bar{k}$ and $\bar{b} = 2\bar{i} + 3\bar{j} - 6\bar{k}$ be two vectors. If $\alpha\bar{i} + \beta\bar{j} + \gamma\bar{k}$ is a vector perpendicular to the plane of $2\bar{a} + \bar{b}$ and $\bar{b} - \bar{a}$ such that $\alpha + \beta + \gamma = 46$, then $\alpha - 2\beta + 3\gamma =$

(A) 12
(B) 14
(C) 0
(D) 1

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

Q68 TS EAPCET 2026 · 9 May · Shift 2 MCQ

Let $\bar{a} = 3\bar{i} - 2\bar{j} + 5\bar{k}$ and $\bar{b} = \bar{i} + 3\bar{j} - 2\bar{k}$ be two vectors. If $\bar{c}$ is a vector such that $\bar{b} \times \bar{c} = \bar{a}$ and $\bar{b} \cdot \bar{c} = 5$ then $14\bar{c} \times \bar{a} =$

(A) $-11(2\bar{i} - 5\bar{j} + 7\bar{k})$
(B) $11(12\bar{i} + 3\bar{j} - 6\bar{k})$
(C) $-11(2\bar{i} + 13\bar{j} + 4\bar{k})$
(D) $11(4\bar{i} + \bar{j} + 3\bar{k})$

Answer: (B) $11(12\bar{i} + 3\bar{j} - 6\bar{k})$ · The council's preliminary key

---

Q69 AP EAPCET 2025 · 27 May · Shift 1 MCQ

P is the circumcentre of ΔABC. If the position vectors of A, B, C and P are $\overline{a}, \overline{b}, \overline{c}$, $\dfrac{\overline{a} + \overline{b} + \overline{c}}{4}$ respectively, then the position vector of the orthocentre of this triangle is

(A) $\overline{a} + \overline{b} + \overline{c}$
(B) $\dfrac{\overline{a} + \overline{b} + \overline{c}}{2}$
(C) $-\left(\dfrac{\overline{a} + \overline{b} + \overline{c}}{2}\right)$
(D) $\overline{0}$

Answer: (B) $\dfrac{\overline{a} + \overline{b} + \overline{c}}{2}$ · The council's preliminary key

EdLoop EAPCET

Q70 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If the position vectors of A, B, C, D are $\bar{i}+2\bar{j}+2\bar{k}$, $2\bar{i}-\bar{j}$, $\bar{i}+\bar{j}+3\bar{k}$ and $4\bar{j}+5\bar{k}$ respectively, then the quadrilateral ABCD is a

(A) square
(B) rectangle
(C) rhombus
(D) parallelogram

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

Q71 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The set of all real values of c so that the angle between the vectors $\bar{a}=cx\,\bar{i}-6\bar{j}+3\bar{k}$ and $\bar{b}=x\bar{i}+2\bar{j}+2cx\bar{k}$ is an obtuse angle for all real x is

(A) $\left(0,\frac{4}{3}\right]$
(B) $\left(0,\frac{2}{3}\right]$
(C) $\left(-\frac{2}{3},0\right)$
(D) $\left(\frac{-4}{3},0\right]$

Answer: (D) $\left(\frac{-4}{3},0\right]$ · The council's preliminary key

Q72 AP EAPCET 2025 · 27 May · Shift 1 MCQ

Let $\bar{a}=2\bar{i}+\bar{j}+3\bar{k}$, $\bar{b}=3\bar{i}+3\bar{j}+\bar{k}$ and $\bar{c}=\bar{i}-2\bar{j}+3\bar{k}$ be three vectors. If $\bar{r}$ is a vector such that $\bar{r}\times\bar{a}=\bar{r}\times\bar{b}$ and $\bar{r}\cdot\bar{c}=18$, then the magnitude of the orthogonal projection of $4\bar{i}+3\bar{j}-\bar{k}$ on $\bar{r}$ is

(A) 4
(B) 6
(C) 12
(D) 24

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

Q73 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If $\bar{u},\bar{v},\bar{w}$ are non coplanar vectors and p, q are real numbers, then the equality $[3\bar{u}\ \ p\bar{v}\ \ p\bar{w}]-[p\bar{v}\ \ \bar{w}\ \ q\bar{u}]-[2\bar{w}\ \ q\bar{v}\ \ q\bar{u}]=0$ holds for

(A) exactly one ordered pair of (p, q)
(B) exactly two ordered pairs of (p, q)
(C) all ordered pairs of (p, q)
(D) no ordered pair of (p, q)

Answer: (A) exactly one ordered pair of (p, q) · The council's preliminary key

Q74 AP EAPCET 2025 · 26 May · Shift 1 MCQ

Let $\bar{i}-2\bar{j}+\bar{k}$, $\bar{i}+\bar{j}-2\bar{k}$, $2\bar{i}-\bar{j}-\bar{k}$ and $\bar{i}+\bar{j}+\bar{k}$ be the position vectors of four points A, B, C and D respectively. If a point P divides AB in the ratio $2:1$ internally and a point Q divides CD in the ratio $1:2$ externally, then the ratio in which the point with position vector $5\bar{i}-6\bar{j}-5\bar{k}$ divides PQ is

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

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

Q75 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If $\bar{a}=\bar{i}+\bar{j}$, $\bar{b}=2\bar{j}-\bar{k}$ are two vectors such that $\bar{r}\times\bar{a}=\bar{b}\times\bar{a}$, $\bar{r}\times\bar{b}=\bar{a}\times\bar{b}$, then the unit vector in the direction of $\bar{r}$ is

(A) $\frac{1}{\sqrt{11}}(\bar{i}+3\bar{j}-\bar{k})$
(B) $\frac{1}{\sqrt{11}}(\bar{i}-3\bar{j}+\bar{k})$
(C) $\frac{1}{\sqrt{3}}(\bar{i}+\bar{j}+\bar{k})$
(D) $\frac{1}{\sqrt{3}}(\bar{i}+\bar{j}-\bar{k})$

Answer: (A) $\frac{1}{\sqrt{11}}(\bar{i}+3\bar{j}-\bar{k})$ · The council's preliminary key

Q76 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If $\bar{a},\bar{b},\bar{c}$ are three unit vectors such that $\bar{a}\times(\bar{b}\times\bar{c})=\frac{\sqrt{3}}{2}\bar{b}+\frac{\bar{c}}{2}$ and α,β are the angles between $\bar{a},\bar{c}$ and $\bar{a},\bar{b}$ respectively, then $\alpha+\beta=$

(A) $\frac{\pi}{2}$
(B) $\frac{7\pi}{6}$
(C) $\frac{\pi}{6}$
(D) $\frac{5\pi}{6}$

Answer: (D) $\frac{5\pi}{6}$ · The council's preliminary key

Q77 AP EAPCET 2025 · 26 May · Shift 2 MCQ

Let $(x,y)\in R\times R$ and $\bar{a}=x\bar{i}+2\bar{j}-\bar{k}$, $\bar{b}=6\bar{i}-y\bar{j}+2\bar{k}$ be two vectors. If $|\bar{a}\times\bar{b}|^2+|\bar{a}.\bar{b}|^2=f(x)g(y)$, then $f(x)+g(y)-46=0$ represents

(A) A pair of lines
(B) An ellipse
(C) A hyperbola
(D) A circle

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

Q78 AP EAPCET 2025 · 26 May · Shift 2 MCQ

$\bar{a}, \bar{b}$ and $\bar{c}$ are the position vectors of three non-collinear points on a plane. If $\alpha = [\bar{a}\ \bar{b}\ \bar{c}]$ and $\bar{r} = \bar{a} \times \bar{b} - \bar{c} \times \bar{b} - \bar{a} \times \bar{c}$, then $\frac{|\alpha|}{|\bar{r}|}$ represents

(A) Ratio of areas of the triangles formed by $\bar{o}, \bar{a}, \bar{b}$ to $\bar{o}, \bar{b}, \bar{c}$
(B) Ratio of the numerical values of volume of the parallelopiped formed with $\bar{o}, \bar{a}, \bar{b}, \bar{c}$ and its height
(C) Ratio of lengths of the diagonals of the parallelopiped formed with $\bar{o}, \bar{a}, \bar{b}, \bar{c}$
(D) Length of the perpendicular from origin to the plane

Answer: (D) Length of the perpendicular from origin to the plane · The council's preliminary key

---

Q79 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If $P = (\bar{a} \times \bar{i})^2 + (\bar{a} \times \bar{j})^2 + (\bar{a} \times \bar{k})^2$ and $Q = (\bar{a} \cdot \bar{i})^2 + (\bar{a} \cdot \bar{j})^2 + (\bar{a} \cdot \bar{k})^2$, then

(A) $P = Q$
(B) $P = 2Q$
(C) $P = 3Q$
(D) $P = 4Q$

Answer: (B) $P = 2Q$ · The council's preliminary key

Q80 AP EAPCET 2025 · 26 May · Shift 2 MCQ

$\bar{a} = \bar{i} + \bar{j} - 2\bar{k},\ \bar{b} = \bar{i} + 2\bar{j} - 3\bar{k},\ \bar{c} = 2\bar{i} - \bar{j} + \bar{k}$ are three vectors. If $\bar{r}$ is a vector such that $\bar{r} \cdot \bar{a} = 0,\ \bar{r} \cdot \bar{c} = 3$ and $[\bar{r}\ \bar{a}\ \bar{b}] = 0$, then $|\bar{r}| =$

(A) $\sqrt{2}$
(B) $\sqrt{3}$
(C) 3
(D) 7

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

Q81 AP EAPCET 2025 · 24 May · Shift 1 MCQ

In a right angled triangle, if the position vector of the vertex having the right angle is $-3i + 5j + 2k$ and the position vector of the midpoint of its hypotenuse is $6i + 2j + 5k$, then the position vector of its centroid is

(A) $3i + 3j + 4k$
(B) $3i + 3j + 3k$
(C) $\frac{3i+7j+7k}{2}$
(D) $4j + 3k$

Answer: (A) $3i + 3j + 4k$ · The council's preliminary key

Q82 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If the position vectors of the vertices A, B, C of a triangle are $3\bar{i} + 4\bar{j} - \bar{k}$, $\bar{i} + 3\bar{j} + \bar{k}$, $5(\bar{i} + \bar{j} + \bar{k})$ respectively, then the magnitude of the altitude drawn from A on to the side BC is

(A) $\frac{4\sqrt{5}}{3}$
(B) $\frac{5\sqrt{5}}{3}$
(C) $\frac{7\sqrt{5}}{3}$
(D) $\frac{8\sqrt{5}}{3}$

Answer: (A) $\frac{4\sqrt{5}}{3}$ · The council's preliminary key

Q83 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If the vectors $2\bar{i} + 4\bar{j} - 3\bar{k}$, $-\bar{i} + 2\bar{j} + 3\bar{k}$ and $p\bar{i} - 2\bar{j} + \bar{k}$ are coplanar, then the unit vector in the direction of the vector $9p\bar{i} - 4\bar{j} + 4\bar{k}$ is

(A) $\frac{1}{6}(2\bar{i} - 4\bar{j} + 4\bar{k})$
(B) $\frac{1}{\sqrt{57}}(5\bar{i} - 4\bar{j} + 4\bar{k})$
(C) $\frac{1}{\sqrt{68}}(6\bar{i} - 4\bar{j} + 4\bar{k})$
(D) $\frac{1}{9}(-7\bar{i} - 4\bar{j} + 4\bar{k})$

Answer: (D) $\frac{1}{9}(-7\bar{i} - 4\bar{j} + 4\bar{k})$ · The council's preliminary key

Q84 AP EAPCET 2025 · 24 May · Shift 1 MCQ

Let $\bar{a} = 4\bar{i} + 3\bar{j}$ and $\bar{b}$ be two perpendicular vectors in the XOY-plane. A vector $\bar{c}$ in the same plane and having projections 1 and 2 respectively on $\bar{a}$ and $\bar{b}$ is

(A) $\bar{i} + 2\bar{j}$
(B) $2\bar{i} + \bar{j}$
(C) $\bar{i} - 2\bar{j}$
(D) $2\bar{i} - \bar{j}$

Answer: (D) $2\bar{i} - \bar{j}$ · The council's preliminary key

EdLoop EAPCET

Q85 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If $A(1,2,3)$, $B(2,3,-1)$, $C(3,-1,-2)$ are the vertices of a triangle ABC, then the direction ratios of the bisector of $\angle ABC$ are

(A) $(4,1,1)$
(B) $(3,5,2)$
(C) $(1,4,1)$
(D) $(2,-3,-5)$

Answer: (D) $(2,-3,-5)$ · The council's preliminary key

Q86 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If the vectors $2\bar{i}+3\bar{j}+l\bar{k}$, $-3\bar{i}-2\bar{j}-4l\bar{k}$ and $\bar{i}-\bar{j}+3l\bar{k}$ form a right angled triangle for a positive value of l, then the length of its hypotenuse is

(A) $\sqrt{\frac{40}{3}}$
(B) $\sqrt{\frac{55}{3}}$
(C) $\sqrt{\frac{65}{3}}$
(D) $\sqrt{\frac{59}{3}}$

Answer: (B) $\sqrt{\frac{55}{3}}$ · The council's preliminary key

Q87 AP EAPCET 2025 · 23 May · Shift 1 MCQ

A unit vector that is perpendicular to the vector $2\bar{i}-\bar{j}+2\bar{k}$ and coplanar with the vectors $\bar{i}+\bar{j}-\bar{k}$ and $2\bar{i}+2\bar{j}-\bar{k}$ is

(A) $\frac{\bar{i}+2\bar{j}+\bar{k}}{\sqrt{6}}$
(B) $\frac{3\bar{i}+2\bar{j}-2\bar{k}}{\sqrt{17}}$
(C) $\frac{2\bar{i}+2\bar{j}-\bar{k}}{3}$
(D) $\frac{3\bar{i}+2\bar{j}+2\bar{k}}{\sqrt{17}}$

Answer: (C) $\frac{2\bar{i}+2\bar{j}-\bar{k}}{3}$ · The council's preliminary key

Q88 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If the vectors $2\bar{i}-\bar{j}+3\bar{k}$, $\bar{i}+4\bar{j}+\bar{k}$, $4\bar{i}+p\bar{j}+\bar{k}$ are coplanar, then $p=$

(A) 53
(B) 37
(C) 43
(D) 59

Answer: (C) 43 · The council's preliminary key

Q89 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If the magnitudes of $\overline{a}, \overline{b}$ and $\overline{a}+\overline{b}$ are respectively 3, 4 and 5, then the magnitude of $\overline{a}-\overline{b}$ is

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

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

Q90 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If the median AD of the triangle ABC is bisected at E and BE meets AC in F, then AF : AC =

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

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

Q91 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If $\overline{a}=2\overline{i}-3\overline{j}+5\overline{k}$ and $\overline{b}=-\overline{i}+3\overline{j}+3\overline{k}$ are two vectors, then the vector of magnitude 28 units in the direction of the vector $\overline{a}-\overline{b}$ is

(A) $3\overline{i}+6\overline{j}-2\overline{k}$
(B) $12\overline{i}-24\overline{j}+8\overline{k}$
(C) $3\overline{i}-6\overline{j}-2\overline{k}$
(D) $12\overline{i}+24\overline{j}-8\overline{k}$

Answer: (B) $12\overline{i}-24\overline{j}+8\overline{k}$ · The council's preliminary key

Q92 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If $\overline{a}$ is a unit vector, then $|\overline{a}\times\overline{i}|^2+|\overline{a}\times\overline{j}|^2+|\overline{a}\times\overline{k}|^2=$

EdLoop EAPCET

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

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

Q93 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If $\overline{a}=\overline{i}-2\overline{j}-3\overline{k}$, $\overline{b}=-2\overline{i}+3\overline{j}+4\overline{k}$, $\overline{c}=5\overline{i}-4\overline{j}+3\overline{k}$ and $\overline{d}=3\overline{i}+\overline{j}+5\overline{k}$ are four vectors then $(\overline{a}\times\overline{b})\times(\overline{c}\times\overline{d})=$

(A) $18\overline{i}+6\overline{j}+30\overline{k}$
(B) $8\overline{i}-3\overline{j}+8\overline{k}$
(C) $19\overline{i}-5\overline{j}+21\overline{k}$
(D) $27\overline{i}-8\overline{j}+29\overline{k}$

Answer: (A) $18\overline{i}+6\overline{j}+30\overline{k}$ · The council's preliminary key

Q94 AP EAPCET 2025 · 23 May · Shift 2 MCQ

$3\overline{i}+\overline{j}+\overline{k}$, $2\overline{i}+\overline{k}$, $\overline{i}+5\overline{j}$ are the position vectors of three non collinear points A, B, C respectively. If the perpendicular drawn from C onto $\overline{AB}$ meets $\overline{AB}$ at the point $a\overline{i}+b\overline{j}+c\overline{k}$, then $a+b+c=$

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

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

Q95 AP EAPCET 2025 · 22 May · Shift 1 MCQ

For $a\in R$, if the vectors $\overline{p}=(a+1)\overline{i}+a\overline{j}+a\overline{k}$, $\overline{q}=a\overline{i}+(a+1)\overline{j}+a\overline{k}$ and $\overline{r}=a\overline{i}+a\overline{j}+(a+1)\overline{k}$ are coplanar and $3(\overline{p}.\overline{q})^2-\lambda|\overline{r}\times\overline{q}|^2=0$, then the value of λ is

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

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

Q96 AP EAPCET 2025 · 22 May · Shift 1 MCQ

If $\overline{a}=\overline{i}+4\overline{j}-4\overline{k}$, $\overline{b}=-2\overline{i}+5\overline{j}-2\overline{k}$ and $\overline{c}=3\overline{i}-2\overline{j}-4\overline{k}$ are three vectors such that $(\overline{b}\times\overline{c})\times\overline{a}=x\overline{i}+y\overline{j}+z\overline{k}$ then $x+y-z=$

(A) 75
(B) -89
(C) 125
(D) -389

Answer: (A) 75 · The council's preliminary key

Q97 AP EAPCET 2025 · 22 May · Shift 2 MCQ

The points in the Argand plane represented by the complex numbers $4\bar{i}+\bar{j}+3\bar{k}$, $6\bar{i}-2\bar{j}-3\bar{k}$ and $\bar{i}-\bar{j}-3\bar{k}$ form

(A) a right - angled triangle
(B) a right - angled isosceles triangle
(C) an equilateral triangle
(D) an isosceles triangle

Answer: (D) an isosceles triangle · The council's preliminary key

---

Q98 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If the vector $\bar{i}-7\bar{j}+2\bar{k}$ is along the internal bisector of the angle between the vectors $\bar{a}$ and $-2\bar{i}-\bar{j}+2\bar{k}$ and the unit vector along $\bar{a}$ is $x\bar{i}+y\bar{j}+z\bar{k}$ then x =

(A) 0
(B) $\frac{7}{9}$
(C) $-\frac{1}{9}$
(D) $\frac{5}{3}$

Answer: (B) $\frac{7}{9}$ · The council's preliminary key

Q99 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If $\bar{a}=2\bar{i}-\bar{j}+6\bar{k}$; $\bar{b}=\bar{i}-\bar{j}+\bar{k}$ and $\bar{c}=3\bar{j}-\bar{k}$, then $\bar{a}\times\bar{b}+\bar{b}\times\bar{c}+\bar{c}\times\bar{a}=$

(A) $20\bar{i}+3\bar{j}-4\bar{k}$
(B) $20\bar{i}-3\bar{j}+4\bar{k}$
(C) $3\bar{i}+20\bar{j}-4\bar{k}$
(D) $4\bar{i}+20\bar{j}-3\bar{k}$

Answer: (A) $20\bar{i}+3\bar{j}-4\bar{k}$ · The council's preliminary key

---

Q100 AP EAPCET 2025 · 22 May · Shift 2 MCQ

Let $\bar{a}=2\bar{i}+\bar{j}-2\bar{k}$ and $\bar{b}=\bar{i}+\bar{j}$ be two vectors. If $\bar{c}$ is a vector such that $\bar{a}\cdot\bar{c}=|\bar{c}|$, $|\bar{c}-\bar{a}|=2\sqrt{2}$ and the angle between $\bar{a}\times\bar{b}$ and $\bar{c}$ is 30°, then $|(\bar{a}\times\bar{b})\times\bar{c}|=$

EdLoop EAPCET

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

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

Q101 AP EAPCET 2025 · 22 May · Shift 2 MCQ

$(\bar{a}+2\bar{b}-\bar{c})\cdot\{(\bar{a}-\bar{b})\times(\bar{a}-\bar{b}-\bar{c})\}=$

(A) $[\bar{a}\,\bar{b}\,\bar{c}]$
(B) $3[\bar{a}\,\bar{b}\,\bar{c}]$
(C) $[\bar{a}\,\bar{b}\,\bar{c}]^2$
(D) $2[\bar{a}\,\bar{b}\,\bar{c}]$

Answer: (B) $3[\bar{a}\,\bar{b}\,\bar{c}]$ · The council's preliminary key

Q102 AP EAPCET 2025 · 21 May · Shift 1 MCQ

Let $2\bar{i}-\bar{j}-\bar{k},\ 5\bar{i}+\bar{j}-2\bar{k},\ -13\bar{i}-11\bar{j}+4\bar{k}$ be the position vectors of three points A, B, C respectively. If $\overline{AB}=\lambda\,\overline{BC}$ and $\overline{AC}=\mu\,\overline{CB}$, then $\lambda+\mu=$

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

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

Q103 AP EAPCET 2025 · 21 May · Shift 1 MCQ

$\overline{a}$, $\overline{b}$ are position vectors of the points A and B respectively, C and D are points on the line AB such that $\overline{AB}, \overline{AC}$ and $\overline{BD}, \overline{BA}$ are two pairs of like vectors. If $\overline{AC}=3\overline{AB}$ and $\overline{BD}=2\overline{BA}$, then $\overline{CD}=$

(A) $3\overline{b}-4\overline{a}$
(B) $4\overline{a}-4\overline{b}$
(C) $4\overline{a}-3\overline{b}$
(D) $3\overline{b}-3\overline{a}$

Answer: (B) $4\overline{a}-4\overline{b}$ · The council's preliminary key

Q104 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If $\overline{a},\overline{b},\overline{c}$ are three unit vectors such that $|\overline{a}-\overline{b}|^2+|\overline{b}-\overline{c}|^2+|\overline{c}-\overline{a}|^2=15$, then $|\overline{a}-\overline{b}-\overline{c}|^2-4(\overline{b}\cdot\overline{c})=$

EdLoop EAPCET

(A) 6
(B) 15
(C) 12
(D) 10

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

Q105 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If $\bar{a} = \bar{i} + p\bar{j} - 3\bar{k}, \bar{b} = p\bar{i} - 3\bar{j} + \bar{k}, \bar{c} = -3\bar{i} + \bar{j} + 2\bar{k}$ are three vectors such that $|\bar{a} \times \bar{b}| = |\bar{a} \times \bar{c}|$, then $p =$

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

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

Q106 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If $\overline{a} = 2\overline{i} - 3\overline{j} + 4\overline{k}, \overline{b} = \overline{i} + 2\overline{j} - \overline{k}, \overline{c} = 3\overline{i} - \overline{j} + 2\overline{k}$ and $\overline{d} = \overline{i} + \overline{j} + \overline{k}$ are four vectors, then $(\overline{a} \times \overline{b}) \times (\overline{c} \times \overline{d}) =$

(A) $17\overline{i} - 15\overline{j} + 9\overline{k}$
(B) $31\overline{i} - \overline{j} + 23\overline{k}$
(C) $17\overline{i} - \overline{j} + 23\overline{k}$
(D) $31\overline{i} - 15\overline{j} + 9\overline{k}$

Answer: (B) $31\overline{i} - \overline{j} + 23\overline{k}$ · The council's preliminary key

---

Q107 AP EAPCET 2025 · 21 May · Shift 2 MCQ

Let the position vectors of the vertices of a triangle ABC be $\overline{a}, \overline{b}, \overline{c}$. If on the plane of the triangle, P is a point having position vector $\overline{x}$ such that $\overline{x}.(\overline{c} - \overline{b}) = \overline{a}.\overline{c} - \overline{a}.\overline{b}$ and $\overline{x}.(\overline{a} - \overline{c}) = \overline{a}.\overline{b} - \overline{b}.\overline{c}$, then for the triangle ABC, P is the

(A) Centroid
(B) Circumcentre
(C) Incentre
(D) Orthocentre

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

Q108 AP EAPCET 2025 · 21 May · Shift 2 MCQ

$\bar{a}, \bar{b}, \bar{c}$ are three vectors such that $|\bar{a}| = 2$, $|\bar{b}| = 3$, $|\bar{c}| = 5$, $|\bar{a} + \bar{b} + \bar{c}| = \sqrt{69}$. If $(\bar{a}, \bar{b}) = (\bar{b}, \bar{c}) = \frac{\pi}{3}$ then $(\bar{c}, \bar{a}) =$

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

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

Q109 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If the points A, B, C, D with position vectors $\bar{i}+\bar{j}-\bar{k}, \bar{i}-\bar{j}+2\bar{k}, \bar{i}-2\bar{j}+\bar{k}, 2\bar{i}+\bar{j}+\bar{k}$ respectively form a tetrahedron, then the angle between the faces ABC and ABD of the tetrahedron is

(A) $\cos^{-1}\left(\frac{-4}{\sqrt{29}}\right)$
(B) $\cos^{-1}\left(\frac{-4}{5}\right)$
(C) $\cos^{-1}\left(\frac{3}{5}\right)$
(D) $\cos^{-1}\left(\frac{\sqrt{29}}{\sqrt{33}}\right)$

Answer: (A) $\cos^{-1}\left(\frac{-4}{\sqrt{29}}\right)$ · The council's preliminary key

Q110 AP EAPCET 2025 · 21 May · Shift 2 MCQ

$\bar{a}, \bar{b}, \bar{c}$ are unit vectors. If $\bar{a}, \bar{b}$ are perpendicular vectors, $(\bar{a}-\bar{c}).(\bar{b}+\bar{c})=0$ and $\bar{c}=l\bar{a}+m\bar{b}+n(\bar{a}\times\bar{b})$; ($l$, m, n are scalars), then $n^2=$

(A) $l^2+\mathrm{m}^2$
(B) $-2l\mathrm{m}$
(C) $2l-2\mathrm{m}$
(D) $l\mathrm{m}+l+\mathrm{m}$

Answer: (B) $-2l\mathrm{m}$ · The council's preliminary key

Q111 TS EAPCET 2025 · 4 May · Shift 1 MCQ

ABCD is a tetrahedron. $\bar{i}-2\bar{j}+3\bar{k}, -2\bar{i}+\bar{j}+3\bar{k}, 3\bar{i}+2\bar{j}-\bar{k}$ are the position vectors of the points A, B, C respectively. $-\bar{i}+2\bar{j}-3\bar{k}$ is the position vector of the centroid of the triangular face BCD. If G is the centroid of the tetrahedron, then GD =

(A) $\frac{\sqrt{13}}{\sqrt{2}}$
(B) $\sqrt{23}$
(C) $\frac{\sqrt{213}}{\sqrt{2}}$
(D) $\sqrt{46}$

Answer: (C) $\frac{\sqrt{213}}{\sqrt{2}}$ · The council's preliminary key

Q112 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If $\overline{a}=\overline{i}-2\overline{j}+2\overline{k}, \overline{b}=6\overline{i}+3\overline{j}-2\overline{k}, \overline{c}=-4\overline{i}+3\overline{j}+12\overline{k}$ are three vectors then $\sqrt{(|\overline{a}|+|\overline{b}|+|\overline{c}|)+|\overline{a}+\overline{b}+\overline{c}|}=$

(A) 13

(B) $13\sqrt{10}$

(C) 6

(D) $10\sqrt{3}$

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

Q113 TS EAPCET 2025 · 4 May · Shift 1 MCQ

Let $\bar{a}$ and $\bar{b}$ be two vectors such that $|\bar{a}|=|\bar{b}|$ and $|\bar{a}+2\bar{b}|=|2\bar{a}-\bar{b}|$. If $\bar{c}$ is a vector parallel to $\bar{a}$ then the angle between $\bar{b}$ and $\bar{c}$ is

(A) 0°

(B) 30°

(C) 60°

(D) 90°

Answer: (D) 90° · The council's preliminary key

Q114 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If $\overline{a}$ and $\overline{b}$ are two vectors such that $|\overline{a}|=|\overline{b}|=\sqrt{6}$ and $\overline{a}.\overline{b}=-1$ then $|\overline{a}\times\overline{b}|\sin(\overline{a},\overline{b})=$

(A) $\left(|\overline{a}|^2-1\right)\left(|\overline{b}|^2+1\right)$

(B) $\frac{1}{6}$

(C) $\left(|\overline{a}|^2-1\right)\left(1+\frac{1}{|\overline{b}|^2}\right)$

(D) $\frac{\sqrt{35}}{6}$

Answer: (C) $\left(|\overline{a}|^2-1\right)\left(1+\frac{1}{|\overline{b}|^2}\right)$ · The council's preliminary key

Q115 TS EAPCET 2025 · 4 May · Shift 1 MCQ

If the volume of a tetrahedron having $\overline{i}+2\overline{j}-3\overline{k}$, $2\overline{i}+\overline{j}-3\overline{k}$ and $3\overline{i}-\overline{j}+\mathrm{p}\overline{k}$ as its coterminous edges is 2, then the values of p are the roots of the equation

(A) $x^2+4x-12=0$
(B) $x^2+8x+12=0$
(C) $x^2-4x-12=0$
(D) $x^2-8x+12=0$

Answer: (A) $x^2+4x-12=0$ · The council's preliminary key

Q116 TS EAPCET 2025 · 4 May · Shift 2 MCQ

Two adjacent sides of a triangle are represented by the vectors $2\bar{i}+\bar{j}-2\bar{k}$ and $2\sqrt{3}\bar{i}-2\sqrt{3}\bar{j}+\sqrt{3}\bar{k}$. Then the least angle of the triangle and perimeter of the triangle are respectively

(A) $\frac{\pi}{3};3\left(3+\sqrt{3}\right)$
(B) $\frac{\pi}{12};6+3\sqrt{2}$
(C) $\frac{\pi}{2};12$
(D) $\frac{\pi}{6};9+3\sqrt{3}$

Answer: (D) $\frac{\pi}{6};9+3\sqrt{3}$ · The council's preliminary key

Q117 TS EAPCET 2025 · 4 May · Shift 2 MCQ

In a quadrilateral ABCD, $\angle A=\frac{2\pi}{3}$ and AC is the bisector of angle $\angle A$. If $15|\overline{AC}|=5|\overline{AD}|=3|\overline{AB}|$, then angle between $\overline{AB}$ and $\overline{BC}$ is

(A) $\cos^{-1}\left(\frac{\sqrt{3}}{\sqrt{7}}\right)$
(B) $\cos^{-1}\left(\frac{3\sqrt{3}}{2\sqrt{7}}\right)$
(C) $\cos^{-1}\left(\frac{4\sqrt{3}}{5\sqrt{7}}\right)$
(D) $\cos^{-1}\left(\frac{3\sqrt{3}}{4\sqrt{7}}\right)$

Answer: (B) $\cos^{-1}\left(\frac{3\sqrt{3}}{2\sqrt{7}}\right)$ · The council's preliminary key

Q118 TS EAPCET 2025 · 4 May · Shift 2 MCQ

$\bar{a},\bar{b},\bar{c}$ are three non-coplanar and mutually perpendicular vectors of same magnitude K. $\bar{r}$ is any vector satisfying $\bar{a}\times((\bar{r}-\bar{b})\times\bar{a})+\bar{b}\times((\bar{r}-\bar{c})\times\bar{b})+\bar{c}\times((\bar{r}-\bar{a})\times\bar{c})=\bar{O}$, then $\bar{r}=$

(A) $\frac{K^2(\bar{a}+\bar{b}+\bar{c})}{3K^2-1}$
(B) $\frac{\bar{a}+\bar{b}+\bar{c}}{2}$
(C) $\frac{K(\bar{a}+\bar{b}+\bar{c})}{K+1}$
(D) $\frac{\bar{a}+\bar{b}+\bar{c}}{K^2+1}$

Answer: (B) $\frac{\bar{a}+\bar{b}+\bar{c}}{2}$ · Checked by our team

---

Q119 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If $\bar{a}=(x+2y-3)\bar{i}+(2x-y+3)\bar{j}$ and $\bar{b}=(3x-2y)\bar{i}+(x-y+1)\bar{j}$ are two vectors such that $\bar{a}=2\bar{b}$, then $y-5x=$

(A) 10
(B) -10
(C) 8
(D) -8

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

Q120 TS EAPCET 2025 · 3 May · Shift 1 MCQ

$7\bar{i}-4\bar{j}+7\bar{k}$, $\bar{i}-6\bar{j}+10\bar{k}$, $-\bar{i}-3\bar{j}+4\bar{k}$, $5\bar{i}-\bar{j}+\bar{k}$ are the position vectors of the points A, B, C, D respectively. If $p\bar{i}+q\bar{j}+r\bar{k}$ is the position vector of the point of intersection of the diagonals of the quadrilateral ABCD, then $p+q+r=$

(A) 4
(B) 5
(C) 0
(D) 1

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

Q121 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If $\bar{a}=\bar{i}+\sqrt{11}\bar{j}-2\bar{k}$ and $\bar{b}=\bar{i}+\sqrt{11}\bar{j}-10\bar{k}$ are two vectors then the component of $\bar{b}$ perpendicular to $\bar{a}$ is

(A) $3\bar{i}-\sqrt{11}\bar{j}-4\bar{k}$
(B) $\bar{i}-\sqrt{11}\bar{j}-5\bar{k}$
(C) $-(\bar{i}+\sqrt{11}\bar{j}+6\bar{k})$
(D) $-5\bar{i}+\sqrt{11}\bar{j}+3\bar{k}$

Answer: (C) $-(\bar{i}+\sqrt{11}\bar{j}+6\bar{k})$ · The council's preliminary key

EDLOOP EAPCET

Q122 TS EAPCET 2025 · 3 May · Shift 1 MCQ

Let $\bar{a} = \bar{i} + 2\bar{j} + 2\bar{k}$ and $\bar{b} = 2\bar{i} - \bar{j} + p\bar{k}$ be two vectors. If $(\bar{a}, \bar{b}) = 60^\circ$, then p =

(A) $\frac{\sqrt{7}}{3\sqrt{2}}$
(B) $\frac{3\sqrt{5}}{\sqrt{7}}$
(C) $\frac{\sqrt{3}}{\sqrt{7}}$
(D) $\frac{\sqrt{5}}{\sqrt{7}}$

Answer: (B) $\frac{3\sqrt{5}}{\sqrt{7}}$ · The council's preliminary key

Q123 TS EAPCET 2025 · 3 May · Shift 1 MCQ

Let π_1 be the plane determined by the vectors $\bar{i} + \bar{j}$, $\bar{i} + \bar{k}$ and π_2 be the plane determined by the vectors $\bar{j} - \bar{k}$, $\bar{k} - \bar{i}$. Let $\bar{a}$ be a non-zero vector parallel to the line of intersection of the planes π_1 and π_2. If $\bar{b} = \bar{i} + \bar{j} - \bar{k}$ then the angle between the vectors $\bar{a}$ and $\bar{b}$ is

(A) $\cos^{-1}\left(\sqrt{\frac{2}{3}}\right)$
(B) $\frac{\pi}{2}$
(C) $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$
(D) $\cos^{-1}\left(\frac{\sqrt{2}}{3}\right)$

Answer: (A) $\cos^{-1}\left(\sqrt{\frac{2}{3}}\right)$ · The council's preliminary key

Q124 TS EAPCET 2025 · 3 May · Shift 2 MCQ

In a triangle ABC, if $\overline{BC} = \bar{i} - 2\bar{j} + 2\bar{k}$ and $\overline{CA} = 6\bar{i} + 3\bar{j} - 2\bar{k}$, then the perimeter of the triangle is

(A) $5(2 + \sqrt{3})$
(B) $5(2 + \sqrt{2})$
(C) $\sqrt{10}(3 + \sqrt{10})$
(D) $10(2 + \sqrt{5})$

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

Q125 TS EAPCET 2025 · 3 May · Shift 2 MCQ

$\bar{i} + \bar{j} + \bar{k}$, $a_1\bar{i} + b_1\bar{j} + c_1\bar{k}$, $a_2\bar{i} + b_2\bar{j} + c_2\bar{k}$, $a_3\bar{i} + b_3\bar{j} + c_3\bar{k}$ are the position vectors of the points A, B, C, D respectively. $\frac{2}{3}(\bar{i} + \bar{j} + \bar{k})$ is the position vector of the centroid of the triangular face BCD of the tetrahedron ABCD. If $\alpha\bar{i} + \beta\bar{j} + \gamma\bar{k}$ is the position vector of the centroid of the tetrahedron, then $2\alpha + \beta + \gamma =$

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

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

Q126 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If $\overline{a} = \overline{i} - 2\overline{j} + 2\overline{k}$ and $\overline{b} = 9\overline{i} + 6\overline{j} - 18\overline{k}$ are two vectors, then $\frac{\text{Projection of } \overline{b} \text{ on } \overline{a}}{\text{Projection of } \overline{a} \text{ on } \overline{b}} =$

(A) 21
(B) 7
(C) $\frac{7}{3}$
(D) 3

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

Q127 TS EAPCET 2025 · 3 May · Shift 2 MCQ

Let $\overline{a} = \overline{i} + 2\overline{j} + 3\overline{k}$, $\overline{b} = 2\overline{i} - 3\overline{j} + \overline{k}$ and $\overline{c} = 3\overline{i} + \overline{j} - 2\overline{k}$ be three vectors. If $\overline{r}$ is a vector such that $\overline{r}.\overline{a} = 0$, $\overline{r}.\overline{b} = -2$ and $\overline{r}.\overline{c} = 6$ then $\overline{r}.\left(3\overline{i} + \overline{j} + \overline{k}\right) =$

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

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

Q128 TS EAPCET 2025 · 3 May · Shift 2 MCQ

Let $\bar{a} = \bar{i} - \bar{j} + \bar{k}$, $\bar{b} = \bar{i} - 2\bar{j} - 2\bar{k}$, $\bar{c} = 6\bar{i} + 3\bar{j} - 2\bar{k}$ be three vectors. If $\bar{d}$ is a vector perpendicular to both $\bar{a}, \bar{b}$ and $|\bar{d} \times \bar{c}| = 14$, then $|\bar{d}.\bar{c}| =$

(A) 35
(B) 70
(C) 140
(D) 105

Answer: (B) 70 · The council's preliminary key

Q129 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The position vectors of two points A and B are $\overline{i} + 2\overline{j} + 3\overline{k}$ and $7\overline{i} - \overline{k}$ respectively. The point P with position vector $-2\overline{i} + 3\overline{j} + 5\overline{k}$ is on the line AB. If the point Q is the harmonic conjugate of P, then the sum of the scalar components of the position vector of Q is

EdLoop EAPCET

(A) 6
(B) 4
(C) 2
(D) 0

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

Q130 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If $\overline{a}$ and $\overline{b}$ are two vectors such that $|\overline{a}| = 5$, $|\overline{b}| = 12$ and $|\overline{a} - \overline{b}| = 13$ then $|2\overline{a} + \overline{b}| =$

(A) $2\sqrt{61}$
(B) 15
(C) $61\sqrt{2}$
(D) 17

Answer: (A) $2\sqrt{61}$ · The council's preliminary key

Q131 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If $\overline{a} = \overline{i} - 2\overline{j} - 2\overline{k}$ and $\overline{b} = 2\overline{i} + \overline{j} + 2\overline{k}$ are two vectors then $(\overline{a} + 2\overline{b}) \times (3\overline{a} - \overline{b}) =$

(A) $2\overline{i} + 6\overline{j} - 5\overline{k}$
(B) $6\overline{i} - 2\overline{j} + 3\overline{k}$
(C) $14\overline{i} + 7\overline{j} - 5\overline{k}$
(D) $14\overline{i} + 42\overline{j} - 35\overline{k}$

Answer: (D) $14\overline{i} + 42\overline{j} - 35\overline{k}$ · The council's preliminary key

Q132 TS EAPCET 2025 · 2 May · Shift 2 MCQ

A, B, C, D are any four points. If E and F are mid points of AC and BD respectively, then $\overline{AB} + \overline{CB} + \overline{CD} + \overline{AD} =$

(A) $\overline{EF}$
(B) $2\overline{EF}$
(C) $3\overline{EF}$
(D) $4\overline{EF}$

Answer: (D) $4\overline{EF}$ · The council's preliminary key

Q133 TS EAPCET 2025 · 2 May · Shift 2 MCQ

The four points whose position vectors are given by $2\overline{a} + 3\overline{b} - \overline{c}$, $\overline{a} - 2\overline{b} + 3\overline{c}$, $3\overline{a} + 4\overline{b} - 2\overline{c}$ and $\overline{a} - 6\overline{b} + 6\overline{c}$ are

EdLoop EAPCET

(A) Collinear
(B) Coplanar
(C) Vertices of a square
(D) Vertices of a rectangle

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

Q134 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If $a = |\bar{a}|; b = |\bar{b}|$ then $\left(\frac{\bar{a}}{a^2} - \frac{\bar{b}}{b^2}\right)^2 =$

(A) $\left(\frac{\bar{a} - \bar{b}}{a^2 b^2}\right)^2$
(B) $\left(\frac{\bar{a} - \bar{b}}{ab}\right)^2$
(C) $\left(\frac{b\bar{a} - a\bar{b}}{ab}\right)^2$
(D) $\left(\frac{a\bar{a} - b\bar{b}}{a^2 b^2}\right)^2$

Answer: (B) $\left(\frac{\bar{a} - \bar{b}}{ab}\right)^2$ · The council's preliminary key

Q135 TS EAPCET 2025 · 2 May · Shift 2 MCQ

$\bar{a}, \bar{b}, \bar{c}$ are three unit vectors such that $x\bar{a} + y\bar{b} + z\bar{c} = p(\bar{b} \times \bar{c}) + q(\bar{c} \times \bar{a}) + r(\bar{a} \times \bar{b})$. If $(\bar{a}, \bar{b}) = (\bar{b}, \bar{c}) = (\bar{c}, \bar{a}) = \frac{\pi}{3}$, $(\bar{a}, \bar{b} \times \bar{c}) = \frac{\pi}{6}$ and $\bar{a}, \bar{b}, \bar{c}$ form a right-handed system, then $\frac{x+y+z}{p+q+r} =$

(A) $\frac{3}{4}$
(B) $\frac{1}{\sqrt{2}}$
(C) $2\sqrt{2}$
(D) $\frac{3}{8}$

Answer: (D) $\frac{3}{8}$ · The council's preliminary key

Q136 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If the vectors $a\bar{i} + \bar{j} + \bar{k}; \bar{i} + b\bar{j} + \bar{k}; \bar{i} + \bar{j} + c\bar{k}$ $(a \neq b \neq c \neq 1)$ are coplanar, then

$$\frac{1}{1-a} + \frac{1}{1-b} + \frac{1}{1-c} =$$

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

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

Q137 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If $\overline{AB} = 2\bar{i} + 3\bar{j} - 6\bar{k}$; $\overline{BC} = 6\bar{i} - 2\bar{j} + 3\bar{k}$ are the vectors along two sides of a triangle ABC, then perimeter of triangle ABC is:

(A) 21
(B) $\sqrt{74} + 14$
(C) $\sqrt{74} + 19$
(D) $\sqrt{74} + 3$

Answer: (B) $\sqrt{74} + 14$ · The council's preliminary key

Q138 AP EAPCET 2024 · 23 May · Shift 1 MCQ

The orthogonal projection vector of $\bar{a} = 2\bar{i} + 3\bar{j} + 3\bar{k}$ on $\bar{b} = \bar{i} - 2\bar{j} + \bar{k}$ is

(A) $-\frac{1}{6}(2\bar{i} + 3\bar{j} + 3\bar{k})$
(B) $\frac{1}{6}(-\bar{i} + 2\bar{j} - \bar{k})$
(C) $\bar{i} - 2\bar{j} + \bar{k}$
(D) $-\bar{i} + 2\bar{j} - \bar{k}$

Answer: (B) $\frac{1}{6}(-\bar{i} + 2\bar{j} - \bar{k})$ · The council's preliminary key

Q139 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If $\bar{a} = -4\bar{i} + 2\bar{j} + 4\bar{k}$, $\bar{b} = \sqrt{2}\,\bar{i} - \sqrt{2}\,\bar{j}$ are two vectors then angle between the vectors $2\bar{a}$ and $\frac{\bar{b}}{2}$ is

(A) 30°
(B) 135°
(C) 90°
(D) 0°

Answer: (B) 135° · The council's preliminary key

Q140 AP EAPCET 2024 · 23 May · Shift 1 MCQ

A unit vector perpendicular to the vectors $\bar{a} = 2\bar{i} + 3\bar{j} + 4\bar{k}$ and $\bar{b} = 3\bar{j} + 2\bar{k}$ is

EdLoop EAPCET

(A) $\frac{3\bar{i}+2\bar{j}-2\bar{k}}{\sqrt{22}}$
(B) $\frac{3\bar{i}+2\bar{j}-3\bar{k}}{\sqrt{22}}$
(C) $\frac{3\bar{i}-2\bar{j}+3\bar{k}}{\sqrt{22}}$
(D) $\frac{3\bar{i}+2\bar{j}+3\bar{k}}{\sqrt{22}}$

Answer: (B) $\frac{3\bar{i}+2\bar{j}-3\bar{k}}{\sqrt{22}}$ · The council's preliminary key

Q141 AP EAPCET 2024 · 22 May · Shift 1 MCQ

Let $\bar{a}=3\bar{i}+4\bar{j}-5\bar{k}$, $\bar{b}=2\bar{i}+\bar{j}-2\bar{k}$. The projection of the sum of the vectors $\bar{a},\bar{b}$ on the vector perpendicular to the plane of $\bar{a},\bar{b}$ is

(A) 0
(B) $4\sqrt{2}$
(C) $7\sqrt{2}$
(D) $\frac{1}{\sqrt{2}}$

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

Q142 AP EAPCET 2024 · 22 May · Shift 1 MCQ

In ΔPQR, $(4\bar{i}+3\bar{j}+6\bar{k})$, $(2\bar{i}+2\bar{j}+3\bar{k})$ and $(3\bar{i}+\bar{j}+3\bar{k})$ are the position vectors of the vertices P, Q and R respectively. Then the position vector of the point of intersection of the angle bisector of P with QR is

(A) $6\bar{i}+5\bar{j}+9\bar{k}$
(B) $2\bar{i}-\bar{j}+3\bar{k}$
(C) $(5\bar{i}+3\bar{j}-2\bar{k})$
(D) $\frac{5}{2}\bar{i}+\frac{3}{2}\bar{j}+3\bar{k}$

Answer: (D) $\frac{5}{2}\bar{i}+\frac{3}{2}\bar{j}+3\bar{k}$ · The council's preliminary key

Q143 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If $\bar{f}=i+j+k$ and $\bar{g}=2i-j+3k$ then the projection vector of $\bar{f}$ on $\bar{g}$ is

(A) $\frac{2}{7}(i+j+k)$
(B) $\frac{2}{7}(2i-j+3k)$
(C) $\frac{1}{3}(i+j+k)$
(D) $\frac{1}{14}(2i-j+3k)$

Answer: (B) $\frac{2}{7}(2i-j+3k)$ · The council's preliminary key

Q144 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If θ is the angle between $\bar{f} = i + 2j - 3k$ and $\bar{g} = 2i - 3j + ak$ and $\sin\theta = \sqrt{\frac{24}{28}}$ then $7a^2 + 24a =$

(A) 10
(B) 12
(C) 36
(D) 15

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

Q145 AP EAPCET 2024 · 22 May · Shift 2 MCQ

If the vectors $a\bar{i} + \bar{j} + 3\bar{k}$, $4\bar{i} + 5\bar{j} + \bar{k}$ and $4\bar{i} + 2\bar{j} + 6\bar{k}$ are coplanar, then $a =$

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

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

Q146 AP EAPCET 2024 · 22 May · Shift 2 MCQ

Let $|\bar{a}| = 2$, $|\bar{b}| = 3$ and the angle between $\bar{a}$ and $\bar{b}$ be $\frac{\pi}{3}$. If a parallelogram is constructed with adjacent sides $2\bar{a} + 3\bar{b}$ and $\bar{a} - \bar{b}$, then its shorter diagonal is of length

(A) 108
(B) 172
(C) $6\sqrt{3}$
(D) $2\sqrt{43}$

Answer: (C) $6\sqrt{3}$ · The council's preliminary key

Q147 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The values of x for which the angle between the vectors $x^2\bar{i} + 2x\bar{j} + \bar{k}$ and $\bar{i} - 2\bar{j} + x\bar{k}$ is obtuse lie in the interval

(A) $(-\infty, 0) \cup (3, \infty)$
(B) $(0, 3)$
(C) $[0, 3]$
(D) $(-\infty, 0) \cup [3, \infty)$

Answer: (B) $(0, 3)$ · The council's preliminary key

EdLoop EAPCET

Q148 AP EAPCET 2024 · 22 May · Shift 2 MCQ

If $\bar{i}-\bar{j}-\bar{k}$, $\bar{i}+\bar{j}+\bar{k}$, $\bar{i}+\bar{j}+2\bar{k}$ and $2\bar{i}+\bar{j}$ are the vertices of a tetrahedron then its volume is

(A) $\frac{1}{6}$
(B) $\frac{2}{3}$
(C) 3
(D) $\frac{1}{3}$

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

Q149 AP EAPCET 2024 · 21 May · Shift 1 MCQ

$\overline{a}=\alpha\bar{i}+\beta\bar{j}+3\bar{k}$, $\overline{b}=\bar{j}+2\bar{k}$, $\overline{c}=3\bar{i}+2\bar{j}+\bar{k}$ are linearly dependent vectors and magnitude of $\overline{a}$ is $\sqrt{14}$. If α,β are integers then $\alpha+\beta=$

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

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

Q150 AP EAPCET 2024 · 21 May · Shift 1 MCQ

$\bar{c}$ is a vector along the bisector of the internal angle between the vectors $\bar{a}=4\bar{i}+7\bar{j}-4\bar{k}$ and $\bar{b}=12\bar{i}-3\bar{j}+4\bar{k}$. If the magnitude of $\bar{c}$ is $3\sqrt{13}$ then $\bar{c}=$

(A) $5\bar{i}-8\bar{j}+2\sqrt{2}\,\bar{k}$
(B) $10\bar{i}+4\bar{j}-\bar{k}$
(C) $\bar{i}-10\bar{j}+4\bar{k}$
(D) $2\sqrt{2\bar{i}}+5\bar{j}-8\bar{k}$

Answer: (B) $10\bar{i}+4\bar{j}-\bar{k}$ · The council's preliminary key

Q151 AP EAPCET 2024 · 21 May · Shift 1 MCQ

$\overline{a}=\bar{i}-\bar{j}+\overline{k},\overline{b}=2\bar{i}+\bar{j}+\overline{k}$ are two vectors and $\overline{c}$ is a unit vector lying in the plane of $\bar{a}$ and $\bar{b}$. If $\bar{c}$ is perpendicular to $\bar{b}$ then $\bar{c}\cdot(\bar{i}+\bar{j}+2\overline{k})=$

(A) 0
(B) 5
(C) $\frac{1}{\sqrt{21}}$
(D) $\frac{2}{\sqrt{21}}$

Answer: (C) $\frac{1}{\sqrt{21}}$ · The council's preliminary key

Q152 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If $\bar{a}=\bar{i}-\bar{j}+\bar{k},\ \bar{b}=\bar{i}+\bar{j}-2\bar{k},\ \bar{c}=2\bar{i}-3\bar{j}-\bar{k},\ \bar{d}=2\bar{i}+\bar{j}+\bar{k}$ are four vectors then $(\bar{a}\times\bar{c})\times(\bar{b}\times\bar{d})=$

(A) $2\bar{i}+19\bar{j}-11\bar{k}$
(B) $-8\bar{i}+19\bar{j}-29\bar{k}$
(C) $2\bar{i}+\bar{j}-11\bar{k}$
(D) $-8\bar{i}+\bar{j}-29\bar{k}$

Answer: (D) $-8\bar{i}+\bar{j}-29\bar{k}$ · The council's preliminary key

Q153 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If $\bar{i}-2\bar{j}+3\bar{k},\ 2\bar{i}+3\bar{j}-\bar{k},\ -3\bar{i}-\bar{j}-2\bar{k}$ are the position vectors of three points A, B, C respectively, then A, B, C

(A) are collinear points
(B) form an isosceles triangle which is not equilateral
(C) form an equilateral triangle
(D) form a scalene triangle

Answer: (C) form an equilateral triangle · The council's preliminary key

Q154 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If $\bar{a},\bar{b},\bar{c},\bar{d}$ are position vectors of 4 points such that $2\bar{a}+3\bar{b}+5\bar{c}-10\bar{d}=\bar{0}$, then the ratio in which the line joining $\bar{c}$ and $\bar{d}$ divides the line segment joining $\bar{a}$ and $\bar{b}$ is

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

Answer: (D) $3:2$ · The council's preliminary key

Q155 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If $\bar{a},\bar{b},\bar{c}$ are 3 vectors such that $|\bar{a}|=5, |\bar{b}|=8, |\bar{c}|=11$ and $\bar{a}+\bar{b}+\bar{c}=\bar{0}$ then the angle between the vectors $\bar{a}$ and $\bar{b}$ is

(A) $\cos^{-1}\frac{2}{5}$
(B) $\cos^{-1}\frac{10}{11}$
(C) $\cos^{-1}\frac{41}{55}$
(D) $\frac{\pi}{3}$

Answer: (A) $\cos^{-1}\frac{2}{5}$ · The council's preliminary key

EdLoop EAPCET

Q156 AP EAPCET 2024 · 20 May · Shift 1 MCQ

Let $O(\overline{0})$, $A(\overline{i}+2\overline{j}+\overline{k})$, $B(-2\overline{i}+3\overline{k})$, $C(2\overline{i}+\overline{j})$, $D(4\overline{k})$ are position vectors of the points O, A, B, C and D. If a line passing through A and B intersects the plane passing through O, C and D at the point R, then position vector of R is

(A) $-8\overline{i}-4\overline{j}+7\overline{k}$
(B) $2\overline{i}+\overline{j}+\overline{k}$
(C) $-7\overline{i}-6\overline{j}-5\overline{k}$
(D) $3\overline{i}+2\overline{j}-5\overline{k}$

Answer: (A) $-8\overline{i}-4\overline{j}+7\overline{k}$ · The council's preliminary key

Q157 AP EAPCET 2024 · 20 May · Shift 1 MCQ

$\overline{a},\overline{b},\overline{c}$ are non-coplanar vectors. If $\alpha\overline{d}=\overline{a}+\overline{b}+\overline{c}$, $\beta\overline{a}=\overline{b}+\overline{c}+\overline{d}$, then $|\overline{a}+\overline{b}+\overline{c}+\overline{d}|=$

(A) 1
(B) 2
(C) $|\overline{a}-\overline{b}-\overline{c}|$
(D) 0

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

Q158 AP EAPCET 2024 · 20 May · Shift 1 MCQ

$\overline{u},\overline{v},\overline{w}$ are three unit vectors. Let $\overline{p}=\overline{u}+\overline{v}+\overline{w}$, $\overline{q}=\overline{u}\times(\overline{v}\times\overline{w})$. If $\overline{p}.\overline{u}=\frac{3}{2}$, $\overline{p}.\overline{v}=\frac{7}{4}$, $|\overline{p}|=2$ and $\overline{v}=K\overline{q}$, then K=

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

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

Q159 AP EAPCET 2024 · 20 May · Shift 1 MCQ

If $\overline{a},\overline{b}$ are the two non collinear vectors, then $|\overline{b}|\overline{a}+|\overline{a}|\,\overline{b}$ represents

(A) a vector parallel to an angle bisector of $\overline{a},\overline{b}$
(B) a vector along the difference of the vectors $\overline{a},\overline{b}$
(C) a vector along $\overline{a}+\overline{b}$
(D) a vector outside the triangle having $\overline{a},\overline{b}$ as adjacent sides

Answer: (A) a vector parallel to an angle bisector of $\overline{a},\overline{b}$ · The council's preliminary key

Q160 AP EAPCET 2024 · 20 May · Shift 2 MCQ

The angle between the diagonals of the parallelogram whose adjacent sides are $2i+4j-5k,\ i+2j+3k$ is

(A) $\text{Cos}^{-1}\left(\frac{7}{\sqrt{69}}\right)$

(B) $\text{Cos}^{-1}\left(\frac{1}{7\sqrt{69}}\right)$

(C) $\text{Cos}^{-1}\left(\frac{1}{7}\right)$

(D) $\text{Cos}^{-1}\left(\frac{31}{7\sqrt{69}}\right)$

Answer: (D) $\text{Cos}^{-1}\left(\frac{31}{7\sqrt{69}}\right)$ · The council's preliminary key

Q161 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If the points having the position vectors $-i+4j-4k, 3i+2j-5k, -3i+8j-5k$ and $-3i+2j+\lambda k$ are coplanar, then $\lambda =$

(A) 1

(B) 2

(C) -2

(D) -3

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

Q162 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If $|\bar{f}|=10, |\bar{g}|=14$ and $|\bar{f}-\bar{g}|=15$ then $|\bar{f}+\bar{g}|=$

(A) 367

(B) $\sqrt{367}$

(C) 400

(D) 20

Answer: (B) $\sqrt{367}$ · The council's preliminary key

Q163 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If $\bar{a},\bar{b},\bar{c}$ are three vectors such that $|\bar{a}|=|\bar{b}|=|\bar{c}|=\sqrt{3}$ and $(\bar{a}+\bar{b}-\bar{c})^2+(\bar{b}+\bar{c}-\bar{a})^2+(\bar{c}+\bar{a}-\bar{b})^2=36$, then $|2\bar{a}-3\bar{b}+2\bar{c}|^2=$

(A) 15

(B) 25

(C) 147

(D) 75

Answer: (D) 75 · The council's preliminary key

Q164 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If O $(0,0,0)$, A $(3,0,0)$, B $(0,4,0)$ form a triangle then the incentre of triangle OAB is

(A) $(0,1,0)$
(B) $(0,1,1)$
(C) $(1,0,1)$
(D) $(1,1,0)$

Answer: (D) $(1,1,0)$ · The council's preliminary key

Q165 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If L, M, N are the mid points of the sides PQ, QR and RP of ΔPQR respectively, then $\overline{QM}+\overline{LN}+\overline{ML}+\overline{RN}-\overline{MN}-\overline{QL}=$

(A) $\overline{PQ}+\overline{QR}+\overline{LM}+\overline{MN}$
(B) $\overline{LP}+\overline{PM}+\overline{MQ}$
(C) $\overline{PQ}+\overline{QR}-\overline{PR}$
(D) $\overline{LM}+\overline{MN}+\overline{NR}$

Answer: (C) $\overline{PQ}+\overline{QR}-\overline{PR}$ · The council's preliminary key

Q166 AP EAPCET 2024 · 19 May · Shift 2 MCQ

Let $\bar{a}\times\bar{b}=7\bar{i}-5\bar{j}-4\bar{k}$ and $\bar{a}=\bar{i}+3\bar{j}-2\bar{k}$. If the length of projection of $\bar{b}$ on $\bar{a}$ is $\frac{8}{\sqrt{14}}$, then $|\bar{b}|=$

(A) 121
(B) $\sqrt{12}$
(C) $\sqrt{11}$
(D) 144

Answer: (C) $\sqrt{11}$ · The council's preliminary key

Q167 AP EAPCET 2024 · 19 May · Shift 2 MCQ

Let ABC be an equilateral triangle of side a. M and N are two points on the sides AB and AC respectively such that $\overline{AN}=K\,\overline{AC}$ and $\overline{AB}=3\,\overline{AM}$. If the vectors $\overline{BN}$ and $\overline{CM}$ are perpendicular, then K=

(A) $\frac{1}{5}$
(B) $\frac{2}{5}$
(C) $-\frac{1}{5}$
(D) $-\frac{2}{5}$

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

Q168 AP EAPCET 2024 · 19 May · Shift 2 MCQ

Let $\bar{a}$ and $\bar{b}$ be two non-collinear vectors of unit modulus. If $\bar{u} = \bar{a} - (\bar{a} \cdot \bar{b})\bar{b}$ and $\bar{v} = \bar{a} \times \bar{b}$, then $|\bar{v}| =$

(A) $|\bar{u}| + |\bar{u} \cdot \bar{v}|$

(B) $\frac{|\bar{u}|}{2}$

(C) $|\bar{u}| + \frac{|\bar{u} \cdot \bar{b}|}{2}$

(D) $\frac{|\bar{u}|}{5}$

Options (1) or (3) were accepted. More than one answer was accepted. · The council's preliminary key

Q169 AP EAPCET 2024 · 18 May · Shift 1 MCQ

In a regular hexagon $ABCDEF$, $\overline{AB} = \overline{a}$ and $\overline{BC} = \overline{b}$, then $\overline{FA}$ =

(A) $\overline{a} - \overline{b}$

(B) $\overline{a} + \overline{b}$

(C) $\overline{b} - \overline{a}$

(D) $2\overline{b} - \overline{a}$

Answer: (A) $\overline{a} - \overline{b}$ · The council's preliminary key

Q170 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If the points with position vectors $(\alpha\bar{i} + 10\bar{j} + 13\bar{k}), (6\bar{i} + 11\bar{j} + 11\bar{k}), \left(\frac{9}{2}\bar{i} + \beta\bar{j} - 8\bar{k}\right)$ are collinear then $(19\alpha - 6\beta)^2 =$

(A) 16

(B) 36

(C) 25

(D) 49

Answer: (B) 36 · The council's preliminary key

Q171 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If $\bar{f}, \bar{g}, \bar{h}$ be mutually orthogonal vectors of equal magnitudes, then the angle between the vectors $\bar{f} + \bar{g} + \bar{h}$ and $\bar{h}$ is

(A) $\cos^{-1}\left(\frac{\sqrt{3}}{4}\right)$

(B) $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$

(C) $\pi - \cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$

(D) $\pi - \cos^{-1}\left(\frac{\sqrt{3}}{4}\right)$

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

EdLoop EAPCET

Q172 AP EAPCET 2024 · 18 May · Shift 1 MCQ

Let $\overline{a}, \overline{b}$ be two unit vector. If $\overline{c} = \overline{a} + 2\overline{b}$ and $\overline{d} = 5\overline{a} - 4\overline{b}$ are perpendicular to each other, then the angle between $\overline{a}$ and $\overline{b}$ is

(A) $\frac{\pi}{6}$
(B) $\frac{\pi}{4}$
(C) $\frac{\pi}{3}$
(D) $\frac{\pi}{8}$

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

Q173 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If the vectors $\bar{a} = 2\bar{i} - \bar{j} + \bar{k},\ \bar{b} = \bar{i} + 2\bar{j} - 3\bar{k},\ \bar{c} = 3\bar{i} + p\bar{j} + 5\bar{k}$ are coplanar then $p =$

(A) 4
(B) 14
(C) -4
(D) 41

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

Q174 TS EAPCET 2024 · 11 May · Shift 1 MCQ

$2\bar{i} - 3\bar{j} + \bar{k}$ and $\bar{i} + 2\bar{j} - 3\bar{k}$ are the position vectors of two points A and B respectively and C divides AB in the ratio $3 : 2$. If $3\bar{i} - \bar{j} + 2\bar{k}$ is the position vector of a point D, then the unit vector in the direction of $\overline{CD}$ is

(A) $\frac{1}{7\sqrt{2}}(8\bar{i} - 5\bar{j} - 3\bar{k})$
(B) $\frac{1}{\sqrt{266}}(4\bar{i} - 13\bar{j} + 9\bar{k})$
(C) $\frac{1}{3\sqrt{42}}(8\bar{i} - 5\bar{j} + 17\bar{k})$
(D) $\frac{1}{7\sqrt{2}}(8\bar{i} - 5\bar{j} + 3\bar{k})$

Answer: (C) $\frac{1}{3\sqrt{42}}(8\bar{i} - 5\bar{j} + 17\bar{k})$ · The council's preliminary key

Q175 TS EAPCET 2024 · 11 May · Shift 1 MCQ

A unit vector $\bar{e} = a\bar{i} + b\bar{j} + c\bar{k}$ is coplanar with the vectors $\bar{i} - 3\bar{j} + 5\bar{k}$ and $3\bar{i} + \bar{j} - 5\bar{k}$. If $\bar{e}$ is perpendicular to the vector $\bar{i} + \bar{j} + \bar{k}$, then $2a^2 + 3b^2 + 4c^2 =$

EdLoop EAPCET

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

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

Q176 TS EAPCET 2024 · 11 May · Shift 1 MCQ

$\bar{a}=\bar{i}+\bar{j}-2\bar{k}$, $\bar{b}=\bar{i}-2\bar{j}+\bar{k}$ and $\bar{c}=2\bar{i}+\bar{j}-\bar{k}$ are three vectors. If $\bar{d}$ is a normal to the plane of $\bar{a}$ and $\bar{b}$ and $\bar{d}\cdot\bar{c}=2$, then $|\bar{d}|=$

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

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

Q177 TS EAPCET 2024 · 10 May · Shift 1 MCQ

P and Q are the points of trisection of the line segment AB. If $2\bar{i}-5\bar{j}+3\bar{k}$ and $4\bar{i}+\bar{j}-6\bar{k}$ are the position vectors of A and B respectively, then the position vector of the point which divides PQ in the ratio $2:3$ is

(A) $\frac{1}{15}(44\bar{i}-33\bar{j}-18\bar{k})$
(B) $\frac{1}{5}(36\bar{i}-26\bar{j}-18\bar{k})$
(C) $\frac{1}{5}(3\bar{i}+7\bar{j}-9\bar{k})$
(D) $\frac{1}{15}(-3\bar{i}-7\bar{j}+9\bar{k})$

Answer: (A) $\frac{1}{15}(44\bar{i}-33\bar{j}-18\bar{k})$ · The council's preliminary key

Q178 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The position vector of the point of intersection of the line joining the points $\bar{i}-\bar{j}+\bar{k}$, $\bar{i}+\bar{j}-2\bar{k}$ and the line joining the points $2\bar{i}+\bar{j}-6\bar{k}$, $3\bar{i}-\bar{j}-7\bar{k}$ is

(A) $\bar{i}-3\bar{j}+4\bar{k}$
(B) $4\bar{i}-3\bar{j}-8\bar{k}$
(C) $\bar{i}+3\bar{j}-5\bar{k}$
(D) $\bar{i}+\bar{j}-2\bar{k}$

Answer: (C) $\bar{i}+3\bar{j}-5\bar{k}$ · The council's preliminary key

Q179 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If $\bar{a}=4\bar{i}+5\bar{j}-3\bar{k}$ and $\bar{b}=6\bar{i}-2\bar{j}-2\bar{k}$ are two vectors, then the magnitude of the component of $\bar{b}$ parallel to $\bar{a}$ is

(A) $2\sqrt{2}$
(B) $10\sqrt{2}$
(C) $4\sqrt{2}$
(D) $6\sqrt{2}$

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

Q180 TS EAPCET 2024 · 10 May · Shift 1 MCQ

$\bar{a} = 2\bar{i} - \bar{j}$, $\bar{b} = 2\bar{j} - \bar{k}$, $\bar{c} = 2\bar{k} - \bar{i}$ are three vectors and $\bar{d}$ is a unit vector perpendicular to $\bar{c}$. If $\bar{a}, \bar{b}, \bar{d}$ are coplanar vectors, then $|\bar{d} \cdot \bar{b}| =$

(A) 0
(B) $\frac{1}{\sqrt{14}}$
(C) $\sqrt{\frac{2}{7}}$
(D) $\sqrt{\frac{7}{2}}$

Answer: (D) $\sqrt{\frac{7}{2}}$ · The council's preliminary key

Q181 TS EAPCET 2024 · 10 May · Shift 2 MCQ

$\overline{n}$ is a unit vector normal to the plane π containing the vectors $\bar{i} + 3\overline{k}$ and $2\bar{i} + \bar{j} - \overline{k}$. If this plane π passes through the point $(-3, 7, 1)$ and p is the perpendicular distance from the origin to this plane π, then $\sqrt{\mathrm{p}^2 + 5} =$

(A) 59
(B) 8
(C) 64
(D) 51

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

Q182 TS EAPCET 2024 · 10 May · Shift 2 MCQ

$\bar{a}, \bar{b}, \bar{c}$ are three vectors each having $\sqrt{2}$ magnitude such that $(\bar{a}, \bar{b}) = (\bar{b}, \bar{c}) = (\bar{c}, \bar{a}) = \frac{\pi}{3}$. If $\bar{x} = \bar{a} \times (\bar{b} \times \bar{c})$ and $\bar{y} = \bar{b} \times (\bar{c} \times \bar{a})$, then

(A) $|\bar{x}| = |\bar{y}|$
(B) $|\bar{x}| = \sqrt{2}|\bar{y}|$
(C) $|\bar{x}| = 2|\bar{y}|$
(D) $|\bar{x}| + |\bar{y}| = 2$

Answer: (A) $|\bar{x}| = |\bar{y}|$ · The council's preliminary key

EdLoop EAPCET

Q183 TS EAPCET 2024 · 10 May · Shift 2 MCQ

$\bar{a}$ is a vector perpendicular to the plane containing non zero vectors $\bar{b}$ and $\bar{c}$. If $\bar{a}, \bar{b}, \bar{c}$ are such that $|\bar{a}+\bar{b}+\bar{c}|=\sqrt{|\bar{a}|^2+|\bar{b}|^2+|\bar{c}|^2}$, then $|(\bar{a}\times\bar{b})\cdot\bar{c}|+|(\bar{a}\times\bar{b})\times\bar{c}|=$

(A) $|\bar{a}|+|\bar{b}|+|\bar{c}|$
(B) $|\bar{a}||\bar{b}||\bar{c}|$
(C) $|\bar{a}|^2+|\bar{b}|^2+|\bar{c}|^2$
(D) $|\bar{a}|^2|\bar{b}|^2|\bar{c}|^2$

Answer: (B) $|\bar{a}||\bar{b}||\bar{c}|$ · The council's preliminary key

Q184 TS EAPCET 2024 · 10 May · Shift 2 MCQ

If $\overline{a}=\overline{i}+2\overline{j}+\overline{k}$, $\overline{b}=3(\overline{i}-\overline{j}+\overline{k})$ and $\overline{c}$ is a vector such that $\overline{a}\times\overline{c}=\overline{b}$ and $\overline{a}.\overline{c}=3$, then $\overline{a}.(\overline{c}\times\overline{b}-\overline{b}-\overline{c})=$

(A) 32
(B) 24
(C) 20
(D) 36

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

Q185 TS EAPCET 2024 · 9 May · Shift 1 MCQ

$\overline{i}-2\overline{j}+\overline{k}$, $2\overline{i}+\overline{j}-\overline{k}$, $\overline{i}-\overline{j}-2\overline{k}$ are the position vectors of the vertices A, B, C of a triangle ABC respectively. If D and E are the mid points of BC and CA respectively, then the unit vector along $\overline{DE}$ is

(A) $\frac{1}{7}(3\overline{i}-2\overline{j}+6\overline{k})$
(B) $\frac{1}{\sqrt{14}}(-\overline{i}-3\overline{j}+2\overline{k})$
(C) $\frac{1}{\sqrt{3}}(\overline{i}-\overline{j}-\overline{k})$
(D) $\frac{1}{13}(12\overline{i}+3\overline{j}+4\overline{k})$

Answer: (B) $\frac{1}{\sqrt{14}}(-\overline{i}-3\overline{j}+2\overline{k})$ · The council's preliminary key

Q186 TS EAPCET 2024 · 9 May · Shift 1 MCQ

A vector of magnitude $\sqrt{2}$ units along the internal bisector of the angle between the vectors $2\overline{i}-2\overline{j}+\overline{k}$ and $\overline{i}+2\overline{j}+2\overline{k}$ is

(A) $\overline{j}+\overline{k}$
(B) $\overline{i}-\overline{j}$
(C) $\overline{i}-\overline{k}$
(D) $\overline{i}+\overline{k}$

Answer: (D) $\overline{i}+\overline{k}$ · The council's preliminary key

Q187 TS EAPCET 2024 · 9 May · Shift 1 MCQ

If θ is the angle between the vectors $4\bar{i}-\bar{j}+2\bar{k}$ and $\bar{i}+3\bar{j}-2\bar{k}$ then $\sin 2\theta =$

(A) $\sqrt{\frac{3}{95}}$
(B) $-\sqrt{\frac{3}{95}}$
(C) $-\frac{\sqrt{285}}{49}$
(D) $\frac{\sqrt{258}}{49}$

Answer: (C) $-\frac{\sqrt{285}}{49}$ · The council's preliminary key

Q188 TS EAPCET 2024 · 9 May · Shift 1 MCQ

$\bar{a},\bar{b},\bar{c}$ are three vectors such that $|\bar{a}|=3, |\bar{b}|=2\sqrt{2}, |\bar{c}|=5$ and $\bar{c}$ is perpendicular to the plane of $\bar{a}$ and $\bar{b}$. If the angle between the vectors $\bar{a}$ and $\bar{b}$ is $\frac{\pi}{4}$ then $|\bar{a}+\bar{b}+\bar{c}| =$

(A) $5\sqrt{3}$
(B) $2\sqrt{5}$
(C) 10
(D) $3\sqrt{6}$

Answer: (D) $3\sqrt{6}$ · The council's preliminary key

Q189 TS EAPCET 2024 · 9 May · Shift 1 MCQ

If $\bar{a},\bar{b},\bar{c}$ are non-coplanar vectors and the points $\lambda\bar{a}+3\bar{b}-\bar{c}$, $\bar{a}-\lambda\bar{b}+3\bar{c}$, $3\bar{a}+4\bar{b}-\lambda\bar{c}$, $\bar{a}-6\bar{b}+6\bar{c}$ are coplanar, then one of the values of λ is

(A) 7
(B) 5
(C) 2
(D) 1

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

Q190 TS EAPCET 2024 · 9 May · Shift 2 MCQ

$\bar{a},\bar{b},\bar{c}$ are non-coplanar vectors. If the three points $\lambda\bar{a}-2\bar{b}+\bar{c}$, $2\bar{a}+\lambda\bar{b}-2\bar{c}$, $4\bar{a}+7\bar{b}-8\bar{c}$ are collinear, then $\lambda =$

EdLoop EAPCET

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

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

Q191 TS EAPCET 2024 · 9 May · Shift 2 MCQ

If $\bar{a}, \bar{b}$ are two vectors such that $|\bar{a}| = 3$, $|\bar{b}| = 4$, $|\bar{a} + \bar{b}| = \sqrt{37}$, $|\bar{a} - \bar{b}| = k$ and $(\bar{a}, \bar{b}) = \theta$, then $\frac{4}{13}(k \sin\theta)^2 =$

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

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

Q192 TS EAPCET 2024 · 9 May · Shift 2 MCQ

$\overline{r}$ is a vector perpendicular to the plane determined by the vectors $2\overline{i} - \overline{j}$ and $\overline{j} + 2\overline{k}$. If the magnitude of the projection of $\overline{r}$ on the vector $2\overline{i} + \overline{j} + 2\overline{k}$ is 1, then $|\overline{r}| =$

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

Answer: (D) $\frac{3\sqrt{6}}{2}$ · The council's preliminary key

Q193 TS EAPCET 2024 · 9 May · Shift 2 MCQ

$\bar{b} = \bar{i} - \bar{j} + 2\bar{k}, \bar{c} = \bar{i} + 2\bar{j} - \bar{k}$ are two vectors and $\bar{a}$ is a vector such that $\cos\left(\bar{a}, \bar{b} \times \bar{c}\right) = \sqrt{\frac{2}{3}}$. If $\bar{a}$ is a unit vector, then $\left|\bar{a} \times \left(\bar{b} \times \bar{c}\right)\right| =$

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

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

Q194 AP EAPCET 2023 · 19 May · Shift 1 MCQ

Let ABCD be a parallelogram and $2\bar{i}+\bar{j}$, $4\bar{i}+5\bar{j}+4\bar{k}$ and $-\bar{i}-4\bar{j}-3\bar{k}$ be the position vectors of the vertices A,B,D respectively. Then the position vector of one of the point of trisection of the diagonal AC is

(A) $\frac{1}{3}(5\bar{i}+2\bar{j}-\bar{k})$
(B) $\frac{1}{3}(5\bar{i}+2\bar{j}+\bar{k})$
(C) $\frac{1}{3}(5\bar{i}+4\bar{j}+\bar{k})$
(D) $\frac{1}{3}(3\bar{i}+2\bar{j}+\bar{k})$

Answer: (B) $\frac{1}{3}(5\bar{i}+2\bar{j}+\bar{k})$ · The council's preliminary key

Q195 AP EAPCET 2023 · 19 May · Shift 1 MCQ

Let $\bar{a},\bar{b},\bar{c}$ be three non-coplanar vectors. Then the point of intersection of the line joining the points $\bar{a}+\bar{b}+\bar{c}$, $\bar{a}-\bar{b}+3\bar{c}$ and the line joining the points $2\bar{a}-\bar{b}+\bar{c}$, $\bar{a}-2\bar{b}+4\bar{c}$ is

(A) $2\bar{a}+4\bar{c}$
(B) $3\bar{a}-3\bar{b}+5\bar{c}$
(C) $\bar{a}-2\bar{b}+4\bar{c}$
(D) $\bar{a}-\bar{b}+3\bar{c}$

Answer: (C) $\bar{a}-2\bar{b}+4\bar{c}$ · The council's preliminary key

Q196 AP EAPCET 2023 · 19 May · Shift 1 MCQ

Let $\overline{a},\overline{b},\overline{c}$ be three vectors such that $\overline{a}$ is perpendicular to $\overline{b}$ and $\overline{b}$ is perpendicular to $\overline{c}$. If $|\overline{a}|=2,\ |\overline{b}|=3,\ |\overline{c}|=5$ and $|\overline{a}+\overline{b}+\overline{c}|=4\sqrt{3}$, then the angle between $\overline{a}$ and $\overline{c}$ is

(A) $\cos^{-1}\left(\frac{2}{5}\right)$
(B) $\frac{\pi}{3}$
(C) $\cos^{-1}\left(\frac{2}{3}\right)$
(D) $\frac{\pi}{6}$

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

Q197 AP EAPCET 2023 · 19 May · Shift 1 MCQ

Let $\bar{a}=\bar{i}+\bar{j}+\bar{k}$, $\bar{b}=\bar{i}+\bar{j}-2\bar{k}$, $\bar{c}=\bar{i}-2\bar{j}+3\bar{k}$ and $\bar{d}=-4\bar{i}+5\bar{j}-3\bar{k}$ be four vectors. If $\bar{d}=x(\bar{b}\times\bar{c})-\frac{7}{9}(\bar{c}\times\bar{a})+z(\bar{a}\times\bar{b})$, then $x=$

EdLoop EAPCET

(A) $\frac{-7}{9}$
(B) $\frac{2}{9}$
(C) $\frac{23}{9}$
(D) 2

Answer: (B) $\frac{2}{9}$ · The council's preliminary key

Q198 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If $\bar{a} = \bar{i} + 2\bar{j} - 3\bar{k}$ and $\bar{b} = 2\bar{i} - 3\bar{j} - 5\bar{k}$, then

(A) $|\bar{a} - \bar{b}| > |\bar{a}| + |\bar{b}|$
(B) $|\bar{a} - \bar{b}| > |\bar{b}| - |\bar{a}|$
(C) $|\bar{a} + \bar{b}| < |\bar{a} - \bar{b}|$
(D) $||\bar{a}| - |\bar{b}|| > |\bar{a} - \bar{b}|$

Answer: (B) $|\bar{a} - \bar{b}| > |\bar{b}| - |\bar{a}|$ · The council's preliminary key

Q199 AP EAPCET 2023 · 18 May · Shift 1 MCQ

Let $\bar{i} - \bar{j} + 2\bar{k}$ and $\bar{i} + 2\bar{j} - 2\bar{k}$ be the position vectors of points A and B respectively. If C is a point on the line joining A and B such that BC= 10, then the position vector of C can be

(A) $\bar{i} + 8\bar{j} - 10\bar{k}$
(B) $\bar{i} + 4\bar{j} - 6\bar{k}$
(C) $\bar{i} - 8\bar{j} + 10\bar{k}$
(D) $\bar{i} - 4\bar{j} - 6\bar{k}$

Answer: (A) $\bar{i} + 8\bar{j} - 10\bar{k}$ · The council's preliminary key

Q200 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If $\bar{a} = 2\bar{i} - \bar{j} - 2\bar{k}$ and $\bar{b} = 6\bar{i} + 2\bar{j} - 3\bar{k}$ are two vectors such that $\bar{a}.\bar{b}$ is minimum, then t =

(A) 8
(B) $-\frac{1}{4}$
(C) $-\frac{1}{8}$
(D) 4

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

Q201 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If $\bar{a} = 2\bar{i} - \bar{j} + 3\bar{k}$, $\bar{b} = -3\bar{i} + 5\bar{j} - 4\bar{k}$ and $\bar{c} = 6\bar{i} - 4\bar{j} + 5\bar{k}$, then $(\bar{a} \times \bar{b}) \cdot (\bar{b} \times \bar{c}) =$

EdLoop EAPCET

(A) -216
(B) 243
(C) 81
(D) -27

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

Q202 AP EAPCET 2023 · 18 May · Shift 1 MCQ

Let π_1 be the plane determined by the vectors $\bar{i}+\bar{j}$ and $\bar{j}+\bar{k}$, π_2 be the plane determined by the vectors $\bar{i}-\bar{j}$ and $\bar{i}+\bar{j}-\bar{k}$. Let $\bar{a}$ be a vector parallel to the line of intersection of π_1 and π_2. If $|\bar{a}|=\sqrt{14}$, then $|\bar{a}\cdot(\bar{i}+\bar{j}+\bar{k})|=$

(A) 1
(B) 2
(C) 5
(D) 7

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

Q203 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $\overline{a}=t\overline{b}$ where $t<0$ is a scalar, then

(A) $\overline{a},\overline{b}$ are like vectors and $|\overline{a}|>|\overline{b}|$
(B) $\overline{a},\overline{b}$ are unlike vectors and $|\overline{a}|>|\overline{b}|$
(C) $\overline{a},\overline{b}$ are like vectors and $|\overline{a}|<|\overline{b}|$
(D) $\overline{a},\overline{b}$ are unlike vectors and either $|\overline{a}|\geq|\overline{b}|$ or $|\overline{a}|<|\overline{b}|$

Answer: (D) $\overline{a},\overline{b}$ **are unlike vectors and either** $|\overline{a}|\geq|\overline{b}|$ **or** $|\overline{a}|<|\overline{b}|$ · The council's preliminary key

Q204 AP EAPCET 2023 · 18 May · Shift 2 MCQ

Let $\bar{a},\bar{b},\bar{c}$ be coinitial vectors and $\bar{a}=2\bar{i}-\bar{j}+5\bar{k}$ and $\bar{b}=3\bar{i}+7\bar{j}-\bar{k}$. Let $(\bar{a},\bar{b})=\theta$ be an acute angle and $\bar{c}$ be the vector along the bisector of the angle θ. If $\lambda,x,y\in\mathbb{R}$, then $\bar{c}=$

(A) $\lambda(5\bar{i}+6\bar{j}+4\bar{k})$
(B) $\lambda(-\bar{i}-8\bar{j}+6\bar{k})$
(C) $(2x+3y)\bar{i}+(7y-x)\bar{j}+(5x-y)\bar{k}$
(D) $(2x+3y)\bar{i}+(x+7y)\bar{j}+(5x+y)\bar{k}$

Answer: (C) $(2x+3y)\bar{i}+(7y-x)\bar{j}+(5x-y)\bar{k}$ · The council's preliminary key

Q205 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $\overline{a}=2\bar{i}-5\bar{j}+8\bar{k}$, $\overline{b}=7\bar{i}-5\bar{j}+3\bar{k}$ are two vectors and $(2\overline{a}-3\overline{b})\times(4\overline{a}+\overline{b})=x\bar{i}+y\bar{j}+z\bar{k}$, then $x+y+z=$

(A) -1000
(B) 1400
(C) 1000
(D) -1400

Answer: (B) 1400 · The council's preliminary key

Q206 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $\overline{a}, \overline{b}$ are two unit vectors with $(\overline{a}, \overline{b}) = \theta$ and $|\overline{a} - \overline{b}| = 1$, then $2|\overline{a} + \overline{b}| \cos\frac{\theta}{2} =$

(A) 3
(B) 1
(C) $\sqrt{3}$
(D) 9

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

Q207 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If the vectors $\bar{a} = 2\bar{i} + 3\bar{j} - \bar{k}$, $\bar{b} = 4\bar{i} - \bar{j} + 3\bar{k}$ and $\bar{c} = p\bar{i} + \bar{j} - \bar{k}$ are coplanar, then $|\bar{a} \times \bar{c}| =$

(A) $\sqrt{14}$
(B) $\frac{3\sqrt{10}}{2}$
(C) $\sqrt{26}$
(D) $\frac{\sqrt{90}}{4}$

Answer: (B) $\frac{3\sqrt{10}}{2}$ · The council's preliminary key

Q208 AP EAPCET 2023 · 17 May · Shift 1 MCQ

Let $\overline{a}, \overline{b}$ and $\overline{c}$ be any three non coplanar vectors. If m, n are scalars such that $\overline{a} + \overline{b} = m\overline{d} - \overline{c}$ and $\overline{b} + \overline{c} = n\overline{a} - \overline{d}$, then $3\overline{a} + 2\overline{b} + 2\overline{c} + \overline{d} =$

(A) $\overline{a} - \overline{d}$
(B) $\overline{a} + \overline{d}$
(C) $\overline{0}$
(D) $\overline{b} + \overline{c} + 2\overline{d}$

Answer: (A) $\overline{a} - \overline{d}$ · The council's preliminary key

Q209 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If $2\bar{i} + \bar{j} - \bar{k}$, $\bar{i} - 3\bar{j} + 5\bar{k}$ and $-3\bar{i} + 4\bar{j} + 4\bar{k}$ are the position vectors of three points A, B and C respectively, then

(A) ABC is a right angled triangle
(B) ABC is an isosceles triangle
(C) A, B, C are collinear points
(D) ABC is a scalene triangle

Answer: (D) ABC is a scalene triangle · The council's preliminary key

Q210 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If $\overline{OA} = 2\bar{i} - \bar{j} + \bar{k}$, $\overline{OB} = 3\bar{i} - \bar{k}$ and $\overline{OC} = 2\bar{j} + 3\bar{k}$ are the position vectors of the points A, B and C, then a unit vector perpendicular to the plane containing A,B and C is

(A) $\frac{8\bar{i} - 4\bar{j} + 2\bar{k}}{2\sqrt{21}}$
(B) $\frac{6\bar{i} + 2\bar{j} + 3\bar{k}}{7}$
(C) $\frac{9\bar{i} + 2\bar{j} + 6\bar{k}}{11}$
(D) $\frac{8\bar{i} + 2\bar{j} + 5\bar{k}}{\sqrt{93}}$

Answer: (D) $\frac{8\bar{i} + 2\bar{j} + 5\bar{k}}{\sqrt{93}}$ · The council's preliminary key

Q211 AP EAPCET 2023 · 17 May · Shift 1 MCQ

Let $\bar{b} = 3\bar{i} - 2\bar{j} + \bar{k}$ and $\bar{c} = \bar{i} - \bar{j} - \bar{k}$ be two vectors. If $\bar{a}$ is a vector such that $\bar{a} + \bar{b} + \bar{c} = \bar{0}$, then $|\bar{a} \times \bar{b} + \bar{b} \times \bar{c} + \bar{c} \times \bar{a}| =$

(A) 15
(B) $\sqrt{261}$
(C) $\sqrt{234}$
(D) 33

Answer: (C) $\sqrt{234}$ · The council's preliminary key

Q212 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If the position vectors of the points A and B are $2\bar{i} + 3\bar{j} - \bar{k}$ and $\bar{i} - \bar{j} + 2\bar{k}$ respectively, then the unit vector along $\overline{BA}$ and in the direction of $\overline{AB}$ is

(A) $\frac{1}{\sqrt{14}}(3\bar{i} + 2\bar{j} + \bar{k})$
(B) $\frac{1}{\sqrt{26}}(-\bar{i} - 4\bar{j} + 3\bar{k})$
(C) $\frac{1}{\sqrt{26}}(-3\bar{i} - 4\bar{j} + \bar{k})$
(D) $\frac{1}{\sqrt{22}}(3\bar{i} - 4\bar{j} + 3\bar{k})$

Answer: (B) $\frac{1}{\sqrt{26}}(-\bar{i} - 4\bar{j} + 3\bar{k})$ · The council's preliminary key

Q213 AP EAPCET 2023 · 17 May · Shift 2 MCQ

Let 'O' be the origin, A and B be two points with position vectors $-3\vec{i}-3\vec{j}+4\vec{k}$ and $4\vec{i}-4\vec{j}-3\vec{k}$ respectively. Let P be a point such that the line drawn through P parallel to $\overline{OB}$ meets OA in L and another line through P parallel to $\overline{OA}$ meets OB in M. If L divides OA in the ratio 2:3 and M divides OB in the ratio 3:2, then the distance from O to P is

(A) $\frac{19}{5}$
(B) $\frac{\sqrt{389}}{5}$
(C) $\frac{\sqrt{341}}{5}$
(D) $\frac{21}{5}$

Answer: (A) $\frac{19}{5}$ · The council's preliminary key

Q214 AP EAPCET 2023 · 17 May · Shift 2 MCQ

For a positive real number λ, if the vector $\vec{a}=\lambda\vec{i}-5\vec{j}+6\vec{k}$ satisfies the equation $\left[\vec{i}\times(\vec{a}\times\vec{i})+\vec{j}\times(\vec{a}\times\vec{j})+\vec{k}\times(\vec{a}\times\vec{k})\right]^2=440$, then $\lambda=$

(A) 3
(B) 4
(C) 7
(D) 11

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

Q215 AP EAPCET 2023 · 17 May · Shift 2 MCQ

Let $\bar{a}=3\bar{i}+\bar{j}-2\bar{k}$, $\bar{b}=-5\bar{i}+7\bar{j}$ and $\bar{c}=3\bar{i}+y\bar{j}$ be three vectors such that $|\bar{a}-\bar{b}+\bar{c}|=\sqrt{141}$. If y_1 and y_2 are the values of y satisfying the given condition, then $|y_1-y_2|=$

(A) 12
(B) 11
(C) 9
(D) 8

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

Q216 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If a point C divides the line segment joining the points with the position vectors $2\bar{i}-3\bar{j}+2\bar{k}$ and $3\bar{i}-\bar{j}-2\bar{k}$ in the ratio $2:3$, then the distance of C from the point with position vector $2\bar{i}-\bar{j}+\bar{k}$ is

EdLoop EAPCET

(A) $\frac{7}{5}$
(B) $\frac{4}{5}$
(C) $\frac{1}{5}$
(D) $\frac{3}{5}$

Answer: (A) $\frac{7}{5}$ · The council's preliminary key

Q217 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If $\bar{a} = (2x + y)\bar{i} + 3\bar{j} + 9\bar{k}$ and $\bar{b} = 2\bar{i} + \bar{j} - (x - y)\bar{k}$ are two collinear vectors, then $x^3 + 27y^3 =$

(A) 1241
(B) 1512
(C) 1072
(D) 1729

Answer: (D) 1729 · The council's preliminary key

Q218 AP EAPCET 2023 · 16 May · Shift 1 MCQ

Let $\bar{a} = \bar{i} - 2\bar{j}$, $\bar{b} = 2\bar{j} + 3\bar{k}$, $\bar{c} = p\bar{i} + q\bar{j}$ and $\bar{d} = p\bar{j} - q\bar{k}$ be four vectors. If $(\bar{a} \times \bar{b}) \cdot \bar{c} = 3 = (\bar{a} \times \bar{b}) \cdot \bar{d}$, then $3p + q =$

(A) 0
(B) 3
(C) -2
(D) 6

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

Q219 AP EAPCET 2023 · 16 May · Shift 1 MCQ

Let $\vec{a} = \hat{i} + 2\hat{j} + 3\hat{k}$ and $\vec{b} = \hat{i} - 2\hat{j} - 3\hat{k}$ be two vectors. If A_1 is the area of the quadrilateral having $\vec{a}, \vec{b}$ as its diagonals and A_2 is the area of the parallelogram having $\vec{a}, \vec{b}$ as its two adjacent sides, then $A_1.A_2 =$

(A) 26
(B) $\frac{27}{2}$
(C) 52
(D) 27

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

Q220 AP EAPCET 2023 · 16 May · Shift 1 MCQ

For some real number λ, if the area of the triangle having $\bar{a} = 3\bar{i} - \bar{j} + \lambda\bar{k}$ and $\bar{b} = \lambda\bar{i} + \bar{j} - 3\bar{k}$ as two of its sides is $\frac{\sqrt{195}}{2}$, then the number of distinct possible values of λ is

EdLoop EAPCET

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

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

Q221 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Let $\bar{a} = 2\bar{i} + \bar{j} - \bar{k}$ and $\bar{b} = \bar{i} + 3\bar{j} - 5\bar{k}$ be two vectors, and $\bar{r}$ be a vector along the vector $3\bar{a} - 2\bar{b}$ such that $|\bar{r}| = \sqrt{74}$. If the direction of $\bar{r}$ is opposite to that of $3\bar{a} - 2\bar{b}$, then $\bar{r} =$

(A) $-7\bar{i} - 4\bar{j} + 3\bar{k}$
(B) $4\bar{i} + 7\bar{j} - 3\bar{k}$
(C) $-4\bar{i} + 3\bar{j} - 7\bar{k}$
(D) $4\bar{i} - 3\bar{j} + 7\bar{k}$

Answer: (C) $-4\bar{i} + 3\bar{j} - 7\bar{k}$ · The council's preliminary key

Q222 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If $\bar{i}$ is the position vector of the centroid G of triangle ABC and $2\bar{i} + \bar{j} + \bar{k}$ and $2\bar{i} + 4\bar{j} - 4\bar{k}$ are respectively the position vectors of its vertices A and B, then $AG^2 + BG^2 + CG^2 =$

(A) 77
(B) 74
(C) 86
(D) 83

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

Q223 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If $\bar{a} = -2\bar{i} + 9\bar{j} - 6\bar{k}$ and $\bar{b} = t\bar{i} - 2\bar{j} + 6\bar{k}$ are vectors such that $|\bar{a} + \bar{b}| = 25$, then the sum of the values of t is

(A) 14
(B) 11
(C) 4
(D) 77

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

Q224 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If $\overline{a} = \bar{i} + 3\bar{j} + 13\overline{k}$ and $\overline{b} = 2\bar{i} - 4\bar{j} + 3\overline{k}$ are two vectors, then the component vector of $\overline{a}$ perpendicular to $\overline{b}$ is

(A) $\bar{i}-\bar{j}-2\bar{k}$
(B) $3\bar{i}+3\bar{j}+2\bar{k}$
(C) $-\bar{i}+7\bar{j}+10\bar{k}$
(D) $4\bar{i}+5\bar{j}+4\bar{k}$

Answer: (C) $-\bar{i}+7\bar{j}+10\bar{k}$ · The council's preliminary key

Q225 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Let $\bar{a}=2\bar{i}-3\bar{j}-5\bar{k}$ and $\bar{b}=3\bar{i}+2\bar{j}-5\bar{k}$ be two vectors and $\bar{r}$ be a vector in the plane of $\bar{a}$ and $\bar{b}$. If $\bar{r}$ is orthogonal to the vector $5\bar{i}-2\bar{j}+3\bar{k}$ and the magnitude of $\bar{r}$ is $\sqrt{94}$, then $|\bar{r}.\bar{b}|=$

(A) 36
(B) 38
(C) 42
(D) 46

Answer: (D) 46 · The council's preliminary key

Q226 AP EAPCET 2023 · 15 May · Shift 1 MCQ

$\bar{a}$ and $\bar{b}$ are two vectors such that $\bar{a}$ is not parallel to $\bar{b}$. If $\bar{p}=(x+2y+3)\bar{a}+(5x-y+2)\bar{b}$ and $\bar{q}=(2x+3y+5)\bar{a}+(x-5y-2)\bar{b}$ are two vectors such that $\bar{p}=2\bar{q}$, then $x-2y=$

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

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

Q227 AP EAPCET 2023 · 15 May · Shift 1 MCQ

$3\bar{i}-2\bar{j}-\bar{k}$, $-2\bar{i}-\bar{j}+3\bar{k}$ and $-\bar{i}+3\bar{j}-2\bar{k}$ are the position vectors of the vertices A, B and C of a ΔABC respectively. If H is its orthocenter, then $\overline{HA}+\overline{HB}+\overline{HC}=$

(A) $2\overline{SA}$
(B) $\bar{0}$
(C) $2\overline{AB}$
(D) $\bar{i}+\bar{j}+\bar{k}$

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

Q228 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $\bar{a}=2\bar{i}+3\bar{j}$, $\bar{b}=3\bar{j}+4\bar{k}$ and $\bar{c}=5\bar{i}+4\bar{k}$ are three vectors, then a vector which is perpendicular to $\bar{a}$ and $\bar{b}\times\bar{c}$ is

EdLoop EAPCET

(A) $45\bar{i}-30\bar{j}+15\bar{k}$
(B) $3\bar{i}-2\bar{j}+\bar{k}$
(C) $-30\bar{i}+20\bar{j}+4\bar{k}$
(D) $-45\bar{i}+30\bar{j}+4\bar{k}$

Answer: (D) $-45\bar{i}+30\bar{j}+4\bar{k}$ · The council's preliminary key

Q229 AP EAPCET 2023 · 15 May · Shift 1 MCQ

Let $\overline{OA}=2\bar{i}-3\bar{j}+\bar{k}$, $\overline{OB}=\bar{i}-4\bar{j}-3\bar{k}$ and $\overline{OC}=-3\bar{i}+\bar{j}+2\bar{k}$ be the position vectors of three points A, B, C respectively. If G is the centroid of triangle ABC, then $BC^2+CA^2+AB^2+9(OG)^2=$

(A) 162
(B) 156
(C) 144
(D) 132

Answer: (A) 162 · The council's preliminary key

Q230 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If $7\bar{i}-4\bar{j}+5\bar{k}$ is the position vector of the vertex A of a tetrahedron ABCD and $-\bar{i}+4\bar{j}-3\bar{k}$ is the position vector of the centroid of the triangle BCD, then the position vector of the centroid of the tetrahedron ABCD is

(A) $-\bar{i}+4\bar{j}-3\bar{k}$
(B) $-\frac{1}{2}\bar{i}+4\bar{j}-3\bar{k}$
(C) $\bar{i}+2\bar{j}-\bar{k}$
(D) $-\bar{i}-2\bar{j}+\bar{k}$

Answer: (C) $\bar{i}+2\bar{j}-\bar{k}$ · The council's preliminary key

Q231 AP EAPCET 2023 · 15 May · Shift 2 MCQ

Let $\overline{OA}=\bar{i}+2\bar{j}-2\bar{k}$ and $\overline{OB}=-2\bar{i}-3\bar{j}+6\bar{k}$ be the position vectors of two points A and B. If C is a point on the bisector $\angle AOB$ and $OC=\sqrt{42}$, then $\overline{OC}=$

(A) $4\bar{i}-\bar{j}+5\bar{k}$
(B) $\bar{i}+5\bar{j}+4\bar{k}$
(C) $5\bar{i}+4\bar{j}+\bar{k}$
(D) $\bar{i}-4\bar{j}+5\bar{k}$

Answer: (B) $\bar{i}+5\bar{j}+4\bar{k}$ · The council's preliminary key

Q232 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If $\bar{a}$ and $\bar{b}$ are two vectors such that $|\bar{a}|=|\bar{b}|=\sqrt{14}$ and $\bar{a}.\bar{b}=-7$, then $\frac{|\bar{a}\times\bar{b}|}{|\bar{a}.\bar{b}|}=$

(A) $7\sqrt{3}$
(B) $\sqrt{3}$
(C) $49\sqrt{3}$
(D) $\frac{\sqrt{3}}{7}$

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

Q233 AP EAPCET 2023 · 15 May · Shift 2 MCQ

Let $(\overline{a}, \overline{b})$ denote the angle between vectors $\overline{a}$ and $\overline{b}$. If $\overline{a} = 2\overline{i} + 3\overline{j} + 6\overline{k}$, $\overline{a}.\overline{b} = 4$ and $(\overline{a}, \overline{b}) = \cos^{-1}\left(\frac{4}{21}\right)$, then $\overline{a} + \overline{b} =$

(A) $3\overline{i} + \overline{j} + 8\overline{k}$
(B) $3\overline{i} + 5\overline{j} + 4\overline{k}$
(C) $3\overline{i} + 5\overline{j} + 8\overline{k}$
(D) $\overline{i} + \overline{j} + 8\overline{k}$

Answer: (D) $\overline{i} + \overline{j} + 8\overline{k}$ · The council's preliminary key

Q234 AP EAPCET 2023 · 15 May · Shift 2 MCQ

The distance of a point $\bar{a}$ from the plane $\bar{r}.\bar{m} = q$ is given by $\frac{|\bar{a}.\bar{m} - q|}{|\bar{m}|}$. If the distance of the point $\bar{i} + 2\bar{j} + 3\bar{k}$ from the plane $\bar{r}.(2\bar{i} + 6\bar{j} - 9\bar{k}) = -1$ is p and the distance of the origin from this plane is q, then $p - q =$

(A) 6
(B) 5
(C) 2
(D) 1

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

Q235 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $|\overline{a}| = 4, |\overline{b}| = 5, |\overline{a} - \overline{b}| = 3$ and θ is the angle between the vectors $\overline{a}$ and $\overline{b}$, then $\cot^2\theta =$

(A) $\frac{9}{16}$
(B) $\frac{4}{3}$
(C) $\frac{3}{4}$
(D) $\frac{16}{9}$

Answer: (D) $\frac{16}{9}$ · The council's preliminary key

Q236 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If A(1, 2, 3), B(3, 7, -2), C(6, 7, 7) and D(-1, 0, -1) are points in a plane, then the vector equation of the line passing through the centroids of ΔABD and ΔACD is

(A) $\bar{r} = (2\bar{i} - \bar{j}) + t(\bar{j} + 4\bar{k})$
(B) $\bar{r} = (1 + t)\bar{i} + 3\bar{j} + 3t\bar{k}$
(C) $\bar{r} = (2\bar{i} + 3\bar{j} + 3\bar{k}) + t(\bar{i} + 3\bar{j})$
(D) $\bar{r} = (\bar{i} + \bar{j} + \bar{k}) + t(2\bar{i} - \bar{j})$

Answer: (B) $\bar{r} = (1 + t)\bar{i} + 3\bar{j} + 3t\bar{k}$ · The council's preliminary key

Q237 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $\overline{a} + \overline{b} + \overline{c} = \overline{0}$, $|\overline{a}| = 3$, $|\overline{b}| = 5$, $|\overline{c}| = 7$, then the angle between $\overline{a}$ and $\overline{b}$ is

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

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

Q238 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $2\bar{i} - \bar{j} + 3\bar{k}, -12\bar{i} - \bar{j} - 3\bar{k}, -\bar{i} + 2\bar{j} - 4\bar{k}$ and $\lambda\bar{i} + 2\bar{j} - \bar{k}$ are the position vectors of four coplanar points, then $\lambda =$

(A) 9
(B) -2
(C) 8
(D) 6

Answer: (D) 6 · Checked by our team

Q239 TS EAMCET 2023 · 14 May · Shift 1 MCQ

Let $\overline{a} = \overline{i} + 2\overline{j} - 2\overline{k}$ and $\overline{b} = 2\overline{i} - \overline{j} - 2\overline{k}$ be two vectors. If the orthogonal projection vector of $\overline{a}$ on $\overline{b}$ is $\overline{x}$ and orthogonal projection vector of $\overline{b}$ on $\overline{a}$ is $\overline{y}$ then $|\overline{x} - \overline{y}| =$

(A) $\frac{4}{9}\sqrt{10}$
(B) $\frac{4}{9}\sqrt{26}$
(C) $\frac{8}{9}\sqrt{10}$
(D) $\frac{8}{9}\sqrt{26}$

Answer: (A) $\frac{4}{9}\sqrt{10}$ · The council's preliminary key

Q240 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If $\vec{a}, \vec{b}, \vec{c}$ are unit vectors such that $\vec{a}$ is perpendicular to both $\vec{b}, \vec{c}$ and angle between $\vec{b}, \vec{c}$ is $\frac{2\pi}{3}$, then $|\vec{a} + 3\vec{b} - 4\vec{c}|^2 =$

EdLoop EAPCET

(A) 6
(B) 14
(C) 38
(D) 26

Answer: (C) 38 · The council's preliminary key

Q241 TS EAMCET 2023 · 14 May · Shift 2 MCQ

Let $\overline{a} = 2\overline{i} - \overline{j} + \overline{k}$ be the position vector of a point A. Let $\overline{b} = \overline{i} + 2\overline{j} - \overline{k}$ and $\overline{c} = \overline{i} + \overline{j} - 2\overline{k}$ be two vectors and $\overline{r}$ be a vector passing through the point $A(\overline{a})$ and parallel to the vector $\overline{b}$. If the projection of $\overline{r}$ on $\overline{c}$ is $\frac{9}{\sqrt{6}}$ then $|\overline{r}| =$

(A) $\sqrt{26}$
(B) 5
(C) $\sqrt{5}$
(D) $\sqrt{34}$

Answer: (A) $\sqrt{26}$ · The council's preliminary key

Q242 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If S is the circumcentre, O is the orthocentre and G is the centroid of a triangle ABC, then match the items of the List-I with those of the items of List-II given below.

List-I	List-II
i) $\overline{SA} + \overline{SB} + \overline{SC}$	a) $2\overline{OS}$
ii) $\overline{GA} + \overline{GB} + \overline{GC}$	b) $\frac{2}{3}\overline{OS}$
iii) $\overline{OA} + \overline{OB} + \overline{OC}$	c) $\overline{0}$
iv) $\overline{OG}$	d) $\overline{SO}$
	e) $\overline{OS}$

Then the correct match is

(A) $i \to c,\ ii \to b,\ iii \to e,\ iv \to a$
(B) $i \to b,\ ii \to c,\ iii \to a,\ iv \to d$
(C) $i \to d,\ ii \to a,\ iii \to c,\ iv \to e$
(D) $i \to d,\ ii \to c,\ iii \to a,\ iv \to b$

Answer: (D) $i \to d,\ ii \to c,\ iii \to a,\ iv \to b$ · The council's preliminary key

Q243 TS EAMCET 2023 · 14 May · Shift 2 MCQ

Let $\vec{a}, \vec{b}, \vec{c}$ be three vectors such that $\vec{a} \cdot \vec{a} = \vec{b} \cdot \vec{b} = \vec{c} \cdot \vec{c} = 5$ and $|\vec{a} + \vec{b} - \vec{c}|^2 + |\vec{b} + \vec{c} - \vec{a}|^2 + |\vec{c} + \vec{a} - \vec{b}|^2 = 50$ then $\vec{a} \cdot \vec{b} + \vec{b} \cdot \vec{c} + \vec{c} \cdot \vec{a} =$

EdLoop EAPCET

(A) $\frac{5}{2}$
(B) $-\frac{5}{2}$
(C) 10
(D) -10

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

Q244 TS EAMCET 2023 · 14 May · Shift 2 MCQ

Let $\bar{c}$ be a vector coplanar with the unit vectors $\bar{a}, \bar{b}$ and let $\bar{d}$ be the unit vector perpendicular to $\bar{a}, \bar{b}$ and $\bar{c}$. If $[\bar{a}\,\bar{b}\,\bar{d}]\bar{c} - [\bar{a}\,\bar{b}\,\bar{c}]\bar{d} = \bar{i} + 2\bar{j} + 2\bar{k}$ and the angle between $\bar{a}$ and $\bar{b}$ is 30°, then $|\bar{c}| =$

(A) 3
(B) $\frac{3}{2}$
(C) 6
(D) 1

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

Q245 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If the vectors $\overline{BC} = 2\bar{i} + \bar{j} + \bar{k}$ and $\overline{CD} = \bar{i} + 2\bar{j} - 2\bar{k}$ represent two adjacent sides of a parallelogram ABCD and θ is the angle between its diagonals $\overline{AC}$ and $\overline{BD}$ then $\tan\theta =$

(A) $\frac{-3}{\sqrt{209}}$
(B) $\frac{-10\sqrt{2}}{3}$
(C) $\frac{10\sqrt{2}}{\sqrt{209}}$
(D) $-\frac{3}{10\sqrt{2}}$

Answer: (B) $\frac{-10\sqrt{2}}{3}$ · The council's preliminary key

Q246 TS EAMCET 2023 · 13 May · Shift 1 MCQ

Let $\overline{a} = \lambda\bar{i} + 3\bar{j} + 4\bar{k}$, $\overline{b} = 3\bar{i} - \bar{j} + \lambda\bar{k}$ and $\overline{c} = \lambda\bar{i} + \bar{j} - 3\bar{k}$ be three vectors for some integer λ. If the volume of the parallelepiped with $\overline{a}, \overline{b}, \overline{c}$ as coterminus edges is 61 cubic units, then the number of possible values of λ is

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

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

EdLoop EAPCET

Q247 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If the points with position vectors $\bar{i}-\bar{j}+\bar{k}$, $2\bar{i}-\bar{k}$, $\bar{j}+2\bar{k}$ and $\bar{i}+\bar{j}+\lambda\bar{k}$ are coplanar, then the magnitude of the vector $6\lambda\bar{i}-3\bar{j}+6\bar{k}$ is

(A) $\sqrt{54}$
(B) $\sqrt{46}$
(C) 7
(D) 9

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

Q248 TS EAMCET 2023 · 13 May · Shift 2 MCQ

Let $\bar{a},\bar{b},\bar{c}$ be three non-coplanar vectors and L be the line passing through the points $\bar{a}-\bar{b}+\bar{c}$ and $\bar{b}-\bar{c}$. If π is a plane passing through the points $2\bar{a}-\bar{b}, 2\bar{b}-\bar{c}$ and $2\bar{c}-\bar{a}$, then the point of intersection of L and π is

(A) $\bar{a}-\bar{b}$
(B) $\bar{b}+\bar{c}$
(C) $\bar{c}-\bar{a}$
(D) $\bar{a}-\bar{b}+\bar{c}$

Answer: (D) $\bar{a}-\bar{b}+\bar{c}$ · The council's preliminary key

Q249 TS EAMCET 2023 · 13 May · Shift 2 MCQ

Let $\bar{a}=\bar{i}-2\bar{j}+2\bar{k}$, $\bar{b}=6\bar{i}+2\bar{j}-3\bar{k}$ and $\bar{c}=3\bar{i}-4\bar{j}-12\bar{k}$ be three vectors. If $\bar{p}$ is the projection of $\bar{b}$ on $\bar{a}$ and $\bar{q}$ is the projection of $\bar{c}$ on $\bar{a}$, then $13\,\bar{p}=$

(A) $4\bar{q}$
(B) $5\bar{q}$
(C) $6\bar{q}$
(D) $7\bar{q}$

Answer: (A) $4\bar{q}$ · The council's preliminary key

Q250 TS EAMCET 2023 · 13 May · Shift 2 MCQ

Let $\bar{a}=\bar{i}+2\bar{j}+3\bar{k}$, $\bar{b}=3\bar{i}-\bar{j}+5\bar{k}$ and $\bar{c}=\bar{i}-4\bar{j}-2\bar{k}$ be three vectors. Let $\bar{r}$ be a vector perpendicular to both $\bar{b},\bar{c}$ and $\bar{r}.\bar{a}=11$. Then the vector among the following that is perpendicular to $\bar{r}$ is

EdLoop EAPCET

(A) $\overline{i}+\overline{j}+\overline{k}$
(B) $\overline{i}-\overline{j}+\overline{k}$
(C) $\overline{i}+\overline{j}-\overline{k}$
(D) $\overline{i}-\overline{j}-\overline{k}$

Answer: (B) $\overline{i}-\overline{j}+\overline{k}$ · The council's preliminary key

Q251 TS EAMCET 2023 · 13 May · Shift 2 MCQ

The volume of the tetrahedron with $\overline{i}-\lambda\overline{j}+\overline{k}$, $\lambda\overline{i}-\overline{j}-\overline{k}$ and $\overline{i}+\overline{j}+\lambda\overline{k}$ as coterminous edges is 2. If λ is an integer, then $|\lambda\overline{i}-3\lambda\overline{j}+3\overline{k}|=$

(A) 3
(B) $\sqrt{19}$
(C) 7
(D) 13

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

Q252 TS EAMCET 2023 · 12 May · Shift 1 MCQ

$\bar{a},\bar{b},\bar{c}$ are three-unit vectors such that $|\bar{a}+\bar{b}+\bar{c}|=1$ and $\bar{a}$ is perpendicular to $\bar{b}$. If $\bar{c}$ makes angles α,β with $\bar{a},\bar{b}$ respectively, then $\cos\alpha+\cos\beta=$

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

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

Q253 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If $\overline{a}$ is a vector such that $\overline{a}\times\overline{i}=\overline{j}+\overline{k}$ and $\overline{a}.\overline{i}=1$, then equation of the line passing through the point $\overline{i}+\overline{j}+\overline{k}$ and parallel to $\vec{a}$ is

(A) $\overline{r}=(t+1)\overline{i}+(1-t)\overline{j}+(t+1)\overline{k}$
(B) $\overline{r}=(t+1)\overline{i}-(2t-1)\overline{j}+t\overline{k}$
(C) $\overline{r}=\overline{i}+t\overline{j}-t\overline{k}$
(D) $\overline{r}=5t\overline{i}+7t\overline{j}+\overline{k}$

Answer: (A) $\overline{r}=(t+1)\overline{i}+(1-t)\overline{j}+(t+1)\overline{k}$ · The council's preliminary key

Q254 TS EAMCET 2023 · 12 May · Shift 1 MCQ

The position vectors of the points A, B are $\overline{a},\overline{b}$ respectively. If the position vector of the point C is $\frac{\overline{a}}{2}+\frac{\overline{b}}{3}$, then

(A) C lies inside ΔOAB
(B) C lies outside ΔOAB but inside $\angle AOB$
(C) C lies outside ΔOAB but inside $\angle OAB$
(D) C lies outside ΔOAB but inside $\angle OBA$

Answer: (A) C lies inside ΔOAB · The council's preliminary key

Q255 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If $|\overline{a}| = 1$, $|\overline{b}| = 2$, $|\overline{a} - \overline{b}|^2 + |\overline{a} + 2\overline{b}|^2 = 20$ then $(\overline{a}, \overline{b}) =$

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

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

Q256 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If two vectors $\overline{a}$ and $\overline{b}$ which are perpendicular to each other are such that $|\overline{a}| = 8$ and $|\overline{b}| = 3$, then $|\overline{a} - 2\overline{b}| =$

(A) 10
(B) 2
(C) 6
(D) 12

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

Q257 TS EAMCET 2023 · 12 May · Shift 2 MCQ

Let $\overline{a}$ and $\overline{b}$ be non-collinear vectors. If the vectors $(\lambda - 1)\overline{a} + 2\overline{b}$ and $3\overline{a} + \lambda\overline{b}$ are collinear, then the set of all possible values of λ is

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

Answer: (B) $\{-2, 3\}$ · The council's preliminary key

Q258 TS EAMCET 2023 · 12 May · Shift 2 MCQ

Vectors $\overline{p} = a\overline{i} + b\overline{j} + c\overline{k}$, $\overline{q} = d\overline{i} + 3\overline{j} + 4\overline{k}$ and $\overline{r} = 3\overline{i} + \overline{j} - 2\overline{k}$ forming a triangle ABC are such that $\overline{p} = \overline{q} + \overline{r}$. If the area of ΔABC is $5\sqrt{6}$ sq. units, then the sum of the absolute values of a, b, c is

EdLoop EAPCET

(A) 14
(B) 13
(C) 12
(D) 10

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

Q259 TS EAMCET 2023 · 12 May · Shift 2 MCQ

$\bar{b}$ and $\bar{c}$ are non collinear vectors and $(\bar{c}.\bar{c})\bar{a} = \bar{c}$.

If $(\overline{a.c})\bar{b} - (\overline{a.b})\bar{c} + (\bar{a}.\bar{b})\bar{b} = (4 - 2\beta - \sin\alpha)\bar{b} + (\beta^2 - 1)\bar{c}$ then $Sin(\alpha + \beta) =$

(A) 0
(B) 1
(C) $\sin 1$
(D) $\cos 1$

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

Q260 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Let ABC be a triangle and $\bar{a}, \bar{b}, \bar{c}$ be the position vectors of A, B, C respectively. If D divides BC in the ratio 2 : 3 internally and E divides CA in the ratio 2 : 1 internally then the position vector of the point P which divides DE in the ratio 3 : 5 internally is

(A) $\frac{1}{8}(2\bar{a} + 3\bar{b} + 3\bar{c})$
(B) $\frac{1}{8}(3\bar{a} + 2\bar{b} + 3\bar{c})$
(C) $\frac{1}{8}(3\bar{a} + 3\bar{b} + 2\bar{c})$
(D) $\frac{3}{8}(\bar{a} + \bar{b} + \bar{c})$

Answer: (A) $\frac{1}{8}(2\bar{a} + 3\bar{b} + 3\bar{c})$ · The council's preliminary key

Q261 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

If $2\bar{i} + 4\bar{j} - 5\bar{k}$, $\bar{i} + \bar{j} + \bar{k}$, $\bar{j} + 2\bar{k}$ are the position vectors of the vertices A, B, C of a triangle respectively, then a unit vector along the median drawn through the vertex A is

EdLoop EAPCET

(A) $\frac{1}{\sqrt{174}}(5\bar{i}+10\bar{j}-7\bar{k})$
(B) $\frac{1}{\sqrt{214}}(3\bar{i}+6\bar{j}-13\bar{k})$
(C) $\frac{1}{\sqrt{66}}(\bar{i}+\bar{j}-8\bar{k})$
(D) $\frac{1}{7}(3\bar{i}+6\bar{j}-2\bar{k})$

Answer: (B) $\frac{1}{\sqrt{214}}(3\bar{i}+6\bar{j}-13\bar{k})$ · The council's preliminary key

Q262 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Let $\bar{a},\bar{b},\bar{c}$ be three unit vectors satisfying $|\bar{a}-\bar{b}|^2+|\bar{a}-\bar{c}|^2=10$. Then
Statement (I) : $|\bar{a}+2\bar{b}|^2+|2\bar{a}+\bar{c}|^2=2$.
Statement (II) : $|2\bar{a}+3\bar{b}|^2+|3\bar{a}+2\bar{c}|^2=10$.
Which of the above statements is(are) true?

(A) Statement I is true, but Statement II is false
(B) Statement II is true but Statement I is false
(C) Both Statement I and Statement II are true
(D) Both Statement I and Statement II are false

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

Q263 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Let ABC be a triangle and $\bar{a},\bar{b},\bar{c}$ be the position vectors of A, B, C respectively. Let D divide BC in the ratio 3:1 internally and E divide AD in the ratio 4:1 internally. Let BE meet AC in F. If E divides BF in the ratio 3 : 2 internally then the position vector of F is

(A) $\frac{\bar{a}+\bar{b}+\bar{c}}{3}$
(B) $\frac{\bar{a}-2\bar{b}+3\bar{c}}{2}$
(C) $\frac{\bar{a}+2\bar{b}+3\bar{c}}{2}$
(D) $\frac{\bar{a}-\bar{b}+3\bar{c}}{3}$

Answer: (D) $\frac{\bar{a}-\bar{b}+3\bar{c}}{3}$ · The council's preliminary key

Q264 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If α,β,γ are real numbers such that $\left(\frac{7}{3}+\beta\right)\bar{i}-\bar{j}+(\alpha+\gamma)\bar{k}=\frac{5}{3}\left(\alpha\bar{i}+\bar{j}-\bar{k}\right)+\beta\left(2\bar{j}+\bar{k}\right)+\left(\bar{i}+\gamma\bar{j}+3\bar{k}\right)$, then $5\alpha-9\beta+13\gamma=$

(A) 4
(B) 12
(C) 0
(D) 15

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

Q265 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If $\bar{a}=2\bar{i}+\bar{j}-\bar{k},\ \bar{b}=\bar{i}-\bar{j}+3\bar{k},\ \bar{x}=\left(\frac{\bar{a}\cdot\bar{b}}{|\bar{b}|^2}\right)\bar{b},\ \bar{y}=\left(\frac{\bar{a}\cdot\bar{b}}{|\bar{a}|^2}\right)\bar{a}$ and θ is angle between $\bar{a}$ and $\bar{b}$, then $x^2+y^2=$

(A) $17\cos^2\theta$
(B) $(\sqrt{6}+\sqrt{11})\cos^2\theta$
(C) $17\cos 2\theta$
(D) $17\sin^2\theta$

Answer: (A) $17\cos^2\theta$ · The council's preliminary key

Q266 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Three non-coplanar vectors $\bar{a},\bar{b},\bar{c}$ are the coterminous edges of a parallelepiped. If $\bar{a}$ and $\bar{b}$ determine the base of the parallelepiped then its height is

(A) $\frac{\left|[\bar{a}\,\bar{b}\,\bar{c}]\right|}{|\bar{b}\times\bar{c}|}$
(B) $\frac{\left|[\bar{a}\,\bar{b}\,\bar{c}]\right|}{|\bar{a}\times\bar{b}|}$
(C) $\frac{\left|[\bar{a}\,\bar{b}\,\bar{c}]\right|}{|\bar{a}\times\bar{c}|}$
(D) $\frac{\left|[\bar{a}\,\bar{b}\,\bar{c}]\right|}{|\bar{b}+\bar{c}|}$

Answer: (B) $\frac{\left|[\bar{a}\,\bar{b}\,\bar{c}]\right|}{|\bar{a}\times\bar{b}|}$ · The council's preliminary key

Q267 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

Let the vectors $\overline{AB}=2\bar{i}+2\bar{j}+\bar{k}$ and $\overline{AC}=2\bar{i}+4\bar{j}+4\bar{k}$ be two sides of a triangle ABC. If G is the centroid of ΔABC, then $\frac{27}{7}\left|\overline{AG}\right|^2+5=$

(A) 25
(B) 38
(C) 47
(D) 52

Answer: (B) 38 · The council's preliminary key

Q268 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If (α, β, γ) is a triad of real numbers satisfying $\bar{i} - 2\bar{j} + 5\bar{k} = \alpha(\bar{i} + \bar{j} + \bar{k}) + \beta(\bar{i} + 2\bar{j} + 3\bar{k}) + \gamma(2\bar{i} - \bar{j} + \bar{k})$, then $\alpha^2 - \beta^2 + \gamma^2 =$

(A) 23
(B) 31
(C) 40
(D) -6

Answer: (B) 31 · The council's preliminary key

Q269 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

Let L be a line passing through a point A and parallel to the vector $2\bar{i} + \bar{j} - 2\bar{k}$. Let $-7\bar{i} - 5\bar{j} + 11\bar{k}$ be the position vector of a point P on L such that $|\overline{AP}| = 12$. Then the position vector of A can be

(A) $\bar{i} + \bar{j} + 3\bar{k}$
(B) $15\bar{i} + 9\bar{j} - 19\bar{k}$
(C) $-\bar{i} - \bar{j} + 3\bar{k}$
(D) $-15\bar{i} - 9\bar{j} + 19\bar{k}$

Answer: (D) $-15\bar{i} - 9\bar{j} + 19\bar{k}$ · The council's preliminary key

Q270 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

If θ is the angle between the vectors $2\bar{i} - \bar{j} + 2\bar{k}$ and $a\bar{i} + 4\bar{j} + b\bar{k}$ and $\cos\theta = \frac{2}{3}$ then $2(a + b + 3) =$

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

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

Q271 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

A bisector of the angle between the normals of the planes $4x + 3y = 5$ and $x + 2y + 2z = 4$ is along the vector

(A) $(17\bar{i} + 9\bar{j} - 12\bar{k})$
(B) $(17\bar{i} - 9\bar{j} + 12\bar{k})$
(C) $(17\bar{i} - \bar{j} + 10\bar{k})$
(D) $(7\bar{i} - \bar{j} - 10\bar{k})$

Answer: (D) $(7\bar{i} - \bar{j} - 10\bar{k})$ · The council's preliminary key

EdLoop EAPCET

Q272 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

Let the volume of the tetrahedron with vertices $\bar{i}-\bar{j}-2\bar{k}$, $-2\bar{i}+\bar{j}-2\bar{k}$, $-\bar{i}-2\bar{j}+\bar{k}$, $2\bar{i}+2\bar{j}+a\bar{k}$ be $\frac{20}{3}$. Then the integral value of a is

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

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

Q273 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If $2\bar{i}-\bar{j}+\bar{k}$, $\bar{i}-3\bar{j}-5\bar{k}$ are the position vectors of the points A and B respectively, C divides AB in the ratio $2:3$ and M is the mid-point of AB, then 5 (position vector of C) $-$ 2 (position vector of M) $=$

(A) $5\bar{i}-5\bar{j}-3\bar{k}$
(B) $11\bar{i}-13\bar{j}-11\bar{k}$
(C) $5\bar{i}+5\bar{j}-3\bar{k}$
(D) $11\bar{i}+13\bar{j}-11\bar{k}$

Answer: (A) $5\bar{i}-5\bar{j}-3\bar{k}$ · The council's preliminary key

Q274 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If $\bar{a},\bar{b},\bar{c}$ are the non-coplanar vectors and $\bar{a}-2\bar{b}+3\bar{c}$, $-4\bar{a}+5\bar{b}-6\bar{c}$, $x\bar{a}-9\bar{b}+z\bar{c}$ are collinear points then $2x-z=$

(A) -10
(B) -9
(C) 0
(D) 9

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

Q275 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If $\bar{a}=\bar{i}-2\bar{j}-2\bar{k}$ and $\bar{b}=2\bar{i}-3\bar{j}+\bar{k}$, then the component of $\bar{b}$ perpendicular to $\bar{a}$ is

(A) $\frac{1}{3}\left(4\bar{i}-5\bar{j}+7\bar{k}\right)$
(B) $\frac{1}{3}\left(8\bar{i}-13\bar{j}-\bar{k}\right)$
(C) $\frac{2}{3}\left(\bar{i}-2\bar{j}-2\bar{k}\right)$
(D) $\frac{1}{7}\left(\bar{i}-5\bar{j}-17\bar{k}\right)$

Answer: (A) $\frac{1}{3}\left(4\bar{i}-5\bar{j}+7\bar{k}\right)$ · The council's preliminary key

EdLoop EAPCET

Q276 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If $2\bar{i}+3\bar{j}-4\bar{k}$ and $-\bar{i}+2\bar{j}+\bar{k}$ are the two diagonals of a parallelogram, then the area of the parallelogram in square units is

(A) $\frac{1}{2}\sqrt{170}$
(B) $\sqrt{174}$
(C) $\sqrt{\frac{87}{2}}$
(D) $\frac{1}{4}\sqrt{174}$

Answer: (C) $\sqrt{\frac{87}{2}}$ · The council's preliminary key

Q277 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

In a triangle ABC, D and E divide the sides BC and CA in the ratio 2:1 respectively. If P is the point of intersection of AD and BE then the ratio in which P divides AD is

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

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

Q278 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If the points with position vectors $\bar{i}-2\bar{j}+3\bar{k}$, $2\bar{i}+3\bar{j}-4\bar{k}$, $-3\bar{i}+\bar{j}-5\bar{k}$ and $a\bar{i}-2\bar{j}+4\bar{k}$ are coplanar then $a=$

(A) $\frac{-4}{19}$
(B) $\frac{42}{19}$
(C) $\frac{-42}{19}$
(D) $\frac{4}{19}$

Answer: (B) $\frac{42}{19}$ · The council's preliminary key

Q279 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If P is a point on the line parallel to the vector $2\bar{i}-3\bar{j}-6\bar{k}$ and passing through the point A whose position vector is $\bar{i}+2\bar{j}-2\bar{k}$ and $AP=21$, then the position vector of P can be

(A) $6\bar{i}-9\bar{j}-18\bar{k}$
(B) $6\bar{i}+9\bar{j}-18\bar{k}$
(C) $-5\bar{i}+11\bar{j}+16\bar{k}$
(D) $5\bar{i}-11\bar{j}+16\bar{k}$

Answer: (C) $-5\bar{i}+11\bar{j}+16\bar{k}$ · The council's preliminary key

Q280 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Let $\bar{a}$ be a vector in the plane containing vectors $\bar{b}=\bar{i}+2\bar{j}+\bar{k}$ and $\bar{c}=2\bar{i}-\bar{j}+\bar{k}$. If $\bar{a}$ is perpendicular to $\bar{i}+\bar{j}+3\bar{k}$ and its projection on $\bar{b}$ is $3\sqrt{6}$, then $|\bar{a}|^2=$

(A) 186
(B) 36
(C) 128
(D) 264

Answer: (D) 264 · The council's preliminary key

Q281 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Let $\bar{a}=\bar{i}+\bar{j}+\bar{k},\ \bar{b}=\bar{i}-2\bar{j}+\bar{k},\ \bar{c}=\bar{i}+3\bar{j}-2\bar{k},\ \bar{d}=2\bar{i}+\bar{j}-\bar{k}$ be four vectors and let $l=\bar{b}\cdot\bar{c}$ and $m=\bar{c}\cdot\bar{a}$. Then $[m\bar{b}+l\bar{a}\quad\bar{b}\quad\bar{d}]=$

(A) 79
(B) -63
(C) 0
(D) 1

Answer: (B) -63 · The council's preliminary key

Q282 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If $3\bar{i}-5\bar{j}+2\bar{k}$, $7\bar{i}+2\bar{j}-4\bar{k}$, $\bar{i}-3\bar{j}+4\bar{k}$ and $-7\bar{i}-17\bar{j}+16\bar{k}$ are position vectors of the points A, B, C and D respectively, then the angle between $\overline{AB}$ and $\overline{CD}$ is

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

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

Q283 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If $A(2\bar{i}+\bar{j}-\bar{k})$, $B(\lambda\bar{i}+5\bar{j}+4\bar{k})$, $C(-4\bar{i}+3\bar{j}+2\bar{k})$ and $D(-\bar{i}-2\bar{j}+3\bar{k})$ are four points in space such that $\overline{AB}=x\overline{AC}+y\overline{AD}$ for some real numbers $x\neq 0, y\neq 0$ then $17(\lambda+9)=$

EdLoop EAPCET

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

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

Q284 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

Let $\bar{a} = \bar{i} + \bar{j} + \bar{k}$ and $\bar{b}$ be two vectors such that $\bar{a} \cdot \bar{b} = 1$, $\cos(\bar{a}, \bar{b}) = \frac{1}{3}$ and the components of $\bar{b}$ w.r.t $(\bar{i}, \bar{j}, \bar{k})$ be integers. Then the number of possible vectors that represent $\bar{b}$ is

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

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

Q285 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If $\bar{a}$ and $\bar{b}$ are two vectors such that $\bar{a} = 2\bar{i} + 2\bar{j} + p\bar{k}$, $|\bar{b}| = 7$, $\bar{a} \cdot \bar{b} = 4$ and $|\bar{a} \times \bar{b}| = 5\sqrt{17}$ then $p =$

(A) ± 5
(B) ± 6
(C) ± 1
(D) ± 3

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

Q286 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

If $G(2, -1, 2)$ is the centroid of tetrahedron $OABC$ where $O = (0, 0, 0)$ and G_1 is the centroid of $\triangle ABC$, then $|\overline{OG_1}| =$

(A) 1
(B) $\frac{3}{2}$
(C) 4
(D) $\frac{9}{2}$

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

Q287 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

Let $\overline{a} = a_1\overline{i} + a_2\overline{j} + a_3\overline{k}$ where a_1, a_2, a_3 and $|\overline{a}|$ are rational numbers. If $\overline{a}$ makes an angle 45^0 with $\overline{b}$ and $\overline{b} = \sqrt{2}\,\overline{i} + 3\sqrt{2}\,\overline{j} + 4\overline{k}$ then $\overline{a}$ lies in

EdLoop EAPCET

(A) XY – plane
(B) YZ – plane
(C) XZ – plane
(D) along the bisector of the angle between $\overline{k}$ and $-\overline{b}$

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

Q288 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

If $\overline{e_1}, \overline{e_2}$ are two non-collinear unit vectors such that $|\overline{e_1}+\overline{e_2}|=\sqrt{3}$ then $(2\overline{e_1}-5\overline{e_2})\cdot(3\overline{e_1}+\overline{e_2})=$

(A) $\frac{11}{2}$
(B) $\frac{-11}{2}$
(C) $\frac{9}{2}$
(D) $\frac{-9}{2}$

Answer: (B) $\frac{-11}{2}$ · The council's preliminary key

Q289 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

A, B, C, D are any 4 points and $|\overline{AB}\times\overline{CD}+\overline{BC}\times\overline{AD}+\overline{CA}\times\overline{BD}|=\lambda\,(\text{Area of }\triangle ABC)$ then $\lambda=$

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

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

Q290 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If $\overline{a},\overline{b}$ be two non collinear vectors and the vector $\overline{a}+\overline{b}$ bisects the angle between $\overline{a}$ and $\overline{b}$, then

(A) $|\overline{a}|=|\overline{b}|$
(B) angle between $\overline{a},\overline{b}$ is 0^0 (or) π
(C) $\overline{a},\overline{b}$ always form adjacent sides of a square.
(D) $\overline{a},\overline{b}$ always form adjacent sides of a rectangle.

Answer: (A) $|\overline{a}|=|\overline{b}|$ · The council's preliminary key

Q291 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

$OABCD$ is a pentagon in which the sides OA and CB are parallel and the sides OD and AB are parallel. Also, it is given that $\frac{OA}{CB}=2$, $\frac{OD}{AB}=\frac{1}{3}$. If $\overrightarrow{OA}=\overline{a}$, $\overrightarrow{OD}=\overline{d}$, then $\overrightarrow{AD}+\overrightarrow{OC}+\overrightarrow{DC}=$

(A) $\overline{d}-\overline{a}$
(B) $\frac{1}{2}\overline{a}+3\overline{d}$
(C) $\frac{1}{2}\overline{a}+2\overline{d}$
(D) $6\overline{d}$

Answer: (D) $6\overline{d}$ · The council's preliminary key

Q292 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If the points $\overline{P}=\overline{i}+2\overline{j}$, $\overline{Q}=4\overline{i}+6\overline{j}$, $\overline{R}=5\overline{i}+7\overline{j}$, $\overline{S}=a\overline{i}+b\overline{j}$ are the consecutive vertices of a parallelogram PQRS, then

(A) $a=2,\ b=4$
(B) $a=3,\ b=4$
(C) $a=2,\ b=3$
(D) $a=3,\ b=5$

Answer: (C) $a=2,\ b=3$ · The council's preliminary key

Q293 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If $\overline{a}=4\overline{i}+6\overline{j}$, $\overline{b}=3\overline{j}+4\overline{k}$ and $\overline{c}$ is the projection vector of $\overline{a}$ on $\overline{b}$, then $\overline{c}$ and $|\overline{c}|$ respectively are

(A) $\frac{18}{25}\overline{b},\ \frac{18}{5}$
(B) $\frac{18}{5}\overline{b},\ 18$
(C) $\frac{25}{18}\overline{b},\ \frac{18}{5}$
(D) $\frac{5}{18}\overline{b},\ \frac{5}{18}$

Answer: (A) $\frac{18}{25}\overline{b},\ \frac{18}{5}$ · The council's preliminary key

Q294 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

The distance between a point P whose position vector is $5\overline{i}+\overline{j}+3\overline{k}$ and the line $\overline{r}=(3\overline{i}+7\overline{j}+\overline{k})+t(\overline{j}+\overline{k})$ is

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

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

EdLoop EAPCET

Q295 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

PQRS is a quadrilateral and $\overline{PQ} = \bar{a}$, $\overline{QR} = \bar{b}$, $\overline{SP} = \bar{a} - \bar{b}$, M is the midpoint of QR and X is a point on $\overline{SM}$ such that $\overline{SX} = \frac{4}{5}\overline{SM}$. If $\overline{SM} = m(4\bar{a} - \bar{b})$ and $\overline{SX} = n(4\bar{a} - \bar{b})$, then $m + n =$

(A) $9/10$
(B) $10/9$
(C) $11/9$
(D) $4/3$

Answer: (A) $9/10$ · The council's preliminary key

Q296 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

If C is the midpoint of the line segment $\overline{AB}$ and P is any point outside the line AB, then

(A) $\overline{PA} + \overline{PB} + 2\overline{PC} = \bar{0}$
(B) $\overline{PA} + \overline{PB} + \overline{PC} = \bar{0}$
(C) $\overline{PA} + \overline{PB} = 2\overline{PC}$
(D) $\overline{PA} + \overline{PB} = \overline{PC}$

Answer: (C) $\overline{PA} + \overline{PB} = 2\overline{PC}$ · The council's preliminary key

Q297 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

$\bar{a}$, $\bar{b}$ are non-collinear vectors, $|\bar{a}| = 2\sqrt{2}$, $|\bar{b}| = 3$ and the angle between $\bar{a}$ and $\bar{b}$ is 45^0. Then the lengths of the diagonals of the parallelogram whose adjacent sides are represented by the vectors $5\bar{a} + 2\bar{b}$ and $\bar{a} - 3\bar{b}$ are

(A) $15, 593$
(B) $15, \sqrt{593}$
(C) $225, \sqrt{593}$
(D) $225, 593$

Answer: (B) $15, \sqrt{593}$ · The council's preliminary key

Q298 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

Two vertices of a triangle are at $-\bar{i} + 3\bar{j}$ and $2\bar{i} + 5\bar{j}$ and its orthocenter is at $\bar{i} + 2\bar{j}$. If the position vector of the 3rd vertex is $a\bar{i} + b\bar{j}$, then $(a, b) =$

(A) $\left(\frac{5}{7}, \frac{5}{7}\right)$
(B) $\left(\frac{5}{7}, \frac{17}{7}\right)$
(C) $\left(\frac{-5}{7}, \frac{17}{7}\right)$
(D) $\left(\frac{5}{7}, \frac{-17}{7}\right)$

Answer: (B) $\left(\frac{5}{7}, \frac{17}{7}\right)$ · The council's preliminary key

---

Q299 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

If 3 vectors $\bar{a}, \bar{b}, \bar{c}$ are such that $\bar{a} \neq \bar{0}$ and $\bar{a} \times \bar{b} = 2(\bar{a} \times \bar{c})$, $|\bar{a}| = 1$, $|\bar{c}| = 1$, $|\bar{b}| = 4$ and angle between $\bar{b}$ and $\bar{c}$ is $\cos^{-1}\left(\frac{1}{4}\right)$ and $\bar{b} - 2\bar{c} = \lambda\bar{a}$, then $\lambda =$

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

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

Q300 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

Let $\overline{a} = \overline{i} + x\overline{j} + \overline{k}$, $\overline{b} = \overline{i} + \overline{j} + \overline{k}$ and $|\overline{a} + \overline{b}| = |\overline{a}| + |\overline{b}|$ then

(A) $x = 1$
(B) $x = -1$
(C) $x = 0$
(D) No such Real x exits (sic)

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

Q301 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If $\overline{a} = \overline{i} + 2\overline{j} + 3\overline{k}$, $\overline{b} = 2\overline{i} + 3\overline{j} + \overline{k}$, $\overline{c} = 8\overline{i} + 13\overline{j} + 9\overline{k}$ and $x\overline{a} + y\overline{b} + z\overline{c} = 0$, then $\frac{xy}{z^2} =$

(A) -1
(B) -6
(C) 6
(D) 1

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

Q302 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

The vector $\overline{x}$ is perpendicular to the vectors $\overline{a}=3\overline{i}+2\overline{j}+2\overline{k}$, $\overline{b}=18\overline{i}-22\overline{j}-5\overline{k}$ and makes an obtuse angle with $\overline{j}$. If $|x|=28$, then $\overline{x}=$

(A) $8\overline{i}+12\overline{j}+24\overline{k}$
(B) $-8\overline{i}+6\overline{j}+24\overline{k}$
(C) $8\overline{i}-12\overline{j}-24\overline{k}$
(D) $-8\overline{i}-12\overline{j}+24\overline{k}$

Answer: (D) $-8\overline{i}-12\overline{j}+24\overline{k}$ · The council's preliminary key

Q303 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

$\overline{a},\overline{b}$ are two vectors such that $|\overline{a}|=\sqrt{3}$, $|\overline{b}|=\sqrt{2}$. If $\overline{x}$ is a unit vector satisfying $\overline{x}\times\overline{a}=\overline{b}$ then $\overline{x}=$

(A) $\frac{1}{2}\left[(\overline{x}.\overline{a})\overline{a}-\overline{b}\times\overline{a}\right]$
(B) $\frac{1}{2}\left[\pm(\overline{x}.\overline{a})\overline{a}+(\overline{b}\times\overline{a})\right]$
(C) $\frac{1}{3}\left[(\overline{x}.\overline{a})\overline{a}+\overline{b}\times\overline{a}\right]$
(D) $\frac{1}{3}\left[\overline{a}\times\overline{b}\pm\overline{a}\right]$

Answer: (D) $\frac{1}{3}\left[\overline{a}\times\overline{b}\pm\overline{a}\right]$ · The council's preliminary key

Q304 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

The set of real values of λ for which the vectors $\lambda\overline{i}-3\overline{j}+5\overline{k}$ and $2\lambda\overline{i}-\lambda\overline{j}+\overline{k}$ are perpendicular to each other is

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

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

Q305 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If $\bar{a}=(p,-2,5)$ and $\bar{b}=(1,q,-3)$ are collinear vectors then

(A) $p=\frac{5}{3},\ q=\frac{6}{5}$
(B) $p=\frac{-5}{3},\ q=\frac{-6}{5}$
(C) $p=\frac{5}{3},\ q=\frac{-6}{5}$
(D) $p=\frac{-5}{3},\ q=\frac{6}{5}$

Answer: (D) $p=\frac{-5}{3},\ q=\frac{6}{5}$ · The council's preliminary key

Q306 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If origin is the ortho-center of an equilateral triangle whose vertices are $\bar{a},\bar{b},\bar{c}$ then

(A) $\bar{a}+\bar{b}=\bar{c}$
(B) $\bar{a}+\bar{b}=-\bar{c}$
(C) $|\bar{a}|^2=|\bar{b}|^2=|\bar{c}|^2$
(D) $\bar{a}=\bar{b}=\bar{c}$

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

Q307 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

Let $\bar{a}=2\bar{i}+3\bar{j}+\bar{k}$, $\bar{b}=4\bar{i}+\bar{j}$, $\bar{c}=\bar{i}-3\bar{j}-7\bar{k}$. If $\bar{r}=x\bar{i}+y\bar{j}+z\bar{k}$, $\bar{r}.\bar{a}=9$, $\bar{r}.\bar{b}=7$, $\bar{r}.\bar{c}=6$ then $(x,y,z)=$

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

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

Q308 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If ABCD is a cyclic quadrilateral with R as the radius of the circumcircle and $(AB)^2+(CD)^2=4R^2$ then

(A) $\bar{b}.\bar{c}-\bar{a}.\bar{d}=0$
(B) $\bar{a}.\bar{c}-\bar{b}.\bar{d}=0$
(C) $\bar{a}.\bar{b}+\bar{c}.\bar{d}=0$
(D) $\bar{a}.\bar{c}+\bar{b}.\bar{d}=0$

Answer: (C) $\bar{a}.\bar{b}+\bar{c}.\bar{d}=0$ · The council's preliminary key

Q309 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If $|a|=13$, $|b|=5$ and $\bar{a}.\bar{b}=60$ then $|\bar{a}\times\bar{b}|=$

(A) 15
(B) 20
(C) 30
(D) 25

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

Q310 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

The vectors $\bar{a}=2\bar{i}+3\bar{j}+6\bar{k}$ and $\bar{b}$ are collinear and $|\bar{b}|=21$, then $\bar{b}=$

EdLoop EAPCET

(A) $\pm(2\bar{i}+3\bar{j}+6\bar{k})$
(B) $\pm(6\bar{i}+9\bar{j}+18\bar{k})$
(C) $\frac{21}{\sqrt{3}}(\bar{i}+\bar{j}+\bar{k})$
(D) $\pm 21(2\bar{i}+3\bar{j}+6\bar{k})$

Answer: (B) $\pm(6\bar{i}+9\bar{j}+18\bar{k})$ · The council's preliminary key

Q311 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

In a trapezium $ABCD$, $\overline{BC}=\lambda\overline{AD}$ and $\bar{x}=\overline{AC}+\overline{BD}$. If $\bar{x}=p\overline{AD}$ then $p=$

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

Answer: (B) $\lambda+1$ · The council's preliminary key

Q312 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

In a ΔABC, $|\overline{CB}|=\bar{a}$, $|\overline{CA}|=\bar{b}$, $|\overline{AB}|=\bar{c}$ and CD is the median through the vertex C. Then $\overline{CA}.\overline{CD}=$

(A) $\frac{1}{4}(3a^2+b^2-c^2)$
(B) $\frac{1}{4}(a^2+3b^2-c^2)$
(C) $\frac{1}{4}(a^2+b^2-3c^2)$
(D) $\frac{1}{4}(-3a^2-b^2+c^2)$

Answer: (B) $\frac{1}{4}(a^2+3b^2-c^2)$ · The council's preliminary key

Q313 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

If $\bar{a}=\bar{i}+\bar{j}+\bar{k}$, $\bar{c}=\bar{j}-\bar{k}$, $\bar{a}\times\bar{b}=\bar{c}$ and $\bar{a}.\bar{b}=3$ then $\bar{b}=$

(A) $\frac{1}{3}(5\bar{i}+2\bar{j}+2\bar{k})$
(B) $\frac{1}{3}(2\bar{i}+5\bar{j}+2\bar{k})$
(C) $\frac{1}{3}(2\bar{i}+2\bar{j}+3\bar{k})$
(D) $\frac{1}{3}(2\bar{i}+5\bar{j}+5\bar{k})$

Answer: (A) $\frac{1}{3}(5\bar{i}+2\bar{j}+2\bar{k})$ · The council's preliminary key

EdLoop EAPCET

Q314 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

$\bar{a}, \bar{b}, \bar{c}$ are non-coplanar vectors. If $\bar{a} + 3\bar{b} + 4\bar{c} = x(\bar{a} - 2\bar{b} + 3\bar{c}) + y(\bar{a} + 5\bar{b} - 2\bar{c}) + z(6\bar{a} + 14\bar{b} + 4\bar{c})$ then $x + y + z =$

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

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

Q315 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Three vectors of magnitudes a, 2a, 3a are along the directions of the diagonals of 3 adjacent faces of a cube that meet in a point. Then the magnitude of the sum of those diagonals is

(A) 4a
(B) 5a
(C) 6a
(D) 8a

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

Q316 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

If $\bar{a}$ is collinear with $\bar{b} = 3\bar{i} + 6\bar{j} + 6\bar{k}$ and $\bar{a} \cdot \bar{b} = 27$ then $|\bar{a}| =$

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

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

Q317 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Let $\bar{a}, \bar{b}, \bar{c}$ be unit vectors such that $\bar{a}$ is perpendicular to the plane containing $\bar{b}$ and $\bar{c}$ and angle between $\bar{b}$ and $\bar{c}$ is $\frac{\pi}{3}$. Then $|\bar{a} + \bar{b} + \bar{c}| =$

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

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

EdLoop EAPCET

Q318 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Let $\bar{F} = 2\bar{i} + 2\bar{j} + 5\bar{k}$, $A = (1, 2, 5)$, $B = (-1, -2, -3)$ and $\overline{BA} \times \bar{F} = 4\bar{i} + 6\bar{j} + 2\lambda\bar{k}$ then $\lambda =$

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

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

Q319 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If the position vectors of the points A, B, C, D are $7\bar{i} - 4\bar{j} + 7\bar{k}$, $\bar{i} - 6\bar{j} + 10\bar{k}$, $-\bar{i} - 3\bar{j} + 4\bar{k}$, $5\bar{i} - \bar{j} + 5\bar{k}$ respectively, then ABCD is

(A) a parallelogram but not rhombus
(B) a square
(C) a quadrilateral which is not a parallelogram
(D) a rectangle

Answer: (C) a quadrilateral which is not a parallelogram · The council's preliminary key

Q320 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

M and N are the mid points of the sides BC and CD of a parallelogram ABCD respectively then $\overline{AM} + \overline{AN} =$

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

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

Q321 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

In ΔABC, 'O' is the circumcenter, G is the centroid then $|\overline{OG}|^2 =$

(A) $R^2 - \frac{1}{3}(a^2 + b^2 + c^2)$
(B) $R^2 - \frac{1}{6}(a^2 + b^2 + c^2)$
(C) $R^2 - \frac{1}{9}(a^2 + b^2 + c^2)$
(D) $R - \frac{1}{9}(a^2 + b^2 + c^2)$

Answer: (C) $R^2 - \frac{1}{9}(a^2 + b^2 + c^2)$ · The council's preliminary key

EdLoop EAPCET

Q322 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

Three vectors $\bar{a}, \bar{b}, \bar{c}$ satisfy the condition $\bar{a}+\bar{b}+\bar{c}=\bar{0}$. If $|\bar{a}|=1$, $|\bar{b}|=3$, $|\bar{c}|=4$ then $\bar{a}.\bar{b}+\bar{b}.\bar{c}+\bar{c}.\bar{a}=$

(A) 12
(B) -12
(C) -13
(D) 13

Answer: (C) -13 · The council's preliminary key

Q323 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

Let $\overline{OA}=-4\bar{i}+3\bar{k}$, $\overline{OB}=14\bar{i}+2\bar{j}-5\bar{k}$. $\overline{OD}$ bisects $\angle AOB$ and $|\overline{OD}|=\sqrt{6}$, then $\overline{OD}=$

(A) $\pm(\bar{i}+\bar{j}+2\bar{k})$
(B) $\pm(\bar{i}+2\bar{j}+\bar{k})$
(C) $\pm(2\bar{i}+\bar{j}+\bar{k})$
(D) $\pm\frac{1}{\sqrt{2}}(2\bar{i}+\bar{j}+\sqrt{7}\bar{k})$

Answer: (A) $\pm(\bar{i}+\bar{j}+2\bar{k})$ · The council's preliminary key

Q324 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

The point of intersection of the lines $\overline{r}=2\overline{b}+t(6\overline{c}-\overline{a})$ and $\overline{r}=\overline{a}+s(\overline{b}-3\overline{c})$ is

(A) $\overline{a}+\overline{b}+\overline{c}$
(B) $\overline{b}-\overline{c}-6\overline{a}$
(C) $2\overline{a}-\overline{b}+\overline{c}$
(D) $\overline{a}+2\overline{b}-6\overline{c}$

Answer: (D) $\overline{a}+2\overline{b}-6\overline{c}$ · The council's preliminary key

Q325 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

In quadrilateral ABCD, $\overline{AB}=\overline{a}$, $\overline{BC}=\overline{b}$, $\overline{DA}=\overline{a}-\overline{b}$, M is the midpoint of BC and X is a point on DM such that $\overline{DX}=\frac{4}{5}\overline{DM}$. Then the points A, X and C

(A) form an equilateral triangle
(B) are collinear
(C) form an isosceles triangle
(D) form a right angled triangle

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

Q326 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

The vectors $3\overline{a}-5\overline{b}$ and $2\overline{a}+\overline{b}$ are mutually perpendicular and the vectors $\overline{a}+4\overline{b}$ and $-\overline{a}+\overline{b}$ are also mutually perpendicular then the acute angle between $\overline{a}$ and $\overline{b}$ is

(A) $\cos^{-1}\left(\frac{19}{5\sqrt{43}}\right)$

(B) $\cos^{-1}\left(\frac{9}{5\sqrt{43}}\right)$

(C) $\pi-\cos^{-1}\left(\frac{19}{5\sqrt{43}}\right)$

(D) $\pi-\cos^{-1}\left(\frac{9}{5\sqrt{43}}\right)$

Answer: (A) $\cos^{-1}\left(\frac{19}{5\sqrt{43}}\right)$ · The council's preliminary key

Q327 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

Let $\overline{a}=x\overline{i}+y\overline{j}+z\overline{k}$ and x = 2y. If $|\overline{a}|=5\sqrt{2}$ and $\overline{a}$ makes and angle of 135^0 with the z-axis then $\overline{a}=$

(A) $2\sqrt{3}\overline{i}+\sqrt{3}\overline{j}-3\overline{k}$

(B) $2\sqrt{6}\overline{i}+\sqrt{6}\overline{j}-6\overline{k}$

(C) $2\sqrt{5}\overline{i}+\sqrt{5}\overline{j}-5\overline{k}$

(D) $2\sqrt{5}\overline{i}+\sqrt{5}\overline{j}+5\overline{k}$

Answer: (C) $2\sqrt{5}\overline{i}+\sqrt{5}\overline{j}-5\overline{k}$ · The council's preliminary key

Q328 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

Let $\overline{a},\overline{b},\overline{c}$ be the position vectors of the vertices of a triangle ABC. Through the vertices, lines are drawn parallel to the sides to form the triangle A'B'C'. Then the centroid of $\Delta A'B'C'$ is

(A) $\frac{\overline{a}+\overline{b}+\overline{c}}{9}$

(B) $\frac{\overline{a}+\overline{b}+\overline{c}}{6}$

(C) $\frac{\overline{a}+\overline{b}+\overline{c}}{3}$

(D) $\frac{2(\overline{a}+\overline{b}+\overline{c})}{3}$

Answer: (C) $\frac{\overline{a}+\overline{b}+\overline{c}}{3}$ · The council's preliminary key

Q329 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

D, E, F are respectively the points on the sides BC, CA and AB of a $\triangle ABC$ dividing them in the ratio 2:3, 1:2, 3:1 internally. The lines $\overline{BE}$ and $\overline{CF}$ intersect on the line $\overline{AD}$ at P. If $\overline{AP}=x_1.\overline{AB}+y_1.\overline{AC}$ then $x_1+y_1=$

(A) $5/6$
(B) 1
(C) $3/2$
(D) 2

Answer: (A) $5/6$ · The council's preliminary key

Q330 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

OABC is a tetrahedron. If D, E are the midpoints of OA and BC respectively, then $\overline{DE} =$

(A) $\frac{1}{2}(\overline{OA} + \overline{OB} + \overline{OC})$
(B) $\frac{1}{2}(\overline{OA} + \overline{OB} - \overline{OC})$
(C) $\frac{1}{2}(\overline{OA} - \overline{OB} + \overline{OC})$
(D) $\frac{1}{2}(-\overline{OA} + \overline{OB} + \overline{OC})$

Answer: (D) $\frac{1}{2}(-\overline{OA} + \overline{OB} + \overline{OC})$ · The council's preliminary key

Q331 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If $\overline{a} + \overline{b} + \overline{c} = 0$ and $|\overline{a}| = 7$, $|\overline{b}| = 5$, $|\overline{c}| = 3$ then the angle between $\overline{b}$ and $\overline{c}$ is

(A) 30^0
(B) 45^0
(C) 60^0
(D) 90^0

Answer: (C) 60^0 · The council's preliminary key

Q332 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If P, Q are two points on the curve $y = 2^{x+2}$ in the rectangular Cartesian coordinate system such that $\overline{OP}.\overline{i} = -1$, $\overline{OQ}.\overline{i} = 2$ then $\overline{OQ} - 4\overline{OP} =$

(A) $3\overline{i} + 8\overline{j}$
(B) $4\overline{i} + 6\overline{j}$
(C) $6\overline{i} + 8\overline{j}$
(D) $4\overline{i} + 3\overline{j}$

Answer: (C) $6\overline{i} + 8\overline{j}$ · The council's preliminary key

Q333 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $ABCDEF$ is a regular hexagon inscribed in a circle with center 'O', then $\overrightarrow{AB} + \overrightarrow{AC} + \overrightarrow{AD} + \overrightarrow{AE} + \overrightarrow{AF}$ equals

EdLoop EAPCET

(A) $4\overrightarrow{AO}$
(B) $5\overrightarrow{AO}$
(C) $6\overrightarrow{AO}$
(D) $8\overrightarrow{AO}$

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

Q334 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

Let $\vec{a}, \vec{b}$ and $\vec{c}$ be three non-zero vectors, no two which are collinear. If $\vec{a} + 2\vec{b}$ is collinear with $\vec{c}$ and $\vec{b} + 3\vec{c}$ is collinear with $\vec{a}$, then $\vec{a} + 2\vec{b} =$

(A) $\vec{c}$
(B) $-4\vec{c}$
(C) $6\vec{c}$
(D) $-6\vec{c}$

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

Q335 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $2\vec{a} + 3\vec{b} - 5\vec{c} = \vec{0}$, then the ratio in which $\vec{c}$ divides $\overrightarrow{AB}$ is

(A) 3 : 2 internally
(B) 3 : 2 externally
(C) 2 : 3 internally
(D) 2 : 3 externally

Answer: (A) 3 : 2 internally · The council's preliminary key

Q336 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $\vec{a} = \hat{i} + \hat{j}$ and $\vec{b} = \hat{j} + \hat{k}$ are two vectors, then $|\vec{a} \times \vec{b}| =$

(A) 0
(B) 3
(C) $\sqrt{3}$
(D) 1

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

Q337 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

The volume of the tetrahedron having the edges $\hat{i} + 2\hat{j} - \hat{k}, \hat{i} + \hat{j} + \hat{k}, \hat{i} - \hat{j} + \lambda\hat{k}$ as coterminal is $\frac{2}{3}$ cu. units, then $\lambda =$

EdLoop EAPCET

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

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

Q338 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $\vec{a}$ and $\vec{b}$ are unit vectors such that $\vec{a}+\vec{b}$ is also a unit vector, then the angle between $\vec{a}$ and $\vec{b}$ is

(A) 75°
(B) 60°
(C) 120°
(D) 135°

Answer: (C) 120° · The council's preliminary key

Q339 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $\vec{a},\vec{b},\vec{c}$ are 3 vectors then $[\vec{a}+\vec{b}\ \ \vec{b}+\vec{c}\ \ \vec{c}+\vec{a}] =$

(A) $[\vec{a}\ \vec{b}\ \vec{c}]$
(B) 0
(C) $2[\vec{a}\ \vec{b}\ \vec{c}]$
(D) $3[\vec{a}\ \vec{b}\ \vec{c}]$

Answer: (C) $2[\vec{a}\ \vec{b}\ \vec{c}]$ · The council's preliminary key

---

Q340 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

If $\vec{r}=x\hat{i}+y\hat{j}+z\hat{k}$ then $(\vec{r}\times\hat{i})\cdot(\vec{r}\times\hat{j})+xy=$

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

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

Q341 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If $\overrightarrow{PQ}+\overrightarrow{QR}=(2\lambda^2-5)\overrightarrow{RP}$ then $\lambda =$

EdLoop EAPCET

(A) ± 1
(B) $\pm\sqrt{2}$
(C) $\pm\sqrt{3}$
(D) 0

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

Q342 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If 'C' is the midpoint of line segment AB and 'P' is any point not on the line AB, then

(A) $\overrightarrow{PA}+\overrightarrow{PB}+\overrightarrow{PC}=0$
(B) $\overrightarrow{PA}+\overrightarrow{PB}+2\overrightarrow{PC}=0$
(C) $\overrightarrow{PA}-\overrightarrow{PC}=\overrightarrow{PC}-\overrightarrow{PB}$
(D) $\overrightarrow{PA}+\overrightarrow{PB}-\overrightarrow{PC}=0$

Answer: (C) $\overrightarrow{PA}-\overrightarrow{PC}=\overrightarrow{PC}-\overrightarrow{PB}$ · The council's preliminary key

Q343 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If 'θ' is the angle between the unit vectors $\vec{a}$ and $\vec{b}$, then $\sin\frac{\theta}{2}$ is equal to

(A) $\left|\frac{\vec{a}-\vec{b}}{\vec{a}+\vec{b}}\right|$
(B) $|\vec{a}+\vec{b}|$
(C) $|\vec{a}-\vec{b}|$
(D) $\frac{1}{2}|\vec{a}-\vec{b}|$

Answer: (D) $\frac{1}{2}|\vec{a}-\vec{b}|$ · The council's preliminary key

Q344 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The vector $\vec{a}$ lies in the plane of vectors $\vec{b}$ and $\vec{c}$, then

(A) $[\vec{a}\,\vec{b}\,\vec{c}]$
(B) $[\vec{a}\,\vec{b}\,\vec{c}]=\vec{b}\,\vec{c}$
(C) $[\vec{a}\,\vec{b}\,\vec{c}]=0$
(D) $[\vec{a}\,\vec{b}\,\vec{c}]=-1$

Answer: (C) $[\vec{a}\,\vec{b}\,\vec{c}]=0$ · The council's preliminary key

Q345 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

$\vec{a}$ and $\vec{b}$ are unit vectors such that $\vec{a}+2\vec{b}$ is also a unit vector. If θ is the angle between $\vec{a}$ and $\vec{b}$, then $\sin\theta+\cos^3\theta+\tan^5\theta=$

EdLoop EAPCET

(A) 3
(B) 5
(C) $\frac{3}{\sqrt{2}}+1$
(D) -1

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

Q346 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If $\vec{a},\vec{b},\vec{c}$ are non-zero vectors such that $\vec{a}\times\vec{b}=\vec{c}$ and $\vec{b}\times\vec{c}=\vec{a}$, then $\vec{a}\times\vec{c}$ is

(A) Equal to $\vec{b}$
(B) Parallel to $\vec{b}$
(C) Perpendicular to $\vec{b}$
(D) Parallel to $\vec{a}$

Answer: (B) Parallel to $\vec{b}$ · The council's preliminary key

Q347 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Consider the vectors $u=ai+bj+ck$, $v=a^2i+b^2j+c^2k$, $w=a^3i+b^3j+c^3k$. These vectors are coplanar if and only if

(A) All a,b and c are equal
(B) One of a,b and c is zero
(C) Any two of a,b and c are equal
(D) Either one of a,b and c is zero, or any two of a,b and c are equal

Answer: (D) Either one of a,b **and** c **is zero, or any two of** a,b **and** c **are equal** · The council's preliminary key

Q348 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

The position vectors of A and B are $(\hat{i}+\hat{j}+\hat{k})$ and $\left(\frac{1}{3}\hat{j}+\frac{1}{3}\hat{k}\right)$. If 'B' divides the line AC in the ratio $2:1$, then position vector of 'C' is

(A) $\left(\frac{1}{2},0,0\right)$
(B) $\left(0,\frac{1}{3},0\right)$
(C) $\left(\frac{-1}{2},\frac{-1}{2},0\right)$
(D) $\left(\frac{-1}{2},0,0\right)$

Answer: (D) $\left(\frac{-1}{2},0,0\right)$ · The council's preliminary key

Q349 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Let $\vec{a},\vec{b}$ and $\vec{c}$ are 3 non zero vectors such that no 2 of these are collinear. If vector $\vec{a}+2\vec{b}$ is collinear with $\vec{c}$ and $\vec{b}+3\vec{c}$ is collinear with $\vec{a}$ (λ being some non-zero scalar) then $\vec{a}+2\vec{b}+6\vec{c}$ equals

EdLoop EAPCET

(A) $\lambda\vec{a}$
(B) $\lambda\vec{b}$
(C) $\lambda\vec{c}$
(D) $\vec{0}$

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

Q350 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If $\vec{a},\vec{b},\vec{c}$ are three vectors such that $|\vec{a}|=|\vec{b}|=2$, $\vec{a}\cdot\vec{b}=2$ and $\vec{a}+\vec{b}+\vec{c}=0$, then $|\vec{c}|$ is equal to

(A) 2
(B) $2\sqrt{3}$
(C) $\sqrt{3}$
(D) 3

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

Q351 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Let u,v and w are non-coplanar vectors, then the value of $\frac{(u+2v-w)\cdot[(u-v)\times(u-v-w)]}{[u\ v\ w]}$ is equal to

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

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

Q352 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Let u and v be two non-zero vectors in R^3. Then $|u\times v|^2+|u\cdot v|^2$ is equal to

(A) $|u|^2+|v|^2$
(B) $2|u||v|$
(C) $|u|^2|v|^2$
(D) $(|u|+|v|)^2$

Answer: (C) $|u|^2|v|^2$ · The council's preliminary key

Q353 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Let u and v be non-collinear vectors in R^2. Let w be the orthogonal projection vector of u on v. Consider two statements:
(i) Any vector in R^2 can be written as a linear combination of u and v
(ii) w can be written as a linear combination of u and v as $w=au+bv$ where both a and b are nonzero real numbers.

EdLoop EAPCET

(A) Both (i) and (ii) are true
(B) Only (i) is true, but (ii) is false
(C) Only (ii) is true, but (i) is false
(D) Both (i) and (ii) are false

Answer: (B) Only (i) is true, but (ii) is false · The council's preliminary key

Q354 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

$ABCD$ is a parallelogram such that L is midpoint of BC, then $\overrightarrow{AL}$ is equal to

(A) $\overrightarrow{DC}+\frac{1}{2}\overrightarrow{AD}$
(B) $\frac{1}{2}\overrightarrow{AD}+\overrightarrow{BC}$
(C) $\frac{1}{2}\overrightarrow{AD}+\overrightarrow{DL}$
(D) $\frac{1}{2}\overrightarrow{AD}+\overrightarrow{BL}$

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

Q355 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The number of values of $m \in R$ for which the vectors $i+2j+mk$ and $i+mj+2k$ are collinear is

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

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

Q356 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If $ABCDEF$ is a regular hexagon, where two adjacent sides $\overrightarrow{AB}$ and $\overrightarrow{BC}$ are $\vec{a}$ and $\vec{b}$ respectively. Then $\overrightarrow{CD}$ is

(A) $\vec{b}-\vec{a}$
(B) $\vec{a}+\vec{b}$
(C) $\vec{a}-\vec{b}$
(D) $\vec{a}+2\vec{b}$

Answer: (A) $\vec{b}-\vec{a}$ · The council's preliminary key

Q357 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If $\vec{a},\vec{b},\vec{c}$ are three vectors such that $|\vec{a}|=3$, $|\vec{b}|=4$, $|\vec{c}|=5$ and $\vec{a}+\vec{b}+\vec{c}=0$, then $\vec{a}\cdot\vec{b}$ is equal to

EdLoop EAPCET

(A) 12
(B) 0
(C) $\frac{12}{5}$
(D) 6

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

Q358 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Let $\vec{a}, \vec{b}$ and $\vec{c}$ be non-zero vectors such that $(\vec{a} \times \vec{b}) \times \vec{c} = \frac{1}{3}|\vec{b}||\vec{c}|\vec{a}$. If θ is the acute angle between the vectors $\vec{b}$ and $\vec{c}$ then $\sin\theta =$

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

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

---

Q359 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If $\vec{a} = x^2\hat{i} + x\hat{j} + 3\hat{k}$ and $\vec{b} = x\hat{i} - 4\hat{j} + 2\hat{k}$ and $\vec{a} \cdot \vec{b} > 6$ then _____

(A) $x \in R^-$
(B) $x \in (-\infty, 0) \cup (1, \infty)$
(C) $x \in (-\infty, -2) \cup (2, \infty)$
(D) $x \in (-2, 0) \cup (2, \infty)$

Answer: (D) $x \in (-2, 0) \cup (2, \infty)$ · The council's preliminary key

---

Q360 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If $\vec{a}, \vec{b}, \vec{c}$ be 3 non-coplanar vectors and $(\vec{a} - \lambda\vec{b}) \cdot (\vec{b} - 2\vec{c}) \times (\vec{c} + 2\vec{a}) = 0$ then $\lambda =$

(A) 1
(B) $\frac{1}{4}$
(C) 0
(D) $\frac{-1}{4}$

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

EdLoop EAPCET

Q361 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

$ABCDEF$ is a regular hexagon. The sum of the vectors $\overrightarrow{BE}$, $\overrightarrow{BC}$, $\overrightarrow{EF}$, $\overrightarrow{BA}$, $\overrightarrow{CF}$, $\overrightarrow{AF}$

(A) $\overrightarrow{BF}$

(B) $2\overrightarrow{BF}$

(C) $\overrightarrow{FB}$

(D) $3\overrightarrow{BF}$

Answer: (D) $3\overrightarrow{BF}$ · The council's preliminary key

Q362 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

If $ABCDEF$ is a regular hexagon with $\overrightarrow{AB} = \vec{a}$ and $\overrightarrow{BC} = \vec{b}$ then $\overrightarrow{CE}$ equals

(A) $\vec{b} - \vec{a}$

(B) $-\vec{b}$

(C) $\vec{b} - 2\vec{a}$

(D) $\vec{a} - 2\vec{b}$

Answer: (C) $\vec{b} - 2\vec{a}$ · The council's preliminary key

Q363 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

R divides the line joining two points P and Q whose position vectors are $\hat{i} + 2\hat{j} - \hat{k}$ and $-\hat{i} + \hat{j} + \hat{k}$ respectively in the ratio $2:1$ externally. S divides PQ internally in the ratio $2:1$. Then the position vector of the midpoint of the line joining R and S is _____

(A) $\frac{-5}{3}\hat{i} - \frac{2}{3}\hat{j} - \frac{5}{3}\hat{k}$

(B) $\frac{-5}{3}\hat{i} + \frac{2}{3}\hat{j} + \frac{5}{3}\hat{k}$

(C) $\frac{5}{3}\hat{i} - \frac{2}{3}\hat{j} - \frac{5}{3}\hat{k}$

(D) $\frac{5}{3}\hat{i} + \frac{2}{3}\hat{j} + \frac{5}{3}\hat{k}$

Answer: (B) $\frac{-5}{3}\hat{i} + \frac{2}{3}\hat{j} + \frac{5}{3}\hat{k}$ · The council's preliminary key

Q364 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

If $\vec{a}$ is a vector of magnitude 7, $\vec{b}$ is a vector of magnitude 8, then the maximum value of $|\vec{a} \cdot \vec{b}|$ is

EdLoop EAPCET

(A) 5 and $(\vec{a} \cdot \vec{b}) = \frac{\pi}{6}$

(B) 28 and $(\vec{a} \cdot \vec{b}) = \frac{\pi}{3}$

(C) 56 and $(\vec{a} \cdot \vec{b}) = \frac{\pi}{2}$

(D) 56 and $(\vec{a} \cdot \vec{b}) = \pi$

Answer: (D) 56 and $(\vec{a} \cdot \vec{b}) = \pi$ · The council's preliminary key

---

Q365 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

The number of vectors of unit length perpendicular to the two vectors $\vec{a} = (1, 1, 0)$ and $\vec{b} = (0, 1, 1)$ is

(A) 1

(B) 2

(C) 3

(D) Infinite

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

Q366 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

If the vectors $\vec{a} = \hat{i} - \hat{j} + 2\hat{k}$, $\vec{b} = 2\hat{i} + 4\hat{j} + \hat{k}$ and $\vec{c} = \lambda\hat{i} + \hat{j} + \mu\hat{k}$ are mutually orthogonal then (λ, μ) is equal to

(A) $(-3, 2)$

(B) $(2, -3)$

(C) $(-2, 3)$

(D) $(3, -2)$

Answer: (A) $(-3, 2)$ · The council's preliminary key

Q367 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

Let $\vec{a}, \vec{b}$ and $\vec{c}$ be the three vectors. If $|\vec{a}| = 1$, $|\vec{b}| = 17$, $|\vec{c}| = 8$ and the angle between $\vec{a}$ and $\vec{b}$ is θ and $\vec{a} \times (\vec{a} \times \vec{b}) - \vec{c} = 0$, then $\cos\theta + \operatorname{cosec}\theta =$

(A) $\frac{409}{136}$

(B) $\frac{309}{136}$

(C) $\frac{419}{126}$

(D) $\frac{409}{126}$

Answer: (A) $\frac{409}{136}$ · The council's preliminary key

---

Q368 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Let u and v be two vectors. Then $|u - v| = ||u| - |v||$ if and only if

(A) $|u| = |v|$
(B) u and v have the same direction
(C) u and v have the opposite direction
(D) $u = v$

Answer: (B) u and v have the same direction · The council's preliminary key

---

Q369 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

In ΔOAC, if B is the midpoint of side AC and $\overrightarrow{OA} = \vec{a}$, $\overrightarrow{OB} = \vec{b}$ then $\overrightarrow{OC} =$

(A) $2\vec{b} - \vec{a}$
(B) $\vec{b} - 2\vec{a}$
(C) $\vec{a} - 2\vec{b}$
(D) $\vec{a} - \vec{b}$

Answer: (A) $2\vec{b} - \vec{a}$ · The council's preliminary key

---

Q370 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Let $ABCDEF$ be a regular hexagon with the vertices A, B, C, D, E, F counterclockwise. Then the vector $\overrightarrow{AB} + \overrightarrow{BC}$ is equal/parallel to

(A) $\overrightarrow{BC} + \overrightarrow{CD}$
(B) $\overrightarrow{CD} + \overrightarrow{DE}$
(C) $\overrightarrow{AF} + \overrightarrow{FE}$
(D) $\overrightarrow{FE} + \overrightarrow{ED}$

Answer: (D) $\overrightarrow{FE} + \overrightarrow{ED}$ · The council's preliminary key

---

Q371 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If $35\hat{i} + 14\hat{j} - 77\hat{k}$, $2\hat{i} + 7\hat{j} + 5\hat{k}$ and $5\hat{i} + 2\hat{j} + \lambda\hat{k}$ are coplanar, then $\lambda =$

(A) 11
(B) -11
(C) -10
(D) 10

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

Q372 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If $\vec{a}, \vec{b}, \vec{c}, \vec{d}$ are vectors in which $|\vec{d}| = 1$ and given $\vec{a} + \vec{b} + \vec{c} = s\vec{d}$, $\vec{b} + \vec{c} + \vec{d} = \vec{a}$, $\vec{a} \cdot \vec{d} = 4$, then '$s$' is equal to

EdLoop EAPCET

(A) 7
(B) 8
(C) -1
(D) 4

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

Q373 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Let $x \in R$ and $\log_2 x > 0$. Then the vectors $\vec{A} = (2, \log_2 x, s)$, $\vec{B} = (\log_2 x, s, \log_2 x)$ include an acute angle if

(A) $s > 1$
(B) $s > -1$
(C) $s = -1$
(D) $s < -1$

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

Q374 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Let $ABCDEF$ be a regular hexagon with the vertices A, B, C, D, E, F counter clockwise. If 'O' is the center of $ABCDEF$, then the vector $\overrightarrow{AO}$ is to parallel/equal

(A) $\overrightarrow{FE}$
(B) $\overrightarrow{CD}$
(C) $\overrightarrow{CB}$
(D) $\overrightarrow{DE}$

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

Q375 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Let A, B, C be three points on a circle of radius R. if O is the centre of the circle and $AOB = 45°$, $BOC = 45°$ then the resultant of $\overrightarrow{OA}, \overrightarrow{OB}$ and $\overrightarrow{OC}$ has magnitude

(A) $2R$
(B) $(\sqrt{2}+1)R$
(C) $2\sqrt{2}R$
(D) $4\sqrt{2}R$

Answer: (B) $(\sqrt{2}+1)R$ · The council's preliminary key

Q376 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

The figure formed by the four points $(\hat{i}+\hat{j}-\hat{k})$, $(2\hat{i}+3\hat{j})$, $(5\hat{j}-2\hat{k})$ and $(\hat{k}-\hat{j})$ is

EdLoop EAPCET

(A) Trapezium
(B) Rectangle
(C) Parallelogram
(D) Quadrilateral

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

Q377 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Let $\vec{A} = \hat{i} + 2\hat{j}$. If $\vec{B}$ is a vector in XY plane such that $(\vec{A} + \vec{B}) \cdot \vec{B} = 15$ and $\vec{A} \cdot \vec{B} = 6$, then $|\vec{B}|$ is

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

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

Q378 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

The area of the parallelogram for which the vectors $i + j + 2k$ and $3i - 2j + k$ are adjacent sides is equal to

(A) $3\sqrt{5}$
(B) $5\sqrt{3}$
(C) $2\sqrt{5}$
(D) $5\sqrt{6}$

Answer: (B) $5\sqrt{3}$ · The council's preliminary key

Q379 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Let $\vec{a}, \vec{b}, \vec{c}$ be unit vectors such that $\vec{a} \cdot \vec{b} = 0 = \vec{a} \cdot \vec{c}$ and the acute angle between $\vec{b}$ and $\vec{c}$ is $\frac{\pi}{3}$ then $|\vec{a} \times \vec{b} - \vec{a} \times \vec{c}| =$

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

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

Q380 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Let $\vec{u}$ and $\vec{v}$ are unit vectors such that $\vec{u} \cdot \vec{v} = 0$. If $\vec{r}$ is any vector coplanar with $\vec{u}$ and $\vec{v}$ then the magnitude of the vector $\vec{r} \times (\vec{u} \times \vec{v})$ is

EdLoop EAPCET

(A) 0
(B) 1
(C) $|\vec{r}|$
(D) $2|\vec{r}|$

Answer: (C) $|\vec{r}|$ · The council's preliminary key

Q381 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

The position vectors of the points 'A' and 'B' with respect to 'O' are $2\hat{i}+2\hat{j}+\hat{k}$ and $2\hat{i}+4\hat{j}+4\hat{k}$. The length of the internal bisector of $\angle BOA$ of ΔAOB is _____ (take proportionality Constant is 2)

(A) $\frac{\sqrt{136}}{9}$
(B) $\frac{\sqrt{136}}{3}$
(C) $\frac{20}{3}$
(D) $\frac{25}{3}$

Answer: (B) $\frac{\sqrt{136}}{3}$ · The council's preliminary key

Q382 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

Let $u=2i+3j+k,\ v=-3i+2j$ and $w=i-j+4k$. Then which of the following statement is true?

(A) u is perpendicular to v but not w
(B) v is perpendicular to w but not u
(C) w is perpendicular to u but not v
(D) u is perpendicular to both v and w

Answer: (A) u **is perpendicular to** v **but not** w · The council's preliminary key

Q383 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If $\vec{a}=(1,1,0),\ \vec{b}=(1,1,1)$, then unit vector in the plane of $\vec{a}$ and $\vec{b}$ and perpendicular to $\vec{a}$ is

(A) $(0,1,0)$
(B) $(1,-1,0)$
(C) $\vec{k}$
(D) $(1,0,1)$

Answer: (C) $\vec{k}$ · The council's preliminary key

Q384 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

Let $\vec{a}=\hat{i}$ and $\vec{b}=\hat{j}$, the point of intersection of the lines $\vec{r}\times\vec{a}=\vec{b}\times\vec{a}$ and $\vec{r}\times\vec{b}=\vec{a}\times\vec{b}$ is

(A) $\vec{r} = \hat{i} + \hat{j}$
(B) $\vec{r} = \hat{i} - \hat{j}$
(C) $\vec{r} = \hat{k}$
(D) $\vec{r} = 2\hat{i} + \hat{j}$

Answer: (A) $\vec{r} = \hat{i} + \hat{j}$ · The council's preliminary key

Q385 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $\vec{a} = \hat{i} + \hat{j} + \hat{k}$, $\vec{b} = \hat{i} - \hat{j} + 2\hat{k}$ and $\vec{c} = x\hat{i} + (x-2)\hat{j} - \hat{k}$ and if the vector $\vec{c}$ lies in the plane of vectors $\vec{a}$ and $\vec{b}$ and then 'x' equals

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

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

Q386 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

Let $u = 2i + j$ and $v = 3i - 5j$. Consider three points P, Q and R having the position vectors $\left(\frac{5}{2}\right) i - 2j$, $\left(\frac{7}{3}\right) i - j$ and $\left(\frac{9}{4}\right) i$ respectively. Among these, the points in the line passing through u and v are

(A) Only P and Q
(B) Only P and R
(C) Only Q and R
(D) All P, Q and R

Answer: (A) Only P and Q · The council's preliminary key

Q387 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

The value of $\frac{(\vec{a}\times\vec{b})^2+(\vec{a}\cdot\vec{b})^2}{2(\vec{a})^2(\vec{b})^2}$ is

(A) 0
(B) 1
(C) $\frac{1}{2}$
(D) $\frac{1}{4}$

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

Q388 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

Let $\vec{a} = \hat{i} - \hat{j}$, $\vec{b} = \hat{j} - \hat{k}$ and $\vec{c} = \hat{k} - \hat{i}$. If $\vec{d}$ is a unit vector such that $\vec{a} \cdot \vec{b} = 0 = [\vec{b}\,\vec{c}\,\vec{d}]$ then $\vec{d}$ is

(A) $\pm\frac{\hat{i}+\hat{j}-\hat{k}}{\sqrt{3}}$
(B) $\pm\frac{\hat{i}+\hat{j}-2\hat{k}}{\sqrt{6}}$
(C) $\pm\frac{\hat{i}+\hat{j}+\hat{k}}{\sqrt{3}}$
(D) $\pm\frac{\hat{i}+\hat{j}+2\hat{k}}{\sqrt{6}}$

Answer: (B) $\pm\frac{\hat{i}+\hat{j}-2\hat{k}}{\sqrt{6}}$ · The council's preliminary key

Q389 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

Let u and v be two nonzero vectors in R^3 with the intermediate angle 45°. Then $|u \times v| =$

(A) $|u||v|$
(B) $2|u||v|$
(C) $u \cdot v$
(D) $|u| + |v|$

Answer: (C) $u \cdot v$ · The council's preliminary key

Q390 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

Given $\vec{a} = 3\hat{i} - \hat{j}$, $\vec{b} = 2\hat{i} + \hat{j} - 3\hat{k}$ and $\vec{b} = \vec{b_1} + \vec{b_2}$ where $\vec{b_1}$ is parallel to $\vec{a}$ and $\vec{b_2}$ is perpendicular to $\vec{a}$ then $\vec{b_2}$ is equal to

(A) $\frac{1}{2}\hat{i} + \frac{3}{2}\hat{j} - 3\hat{k}$
(B) $\frac{1}{2}\hat{i} - \frac{3}{2}\hat{j} + 3\hat{k}$
(C) $\frac{1}{2}\hat{i} + \frac{3}{2}\hat{j} + 3\hat{k}$
(D) $\frac{1}{2}\hat{i} - \frac{3}{2}\hat{j} - 3\hat{k}$

Answer: (A) $\frac{1}{2}\hat{i} + \frac{3}{2}\hat{j} - 3\hat{k}$ · The council's preliminary key

Q391 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If D, E and F are respectively mid points of AB, AC and BC in $\triangle ABC$, then $\overrightarrow{BE} + \overrightarrow{AF}$ is equal to

(A) $\overrightarrow{DC}$
(B) $\frac{3}{2}\overrightarrow{BF}$
(C) $\frac{1}{2}\overrightarrow{BF}$
(D) $\frac{1}{2}\overrightarrow{DC}$

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

Q392 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If the volume of the parallelopiped formed by the vectors $\hat{i} + a\hat{j} + \hat{k}$, $\hat{j} + a\hat{k}$ and $a\hat{i} + \hat{k}$ becomes minimum, then $a =$

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

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

Q393 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If $\vec{a} = \frac{3}{2}\hat{k}, \vec{b} = \frac{2\hat{i} + 2\hat{j} - \hat{k}}{2}$, then angle between $\vec{a} + \vec{b}$ and $\vec{a} - \vec{b}$ is

(A) 45°
(B) 90°
(C) 30°
(D) 60°

Answer: (B) 90° · The council's preliminary key

Q394 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Let $\vec{a} = \hat{i} + \hat{j} + \hat{k}, \vec{b} = \hat{i} + 3\hat{j} + 5\hat{k}$ and $\vec{c} = 7\hat{i} + 9\hat{j} + 11\hat{k}$ then the area of parallelogram having diagonals $\vec{a} + \vec{b}$ and $\vec{b} + \vec{c}$ is

(A) $4\sqrt{6}$ sq. units
(B) $2\sqrt{6}$ sq. units
(C) $\sqrt{6}$ sq. units
(D) $6\sqrt{6}$ sq. units

Answer: (A) $4\sqrt{6}$ **sq. units** · The council's preliminary key

Q395 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If $\vec{a} = 2\hat{i} + \hat{j} + 3\hat{k}, \vec{b} = \hat{i} + 3\hat{j} - \hat{k}$ and $\vec{c} = 3\hat{i} - \hat{j} - 2\hat{k}$ then the value of $\begin{vmatrix} \vec{a}.\vec{a} & \vec{a}.\vec{b} & \vec{a}.\vec{c} \\ \vec{b}.\vec{a} & \vec{b}.\vec{b} & \vec{b}.\vec{c} \\ \vec{c}.\vec{a} & \vec{c}.\vec{b} & \vec{c}.\vec{c} \end{vmatrix} =$

(A) 2020
(B) 2025
(C) 2030
(D) 1849

Answer: (B) 2025 · The council's preliminary key

EdLoop EAPCET

Q396 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If $\vec{a}$ and $\vec{b}$ are two vectors such that $|\vec{a}| = 2$, $|\vec{b}| = 3$ and $\vec{a} + t\vec{b}$ and $\vec{a} - t\vec{b}$ are perpendicular, where 't' is a positive scalar, then

(A) $t = \pm\frac{2}{3}$

(B) $t = \frac{4}{9}$

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

(D) $t = \frac{2}{9}$

Answer: (C) $t = \frac{2}{3}$ · The council's preliminary key

Q397 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If $\hat{i} + 4\hat{j} + 3\hat{k}$, $\hat{i} + 2\hat{j} + 3\hat{k}$, $3\hat{i} + 2\hat{j} + \hat{k}$ are position vectors of A, B, C respectively and if D, E are mid points of sides BC and AC, then $\overrightarrow{DE}$ is equal to

(A) $\hat{i} + \hat{j} + \hat{k}$

(B) $\hat{i} + \hat{j}$

(C) $\hat{j}$

(D) $\hat{j} + \hat{k}$

Answer: (C) $\hat{j}$ · The council's preliminary key

Q398 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If $\vec{a}$ and $\vec{b}$ are two vectors such that $\frac{\vec{a}\cdot\vec{b}}{|\vec{a}||\vec{b}|} < 0$ and $|\vec{a} \cdot \vec{b}| = |\vec{a} \times \vec{b}|$ then the angle between the vectors $\vec{a}$ and $\vec{b}$ is _____

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

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

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

(D) $\mathrm{Sin}^{-1}\left(\frac{1}{2}\right)$

Answer: (B) $\mathrm{Sec}^{-1}(-\sqrt{2})$ · The council's preliminary key

Q399 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Let $\vec{a}, \vec{b}, \vec{c}$ be three-unit vectors and $\vec{a} \cdot \vec{b} = \vec{a} \cdot \vec{c} = 0$. If the angle between $\vec{b}$ and $\vec{c}$ is $\frac{\pi}{3}$, then $[\vec{a}, \vec{b}, \vec{c}]^2 =$

EdLoop EAPCET

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

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

Q400 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Let x, y are real numbers. If $\vec{a} = (\sin x)\hat{i} + (\sin y)\hat{j}$ and $\vec{b} = (\cos x)\hat{i} + (\cos y)\hat{j}$, then $|\vec{a} \times \vec{b}|$ is

(A) 0
(B) Greater than one
(C) Less than or equal to 1
(D) Less than 1

Answer: (C) Less than or equal to 1 · The council's preliminary key

Q401 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

If x and y are real numbers such that, $\bar{i} + \bar{j} + \bar{k}$, $-2\bar{i} + 3\bar{j} + 2\bar{k}$, $x\bar{i} - 5\bar{j} + 3\bar{k}$, $\bar{i} + y\bar{j} - \bar{k}$ are the position vectors of four coplanar points, then the locus of P(x, y) is

(A) $x^2 + y^2 + 3x + 5y = 0$
(B) $(x + 5)(y + 3) = 60$
(C) $(x + 3)^2 = 5(y + 5)$
(D) $(x + 3)(y + 5) = 45$

Answer: (B) $(x + 5)(y + 3) = 60$ · The council's preliminary key

Q402 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

Suppose ABCDE is a pentagon. The resultant vector of the vectors $\overline{AB}$, $\overline{AE}$, $\overline{BC}$, $\overline{DC}$, $\overline{ED}$ and $\overline{AC}$ is

(A) $3\overline{AC}$
(B) $3\overline{AD}$
(C) $3\overline{AE}$
(D) $2\overline{AB}$

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

Q403 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

If $\bar{a} = \bar{i} + \bar{j} + \bar{k}$, $\bar{c} = \bar{j} - \bar{k}$, $\bar{a} \times \bar{b} = \bar{c}$ and $\bar{a} \cdot \bar{b} = 3$, then $\bar{b} =$

(A) $\frac{1}{3}(5\bar{i}+2\bar{j}+2\bar{k})$
(B) $\frac{1}{3}(2\bar{i}+5\bar{j}+2\bar{k})$
(C) $\frac{1}{3}(2\bar{i}+2\bar{j}+5\bar{k})$
(D) $\frac{1}{3}(2\bar{i}+5\bar{j}+5\bar{k})$

Answer: (A) $\frac{1}{3}(5\bar{i}+2\bar{j}+2\bar{k})$ · The council's preliminary key

---

Q404 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Let $\vec{a}=2\vec{i}-\vec{j}+2\vec{k}$ and $\vec{b}=3\vec{i}-2\vec{j}-5\vec{k}$ be two vectors. Then the projection vector of $\vec{b}$ on a vector perpendicular to $\vec{a}$ is

(A) $-\frac{2}{3}\left(2\vec{i}-\vec{j}-2\vec{k}\right)$
(B) $\vec{i}+4\vec{j}+\vec{k}$
(C) $\frac{13}{3}\vec{i}+\frac{4}{3}\vec{j}-\frac{11}{3}\vec{k}$
(D) $\frac{31}{9}\vec{i}-\frac{20}{9}\vec{j}-\frac{41}{9}\vec{k}$

Answer: (D) $\frac{31}{9}\vec{i}-\frac{20}{9}\vec{j}-\frac{41}{9}\vec{k}$ · The council's preliminary key

---

Q405 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

If $P\vec{i}-2\vec{j}+3\vec{k},\ 2\vec{i}+3\vec{j}-4\vec{k},\ 4\vec{i}+13\vec{j}-18\vec{k}$ are the position vectors of three collinear points A, B, C respectively, then the vector in the direction of $\overline{AB}$ of length $|P|$ units is

(A) $\frac{2}{5\sqrt{3}}\left(\vec{i}+5\vec{j}-7\vec{k}\right)$
(B) $\frac{1}{\sqrt{83}}\left(3\vec{i}+5\vec{j}-7\vec{k}\right)$
(C) $\frac{1}{\sqrt{78}}\left(2\vec{i}+5\vec{j}-7\vec{k}\right)$
(D) $\frac{1}{5\sqrt{3}}\left(\vec{i}+5\vec{j}-7\vec{k}\right)$

Answer: (D) $\frac{1}{5\sqrt{3}}\left(\vec{i}+5\vec{j}-7\vec{k}\right)$ · The council's preliminary key

---

Q406 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Let $\vec{a},\vec{b},\vec{c}$ be three unit vectors such that $\vec{a}\times\left(\vec{b}\times\vec{c}\right)=\frac{1}{2}\vec{b}$. If the angle between $\vec{a},\vec{b}$ is θ_1, and the angle between $\vec{a},\vec{c}$ is θ_2, then $\theta_1+\theta_2=$

(A) 150°
(B) 180°
(C) 120°
(D) 90°

Answer: (A) 150° · The council's preliminary key

Q407 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Consider the four points $A(1,-2,-1)$, $B(4,0,-3)$, $C(1,2,-1)$ and $D(2,-4,-5)$ in space. If $\vec{b}=\overrightarrow{AB}$, $\vec{c}=\overrightarrow{AC}$, $\vec{d}=\overrightarrow{AD}$ then $\frac{[\vec{b}\times\vec{c}\ \ \vec{c}\times\vec{d}\ \ \vec{d}\times\vec{b}]}{[\vec{b}+\vec{c}\ \ \vec{c}+\vec{d}\ \ \vec{d}+\vec{b}]}=$

(A) 40
(B) -40
(C) 20
(D) -20

Answer: (D) -20 · The council's preliminary key

Q408 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

The position vectors of the points P and Q are respectively $-2\bar{i}-3\bar{j}+\bar{k}$ and $3\bar{i}+3\bar{j}+2\bar{k}$. The ratio in which the point having position vector $\frac{-9}{2}\bar{i}-6\bar{j}+\frac{1}{2}\bar{k}$ divides the line segment joining P and Q is

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

Answer: (D) $-1:3$ · The council's preliminary key

Q409 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

Consider the vectors $\bar{a}=3\bar{i}+5\bar{j}+2\bar{k}$, $\bar{b}=2\bar{i}-3\bar{j}-5\bar{k}$ and $\bar{c}=-5\bar{i}-2\bar{j}+3\bar{k}$. If l, m and n are length of projections of $\bar{a}$ on $\bar{b}$, $\bar{b}$ on $\bar{c}$ and $\bar{c}$ on $\bar{a}$ respectively, then

(A) $l+m-n=0$
(B) $l=m=n$
(C) $l-m+n=0$
(D) $m+n-l=0$

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

Q410 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

Let $(x,y)\in(\mathbb{R}\times\mathbb{R})$ and $\bar{a}=x\bar{i}+2\bar{j}-\bar{k}$, $\bar{b}=6\bar{i}-y\bar{j}+2\bar{k}$ be two vectors. If $|\bar{a}\times\bar{b}|^2+|\bar{a}.\bar{b}|^2=f(x)g(y)$ then $f(x)+g(y)-46=0$ represents

(A) a pair of lines
(B) an ellipse
(C) a hyperbola
(D) a circle

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

Q411 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

If $\bar{a} = 2\bar{i} + 2\bar{j} + \bar{k}$, $|\bar{b}| = 6$ and the angle between $\bar{a}$ and $\bar{b}$ is $\frac{\pi}{6}$, then the area of the triangle (in square units) with $\bar{a}$ and $\bar{b}$ as two of its sides is

(A) $\frac{3\sqrt{3}}{2}$
(B) $\frac{\sqrt{3}}{2}$
(C) $\frac{5}{4}$
(D) $\frac{9}{2}$

Answer: (D) $\frac{9}{2}$ · The council's preliminary key

Q412 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

If $\bar{r}$ is a vector perpendicular to both the vectors $2\bar{i} + 3\bar{j} - 4\bar{k}$ and $3\bar{i} - \bar{j} + \bar{k}$ and satisfy $\bar{r} \cdot (3\bar{i} - 3\bar{j} + 4\bar{k}) = 5$ then $|\bar{r}| =$

(A) $\sqrt{366}$
(B) $\sqrt{222}$
(C) $\sqrt{318}$
(D) $\sqrt{246}$

Answer: (C) $\sqrt{318}$ · The council's preliminary key

Q413 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

If the collinear points A, B and C have position vectors respectively $(1, x, 3)$, $(3, 4, 7)$ and $(y, -2, -5)$, then $x + y =$

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

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

EdLoop EAPCET

Q414 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

$\bar{a}, \bar{b}, \bar{c}$ are non-coplanar vectors. If the position vector of the point of intersection of the line $\bar{r} = \bar{a} + 2\bar{b} + p(\bar{a} - 2\bar{c})$ and the plane $\bar{r} = 3\bar{a} - q(\bar{c} - \bar{b}) + K(\bar{a} - \bar{b} + \bar{c})$ is $\bar{r} = x\bar{a} + y\bar{b} + z\bar{c}$, then $xyz =$

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

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

Q415 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

Let $\bar{a}, \bar{b}, \bar{c}$ be unit vectors such that $2\bar{a} + 3\bar{b} + 4\bar{c} = \bar{0}$. Then $|\bar{b} \times \bar{c}| =$

(A) $\frac{\sqrt{15}}{8}$
(B) $\frac{\sqrt{15}}{16}$
(C) $\frac{\sqrt{15}}{4}$
(D) $\frac{\sqrt{15}}{2}$

Answer: (A) $\frac{\sqrt{15}}{8}$ · The council's preliminary key

Q416 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

If $\bar{b} = 2\bar{i} - \bar{j} - \bar{k}$, $\bar{a} = 3\bar{i} + 4\bar{j} - 5\bar{k}$ and $\bar{b} \times (\bar{a} \times \bar{b}) = \frac{\bar{a} - k\bar{b}}{l}$ then $\frac{k}{l|\bar{b}|}$ is

(A) the orthogonal projection of $\bar{b}$ on $\bar{a}$ and equal to $\frac{7}{\sqrt{50}}$
(B) the orthogonal projection of $\bar{a}$ on $\bar{b}$ and equal to $\frac{7}{\sqrt{6}}$
(C) the orthogonal projection of $\bar{b}$ in the direction perpendicular to $\bar{a}$ and equal to $\frac{5}{3}$
(D) the orthogonal projection of $\bar{a}$ in the direction perpendicular to $\bar{b}$ and equal to $\frac{752}{3}$

Answer: (B) the orthogonal projection of $\bar{a}$ on $\bar{b}$ and equal to $\frac{7}{\sqrt{6}}$ · The council's preliminary key

Q417 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If the vectors $-3\vec{i} + 4\vec{j} + \lambda\vec{k}$ and $\mu\vec{i} + 8\vec{j} + 6\vec{k}$ are collinear, then $\lambda - \mu =$

(A) 0
(B) -3
(C) 6
(D) 9

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

Q418 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

The angle between the vectors $2\vec{k} - 3\vec{j}$ and $\vec{i} - 2\vec{k}$ is

(A) $\text{Cos}^{-1}\left(\frac{8}{\sqrt{65}}\right)$
(B) $\text{Cos}^{-1}\left(\frac{-4}{\sqrt{65}}\right)$
(C) $\text{Cos}^{-1}\left(\frac{2}{\sqrt{65}}\right)$
(D) $\text{Cos}^{-1}\left(\frac{3}{\sqrt{13}}\right)$

Answer: (B) $\text{Cos}^{-1}\left(\frac{-4}{\sqrt{65}}\right)$ · The council's preliminary key

Q419 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

Three vectors $\vec{a}, \vec{b}$ and $\vec{c}$ satisfy $\vec{a}+\vec{b}+\vec{c}=\vec{0}$. If $|\vec{a}|=3,\ |\vec{b}|=4,\ |\vec{c}|=2$, then $\vec{a}.\vec{b}+\vec{b}.\vec{c}+\vec{c}.\vec{a}+2\left(|\vec{a}|+|\vec{b}|+|\vec{c}|\right)=$

(A) $\frac{-7}{2}$
(B) $\frac{7}{2}$
(C) $\frac{-11}{2}$
(D) $\frac{11}{2}$

Answer: (B) $\frac{7}{2}$ · The council's preliminary key

Q420 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

$(\vec{a}+2\vec{b}-\vec{c}).\{(\vec{a}-\vec{b})\times(\vec{a}-\vec{b}-\vec{c})\}=$

(A) $2\left[\vec{a}\,\vec{b}\,\vec{c}\right]$
(B) $\left[\vec{a}\,\vec{b}\,\vec{c}\right]$
(C) $3\left[\vec{a}\,\vec{b}\,\vec{c}\right]$
(D) $\left[\vec{a}\,\vec{b}\,\vec{c}\right]^2$

Answer: (C) $3\left[\vec{a}\,\vec{b}\,\vec{c}\right]$ · The council's preliminary key

Q421 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If $\vec{a}=\vec{i}+\vec{j}+\vec{k},\ \vec{c}=\vec{j}-\vec{k}$ are given vectors, then a vector $\vec{b}$ satisfying the equations $\vec{a}\times\vec{b}=\vec{c}$ and $\vec{a}\cdot\vec{b}=3$ is

(A) $5\vec{i}+2\vec{j}+2\vec{k}$
(B) $\frac{5}{2}\vec{i}+\vec{j}+\vec{k}$
(C) $\frac{5}{3}\vec{i}+\frac{2}{3}\vec{j}+\frac{2}{3}\vec{k}$
(D) $\vec{i}+\frac{2}{5}\vec{j}+\frac{2}{5}\vec{k}$

Answer: (C) $\frac{5}{3}\vec{i}+\frac{2}{3}\vec{j}+\frac{2}{3}\vec{k}$ · The council's preliminary key

Q422 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

Let $\vec{a}=2\vec{i}-3\vec{j}+\vec{k},\ \vec{b}=\vec{i}+2\vec{j}-3\vec{k},\ \vec{c}=\vec{i}-\vec{j}$ and $\vec{d}=\vec{i}+\vec{j}+x\vec{k}$. If $(\vec{a}\times\vec{b})\times\vec{c}$ is perpendicular to $\vec{d}$, then $x=$

EdLoop EAPCET

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

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

Q423 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

The vector in the direction of the sum of the vectors $\bar{a} = 2\bar{i} - 2\bar{j} + 5\bar{k}$ and $\bar{b} = -2\bar{i} + 5\bar{j} - 3\bar{k}$ is

(A) Perpendicular to ZX - plane
(B) Parallel to ZX - plane
(C) Parallel to YZ - plane
(D) Perpendicular to YZ - plane

Answer: (C) Parallel to YZ - plane · The council's preliminary key

---

Q424 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Consider the vectors $\bar{a} = 2\bar{i} + 3\bar{j} - 6\bar{k}$, $\bar{b} = 6\bar{i} - 2\bar{j} + 3\bar{k}$ and $\bar{c} = 3\bar{i} - 6\bar{j} - 2\bar{k}$.
Assertion (A): The three vectors do not form a triangle
Reason (R): The three vectors are non-coplanar
The correct option among the following is

(A) (A) is true, (R) is true and (R) is the correct explanation for (A)
(B) (A) is true, (R) is true but (R) is not the correct explanation for (A)
(C) (A) is true but (R) is false
(D) (A) is false but (R) is true

Answer: (A) (A) is true, (R) is true and (R) is the correct explanation for (A) · The council's preliminary key

---

Q425 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

The unit vector perpendicular to the vector $\bar{i} - 2\bar{j} + 3\bar{k}$ and coplanar with the vectors $\bar{i} + \bar{j} + \bar{k}$ and $2\bar{i} - \bar{j} - \bar{k}$ is

(A) $\pm\frac{1}{\sqrt{5}}(2\bar{i} + \bar{j})$
(B) $\pm\frac{1}{4\sqrt{5}}(3\bar{i} - 6\bar{j} - 5\bar{k})$
(C) $\pm\frac{1}{\sqrt{6}}(\bar{i} + 2\bar{j} + \bar{k})$
(D) $\pm\frac{1}{\sqrt{3}}(\bar{i} - \bar{j} - \bar{k})$

Answer: (D) $\pm\frac{1}{\sqrt{3}}(\bar{i} - \bar{j} - \bar{k})$ · The council's preliminary key

EdLoop EAPCET

Q426 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Let $\bar{a}=2\bar{i}-\bar{j}+\bar{k},\ \bar{b}=2\bar{j}-3\bar{k}$. If $\bar{b}=\bar{c}-\bar{d}$, $\bar{a}$ is parallel to $\bar{c}$ and perpendicular to $\bar{d}$, then $\bar{c}+\bar{d}=$

(A) $\frac{-1}{6}\left(2\bar{a}+5\bar{b}\right)$

(B) $\frac{1}{3}\left(3\bar{a}+5\bar{b}\right)$

(C) $\frac{1}{6}\left(5\bar{a}+2\bar{b}\right)$

(D) $\frac{-1}{3}\left(5\bar{a}+3\bar{b}\right)$

Answer: (D) $\frac{-1}{3}\left(5\bar{a}+3\bar{b}\right)$ · The council's preliminary key

Q427 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Let $\bar{a},\bar{b},\bar{c},\bar{d}$ be four vectors such that $\bar{a}$ is perpendicular only to $\bar{c}$. The vector $\bar{b}$ is parallel to $(\bar{c}-\bar{d})$ then $\bar{c}=$

(A) $\bar{b}-\left(\frac{\bar{a}\cdot\bar{d}}{\bar{a}\cdot\bar{b}}\right)\bar{d}$

(B) $\bar{d}-\left(\frac{\bar{a}\cdot\bar{d}}{\bar{a}\cdot\bar{b}}\right)\bar{b}$

(C) $\bar{d}+\left(\frac{\bar{a}\cdot\bar{d}}{\bar{a}\cdot\bar{b}}\right)\bar{b}$

(D) $\bar{b}+\left(\frac{\bar{a}\cdot\bar{d}}{\bar{a}\cdot\bar{b}}\right)\bar{d}$

Answer: (B) $\bar{d}-\left(\frac{\bar{a}\cdot\bar{d}}{\bar{a}\cdot\bar{b}}\right)\bar{b}$ · The council's preliminary key

Q428 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

Let u, v and w be non-coplanar vectors. Then the points corresponding to which of the following vectors are collinear.

(A) $u-2v+3w,\ 2u+3v-4w,\ u-7v+10w$

(B) $u-2v+3w,\ 2u+3v-4w,\ -7v+10w$

(C) $3u-4v+3w,\ -4u+5v-6w,\ 4u-7v+6w$

(D) $3u-4v+3w,\ -4u+5v-6w,\ -7v+10w$

Answer: (B) $u-2v+3w,\ 2u+3v-4w,\ -7v+10w$ · The council's preliminary key

Q429 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

Let ABC be a triangle. Let $\mathbf{u}=\overrightarrow{AB}$ and $\mathbf{v}=\overrightarrow{AC}$. If D is a middle point of BC, then the median of ΔABD through the vertex B has the length _____

EdLoop EAPCET

(A) $\frac{|\mathbf{u}-3\mathbf{v}|}{2}$
(B) $\frac{|\mathbf{v}-3\mathbf{u}|}{2}$
(C) $\frac{|\mathbf{u}-3\mathbf{v}|}{4}$
(D) $\frac{|\mathbf{v}-3\mathbf{u}|}{4}$

Answer: (D) $\frac{|\mathbf{v}-3\mathbf{u}|}{4}$ · Checked by our team

Q430 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

A vector in the direction of $v = 2\hat{i}+3\hat{j}+\hat{k}$ with magnitude $\sqrt{7}$ is

(A) $\frac{2}{\sqrt{3}}\hat{i}+\frac{3}{\sqrt{3}}\hat{j}+\frac{1}{\sqrt{3}}\hat{k}$
(B) $\hat{i}+\frac{3}{2}\hat{j}+\frac{1}{2}\hat{k}$
(C) $\frac{2}{\sqrt{2}}\hat{i}+\frac{3}{\sqrt{2}}\hat{j}+\frac{1}{\sqrt{2}}\hat{k}$
(D) $\frac{2}{\sqrt{7}}\hat{i}+\frac{3}{\sqrt{7}}\hat{j}+\frac{1}{\sqrt{7}}\hat{k}$

Answer: (C) $\frac{2}{\sqrt{2}}\hat{i}+\frac{3}{\sqrt{2}}\hat{j}+\frac{1}{\sqrt{2}}\hat{k}$ · The council's preliminary key

Q431 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If θ is the angle of a regular pentagon, then $\left|(\sin\theta)\hat{i}+(\cos\theta)\hat{j}+(\tan\theta)\hat{k}\right| =$

(A) $|\sec 18|$
(B) $|\text{cosec } 18|$
(C) $-\sec 18$
(D) $\text{cosec } 108$

Answer: (B) $|\text{cosec } 18|$ · The council's preliminary key

Q432 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If $\vec{a},\vec{b},\vec{c}$ are unit vectors such that $\vec{a}\cdot\vec{b}=\vec{a}\cdot\vec{c}=0$ and the angle between $\vec{b}$ and $\vec{c}$ is $\pi/3$, then $\vec{a}$ is equal to _____

(A) $2(\vec{b}\times\vec{c})$ only
(B) $-2(\vec{b}\times\vec{c})$ only
(C) $\pm\frac{2}{\sqrt{3}}(\vec{b}\times\vec{c})$
(D) $\pm 2(\vec{b}\times\vec{c})$

Answer: (C) $\pm\frac{2}{\sqrt{3}}(\vec{b}\times\vec{c})$ · The council's preliminary key

Q433 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

If $\vec{a}, \vec{b}, \vec{c}$ are unit vectors such that $\vec{a} + \vec{b} + \sqrt{3}\vec{c} = \vec{0}$, then the angle between $\vec{a}$ and $\vec{b}$ is

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

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

Q434 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

Let u and v be two vectors. Then $|u - v| = ||u| - |v||$ if and only if

(A) $|u| = |v|$
(B) u and v have the opposite direction
(C) u and v have the same direction
(D) u and v are perpendicular to each other

Answer: (C) u and v have the same direction · The council's preliminary key

Q435 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

The area of the parallelogram, whose diagonals are $2\hat{i} - \hat{j} + \hat{k}$ and $\hat{i} + 3\hat{j} - \hat{k}$, is equal to _____ sq. units

(A) $\frac{\sqrt{26}}{2}$
(B) $\frac{2}{\sqrt{26}}$
(C) $\frac{\sqrt{62}}{2}$
(D) $\frac{2}{\sqrt{62}}$

Answer: (C) $\frac{\sqrt{62}}{2}$ · The council's preliminary key

Q436 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

Number of unit vectors of the form $a\hat{i} + b\hat{j} + c\hat{k}$, where $a, b, c \in W$ is ___

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

Answer: (C) 3 · Checked by our team

EdLoop EAPCET

Q437 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

The scalar product of the vector $\vec{a} = \hat{i} + \hat{j} + \hat{k}$ with a unit vector along the sum of the vectors $\vec{b} = 2\hat{i} + 4\hat{j} - 5\hat{k}$ and $\vec{c} = \lambda\hat{i} + 2\hat{j} + 3\hat{k}$ is equal to one. Then, $\lambda =$

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

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

Q438 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If $PQRST$ is a pentagon, then the resultant of forces $\overline{PQ}, \overline{PT}, \overline{QR}, \overline{SR}, \overline{TS}$ and $\overline{PS}$ is

(A) $3\overline{PT}$
(B) $3\overline{PQ}$
(C) $3\overline{PS}$
(D) $\overline{0}$

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

Q439 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If P divides the line segment joining the points A and B in the ratio $2:1$ and the position vectors of A and B are $\hat{i} - 2\hat{j}$ and $-3\hat{i} + 5\hat{j}$ respectively, then the position vector of P is

(A) $\dfrac{5\hat{i} - 8\hat{j}}{3}$
(B) $\dfrac{-5\hat{i} + 8\hat{j}}{3}$
(C) $\dfrac{5\hat{i} + 8\hat{j}}{3}$
(D) $\dfrac{-5\hat{i} - 8\hat{j}}{3}$

Answer: (B) $\dfrac{-5\hat{i} + 8\hat{j}}{3}$ · The council's preliminary key

Q440 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If $\vec{a}$ and $\vec{b}$ are two unit vectors and θ is the angle between them, then the unit vector along the angular bisector of $\vec{a}$ and $\vec{b}$ is given by _____

EdLoop EAPCET

(A) $\dfrac{\vec{a}+\vec{b}}{2\sin(\theta/2)}$

(B) $\dfrac{\vec{a}+\vec{b}}{2\cos(\theta/2)}$

(C) $\dfrac{\vec{a}-\vec{b}}{2\cos(\theta/2)}$

(D) $\dfrac{\vec{a}+\vec{b}}{\cos(\theta/2)}$

Answer: (B) $\dfrac{\vec{a}+\vec{b}}{2\cos(\theta/2)}$ · The council's preliminary key

---

Q441 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If $\vec{a},\vec{b},\vec{c}$ are coterminous edges of a parallelepiped such that $\begin{vmatrix}\vec{a}.\vec{a} & \vec{a}.\vec{b} & \vec{a}.\vec{c}\\ \vec{b}.\vec{a} & \vec{b}.\vec{b} & \vec{b}.\vec{c}\\ \vec{c}.\vec{a} & \vec{c}.\vec{b} & \vec{c}.\vec{c}\end{vmatrix} = 16$ then find the volume of the parallelepiped

(A) 32

(B) 16

(C) 4

(D) 8

Answer: (C) 4 · Checked by our team

Q442 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

If $\vec{a},\vec{b}$ and $\vec{c}$ are three vectors such that $\vec{a}\times\vec{b}=\vec{c}$, $\vec{b}\times\vec{c}=\vec{a}$ and $\vec{a},\vec{b},\vec{c}$ are mutually perpendicular to each other, then $|\vec{b}|$ is equal to

(A) -1 only

(B) 0 only

(C) 1 only

(D) ± 1

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

Q443 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If O is any point $\overrightarrow{OA}+\overrightarrow{OB}+\overrightarrow{OC}+\overrightarrow{OD}=x\overrightarrow{OE}$, then find x, given that $ABCD$ is quadrilateral, E is the point of intersection of the line joining the mid-points of opposite sides.

(A) 4
(B) 3
(C) 5
(D) 9

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

Q444 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Let $\bar{u}$ and $\bar{v}$ be two vectors in $\mathbf{R}^2$. If $|\bar{u}+\bar{v}|^2 = 2\left(|\bar{u}|^2+|\bar{v}|^2\right)$, then _____

(A) $\bar{u}=\bar{v}$
(B) $\bar{u}$ and $\bar{v}$ need not be same but they have same direction
(C) $\bar{u}$ and $\bar{v}$ need not be same but they have the opposite direction
(D) $\bar{u}=2\bar{v}$

Answer: (A) $\bar{u}=\bar{v}$ · The council's preliminary key

Q445 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If $\vec{a},\vec{b}$ and $\vec{c}$ are position vectors of the vertices of $\triangle ABC$, then $\dfrac{(\vec{a}-\vec{c})\times(\vec{b}-\vec{a})}{(\vec{b}-\vec{a})\cdot(\vec{c}-\vec{a})} =$

(A) $\cot C$
(B) $\tan A$
(C) $\tan C$
(D) $-\tan A$

Answer: (B) $\tan A$ · The council's preliminary key

Q446 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

For a parallelogram $ABCD$, if L and M are midpoints of BC and CD then $\overrightarrow{AL}+\overrightarrow{AM} =$

(A) $\frac{2}{3}\overrightarrow{AC}$
(B) $\frac{3}{2}\overrightarrow{AC}$
(C) $\frac{5}{2}\overrightarrow{AC}$
(D) $3\overrightarrow{AC}$

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

Q447 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If $\bar{p}\times\bar{q}=\bar{p}\times\bar{r}$ and $\bar{p}\cdot\bar{q}=\bar{p}\cdot\bar{r}$, then _____

EdLoop EAPCET

(A) $\bar{p} = \bar{r}$

(B) $\bar{q} = \bar{r}$

(C) $\bar{p} = \bar{q}$

(D) $\bar{p} + \bar{q} = 0$

Answer: (B) $\bar{q} = \bar{r}$ · The council's preliminary key

Q448 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Find the angle between the diagonals of parallelogram $PQRS$ if $\overline{PQ} = 3\hat{i} - 2\hat{j} + 2\hat{k}$ and $\overline{PS} = \hat{i} - 2\hat{k}$

(A) Only $\cos\theta = -\sqrt{\frac{3}{10}}$

(B) Both $\cos\theta = \pm\sqrt{\frac{3}{10}}$

(C) $\tan\theta = -\sqrt{\frac{3}{10}}$

(D) $\tan\theta = -\sqrt{\frac{11}{10}}$

Options (1) or (2) were accepted. More than one answer was accepted. · The council's preliminary key

Q449 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If $\vec{a} = 2\hat{i} - 3\hat{j} - 4\hat{k}$, $\vec{b} = \hat{i} + 4\hat{j} - 2\hat{k}$, $\vec{c} = 3\hat{i} - \hat{j} + 4\hat{k}$ then, $[\vec{a} \times \vec{b}\ \ \vec{b} \times \vec{c}\ \ \vec{c} \times \vec{a}] =$

(A) 4900

(B) 6400

(C) 8100

(D) 12100

Answer: (D) 12100 · The council's preliminary key

Q450 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Let u and v be two vectors in a plane. Then any vector w in the plane can be written as $w = au + bv$ for some scalars 'a' and 'b' if and only if

(A) None of u and v is a scalar multiple of the other

(B) None of $|u|$ and $|v|$ is a scalar multiple of the other

(C) u and v have different direction

(D) u and v are perpendicular to each other

Answer: (A) None of u and v is a scalar multiple of the other · The council's preliminary key

Q451 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If $\vec{a}$ and $\vec{b}$ are unit vectors such that $\vec{a} + \vec{b}$ is also a unit vector, then the angle between $\vec{a}$ and $\vec{b}$ is

_____

(A) 60°
(B) 90°
(C) 30°
(D) 120°

Answer: (D) 120° · The council's preliminary key

Q452 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Let $\vec{u} = -2\hat{i} + 2\hat{j} + \hat{k}$ and $\vec{v} = \hat{i} - 2\hat{j} + 2\hat{k}$. Then angle between $\vec{u}$ and $\vec{v}$ is ___

(A) $\text{Cos}^{-1}\left(\frac{-4}{9}\right)$
(B) $\text{Cos}^{-1}\left(\frac{-4}{3}\right)$
(C) $\text{Cos}^{-1}\left(\frac{4}{3}\right)$
(D) $\text{Sin}^{-1}\left(\frac{-4}{9}\right)$

Answer: (A) $\text{Cos}^{-1}\left(\frac{-4}{9}\right)$ · The council's preliminary key

Q453 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

Let $\vec{u} = \hat{i} - 2\hat{j}$ and $\vec{v} = -3\hat{i} + 5\hat{j}$. Consider three points P, Q and R having position vectors $\frac{-1}{7}\hat{i}$, $\frac{-1}{4}\hat{j}$ and $-2\hat{i} + 3\hat{j}$ respectively. Among these, the points in the line segment passing through $\vec{u}$ and $\vec{v}$ are

(A) Only P and Q
(B) Only P and R
(C) Only Q and R
(D) all P, Q and R

Answer: (A) Only P and Q · The council's preliminary key

Q454 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Let $ABCDEF$ be a regular hexagon with the vertices A, B, C, D, E, F counterclock-wise. Then the vector $\overrightarrow{AB} + \overrightarrow{AF} + \overrightarrow{CD} + \overrightarrow{EF}$ is equal to

(A) $\overrightarrow{DE} + \overrightarrow{FA}$
(B) $\overrightarrow{CB} + \overrightarrow{ED}$
(C) $\overrightarrow{BC} + \overrightarrow{FA}$
(D) $\overrightarrow{BC} + \overrightarrow{DE}$

Answer: (D) $\overrightarrow{BC} + \overrightarrow{DE}$ · The council's preliminary key

Q455 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

In quadrilateral $ABCD$, $\overrightarrow{AB} = \vec{a}$, $\overrightarrow{BC} = \vec{b}$, $\overrightarrow{AD} = \vec{b} - \vec{a}$ if M is the midpoint of BC and N is a point on DM such that $DN = \left(\frac{4}{5}\right) DM$, then $5\overrightarrow{AN} =$

(A) $\overrightarrow{AC}$
(B) $2\overrightarrow{AC}$
(C) $3\overrightarrow{AC}$
(D) $4\overrightarrow{AC}$

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

Q456 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Let $\mathbf{u} = -2\hat{i} + 2\hat{j} + \hat{k}$ and $\mathbf{v} = \hat{i} - 2\hat{j} + 2\hat{k}$. Then the component of $\mathbf{v}$ on $\mathbf{u}$ is

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

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

Q457 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

If $\bar{P} = 3\hat{i} + 5\hat{j} - \hat{k}$ and $\bar{Q} = \hat{i} + 2\hat{j} + 3\hat{k}$ are two sides of a triangle, then its area is equal to _____ sq. units

(A) $\frac{\sqrt{390}}{4}$
(B) $\sqrt{390}$
(C) $\frac{\sqrt{390}}{2}$
(D) $\frac{\sqrt{390}}{8}$

Answer: (C) $\frac{\sqrt{390}}{2}$ · The council's preliminary key

Q458 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Given ΔABC such that A is $2\hat{i} - \hat{j} + \hat{k}$, B is $\hat{i} - 3\hat{j} - 5\hat{k}$ and C is $3\hat{i} - 4\hat{j} - 4\hat{k}$ then ΔABC is

(A) An equilateral triangle
(B) A right-angled triangle
(C) An isosceles triangle
(D) A scalene triangle

Answer: (B) A right-angled triangle · The council's preliminary key

EdLoop EAPCET

Q459 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Let u and v be two non-zero vectors. Then the magnitude of the cross product $u \times v$ is always

(A) $\leq |u||v|$
(B) $= |u||v|$
(C) $> |u||v|$
(D) $= 0$

Answer: (A) $\leq |u||v|$ · Checked by our team

Q460 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Let ABC be a triangle. Let $u = \overrightarrow{AB}$ and $v = \overrightarrow{AC}$. If D is a middle point of BC, then $\overrightarrow{AD} =$

(A) $\frac{u-v}{2}$
(B) $\frac{v-u}{2}$
(C) $\frac{u+v}{2}$
(D) $u+v$

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

Q461 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Let u, v and w be vectors such that $u+v+w=0$, $|u|=3$, $|v|=5$ and $|w|=7$. Then the angle between u and v is

(A) 60°
(B) 70°
(C) 80°
(D) 90°

Answer: (A) 60° · The council's preliminary key

Q462 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

If α is the angle between two vectors $\bar{p} = 3\hat{i} + 4\hat{j} - \hat{k}$ and $\bar{q} = 2\hat{i} - \hat{j} + \hat{k}$ then, $\sin(\alpha) =$

(A) $\sqrt{145/156}$
(B) $\sqrt{135/156}$
(C) $\sqrt{155/156}$
(D) $\sqrt{165/156}$

Answer: (C) $\sqrt{155/156}$ · The council's preliminary key

EdLoop EAPCET

Q463 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Equation of the perpendicular bisector of the line joining the points whose position vectors are $\vec{a}$ and $\vec{b}$ respectively is

(A) $(2\vec{r}-\vec{a}-\vec{b})\cdot(\vec{a}-\vec{b})=0$
(B) $(2\vec{r}-\vec{a}-\vec{b})\cdot(\vec{a}+\vec{b})=0$
(C) $(2\vec{r}+\vec{a}+\vec{b})\cdot(\vec{a}-\vec{b})=0$
(D) $(2\vec{r}-\vec{a}+\vec{b})\cdot(\vec{a}+\vec{b})=0$

Answer: (A) $(2\vec{r}-\vec{a}-\vec{b})\cdot(\vec{a}-\vec{b})=0$ · The council's preliminary key

Q464 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

If $\bar{a}=2\hat{i}+2\hat{j}-3\hat{k}$ and $\bar{b}=3\hat{i}-\hat{j}+2\hat{k}$, then find the angle between the vectors $2\bar{a}+\bar{b}$ and $\bar{a}+2\bar{b}$.

(A) $\text{Cos}^{-1}\left(\frac{36}{\sqrt{42\times35}}\right)$
(B) $\text{Cos}^{-1}\left(\frac{72}{\sqrt{24\times32}}\right)$
(C) $\text{Cos}^{-1}\left(\frac{52}{\sqrt{74\times65}}\right)$
(D) $\text{Cos}^{-1}\left(\frac{24}{\sqrt{18\times32}}\right)$

Answer: (C) $\text{Cos}^{-1}\left(\frac{52}{\sqrt{74\times65}}\right)$ · The council's preliminary key

Q465 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If the magnitude of the vector product of the vector $\hat{i}+\hat{j}+\hat{k}$ with a unit vector along the sum of the vectors $2\hat{i}+4\hat{j}-5\hat{k}$ and $\lambda\hat{i}+2\hat{j}+3\hat{k}$ is equal to $\sqrt{2}$, then the value of 'λ' is

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

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

Q466 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Find 'λ' if $\vec{a},\vec{b},\vec{c}$ are three non-coplanar vectors such that $[4\vec{a}+3\vec{b}-\vec{c}\quad 4\vec{a}+3\vec{b}+2\vec{c}\quad \vec{a}-4\vec{b}-\vec{c}]=(\lambda^2+\lambda+1)[\vec{a}\quad\vec{b}\quad\vec{c}]$

EdLoop EAPCET

(A) $-7, 8$
(B) $-7, -6$
(C) $7, -8$
(D) $-7, -8$

Answer: (C) $7, -8$ · The council's preliminary key

Q467 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

In a regular hexagon $ABCDEF$, $\overrightarrow{AD} + \overrightarrow{EB} + \overrightarrow{FC} = (3\lambda - 8)\overrightarrow{AB}$. Then $\lambda =$

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

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

Q468 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Two $\mathbf{u}$ and $\mathbf{v}$ are parallel if and only if

(A) $\mathbf{u}$ and $\mathbf{v}$ have the same direction
(B) $\mathbf{u}$ and $\mathbf{v}$ have the opposite direction
(C) One of them is a scalar multiple of the other
(D) The dot product of $\mathbf{u}$ and $\mathbf{v}$ are Zero

Answer: (C) One of them is a scalar multiple of the other · The council's preliminary key

---

Q469 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Let $\mathbf{u}$ and $\mathbf{v}$ be two nonzero vectors. if $|\mathbf{u} + \mathbf{v}| = |\mathbf{u} - \mathbf{v}|$ then

(A) $\mathbf{u}$ and $\mathbf{v}$ have the same direction
(B) $\mathbf{u}$ and $\mathbf{v}$ are perpendicular
(C) $\mathbf{u}$ and $\mathbf{v}$ have the opposite direction
(D) Data Insufficient

Answer: (B) $\mathbf{u}$ and $\mathbf{v}$ are perpendicular · The council's preliminary key

---

Q470 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

The unit vectors orthogonal to $3\hat{i} + 2\hat{j} + 6\hat{k}$ and coplanar with $2\hat{i} + \hat{j} + \hat{k}$ and $\hat{i} - \hat{j} + \hat{k}$ are

EdLoop EAPCET

(A) $\pm\frac{1}{\sqrt{5}}(2\hat{i}-\hat{k})$
(B) $\pm\frac{1}{\sqrt{10}}(3\hat{j}-\hat{k})$
(C) $\pm\frac{1}{\sqrt{13}}(2\hat{i}-3\hat{j})$
(D) $\pm\frac{1}{\sqrt{17}}(2\hat{i}+3\hat{j}-2\hat{k})$

Answer: (B) $\pm\frac{1}{\sqrt{10}}(3\hat{j}-\hat{k})$ · The council's preliminary key

Q471 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

Let $\bar{p},\bar{q}$ and $\bar{r}$ be such that $\bar{r}\neq\bar{0},\ \bar{p}\times\bar{q}=\bar{r},\ \bar{q}\times\bar{r}=\bar{p}$ then
(i) $\bar{p},\bar{q},\bar{r}$ are pair-wise orthogonal vectors
(ii) $|\bar{q}|=|\bar{r}|=|\bar{p}|$

(A) (i) is correct, (ii) is incorrect
(B) (i) is incorrect, (ii) is correct
(C) Both (i) and (ii) are incorrect
(D) Both (i) and (ii) are correct

Answer: (A) (i) is correct, (ii) is incorrect · Checked by our team

Q472 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

Find $|\bar{a}\times\bar{b}|^2$ if $|\bar{a}|=2,\ |\bar{b}|=3$ and $(\bar{a},\bar{b})=\pi/6$

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

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

Q473 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If $\vec{a}=\alpha\hat{i}+3\hat{j}-6\hat{k}$ and $\vec{b}=2\hat{i}-\hat{j}+\beta\hat{k}$ then the values of α,β so that $\vec{a}$ & $\vec{b}$ may be collinear are

(A) $(5,3)$
(B) $(6,2)$
(C) $(2,-6)$
(D) $(-6,2)$

Answer: (D) $(-6,2)$ · The council's preliminary key

Q474 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

Let $\bar{a},\bar{b},\bar{c}$ be three vectors
(i) $(\bar{a}\times\bar{b})\times\bar{c}=(\bar{a}\cdot\bar{c})\bar{b}-(\bar{b}\cdot\bar{c})\bar{a}$
(ii) $(\bar{a})\times(\bar{b}\times\bar{c})=(\bar{a}\cdot\bar{b})\bar{c}-(\bar{a}\cdot\bar{c})\bar{b}$

EdLoop EAPCET

(A) (i) is incorrect, (ii) is correct
(B) (i) is correct, (ii) is incorrect
(C) Both (i) and (ii) are correct
(D) Both (i) and (ii) are incorrect

Answer: (B) (i) is correct, (ii) is incorrect · The council's preliminary key

Q475 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

ABC is a right-angled triangle in which $\max\{AB, BC, AC\} = BC$. If the position vectors of B and C are respectively $3\hat{i} - 2\hat{j} + \hat{k}$ and $5\hat{i} + \hat{j} - 3\hat{k}$ then $\overrightarrow{AB} \cdot \overrightarrow{AC} + \overrightarrow{BA} \cdot \overrightarrow{BC} + \overrightarrow{CA} \cdot \overrightarrow{CB} =$

(A) 28
(B) 29
(C) 27
(D) 25

Answer: (B) 29 · The council's preliminary key

Q476 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

If $\vec{a} + \vec{b} + \vec{c} = \vec{0}$ and $|\vec{a}| = 3$, $|\vec{b}| = 5$, $|\vec{c}| = 7$, then the angle between $\vec{a}$ and $\vec{b}$ is _____

(A) 30°
(B) 120°
(C) 90°
(D) 60°

Answer: (D) 60° · The council's preliminary key

Q477 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

If $\vec{a}, \vec{b}, \vec{c}$ and $\vec{r}$ are vectors such that $\vec{a}$ is not perpendicular to $\vec{b}$, $\vec{r} \times \vec{b} = \vec{c} \times \vec{b}$ and $\vec{r} \cdot \vec{a} = 0$ then $\vec{r} =$

(A) $\vec{c} + \frac{(\vec{c} \cdot \vec{a})}{(\vec{b} \cdot \vec{a})}\vec{b}$
(B) $\vec{b} - \frac{(\vec{c} \cdot \vec{a})}{(\vec{b} \cdot \vec{a})}\vec{c}$
(C) $\vec{c} - \frac{(\vec{c} \cdot \vec{a})}{(\vec{b} \cdot \vec{a})}\vec{b}$
(D) $\vec{b} + \frac{(\vec{c} \cdot \vec{a})}{(\vec{b} \cdot \vec{a})}\vec{c}$

Answer: (C) $\vec{c} - \frac{(\vec{c} \cdot \vec{a})}{(\vec{b} \cdot \vec{a})}\vec{b}$ · The council's preliminary key

Q478 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

In a triangle ABC (shown in the figure below), state whether the following are true or false

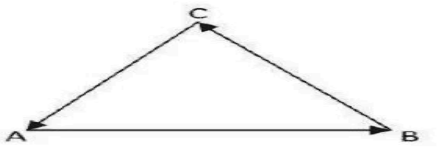
(see the figure above)

(i) $\overrightarrow{AB} + \overrightarrow{BC} + \overrightarrow{CA} = 0$

EdLoop EAPCET

(ii) $\overrightarrow{AB}+\overrightarrow{BC}-\overrightarrow{AC}=0$
(iii) $\overrightarrow{AB}-\overrightarrow{CB}+\overrightarrow{CA}=0$
(iv) $\overrightarrow{AB}+\overrightarrow{BC}-\overrightarrow{CA}=0$

Orientation : Vertical
In a triangle ABC (shown in the figure below), state whether the following are true or false
క్రింది చూపిన ABC త్రిభుజమునకు ఈ క్రిందివి నిజమా కాదో తెలపండి.



(i) $\overrightarrow{AB}+\overrightarrow{BC}+\overrightarrow{CA}=\overrightarrow{0}$
(ii) $\overrightarrow{AB}+\overrightarrow{BC}-\overrightarrow{AC}=\overrightarrow{0}$
(iii) $\overrightarrow{AB}-\overrightarrow{CB}+\overrightarrow{CA}=\overrightarrow{0}$
(iv) $\overrightarrow{AB}+\overrightarrow{BC}-\overrightarrow{CA}=\overrightarrow{0}$

Options :

AP EAMCET 2020
AP EAMCET 2020

1. (i)- True, (ii)- True, (iii)- True, (iv)- False
(i)- నిజము, (ii)- నిజము, (iii)- నిజము, (iv)- అబద్ధము

2. (i)- True, (ii)- False, (iii)- True, (iv)- False
(i)- నిజము, (ii)- అబద్ధము, (iii)- నిజము, (iv)- అబద్ధము

3. (i)- False, (ii)- False, (iii)- True, (iv)- True
(i)- అబద్ధము, (ii)- అబద్ధము, (iii)- నిజము, (iv)- నిజము

4. (i)- False, (ii)- True, (iii)- False, (iv)- False
(i)- అబద్ధము, (ii)- నిజము, (iii)- అబద్ధము, (iv)- అబద్ధము

(A) (i)- True, (ii)- True, (iii)- True, (iv)- False
(B) (i)- True, (ii)- False, (iii)- True, (iv)- False
(C) (i)- False, (ii)- False, (iii)- True, (iv)- True
(D) (i)- False, (ii)- True, (iii)- False, (iv)- False

Answer: (A) (i)- True, (ii)- True, (iii)- True, (iv)- False · The council's preliminary key

Q479 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Length of the perpendicular from the origin to the plane passing through three non collinear points with position vectors $\vec{a},\vec{b}$ and $\vec{c}$ is

(A) $\left|[\vec{a}\ \vec{b}\ \vec{c}]\right|$
(B) $\left|2[\vec{a}\ \vec{b}\ \vec{c}]\right|$
(C) $\left|\frac{2[\vec{a}\ \vec{b}\ \vec{c}]}{|\vec{a}\times\vec{b}+\vec{b}\times\vec{c}+\vec{c}\times\vec{a}|}\right|$
(D) $\left|\frac{[\vec{a}\ \vec{b}\ \vec{c}]}{|\vec{a}\times\vec{b}+\vec{b}\times\vec{c}+\vec{c}\times\vec{a}|}\right|$

Answer: (D) $\left|\frac{[\vec{a}\ \vec{b}\ \vec{c}]}{|\vec{a}\times\vec{b}+\vec{b}\times\vec{c}+\vec{c}\times\vec{a}|}\right|$ · Checked by our team

Q480 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

If the vectors $a\hat{i}+\hat{j}+\hat{k}$, $\hat{i}+b\hat{j}+\hat{k}$ and $\hat{i}+\hat{j}+c\hat{k}$ are coplanar, where $(a,b,c\neq 1)$ then the value of $\frac{1}{1-a}+\frac{1}{1-b}+\frac{1}{1-c}=$

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

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

Q481 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Let u, v and w be three vectors in $\mathbf{R}^3$. Then any vector $z \in \mathbf{R}^3$ can be written as $z = au + bv + cw$ for some scalars a, b and c if and only if

(A) Each pair of u, v and w are not parallel
(B) Each of u, v and w can be written as a linear combination of the other two
(C) All have different magnitude and directions
(D) None of the options are correct

Answer: (D) None of the options are correct · The council's preliminary key

Q482 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

If $\overline{PO} + \overline{OQ} = \overline{QO} + \overline{OR}$ then _____

(A) Q is the midpoint of $\overline{PR}$
(B) Q divides $\overline{PR}$ in $2:1$
(C) Q divides $\overline{PR}$ in $1:2$
(D) Q divides $\overline{PR}$ in $-1:2$

Answer: (A) Q **is the midpoint of** $\overline{PR}$ · The council's preliminary key

Q483 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Let ABCD be a parallelogram and E be the midpoint of AB. If P is the point of intersection of DE and AC, then $\frac{DP}{PE} + \frac{AP}{PC} =$

(A) $\frac{5}{2}$
(B) $\frac{4}{3}$
(C) $\frac{3}{2}$
(D) $\frac{2}{3}$

Answer: (A) $\frac{5}{2}$ · Official TGCHE final key

Q484 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

A vector $\bar{a}$ has components $2p$ and 1 with respect to a two dimensional rectangular cartesian system. This system is rotated through a certain angle about the origin in the counter - clockwise direction. If $\bar{a}$ has components $p+1$ and 1 with respect to the new system, then

EdLoop EAPCET

(A) $p = 1$ or $p = \frac{-1}{3}$
(B) $p = -1$ or $p = \frac{1}{3}$
(C) $p = 1$ or $p = -1$
(D) $p = 0$ or $p = \frac{1}{2}$

Answer: (A) $p = 1$ or $p = \frac{-1}{3}$ · Official TGCHE final key

Q485 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Let A $(3\bar{i} + \bar{j} - \bar{k})$ and B $(13\bar{i} - 4\bar{j} + 9\bar{k})$ be two points on a line L. C and D be the points on L on either side of A at distances of 9 and 6 units respectively and C lies between A and B . Then position vectors of C and D are respectively

(A) $-3\bar{i} + 4\bar{j} - 7\bar{k},\ 7\bar{i} - \bar{j} + 3\bar{k}$
(B) $9\bar{i} - 2\bar{j} + 5\bar{k},\ 7\bar{i} - \bar{j} + 3\bar{k}$
(C) $-3\bar{i} + 4\bar{j} - 7\bar{k},\ -\bar{i} + 3\bar{j} - 5\bar{k}$
(D) $9\bar{i} - 2\bar{j} + 5\bar{k},\ -\bar{i} + 3\bar{j} - 5\bar{k}$

Answer: (D) $9\bar{i} - 2\bar{j} + 5\bar{k},\ -\bar{i} + 3\bar{j} - 5\bar{k}$ · Official TGCHE final key

Q486 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

If $\bar{a} = 2\bar{u} + 3\bar{v} + 7\bar{w}$, $\bar{b} = \bar{u} + \bar{v} - 2\bar{w}$ and $\bar{c} = -\bar{u} - 2\bar{v} - 3\bar{w}$ then $\left|\frac{[\bar{u}\ \bar{v}\ \bar{w}]}{[\bar{a}\ \bar{b}\ \bar{c}]}\right| (\bar{a} + \bar{b} + \bar{c}) =$

(A) $12(\bar{u} + \bar{v} + \bar{w})$
(B) $3(\bar{u} + \bar{v} + \bar{w})$
(C) $\frac{2}{3}(\bar{u} + \bar{v} + \bar{w})$
(D) $\frac{1}{3}(\bar{u} + \bar{v} + \bar{w})$

Answer: (D) $\frac{1}{3}(\bar{u} + \bar{v} + \bar{w})$ · Official TGCHE final key

Q487 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Let $\bar{V} = 2\bar{i} + \bar{j} - \bar{k}$ and $\bar{W} = \bar{i} + 3\bar{k}$. If $\bar{U}$ is a unit vector, then the maximum value of $[\bar{U}\ \bar{V}\ \bar{W}]$ is

(A) -1
(B) $\sqrt{10} + \sqrt{16}$
(C) $\sqrt{59}$
(D) $\sqrt{60}$

Answer: (C) $\sqrt{59}$ · Official TGCHE final key

Q488 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If $\bar{a}, \bar{b}, \bar{c}$ are three independent vectors, and there exists a non zero scalar traid (l, m, n) such that $l(3\bar{a} + 2\bar{b} + \bar{c}) + m(2\bar{a} + 2\bar{b} + 3\bar{c}) + n(\bar{a} + 2\bar{b} + 5\bar{c}) = \bar{0}$, then

(A) $l = m = n$

(B) $l = n$

(C) $l = n,\ m + 2n = 0$

(D) $m + 2n = 0,\ l + n = 0$

Answer: (C) $l = n,\ m + 2n = 0$ · Official TGCHE final key

Q489 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If $\bar{a}$ and $\bar{b}$ represent two non collinear vectors, the equation $\bar{r} = t\bar{a} + (1-t)\bar{b}$ represents

(A) a point on the third side of a triangle for which $\bar{a}, \bar{b}$ are two sides, only when $0 \leq t \leq 1$

(B) a point on the line joining the points whose position vectors are $\bar{a}$ and $\bar{b}$

(C) a vector in the plane of $\bar{a}, \bar{b}$ only when $t > 1$

(D) a vector in the plane parallel to the plane of $\bar{a}$ and $\bar{b}$, only when $-1 \leq t \leq 1$

Options (1) or (2) were accepted. More than one answer was accepted. · Official TGCHE final key

Q490 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Let $\bar{a}, \bar{b}, \bar{c}$ be three vectors such that the magnitude of $\bar{b}$ is twice that of $\bar{a}$ and magnitude of $\bar{c}$ is three times that of $\bar{a}$. If the angle between each pair of vectors is $\frac{\pi}{3}$ and $|\bar{a} + \bar{b} + \bar{c}| = 5$, then $|\bar{c}| + |\bar{a}| + |\bar{b}| =$

(A) 6

(B) 12

(C) $3\sqrt{2}$

(D) 3

Answer: (A) 6 · Official TGCHE final key

Q491 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If $\bar{a}, \bar{b}, \bar{c}$ are three mutually perpendicular vectors such that the magnitudes of $\bar{b}$ and $\bar{c}$ are $\frac{1}{2}$ times and $\frac{\sqrt{3}}{2}$ times that of $\bar{a}$, respectively, then the angle between the vectors $\bar{a} + \bar{b} + \bar{c}$ and $\bar{b}$ is

(A) 45^0

(B) $\text{Cos}^{-1}\left(\frac{1}{2\sqrt{2}}\right)$

(C) $\text{Cos}^{-1}\left(\frac{\sqrt{6}}{4}\right)$

(D) $\text{Cos}^{-1}\left(\frac{1}{4}\right)$

Answer: (B) $\text{Cos}^{-1}\left(\frac{1}{2\sqrt{2}}\right)$ · Official TGCHE final key

Q492 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

The locus of the point $P(\bar{r})$ which encloses a triangle ABP of area 1 sq. unit with the fixed points $A(\bar{i})$ and $B(\bar{j})$ is

(A) $x^2+y^2+z^2=4$
(B) $(x+2)^2+x^2+y^2=1$ (sic)
(C) $(x+y-1)^2+2z^2=4$
(D) $(x+y-1)^2+y^2+z^2=1$

Answer: (C) $(x+y-1)^2+2z^2=4$ · Official TGCHE final key

Q493 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

If $\bar{a},\bar{b},\bar{c}$ are the position vectors of the points A, B, C respectively, then match the items of list - I with those of list - II

List - I

A) $\bar{a}=2\bar{i}+3\bar{j}+4\bar{k}$, $\bar{b}=3\bar{i}+4\bar{j}+2\bar{k}$, $\bar{c}=4\bar{i}+2\bar{j}+3\bar{k}$

B) $\bar{a}=\bar{i}+2\bar{j}+3\bar{k}$, $\bar{b}=3\bar{i}+4\bar{j}+7\bar{k}$, $\bar{c}=-3\bar{i}-2\bar{j}-5\bar{k}$

C) $\bar{a}=2\bar{i}-\bar{j}+\bar{k}$, $\bar{b}=\bar{i}-3\bar{j}-5\bar{k}$, $\bar{c}=-3\bar{i}-4\bar{j}-4\bar{k}$

D) $\bar{a}=\bar{i}+\bar{j}+\bar{k}$, $\bar{b}=\bar{i}+2\bar{j}+3\bar{k}$, $\bar{c}=2\bar{i}-\bar{j}+\bar{k}$

List - II

I) A, B, C are collinear

II) ΔABC is an isosceles triangle

III) ΔABC is a right-angled triangle

IV) ΔABC is a right-angled isosceles triangle.

V) ΔABC is an equilateral triangle

The correct match is

(A) A-I, B-IV, C-III, D-II
(B) A-I, B-II, C-III, D-IV
(C) A-V, B-I, C-IV, D-II
(D) A-V, B-I, C-III, D-II

Answer: (D) A-V, B-I, C-III, D-II · Official TGCHE final key

Q494 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

Let $\bar{a}=\bar{i}+2\bar{j}-2\bar{k}$ and $\bar{b}=2\bar{i}-\bar{j}-2\bar{k}$. If the orthogonal projection vector of $\bar{a}$ on $\bar{b}$ be $\bar{x}$ and the orthogonal projection vector of $\bar{b}$ on $\bar{a}$ be $\bar{y}$, then $|\bar{x}-\bar{y}|=$

(A) $\frac{4}{9}\sqrt{26}$
(B) $\frac{8}{9}\sqrt{10}$
(C) $\frac{4}{9}\sqrt{10}$
(D) $\frac{8}{9}\sqrt{26}$

Answer: (C) $\frac{4}{9}\sqrt{10}$ · Official TGCHE final key

EdLoop EAPCET

Q495 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

Let $\bar{p}, \bar{q}, \bar{r}$ be three non-coplanar vectors and $[\bar{p}\,\bar{q}\,\bar{r}]\bar{a} = \bar{q} \times \bar{r}$, $[\bar{p}\,\bar{q}\,\bar{r}]\bar{b} = \bar{r} \times \bar{p}$, $[\bar{p}\,\bar{q}\,\bar{r}]\bar{c} = \bar{p} \times \bar{q}$. If $\bar{a}, \bar{b}, \bar{c}$ denote the coterminous edges of a parallelopiped, then its height with the base having $\bar{a}$ and $\bar{c}$ is

(A) $|\bar{p}|$
(B) $\dfrac{1}{|\bar{a}|}$
(C) $\dfrac{1}{|\bar{b}|}$
(D) $\dfrac{1}{|\bar{q}|}$

Answer: (D) $\dfrac{1}{|\bar{q}|}$ · Official TGCHE final key

Q496 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

If $\bar{b}, \bar{c}$ are non collinear vectors, $|\bar{c}| \neq 0$, $\bar{a} \times (\bar{b} \times \bar{c}) + (\bar{a} \cdot \bar{b})\bar{b} = (4 - 2\beta - \operatorname{Sin}\alpha)\bar{b} + (\beta^2 - 1)\bar{c}$ and $(\bar{c} \cdot \bar{c})\bar{a} = \bar{c}$, then the scalars α and β are

(A) $\alpha = \dfrac{\pi}{2} + \dfrac{n\pi}{3}, n \in \mathbb{Z}; \beta = 1$
(B) $\alpha = \dfrac{\pi}{2} + 2n\pi, n \in \mathbb{Z}; \beta = 1$
(C) $\alpha = \dfrac{\pi}{2} + (2n+1)\dfrac{\pi}{2}, n \in \mathbb{Z}, \beta = 2$
(D) $\alpha = (2n+1)\pi/2, n \in \mathbb{Z}, \beta = \dfrac{3}{2}$

Answer: (B) $\alpha = \dfrac{\pi}{2} + 2n\pi, n \in \mathbb{Z}; \beta = 1$ · Official TGCHE final key

Q497 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

$\bar{x}, \bar{y}, \bar{z}$ are three vectors each of magnitude $\sqrt{2}$ and each making an angle 60° with one another. If $\bar{a} = \bar{x} \times (\bar{y} \times \bar{z})$, $\bar{b} = \bar{y} \times (\bar{z} \times \bar{x})$, $\bar{c} = \bar{x} \times \bar{y}$, then $\bar{x} =$

(A) $\dfrac{1}{2}\left[(\bar{a} + \bar{b}) \times \bar{c} - (\bar{a} + \bar{b})\right]$
(B) $\dfrac{1}{2}\left[\bar{c} + \bar{a} - \bar{b}\right]$
(C) $\dfrac{1}{2}\left[(\bar{a} + \bar{b}) \times \bar{c} + (\bar{a} + \bar{b})\right]$
(D) $\dfrac{1}{2}\left[(\bar{a} \times \bar{b}) \times \bar{c} - \bar{a} + \bar{b}\right]$

Answer: (A) $\dfrac{1}{2}\left[(\bar{a} + \bar{b}) \times \bar{c} - (\bar{a} + \bar{b})\right]$ · Official TGCHE final key

Q498 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

Let $\bar{a} = 2\bar{i} - 2\bar{j} + \bar{k}$, $\bar{b} = -\bar{j} + \bar{k}$. If $\bar{c}$ is a vector such that $\bar{a} \cdot \bar{c} = |\bar{c}|$, $|\bar{c} - \bar{a}| = 2\sqrt{2}$ and the angle between $\bar{a} \times \bar{b}$ and $\bar{c}$ is $\dfrac{\pi}{3}$, then $|(\bar{a} \times \bar{b}) \times \bar{c}| =$

(A) $3\sqrt{3}$
(B) $\frac{3}{2}$
(C) $\frac{3\sqrt{3}}{2}$
(D) 0

Answer: (C) $\frac{3\sqrt{3}}{2}$ · Official TGCHE final key

Q499 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

Let $\overline{OA} = \bar{a}$, $\overline{OB} = \bar{b}$ be two non collinear vectors, $\overline{OP} = x_1\bar{a} + y_1\bar{b}$, $\overline{OQ} = x_2\bar{a} + y_2\bar{b}$ and $\overline{A'O} = \overline{OA}$, $\overline{B'O} = \overline{OB}$. If $x_1 = \frac{-3}{4}$, $x_2 = \frac{1}{3}$, $y_1 = \frac{7}{4}$, $y_2 = \frac{5}{3}$, then

(A) P lies inside the $\Delta A'OB$ and Q lies outside the ΔAOB
(B) P lies outside the $\Delta AOB'$ and Q lies on the $\Delta A'OB'$
(C) P lies inside the ΔAOB and Q lies outside the $\Delta AOB'$
(D) P lies on the $\Delta A'OB$ and Q lies outside the ΔAOB

Answer: (D) P lies on the $\Delta A'OB$ and Q lies outside the ΔAOB · Official TGCHE final key

Q500 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

The position vector of a point P is $2\bar{i} + \bar{j} + 3\bar{k}$ and $\bar{a} = -\bar{i} - 2\bar{k}$, $\bar{b} = \bar{i} + \bar{j} + 2\bar{k}$ are two vectors which determine a plane π. The equation of a line through P normal to $\bar{b}$ and lying on the plane π is

(A) $\bar{r} = 2\bar{i} + \bar{j} + 3\bar{k} + \lambda(-\bar{i} + 5\bar{j} - 2\bar{k})$
(B) $\bar{r} = 2\bar{i} + \bar{j} + 3\bar{k} + \lambda(\bar{i} + \bar{j} + \bar{k})$
(C) $\bar{r} = 2\bar{i} + \bar{j} + 3\bar{k} + \lambda(-2\bar{i} - \bar{j} + 3\bar{k})$
(D) $\bar{r} = 2\bar{i} + \bar{j} + 3\bar{k} + \lambda(-3\bar{i} + 4\bar{j} - 5\bar{k})$

Answer: (A) $\bar{r} = 2\bar{i} + \bar{j} + 3\bar{k} + \lambda(-\bar{i} + 5\bar{j} - 2\bar{k})$ · Official TGCHE final key

Q501 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

In a quadrilateral ABCD, the point P divides DC in the ratio $1 : 3$ internally and Q is the midpoint of AC. If $\overline{AB} + \overline{AD} + \overline{BC} - 2\overline{DC} = \lambda\,\overline{PQ}$, then the value of λ is

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

Answer: (D) -4 · Official TGCHE final key

Q502 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

$\bar{p} = 2\bar{i} - 3\bar{j} + \bar{k}$, $\bar{q} = \bar{i} + \bar{j} - \bar{k}$. If the vectors $\bar{a}$ and $\bar{b}$ are the orthogonal projections of $\bar{p}$ on $\bar{q}$ and $\bar{q}$ on $\bar{p}$ respectively, then $\frac{\bar{a} \times \bar{b}}{\bar{a} \cdot \bar{b}} =$

(A) $\frac{2\bar{i} + 3\bar{j} + 5\bar{k}}{19\sqrt{2}}$

(B) $\frac{2\bar{i} + 3\bar{j} + 5\bar{k}}{\sqrt{38}}$

(C) $\frac{2\bar{i} + 3\bar{j} + 5\bar{k}}{2}$

(D) $\frac{3\bar{i} - 2\bar{j}}{13}$

Answer: (C) $\frac{2\bar{i} + 3\bar{j} + 5\bar{k}}{2}$ · Official TGCHE final key

Q503 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

Let $\bar{a} = 2\bar{i} - 3\bar{j} + 4\bar{k}$, $\bar{b} = 7\bar{i} + 2\bar{j} - 3\bar{k}$, $\bar{c} = \bar{i} + \bar{j} + \bar{k}$. The vector $\bar{x}$ such that $\bar{x} \cdot \bar{c} = 60$ and perpendicular to both $\bar{a}, \bar{b}$ is

(A) $14\bar{i} - 6\bar{j} - 12\bar{k}$

(B) $\bar{i} + 34\bar{j} + 25\bar{k}$

(C) $4\bar{i} - 21\bar{j} - 12\bar{k}$

(D) $6\bar{i} - 6\bar{j} + 28\bar{k}$

Answer: (B) $\bar{i} + 34\bar{j} + 25\bar{k}$ · Official TGCHE final key

Q504 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If $12\bar{i} - 12\bar{j} - 18\bar{k}$, $-3\bar{i} - 6\bar{j} - 9\bar{k}$ and $3\bar{i} + 3\bar{j} - 24\bar{k}$ be the position vectors of the vertices A, B and C respectively of ΔABC, then the position vector of the incentre of ΔABC is

(A) $12\bar{i} - 15\bar{j} - 51\bar{k}$

(B) $6\bar{i} - \frac{15}{2}\bar{j} - \frac{51}{2}\bar{k}$

(C) $\frac{4}{3}\bar{i} - \frac{5}{3}\bar{j} - 17\bar{k}$

(D) $4\bar{i} - 5\bar{j} - 17\bar{k}$

Answer: (D) $4\bar{i} - 5\bar{j} - 17\bar{k}$ · Official TGCHE final key

Q505 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If the orthocentre of the triangle whose vertices are $2\bar{i} + 3\bar{j} + 5\bar{k}$, $5\bar{i} + 2\bar{j} + 3\bar{k}$ and $3\bar{i} + 5\bar{j} + 2\bar{k}$ is $x\bar{i} + y\bar{j} + z\bar{k}$ then

(A) $x = 2y = z$

(B) $x = y = 2z$

(C) $x = y = -z$

(D) $x = y = z$

Answer: (D) $x = y = z$ · Official TGCHE final key

Q506 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If the vectors $\overline{AB} = p\bar{i} + q\bar{j} + r\bar{k}$, $\overline{AC} = s\bar{i} + 3\bar{j} + 4\bar{k}$, $\overline{CB} = 3\bar{i} + \bar{j} - 2\bar{k}$ from ΔABC, then the values of p, q, r and s such that the area of that ΔABC is $5\sqrt{6}$ are

(A) $p = 11, q = 4, r = -2, s = 8$

(B) $p = 8, q = 4, r = 2, s = 5$

(C) $p = -5, q = 4, r = 2, s = -8$

(D) $p = 14, q = 4, r = 2, s = 11$

Answer: (B) $p = 8, q = 4, r = 2, s = 5$ · Official TGCHE final key

Q507 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

Let $\bar{a}$, $\bar{b}$, and $\bar{c}$ be three unit vectors such that $\bar{a} \times (\bar{b} \times \bar{c}) = \frac{1}{\sqrt{2}}(\bar{b} + \bar{c})$ and $\bar{b}$ is not parallel to $\bar{c}$. If α and β are the angles between $\bar{a}, \bar{b}$ and $\bar{a}, \bar{c}$ respectively then $\alpha - \beta =$

(A) $\frac{3\pi}{4}$

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

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

(D) 0

Answer: (C) $\frac{\pi}{2}$ · Official TGCHE final key

Q508 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

$A(\bar{a}), B(\bar{b}), C(\bar{c}), D(\bar{d})$ are four concyclic points, such that $x\bar{a} + y\bar{b} + z\bar{c} + t\bar{d} = \bar{0}$, $x + y + z + t = 0$ where x, y, z, t are constants not all zero. If the chords AB and CD intersect at P, then

(A) $|xy|\,|\bar{a} + \bar{c}|^2 = |zt|\,|\bar{b} + \bar{d}|^2$

(B) $|xy|\,|\bar{a} - \bar{b}|^2 = |zt|\,|\bar{c} - \bar{d}|^2$

(C) $|xt|\,|\bar{a} - \bar{c}|^2 = |yz|\,|\bar{b} - \bar{c}|^2$

(D) $|xz|\,|\bar{b} + \bar{d}|^2 = |yt|\,|\bar{a} + \bar{c}|^2$

Answer: (B) $|xy|\,|\bar{a} - \bar{b}|^2 = |zt|\,|\bar{c} - \bar{d}|^2$ · Official TGCHE final key

Q509 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If $\bar{a}$ and $\bar{b}$ are two non collinear vectors, then $\frac{\bar{a} \times (\bar{b} \times \bar{a})}{|\bar{a}|^2}$ represent

(A) a vector perpendicular to the plane of $\bar{a}, \bar{b}$

(B) projection of $\bar{b}$ along a vector perpendicular to the vector $\bar{a}$

(C) projection of $\bar{a}$ along the vector perpendicular to $\bar{b}$

(D) a vector on the plane of $\bar{a}, \bar{b}$ whose magnitude is equal to $|\bar{a}| + |\bar{b}|$

Answer: (B) projection of $\bar{b}$ along a vector perpendicular to the vector $\bar{a}$ · Official TGCHE final key

Q510 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If A (1, 2, 3), B (3, 7, -2), C (6, 7, 7) and D (-1, 0, -1) are points in a plane, then the vector equation of the line passing through the centroids of Δ ABD and Δ ACD is

(A) $\bar{r} = 2\bar{i} + 3\bar{j} + 3\bar{k} + t(\bar{i} + 3\bar{j})$

(B) $\bar{r} = (1+t)\bar{i} + 3\bar{j} + 3t\bar{k}$

(C) $\bar{r} = \bar{i} + \bar{j} + \bar{k} + t(2\bar{i} - \bar{j})$

(D) $\bar{r} = 2\bar{i} - \bar{j} + t(\bar{j} + 4\bar{k})$

Answer: (B) $\bar{r} = (1+t)\bar{i} + 3\bar{j} + 3t\bar{k}$ · Official TGCHE final key

Q511 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If $\bar{a} = \bar{i} + (\tan\theta)\bar{j} + \left(\frac{3}{\sqrt{\sin\frac{\theta}{2}}}\right)\bar{k}$ and $\bar{b} = \tan\theta(\bar{j} - \bar{i}) - \left(2\sqrt{\sin\frac{\theta}{2}}\right)\bar{k}$ are orthogonal vectors and $\bar{c} = (\sin 2\theta)\bar{i} - 2\bar{j} + 2\bar{k}$ makes an obtuse angle with X-axis, then $\theta =$

(A) $(2n+1)\pi + \mathrm{Tan}^{-1}2,\ n \in \mathbb{Z}$

(B) $n\pi - \mathrm{Tan}^{-1}2,\ n \in \mathbb{Z}$

(C) $(2n+1)\pi - \mathrm{Tan}^{-1}3,\ n \in \mathbb{Z}$

(D) $(2n+1)\pi + \mathrm{Tan}^{-1}3,\ n \in \mathbb{Z}$

Answer: (B) $n\pi - \mathrm{Tan}^{-1}2,\ n \in \mathbb{Z}$ · Official TGCHE final key

Q512 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If $\bar{a}, \bar{b}$ and $\bar{c}$ be three non-coplanar vectors and $\bar{p}, \bar{q}$, and $\bar{r}$ be defined by $\bar{p} = \frac{\bar{b}\times\bar{c}}{\bar{a}\cdot(\bar{b}\times\bar{c})}$, $\bar{q} = \frac{\bar{c}\times\bar{a}}{\bar{b}\cdot(\bar{c}\times\bar{a})}$, $\bar{r} = \frac{\bar{a}\times\bar{b}}{\bar{c}\cdot(\bar{a}\times\bar{b})}$ such that $\alpha = (\bar{a}+\bar{b})\cdot\bar{p} + (\bar{b}+\bar{c})\cdot\bar{q} + (\bar{c}+\bar{a})\cdot\bar{r}$ and $\beta = \frac{(\bar{a}+\bar{b})\cdot(\bar{b}+\bar{c})\times(\bar{a}+\bar{b}+\bar{c})}{\bar{b}\cdot(\bar{a}\times\bar{c})}$, then $\alpha + \beta =$

(A) 2

(B) 3

(C) 4

(D) 0

Answer: (A) 2 · Official TGCHE final key

Q513 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

If $\bar{a} + l\bar{b} + l^2\bar{c} = \bar{0}$ and $\bar{a}\times\bar{b} + \bar{b}\times\bar{c} + \bar{c}\times\bar{a} = 3(\bar{b}\times\bar{c})$, then the minimum value of such l is

(A) 1

(B) -2

(C) $\frac{-9}{4}$

(D) 0

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

Q514 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

In $\triangle ABC$, the points P, Q, R divide BC, CA, AB in the ratio $3:4$, $2:5$, $9:5$, respectively and the point D divides BC in the ratio $2:3$. If $\overline{AP}+\overline{BQ}+\overline{CR}=k\overline{AD}$, then $(14k+1):(14k-1)=$

(A) $7:5$

(B) $4:3$

(C) $4:5$

(D) $3:2$

Answer: (D) $3:2$ · Official TGCHE final key

Q515 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

If A $(1,1,2)$, B $(4,2,1)$ and C $(2,3,5)$ are the vertices of a triangle, then a vector representing the median of the triangle through A is

(A) $3\bar{i}+4\bar{j}+5\bar{k}$

(B) $(1+2t)\bar{i}+\left(1+\frac{3t}{2}\right)\bar{j}+(2+t)\bar{k}$

(C) $2t\bar{i}+(7t-1)\bar{j}+5t^2\bar{k}$

(D) $7t^2\bar{i}+6\bar{j}+4\bar{k}$

Answer: (B) $(1+2t)\bar{i}+\left(1+\frac{3t}{2}\right)\bar{j}+(2+t)\bar{k}$ · Official TGCHE final key

---

Q516 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

Let $\bar{a}=\bar{i}-2\bar{j}+3\bar{k}$ and $\bar{b}=2\bar{i}+\bar{j}+\bar{k}$. If $\bar{c}$ is a unit vector such that $[\bar{a}\ \bar{b}\ \bar{c}]$ is maximum, then $\bar{c}=$

(A) $\frac{-\bar{i}+\bar{j}+\bar{k}}{\sqrt{3}}$

(B) $\frac{2\bar{i}-\bar{j}-\bar{k}}{\sqrt{6}}$

(C) $\frac{2\bar{i}-\bar{j}+3\bar{k}}{\sqrt{14}}$

(D) $\frac{\bar{i}+\bar{j}-2\bar{k}}{\sqrt{6}}$

Answer: (A) $\frac{-\bar{i}+\bar{j}+\bar{k}}{\sqrt{3}}$ · Official TGCHE final key

Q517 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If P, Q, R and S are the points with position vectors $\bar{i}+\bar{j}-\bar{k},\ 2\bar{i}-\bar{j}+3\bar{k},\ 2\bar{i}-3\bar{k}$ and $3\bar{i}-2\bar{j}+\bar{k}$ respectively, then the angle between $\overline{PQ}$ and $\overline{RS}$ is

(A) 0
(B) $\frac{\pi}{2}$
(C) π
(D) $\frac{\pi}{3}$

Answer: (A) 0 · Official TGCHE final key

Q518 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If the vector $19\bar{i}+22\bar{j}+5\bar{k}$ bisects an angle between the vectors $\bar{a}$ and $6\bar{i}+8\bar{j}$, then the unit vector in the direction of $\bar{a}$ is

(A) $\frac{1}{5}(4\bar{i}+3\bar{k})$
(B) $\frac{1}{3}(2\bar{i}+2\bar{j}+\bar{k})$
(C) $\frac{1}{3}(\bar{i}+2\bar{j}+2\bar{j})$ (sic)
(D) $\frac{1}{3}(2\bar{i}+2\bar{j}-\bar{k})$

Answer: (B) $\frac{1}{3}(2\bar{i}+2\bar{j}+\bar{k})$ · Official TGCHE final key

Q519 TS EAMCET 2019 · 6 May · Shift 1 MCQ

Let $\bar{p}=\bar{i}+2\bar{j}-\bar{k},\ \bar{q}=2\bar{i}-\bar{j}+\bar{k}$. If $\bar{a}$ and $\bar{b}$ are two vectors such that $\bar{p}=\bar{a}-2\bar{b},\ \bar{q}=2\bar{a}+\bar{b}$, then the angle between $\bar{a}$ and $\bar{b}$ is

(A) $\text{Cos}^{-1}\left(\frac{3}{2\sqrt{221}}\right)$
(B) $\frac{\pi}{2}$
(C) $\text{Cos}^{-1}\frac{7}{\sqrt{143}}$
(D) $\frac{\pi}{3}$

Answer: (A) $\text{Cos}^{-1}\left(\frac{3}{2\sqrt{221}}\right)$ · Official TGCHE final key

Q520 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If $\bar{a}=\bar{i}+\bar{j}+\bar{k},\ \bar{a}\cdot\bar{b}=1$ and $\bar{a}\times\bar{b}=\bar{j}-\bar{k}$, then $\bar{b}=$

EdLoop EAPCET

(A) $2\bar{i}$
(B) $2\bar{j}-\bar{k}$
(C) $\bar{i}-\bar{j}+\bar{k}$
(D) $\bar{i}$

Answer: (D) $\bar{i}$ · Official TGCHE final key

Q521 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If the position vectors of the points A, B, C, D given by $\bar{i}+2\bar{j}+3\bar{k}$, $2\bar{i}-\bar{j}+2\bar{k}$, $\frac{1}{4}(7\bar{i}+15\bar{j}+15\bar{k})$ and $\frac{1}{3}\left[7\bar{i}+2\bar{j}+(5+3a)\bar{k}\right]$ respectively are such that $|\overline{AC}|=|\overline{BD}|$, then $16(3a-1)^2=$

(A) 143
(B) 139
(C) 189
(D) 187

Answer: (D) 187 · Official TGCHE final key

Q522 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If the points $2\bar{a}+3\bar{b}-\bar{c}$, $\bar{a}-2\bar{b}+3\bar{c}$, $3\bar{a}+\lambda\bar{b}-2\bar{c}$ and $\bar{a}-6\bar{b}+6\bar{c}$ are coplanar, then the direction cosines of the vector $\lambda\bar{i}-2\lambda\bar{j}+\bar{k}$ are

(A) $\frac{2}{\sqrt{21}}, \frac{-4}{\sqrt{21}}, \frac{1}{\sqrt{21}}$
(B) $-\frac{2}{\sqrt{78}}, \frac{5}{\sqrt{78}}, \frac{7}{\sqrt{78}}$
(C) $\frac{4}{9}, -\frac{8}{9}, \frac{1}{9}$
(D) $\frac{2}{3}, -\frac{2}{3}, -\frac{1}{3}$

Answer: (C) $\frac{4}{9}, -\frac{8}{9}, \frac{1}{9}$ · Official TGCHE final key

Q523 TS EAMCET 2019 · 4 May · Shift 1 MCQ

$\bar{a}=4\bar{i}+3\bar{j}$ and $\bar{b}$ are two vectors in the XOY plane and $\bar{a}$ is perpendicular to $\bar{b}$. A vector $\bar{c}$ lying in the same plane and having projections 1 and 2 respectively on $\bar{a}$ and $\bar{b}$ is

(A) $2\bar{i}-\bar{j}$
(B) $2\bar{i}+\bar{j}$
(C) $\bar{i}+2\bar{j}$
(D) $2\bar{i}+2\bar{j}$

Answer: (A) $2\bar{i}-\bar{j}$ · Official TGCHE final key

Q524 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If $\overline{OA}=6\bar{i}+3\bar{j}-4\bar{k}$, $\overline{OB}=2\bar{j}+\bar{k}$, $\overline{OC}=5\bar{i}-\bar{j}+2\bar{k}$ are the coterminous edges of a parallelopiped, then the height of the parallelopiped drawn from the vertex A is

(A) $\frac{85}{3}$
(B) $\frac{5}{\sqrt{32}}$
(C) $\frac{85}{\sqrt{257}}$
(D) $\frac{17}{\sqrt{6}}$

Answer: (D) $\frac{17}{\sqrt{6}}$ · Official TGCHE final key

Q525 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If $\bar{a}$ and $\bar{b}$ are respectively the internal and external bisectors of the angles between the vectors $-\bar{i}+2\bar{j}-2\bar{k}$ and $3\bar{i}+4\bar{j}$ and $|\bar{a}|=\frac{2}{3}\sqrt{6}$, $|\bar{b}|=\frac{2}{3}\sqrt{3}$, then one of the values of $\bar{a}-\bar{b}$ is

(A) $\frac{1}{10}(-8\bar{i}+11\bar{j}-2\bar{k})$
(B) $\frac{2}{3}(-\bar{i}+2\bar{j}-2\bar{k})$
(C) $\frac{1}{15}(9\bar{i}-11\bar{j}+3\bar{k})$
(D) $\frac{1}{12}(2\bar{i}-3\bar{j}-\bar{k})$

Answer: (B) $\frac{2}{3}(-\bar{i}+2\bar{j}-2\bar{k})$ · Official TGCHE final key

Q526 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If the angle between the vectors $2\alpha^2\bar{i}+4\alpha\bar{j}+\bar{k}$ and $7\bar{i}-2\bar{j}+\alpha\bar{k}$ is obtuse, then

(A) $\alpha>\frac{1}{2}$
(B) $0<\alpha<\frac{1}{2}$
(C) $\alpha<0$
(D) $|\alpha|<\frac{1}{2}$

Answer: (B) $0<\alpha<\frac{1}{2}$ · Official TGCHE final key

Q527 TS EAMCET 2019 · 4 May · Shift 2 MCQ

Let L be the line parallel to the vector $\sqrt{2}\bar{i}-5\bar{j}+3\bar{k}$ and passing through the point A given by $\bar{i}+2\bar{j}-3\bar{k}$. If the distance between A and a point P on the line L is 18 units, then the position vector of such a point P is

(A) $(1-3\sqrt{2})\bar{i}+17\bar{j}-12\bar{k}$
(B) $(1+3\sqrt{2})\bar{i}+17\bar{j}+12\bar{k}$
(C) $(1+3\sqrt{2})\bar{i}-17\bar{j}-12\bar{k}$
(D) $(1-3\sqrt{2})\bar{i}-17\bar{j}+12\bar{k}$

Answer: (A) $(1-3\sqrt{2})\bar{i}+17\bar{j}-12\bar{k}$ · Official TGCHE final key

EdLoop EAPCET

Q528 TS EAMCET 2019 · 4 May · Shift 2 MCQ

Let $\bar{a} = p(\bar{i} + \bar{j} + \bar{k})$, $\bar{b} = \bar{i} + \bar{j} - 2\bar{k}$ and $\bar{c} = 2\bar{i} - \bar{j} + 2\bar{k}$ be three vectors. If the value of $[\bar{a}\ \bar{b}\ \bar{c}]$ is not more than 15 and not less than -5, then p lies in the interval

(A) $\left(\frac{-5}{3}, \frac{5}{9}\right)$

(B) $\left(\frac{-5}{9}, \frac{5}{9}\right)$

(C) $\left(0, \frac{5}{9}\right)$

(D) $\left[\frac{-5}{3}, \frac{5}{9}\right]$

Answer: (D) $\left[\frac{-5}{3}, \frac{5}{9}\right]$ · Official TGCHE final key

Q529 TS EAMCET 2019 · 4 May · Shift 2 MCQ

Let $\bar{a} = \bar{i} + 2\bar{j} - \bar{k}$ and $\bar{b} = \bar{i} + \bar{j} + \bar{k}$. If $\bar{p}$ is a unit vector such that $[\bar{a}\ \bar{b}\ \bar{p}]$ is maximum, then $\bar{p} =$

(A) $\frac{1}{\sqrt{6}}(\bar{i} - 2\bar{j} + \bar{k})$

(B) $\frac{1}{\sqrt{3}}(\bar{i} + \bar{j} - \bar{k})$

(C) $\frac{1}{\sqrt{14}}(3\bar{i} - 2\bar{j} - \bar{k})$

(D) $\frac{1}{\sqrt{14}}(\bar{i} + 2\bar{j} + 3\bar{k})$

Answer: (C) $\frac{1}{\sqrt{14}}(3\bar{i} - 2\bar{j} - \bar{k})$ · Official TGCHE final key

Q530 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If $\bar{a} = 2\bar{i} - 3\bar{j} + \bar{k}$, $\bar{b} = \bar{i} - \bar{j} + 2\bar{k}$ and $\bar{c} = 2\bar{i} + \bar{j} + \bar{k}$ are three vectors, then $|(\bar{a} \times \bar{b}) \times \bar{c}| =$

(A) $|\bar{a} \times (\bar{b} \times \bar{c})|$

(B) $\frac{\sqrt{39}}{\sqrt{11}}|\bar{a} \times (\bar{b} \times \bar{c})|$

(C) $\sqrt{\frac{11}{39}}|\bar{a} \times (\bar{b} \times \bar{c})|$

(D) $\sqrt{11}|\bar{a} \times (\bar{b} \times \bar{c})|$

Answer: (C) $\sqrt{\frac{11}{39}}|\bar{a} \times (\bar{b} \times \bar{c})|$ · Official TGCHE final key

Q531 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Let the position vectors of two points A and B be $\overline{a} + \overline{b} + \overline{c}$ and $\overline{a} - 2\overline{b} + 3\overline{c}$ respectively. If the points P and Q divide AB in the ratio 1 : 3 internally and externally respectively, then $3|\overline{AB}| =$

(A) $4|\overline{PQ}|$
(B) $3|\overline{PQ}|$
(C) $\frac{1}{2}|\overline{PQ}|$
(D) $2|\overline{PQ}|$

Answer: (A) $4|\overline{PQ}|$ · Official TGCHE final key

Q532 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If $\overline{a}, \overline{b}$ and $\overline{c}$ are three non-collinear points and $k\overline{a} + 2\overline{b} + 3\overline{c}$ is a point in the plane of $\overline{a}, \overline{b}, \overline{c}$ then $k =$

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

Answer: (D) -4 · Official TGCHE final key

Q533 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If the vector $\overline{a} = 3\overline{j} + 4\overline{k}$ is the sum of two vectors $\overline{a}_1$ and $\overline{a}_2$, vector $\overline{a}_1$ is parallel to $\overline{b} = \overline{i} + \overline{j}$ and vector $\overline{a}_2$ is perpendicular to $\overline{b}$, then $\overline{a}_1 =$

(A) $\frac{1}{2}(\overline{i} + \overline{j})$
(B) $\frac{1}{3}(\overline{i} + \overline{j})$
(C) $\frac{2}{3}(\overline{i} + \overline{j})$
(D) $\frac{3}{2}(\overline{i} + \overline{j})$

Answer: (D) $\frac{3}{2}(\overline{i} + \overline{j})$ · Official TGCHE final key

Q534 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Let $\overline{x} = \overline{i} + \overline{j}$ and $\overline{y} = 3\overline{i} - 2\overline{k}$. Then the vector $\overline{r}$ of magnitude $\sqrt{21}$ satisfying $\overline{r} \times \overline{x} = \overline{y} \times \overline{x}$ and $\overline{r} \times \overline{y} = \overline{x} \times \overline{y}$ is

(A) $-\overline{i} + 4\overline{j} - 2\overline{k}$
(B) $-\overline{i} - 4\overline{j} - 2\overline{k}$
(C) $4\overline{i} + \overline{j} - 2\overline{k}$
(D) $4\overline{i} - \overline{j} - 2\overline{k}$

Answer: (C) $4\overline{i} + \overline{j} - 2\overline{k}$ · Official TGCHE final key

Q535 TS EAMCET 2019 · 3 May · Shift 2 MCQ

Vectors $\bar{a}, \bar{b}, \bar{c}, \bar{d}$ are such that $(\bar{a} \times \bar{b}) \times (\bar{c} \times \bar{d}) = \bar{0}$. P_1 and P_2 are two planes determined by vectors $\bar{a}, \bar{b}$ and $\bar{c}, \bar{d}$ respectively. Then the angle between the planes P_1 and P_2 is

(A) 0
(B) $\frac{\pi}{4}$
(C) $\frac{\pi}{3}$
(D) $\frac{\pi}{2}$

Answer: (A) 0 · Official TGCHE final key

Q536 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If $\overline{OA} = \bar{i} + 2\bar{j} + 3\bar{k}$ and $\overline{OB} = 4\bar{i} + \bar{k}$ are the position vectors of the points A and B, then the position vector of a point on the line passing through B and parallel to the vector $\overline{OA} \times \overline{OB}$ which is at a distance of $\sqrt{189}$ units from B is

(A) $6\bar{i} + 11\bar{j} - 7\bar{k}$
(B) $4\bar{i} + 11\bar{j} - 8\bar{k}$
(C) $2\bar{i} - 11\bar{j} + 8\bar{k}$
(D) $-2\bar{i} - 11\bar{j} + 8\bar{k}$

Answer: (A) $6\bar{i} + 11\bar{j} - 7\bar{k}$ · Official TGCHE final key

Q537 TS EAMCET 2019 · 3 May · Shift 2 MCQ

A vector $\bar{a}$ of length 2 units is making an angle 60° with each of the X-axis and Y-axis. If another vector $\bar{b}$ of length $\sqrt{2}$ units is making an angle 45° with each of the Y-axis and Z-axis, then $\bar{a} \times \bar{b} =$

(A) $(1 - \sqrt{2})\bar{i} - \bar{j} + \bar{k}$
(B) $\bar{i} - \sqrt{2}\bar{j} + \bar{k}$
(C) $\sqrt{2}\bar{i} - \bar{j} + 2\bar{k}$
(D) $\bar{i} - 2\bar{j} + (1 - \sqrt{2})\bar{k}$

Answer: (A) $(1 - \sqrt{2})\bar{i} - \bar{j} + \bar{k}$ · Official TGCHE final key

Q538 TS EAMCET 2019 · 3 May · Shift 2 MCQ

Let $\bar{a}$ be a non zero vector. If $\bar{x} = \bar{i} \times (\bar{a} \times \bar{i})$, $\bar{y} = \bar{j} \times (\bar{a} \times \bar{j}) - \bar{a}$ and $\bar{z} = \bar{k} \times (\bar{a} \times \bar{k}) - \bar{a}$, then $[\bar{x}\ \bar{y}\ \bar{z}] =$

(A) $|\bar{a}|$
(B) $2|\bar{a}|$
(C) 0
(D) 1

Answer: (C) 0 · Official TGCHE final key

Q539 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If $\bar{r}$ is a unit vector satisfying $\bar{r} \times \bar{a} = \bar{b}$, $|\bar{a}| = 2$ and $|\bar{b}| = \sqrt{3}$, then one such $\bar{r} =$

(A) $\frac{1}{4}\left[2\bar{a}+(\bar{b}\times\bar{a})\right]$
(B) $\frac{1}{4}\left[\bar{a}-(2\bar{b}\times\bar{a})\right]$
(C) $\frac{1}{3}\left[\bar{a}-(\bar{b}\times\bar{a})\right]$
(D) $\frac{1}{4}\left[\bar{a}-(\bar{b}\times\bar{a})\right]$

Answer: (D) $\frac{1}{4}\left[\bar{a}-(\bar{b}\times\bar{a})\right]$ · Official TGCHE final key

Q540 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If A(3, 2, 3), B(1, 4, 6) and C(7, 4, 5) are the three vertices of a parallelogram ABCD, then the angle between its diagonal through D and the side DC is

(A) $\text{Cos}^{-1}\left(\frac{16}{\sqrt{357}}\right)$
(B) $\text{Cos}^{-1}\left(\frac{5}{\sqrt{126}}\right)$
(C) $\text{Cos}^{-1}\left(\frac{5}{\sqrt{21}}\right)$
(D) $\text{Cos}^{-1}\left(\frac{2}{\sqrt{357}}\right)$

Answer: (A) $\text{Cos}^{-1}\left(\frac{16}{\sqrt{357}}\right)$ · Official TGCHE final key

Q541 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If α,β,γ are distinct real numbers and $\alpha+\beta+\gamma\neq 0$, then the points with position vectors $\alpha\bar{i}+\beta\bar{j}+\gamma\bar{k},\ \beta\bar{i}+\gamma\bar{j}+\alpha\bar{k}$ and $\gamma\bar{i}+\alpha\bar{j}+\beta\bar{k}$ are

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

Answer: (D) vertices of an equilateral triangle · Official APSCHE final key

Q542 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

Given three vectors $\bar{a}=2\bar{i}-\bar{j}+\bar{k},\ \bar{b}=\bar{i}+2\bar{j}-\bar{k}$ and $\bar{c}=\bar{i}+\bar{j}-2\bar{k}$, a vector in the plane of $\bar{b}$ and $\bar{c}$ whose projection on $\bar{a}$ is of magnitude $\sqrt{\frac{2}{3}}$ is

(A) $-2\bar{i}-\bar{j}+5\bar{k}$
(B) $2\bar{i}+3\bar{j}+3\bar{k}$
(C) $2\bar{i}+\bar{j}+5\bar{k}$
(D) $2\bar{i}-3\bar{j}+3\bar{k}$

Answer: (A) $-2\bar{i}-\bar{j}+5\bar{k}$ · Official APSCHE final key

EdLoop EAPCET

Q543 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

$\overline{a} = 3\overline{i} + \overline{j} - \overline{k}$, $\overline{b} = \overline{i} - 4\overline{j} + 5\overline{k}$, $\overline{c} = 4\overline{i} + 5\overline{j} - \overline{k}$ are three vectors and a vector $\overline{r}$ is perpendicular to both the vectors $\overline{b}$ and $\overline{c}$. If $\overline{r} \cdot \overline{a} = 9$, then $\overline{r} =$

(A) $3(\overline{i} - \overline{j} - \overline{k})$
(B) $3(\overline{i} - \overline{j} + \overline{k})$
(C) $9(\overline{i} - \overline{j} - \overline{k})$
(D) $9(\overline{i} - \overline{j} + \overline{k})$

Answer: (A) $3(\overline{i} - \overline{j} - \overline{k})$ · Official APSCHE final key

Q544 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

$\overline{AB} = \overline{a}$ and $\overline{AC} = \overline{b}$ are the sides of a ΔABC. P is a point on $\overline{AB}$ and Q is a point on $\overline{BC}$ such that $\frac{AP}{PB} = \frac{1}{2}$ and $\frac{BQ}{QC} = \frac{1}{2}$. If the point of intersection of $\overline{AQ}$ and $\overline{CP}$ is D and the area of ΔBCD is 7 square units, then the area of the ΔABC (in the same sq.units) is

(A) $\frac{49}{4}$
(B) $\frac{49}{2}$
(C) $\frac{7}{2}$
(D) $\frac{7}{4}$

Answer: (A) $\frac{49}{4}$ · Official APSCHE final key

Q545 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If $\overline{a} = \overline{i} + \overline{j} + \overline{k}$, $\overline{b} = \overline{i} + \overline{j} + 2\overline{k}$ and $\overline{c} = 2\overline{i} + 3\overline{j} + 4\overline{k}$ then the magnitude of the projection on $\overline{c}$ of a unit vector that is perpendicular to both $\overline{a}$ and $\overline{b}$ is

(A) $\frac{1}{\sqrt{29}\sqrt{3}}$
(B) $\frac{1}{\sqrt{6}}$
(C) $\frac{1}{\sqrt{58}}$
(D) $\frac{3}{\sqrt{29}}$

Answer: (C) $\frac{1}{\sqrt{58}}$ · Official APSCHE final key

Q546 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If $\overline{a}, \overline{b}, \overline{c}$ are three unit vectors such that $\overline{a} \times (\overline{b} \times \overline{c}) = \frac{\sqrt{3}}{2}\overline{b} + \frac{1}{2}\overline{c}$, then the angles between $\overline{a}, \overline{b}$ and $\overline{a}, \overline{c}$ respectively are

(A) $60^\circ, 30^\circ$
(B) $120^\circ, 30^\circ$
(C) $60^\circ, 150^\circ$
(D) $120^\circ, 150^\circ$

Answer: (B) $120^\circ, 30^\circ$ · Official APSCHE final key

Q547 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

For a non-zero real number x, if the points with position vectors $(x-u)\bar{i}+x\bar{j}+x\bar{k},\ x\bar{i}+(x-v)\bar{j}+x\bar{k},\ x\bar{i}+x\bar{j}+(x-w)\bar{k}$ and $(x-1)\bar{i}+(x-1)\bar{j}+(x-1)\bar{k}$ are coplanar, then

(A) $u+v+w=1$
(B) $uvw=1$
(C) $\frac{1}{u}+\frac{1}{v}+\frac{1}{w}=1$
(D) $uv+vw+uw=1$

Answer: (C) $\frac{1}{u}+\frac{1}{v}+\frac{1}{w}=1$ · Official APSCHE final key

Q548 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If P is a point lying on the line passing through the point $A(\bar{i}-\bar{j}+3\bar{k})$ and parallel to the vector $2\bar{i}+\bar{j}-2\bar{k}$ such that $|\overline{AP}|=18$, then a position vector of P is

(A) $-13\bar{i}-5\bar{j}+9\bar{k}$
(B) $11\bar{i}+7\bar{j}-15\bar{k}$
(C) $13\bar{i}-5\bar{j}+9\bar{k}$
(D) $13\bar{i}+5\bar{j}-9\bar{k}$

Answer: (D) $13\bar{i}+5\bar{j}-9\bar{k}$ · Official APSCHE final key

Q549 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

$\bar{a},\bar{b},\bar{c}$ are three vectors such that $|\bar{a}|=1,\ |\bar{b}|=2,\ |\bar{c}|=3$ and $\bar{b}\cdot\bar{c}=0$. If the projection of $\bar{b}$ along $\bar{a}$ is equal to the projection of $\bar{c}$ along $\bar{a}$, then $|2\bar{a}+3\bar{b}-3\bar{c}|=$

(A) 3
(B) $\sqrt{22}$
(C) 9
(D) 11

Answer: (D) 11 · Official APSCHE final key

Q550 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

Let $\bar{m}$ be a vector of magnitude $\sqrt{3}$ and perpendicular to the vectors $\bar{i}+\bar{j}$ and $\bar{j}-\bar{k}$. Let $\bar{n}$ be another vector of magnitude $2\sqrt{6}$ and perpendicular to the vectors $2\bar{i}-\bar{j}$ and $\bar{j}+2\bar{k}$. The area (in sq. units) of the triangle formed with $\bar{m}$ and $\bar{n}$ as sides is

EdLoop EAPCET

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

Answer: (D) $3\sqrt{2}$ · Official APSCHE final key

Q551 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

$\bar{a}=\bar{i}-\bar{j}+\bar{k},\ \bar{b}=\bar{i}-2\bar{j}+\bar{k},\ \bar{c}=p\bar{i}+2\bar{j}+q\bar{k}$ and $\bar{d}=p\bar{i}+q\bar{j}+2\bar{k}$ are given vectors. If the projection of $\bar{c}$ on $\bar{a}$ is $5\sqrt{3}$ units and if $\bar{a},\bar{b},\bar{c}$ form a parallelopiped of volume 5 cubic units, then $\mathrm{Tan}^{-1}(\bar{b}\cdot\bar{d})=$

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

Answer: (C) $\frac{\pi}{4}$ · Official APSCHE final key

Q552 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

Given $\bar{a}=2\bar{i}+\bar{j}+\bar{k},\bar{b}=\bar{i}+2\bar{j}-\bar{k}$ and a unit vector $\bar{c}$ are coplanar. If $\bar{c}$ is perpendicular to $\bar{a}$, then $\bar{c}=$

(A) $\pm\frac{1}{\sqrt{3}}(\bar{i}-\bar{j}-\bar{k})$
(B) $\frac{1}{\sqrt{5}}(\bar{i}-2\bar{j})$
(C) $\frac{-1}{\sqrt{3}}(\bar{i}+\bar{j}+\bar{k})$
(D) $\pm\frac{1}{\sqrt{2}}(-\bar{j}+\bar{k})$

Answer: (D) $\pm\frac{1}{\sqrt{2}}(-\bar{j}+\bar{k})$ · Official APSCHE final key

Q553 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

$\bar{a},\bar{b},\bar{c}$ are three mutually perpendicular unit vectors in the right handed system. If the points P, Q, R with position vectors $2\bar{a}+5\bar{b}-4\bar{c}$, $\bar{a}+4\bar{b}-3\bar{c}$ and $k\bar{a}+7\bar{b}-6\bar{c}$ respectively lie on a line, then, the ratio in which the point P divides QR is

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

Answer: (A) $1:2$ · Official APSCHE final key

Q554 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If $\bar{a}=\bar{i}-\bar{j}-\bar{k}, \bar{b}=2\bar{i}-3\bar{j}+\bar{k}$ and $\bar{p}_1, \bar{p}_2$ are the orthogonal projection vectors of $\bar{a}$ on $\bar{b}$ and $\bar{b}$ on $\bar{a}$ respectively, then $(\bar{p}_1+\bar{p}_2)\cdot(\bar{p}_1-\bar{p}_2)=$

(A) $-\frac{46}{21}$
(B) $\frac{25}{7}$
(C) $\frac{44}{7}$
(D) $-\frac{88}{21}$

Answer: (D) $-\frac{88}{21}$ · Official APSCHE final key

Q555 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

Let $\bar{a}, \bar{b}, \bar{c}$ be three non-coplanar vectors and $\bar{a}'=\frac{\bar{b}\times\bar{c}}{[\bar{a}\,\bar{b}\,\bar{c}]}$, $\bar{b}'=\frac{\bar{c}\times\bar{a}}{[\bar{a}\,\bar{b}\,\bar{c}]}$, $\bar{c}'=\frac{\bar{a}\times\bar{b}}{[\bar{a}\,\bar{b}\,\bar{c}]}$. The length of the altitude of the parallelopiped formed by $\bar{a}', \bar{b}', \bar{c}'$ as coterminous edges, with respect to the base having $\bar{a}'$ and $\bar{c}'$ as its adjacent sides is

(A) $|\bar{a}|$
(B) $\frac{1}{|\bar{b}|}$
(C) $|\bar{c}|$
(D) $\frac{1}{|\bar{a}\times\bar{c}|}$

Answer: (B) $\frac{1}{|\bar{b}|}$ · Official APSCHE final key

Q556 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

Let $\bar{a}, \bar{b}, \bar{c}$ be three non-coplanar vectors. Let S_i $(i=1,2,3,4,5,6)$ denote the six scalar triple products formed by all possible permutations of $\bar{a}, \bar{b}, \bar{c}$. If i, j, k, l are randomly chosen distinct numbers from 1 to 6 and if $x=\frac{S_i}{S_j}+\frac{S_k}{S_l}$, $y=\frac{S_i}{S_j}-\frac{S_k}{S_l}$ then $x^2+y^2=$

(A) 1
(B) 4
(C) 8
(D) 2

Answer: (B) 4 · Official APSCHE final key

Q557 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If $\bar{a}=\bar{i}-2\bar{j}+\bar{k}, \bar{b}=\bar{i}+3\bar{j}-2\bar{k}, \bar{c}=2\bar{i}+\bar{j}-\bar{k}$ and $\bar{d}=\bar{i}+\bar{j}+\bar{k}$ then the volume (in cubic units) of the tetrahedron having $(\bar{a}\times\bar{b})\times\bar{c}, \bar{b}, \bar{d}$ as its coterminous edges is

EdLoop EAPCET

(A) $\frac{15}{2}$
(B) 90
(C) $\frac{21}{2}$
(D) $\frac{66}{5}$

Answer: (C) $\frac{21}{2}$ · Official APSCHE final key

Q558 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If $3\bar{i}-2\bar{j}-\bar{k}$, $2\bar{i}+3\bar{j}-4\bar{k}$, $-\bar{i}+\bar{j}+2\bar{k}$ and $4\bar{i}+5\bar{j}+\lambda\bar{k}$ are respectively the position vectors of four coplanar points P, Q, R and S then $\lambda=$

(A) $\frac{46}{17}$
(B) $-\frac{46}{17}$
(C) $\frac{146}{17}$
(D) $-\frac{146}{17}$

Answer: (D) $-\frac{146}{17}$ · Official APSCHE final key

Q559 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If $\overline{OA}=2\bar{i}+2\bar{j}+\bar{k}$, $\overline{OB}=2\bar{i}+4\bar{j}+4\bar{k}$ and the length of the internal bisector of $\angle BOA$ of triangle AOB is k, then $9k^2=$

(A) $\sqrt{225}$
(B) 136
(C) 712
(D) 20

Answer: (B) 136 · Official APSCHE final key

Q560 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If $\bar{a}+x\bar{b}+y\bar{c}=\bar{0}$, $\bar{a}\times\bar{b}+\bar{b}\times\bar{c}+\bar{c}\times\bar{a}=6(\bar{b}\times\bar{c})$, then the locus of the point (x,y) is

(A) $x^2+y^2=1$
(B) $x+y-5=0$
(C) $2x+6y=5$
(D) $x+y+6=0$

Answer: (B) $x+y-5=0$ · Official APSCHE final key

Q561 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

Let $A=(\alpha,1,2\alpha)$, $B=(3,1,2)$ and $\bar{C}=4\bar{i}-\bar{j}+3\bar{k}$. If $\overline{AB}\times\bar{C}=6\bar{i}+9\bar{j}-5\bar{k}$, then $\alpha^2+\alpha+5=$

EdLoop EAPCET

(A) 11
(B) 7
(C) 9
(D) 5

Answer: (B) 7 · Official APSCHE final key

Q562 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If $\bar{a}$ makes an acute angle with $\bar{b}$, $\bar{r} \cdot \bar{a} = 0$ and $\bar{r} \times \bar{b} = \bar{c} \times \bar{b}$, then $\bar{r} =$

(A) $\bar{a} \times \bar{c} - \bar{b}$
(B) $\bar{c} \times \bar{a}$
(C) $\bar{c} - \left(\frac{\bar{c} \cdot \bar{a}}{\bar{b} \cdot \bar{a}}\right) \bar{b}$
(D) $\bar{c} + \left(\frac{\bar{c} \cdot \bar{a}}{\bar{b} \cdot \bar{a}}\right) \bar{b}$

Answer: (C) $\bar{c} - \left(\frac{\bar{c} \cdot \bar{a}}{\bar{b} \cdot \bar{a}}\right) \bar{b}$ · Official APSCHE final key

Q563 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Let D and E be the midpoints of the sides AC and BC of a triangle ABC respectively. If O is an interior point of the triangle ABC such that $\overrightarrow{OA} + 2\overrightarrow{OB} + 3\overrightarrow{OC} = \vec{0}$, then the area (in sq. units) of the triangle ODE is

(A) 6
(B) 5
(C) $\frac{3}{4}$
(D) 0

Answer: (D) 0 · Official APSCHE final key

Q564 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

If $\bar{a}, \bar{b}, \bar{c}$ are non-zero non-collinear vectors and $\bar{a} \times \bar{b} = \bar{b} \times \bar{c} = \bar{c} \times \bar{a}$, then $\bar{a} + \bar{b} + \bar{c} =$

(A) $3\bar{a}$
(B) $\bar{0}$
(C) $3(\bar{a} \times \bar{b})$
(D) $3(\bar{b} \times \bar{c})$

Answer: (B) $\bar{0}$ · Official APSCHE final key

Q565 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

If $\bar{V} = 2\bar{i} + \bar{j} - \bar{k}$, $\bar{W} = \bar{i} + 3\bar{k}$ and $\bar{U}$ is a unit vector, then the maximum value of $\left[\bar{U}\, \bar{V}\, \bar{W}\right]$ is

(A) $\sqrt{57}$
(B) $\sqrt{59}$
(C) $\sqrt{60}$
(D) $\sqrt{10}+\sqrt{6}$

Answer: (B) $\sqrt{59}$ · Official APSCHE final key

Q566 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Assertion (A): If $\bar{a}, \bar{b}$ are two non collinear vectors then the vector component of $\bar{b}$ along the line perpendicular to $\bar{a}$ is $\frac{\bar{a}\times(\bar{b}\times\bar{a})}{|\bar{a}|^2}$

Reason (R): $\bar{a}\times(\bar{b}\times\bar{c})=(\bar{a}\cdot\bar{c})\bar{b}-(\bar{a}\cdot\bar{b})\bar{c}$ and vector component of $\bar{b}$ on $\bar{c}$ is $\left(\bar{b}\cdot\frac{\bar{c}}{|\bar{c}|}\right)\frac{\bar{c}}{|\bar{c}|}$

(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: (A) Both (A) and (R) are true and (R) is the correct explanation of (A) · Official APSCHE final key

Q567 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If $4\vec{i}+7\vec{j}+8\vec{k},\ 2\vec{i}+3\vec{j}+4\vec{k},\ 2\vec{i}+5\vec{j}+7\vec{k}$ are respectively the position vectors of the vertices A, B, C of ΔABC, then the position vector of the point where the bisector of angle A meet $\overline{BC}$ is

(A) $2\vec{i}+\frac{13}{3}\vec{j}+2\vec{k}$
(B) $2\vec{i}-\frac{13}{3}\vec{j}+6\vec{k}$
(C) $2\vec{i}+13\vec{j}+6\vec{k}$
(D) $2\vec{i}+\frac{13}{3}\vec{j}+6\vec{k}$

Answer: (D) $2\vec{i}+\frac{13}{3}\vec{j}+6\vec{k}$ · Official APSCHE final key

Q568 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If the position vectors of the vertices A, B and C of ΔABC are $\bar{i}+2\bar{j}-5\bar{k}, -2\bar{i}+2\bar{j}+\bar{k}$ and $2\bar{i}+\bar{j}-\bar{k}$ respectively then $\angle B=$

(A) $\text{Cos}^{-1}\left(\frac{7}{3\sqrt{10}}\right)$

(B) $\text{Cos}^{-1}\left(\frac{8}{\sqrt{105}}\right)$

(C) $\text{Cos}^{-1}\left(\frac{1}{\sqrt{42}}\right)$

(D) $\text{Cos}^{-1}\left(-\frac{7}{3\sqrt{10}}\right)$

Answer: (B) $\text{Cos}^{-1}\left(\frac{8}{\sqrt{105}}\right)$ · Official APSCHE final key

---

Q569 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

If the position vectors of the vertices of a ΔABC are $\overline{OA} = 3\bar{i} + \bar{j} + 2\bar{k}, \overline{OB} = \bar{i} + 2\bar{j} + 3\bar{k}$ and $\overline{OC} = 2\bar{i} + 3\bar{j} + \bar{k}$, then the length of the altitude of ΔABC drawn from A is

(A) $\sqrt{\frac{3}{2}}$

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

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

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

Answer: (B) $\frac{3}{\sqrt{2}}$ · Official APSCHE final key

Q570 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

A new tetrahedron is formed by joining the centroids of the faces of a given tetrahedron OABC. Then the ratio of the volume of the new tetrahedron to that of the given tetrahedron is

(A) $\frac{3}{25}$

(B) $\frac{1}{27}$

(C) $\frac{5}{62}$

(D) $\frac{1}{162}$

Answer: (B) $\frac{1}{27}$ · Official APSCHE final key

Q571 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

Let $\bar{A} = 2\bar{i} + \bar{j} - 2\bar{k}$ and $\bar{B} = \bar{i} + \bar{j}$. If $\bar{C}$ is a vector such that $\bar{A} \cdot \bar{C} = |\bar{C}|$, $|\bar{C} - \bar{A}| = 2\sqrt{2}$ and the angle between $\bar{A} \times \bar{B}$ and $\bar{C}$ is 30°, then the value of $|(\bar{A} \times \bar{B}) \times \bar{C}|$ is

EdLoop EAPCET

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

Answer: (B) $\frac{3}{2}$ · Official APSCHE final key

Q572 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

If the vectors $\overline{AB} = \bar{i} + 3\bar{j} + 4\bar{k}$, $\overline{AC} = 5\bar{i} + \bar{j} + 2\bar{k}$ are two sides of a triangle ABC, whose centroid is G, then $|\overline{AG}| =$

(A) $\frac{2}{3}\sqrt{22}$
(B) $\sqrt{22}$
(C) $\frac{1}{3}\sqrt{22}$
(D) $\sqrt{18}$

Answer: (A) $\frac{2}{3}\sqrt{22}$ · Official APSCHE final key

Q573 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

If A, B, C and D are points whose position vectors are $\bar{i} + \bar{j} + \bar{k}$, $4\bar{i} - \bar{j} + 2\bar{k}$, $5\bar{i} + \bar{j}$, $7\bar{i} + 2\bar{j} + 3\bar{k}$ respectively, then the projection of $\overline{AB}$ on $\overline{CD}$ is

(A) $\frac{4}{3}$
(B) $\sqrt{\frac{2}{7}}$
(C) $\frac{3}{4}$
(D) $\sqrt{\frac{7}{2}}$

Answer: (D) $\sqrt{\frac{7}{2}}$ · Official APSCHE final key

Q574 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

Let $\bar{a}$ and $\bar{b}$ be unit vectors with θ as the acute angle between them. If $\frac{1}{2}|\bar{a} - \bar{b}| = \sin\lambda\theta$, then $4\lambda^2 =$

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

Answer: (B) 1 · Official APSCHE final key

Q575 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

Let $\bar{a} = 2\bar{i} - 3\bar{j} + 4\bar{k}$, $\bar{b} = \bar{i} + 2\bar{j} - 2\bar{k}$ and $\bar{c} = 3\bar{i} - \bar{j} + \bar{k}$. The volume (in cubic units) of the parallelopiped having $\bar{a} + \bar{b} + \bar{c}$, $\bar{a} - \bar{b} + \bar{c}$ and $\bar{a} + \bar{b} - \bar{c}$ as coterminus edges is

(A) 6
(B) 7
(C) 28
(D) 36

Answer: (C) 28 · Official APSCHE final key

Q576 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

If $|\bar{a}| = 1$, $|\bar{b}| = 1$, $|\bar{c}| = 2$ and $\bar{a} \times (\bar{a} \times \bar{c}) + \bar{b} = \bar{0}$, then $(\bar{a} \cdot \bar{c})^2 =$

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

Answer: (D) 3 · Official APSCHE final key

Q577 TS EAMCET 2018 · 7 May · Shift 1 MCQ

The position vectors of three points A, B and C are $(1, 3, x)$, $(3, 5, 8)$ and $(y, -1, -6)$ respectively. If A, B and C are collinear, then $(x, y) =$

(A) $\left(\frac{2}{3}, -3\right)$
(B) $\left(\frac{10}{3}, 3\right)$
(C) $\left(\frac{10}{3}, -3\right)$
(D) $\left(-3, \frac{10}{3}\right)$

Answer: (C) $\left(\frac{10}{3}, -3\right)$ · The council's preliminary key

Q578 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If P, Q, R are the mid points of the sides AB, BC and CA of $\triangle ABC$ respectively, then $\overline{PC} - \overline{BQ} =$

(A) $\overline{CP}$
(B) $\overline{PQ}$
(C) $\overline{BR}$
(D) $\overline{AR}$

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

EdLoop EAPCET

Q579 TS EAMCET 2018 · 7 May · Shift 1 MCQ

Let $\bar{a}=\bar{i}+\bar{j}$, $\bar{b}=\bar{j}+\bar{k}$ and $\bar{c}=\bar{i}+\bar{k}$. If $\bar{d}$ is a unit vector such that $\bar{a}\cdot\bar{d}=0$ and $\bar{b}\cdot(\bar{c}\times\bar{d})=0$, then $\bar{d}=$

(A) $\pm\frac{1}{\sqrt{2}}(\bar{i}+\bar{j})$

(B) $\pm\frac{1}{\sqrt{2}}(\bar{i}-\bar{j})$

(C) $\frac{1}{\sqrt{2}}\bar{i}+\frac{1}{\sqrt{2}}\bar{j}+\frac{1}{\sqrt{3}}\bar{k}$

(D) $\pm\left(\frac{1}{\sqrt{2}}\bar{j}+\frac{1}{\sqrt{2}}\bar{k}\right)$

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

Q580 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If $\bar{a}=\bar{i}+\bar{j}$ and $\bar{b}=3\bar{i}-2\bar{j}$, then the vector $\bar{r}$ satisfying the equations $\bar{r}\times\bar{a}=\bar{b}\times\bar{a}$ and $\bar{r}\times\bar{b}=\bar{a}\times\bar{b}$ is

(A) $-\bar{i}+\bar{j}-2\bar{k}$

(B) $-\bar{i}-4\bar{j}-2\bar{k}$

(C) $4\bar{i}+\bar{j}$

(D) $4\bar{i}-\bar{j}$

Answer: (D) $4\bar{i}-\bar{j}$ · The council's preliminary key

Q581 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If a,b,c are distinct real numbers and P, Q, R are three points whose position vectors are respectively $a\bar{i}+b\bar{j}+c\bar{k}$, $b\bar{i}+c\bar{j}+a\bar{k}$ and $c\bar{i}+a\bar{j}+b\bar{k}$, then $\angle QPR=$

(A) $\mathrm{Cos}^{-1}(a+b+c)$

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

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

(D) $\mathrm{Cos}^{-1}\left(\frac{a^2+b^2+c^2}{abc}\right)$

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

Q582 TS EAMCET 2018 · 5 May · Shift 1 MCQ

Let $\bar{a}=\sin^2 x\,\bar{i}+\cos^2 x\,\bar{j}+\bar{k},\ (x\in\mathbb{R})$. If the pairs of vectors $\bar{a},\bar{i};\ \bar{a},\bar{j}$ and $\bar{a},\bar{k}$ are adjacent sides of 3 distinct parallelograms and A is the sum of the squares of areas of these parallelograms, then A lies in the interval

(A) $(0,\ 1)$
(B) $[3,\ 4]$
(C) $[0,\ 2]$
(D) $[1,\ 2]$

Answer: (B) $[3,\ 4]$ · The council's preliminary key

Q583 TS EAMCET 2018 · 5 May · Shift 1 MCQ

Assertion (A): $\bar{a}, \bar{b}, \bar{c}, \bar{d}$ are position vectors of 4 points such that $2\bar{a} - 3\bar{b} + 7\bar{c} - 6\bar{d} = \bar{0} \Rightarrow \bar{a}, \bar{b}, \bar{c}, \bar{d}$ are coplanar.
Reason (R): Vector equation of the plane passing through three points whose position vectors are $\bar{a}, \bar{b}, \bar{c}$ is $\bar{r} = (1 - x - y)\bar{a} + x\bar{b} + y\bar{c}$.
Which of the following is true?

(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: (A) Both (A) and (R) are true and (R) is the correct explanation of (A) · The council's preliminary key

Q584 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $|\bar{a}| = 4,\ |\bar{b}| = 5,\ |\bar{a} - \bar{b}| = 3$ and θ is the angle between the vectors $\bar{a}$ and $\bar{b}$ then $\tan^2\theta =$

(A) $\frac{4}{3}$
(B) $\frac{3}{4}$
(C) $\frac{16}{9}$
(D) $\frac{9}{16}$

Answer: (D) $\frac{9}{16}$ · The council's preliminary key

Q585 TS EAMCET 2018 · 5 May · Shift 1 MCQ

$\bar{e}$ is a unit vector perpendicular to the plane determined by the points $2\bar{i} + \bar{j} + \bar{k},\ \bar{i} - \bar{j} + \bar{k}$ and $-\bar{i} + \bar{j} - \bar{k}$. If $\bar{a} = 2\bar{i} - 3\bar{j} + 6\bar{k}$ then the projection vector of $\bar{a}$ on $\bar{e}$ is

(A) $\frac{11}{14}(-2\bar{i} + \bar{j} + 3\bar{k})$
(B) $\frac{1}{3}(\bar{i} - 2\bar{j} + 2\bar{k})$
(C) $\frac{1}{7}(2\bar{i} - 3\bar{j} + 6\bar{k})$
(D) $\frac{1}{\sqrt{14}}(2\bar{i} - \bar{j} + 3\bar{k})$

Answer: (A) $\frac{11}{14}(-2\bar{i} + \bar{j} + 3\bar{k})$ · The council's preliminary key

Q586 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $\bar{a} = 2\bar{i} + \bar{j} - 3\bar{k},\ \bar{b} = \bar{i} - 2\bar{j} + 3\bar{k},\ \bar{c} = -\bar{i} + \bar{j} - 4\bar{k}$ and $\bar{d} = \bar{i} + \bar{j} + 2\bar{k}$ then $(\bar{a} \times \bar{b}) \times (\bar{c} \times \bar{d}) =$

(A) $-7\bar{i}+\bar{j}+3\bar{k}$
(B) $8\bar{i}-36\bar{j}+60\bar{k}$
(C) $5\bar{i}+\bar{j}-\bar{k}$
(D) $-8\bar{i}-36\bar{j}+12\bar{k}$

Answer: (B) $8\bar{i}-36\bar{j}+60\bar{k}$ · The council's preliminary key

Q587 TS EAMCET 2018 · 5 May · Shift 2 MCQ

In a quadrilateral PQRS, A divides SR in the ratio $1:3$ and B is the mid point of PR. If, $3\overline{SR}-\overline{QR}-3\overline{PS}-\overline{PQ}=k\overline{AB}$, then $k=$

(A) 2
(B) 4
(C) 6
(D) 8

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

Q588 TS EAMCET 2018 · 5 May · Shift 2 MCQ

It is given that $\overline{a},\overline{b},\overline{c}$ are vectors of lengths 6, 8, 10 respectively. If $\overline{a}$ is perpendicular to $(\overline{b}+\overline{c})$, $\overline{b}$ is perpendicular $(\overline{c}+\overline{a})$; and $\overline{c}$ is perpendicular to $(\overline{a}+\overline{b})$, then the length of the vector $\overline{a}+\overline{b}+\overline{c}$ is

(A) $6\sqrt{2}$
(B) $12\sqrt{2}$
(C) $5\sqrt{2}$
(D) $10\sqrt{2}$

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

Q589 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If $\overline{a},\overline{b},\overline{c},\overline{d}$ are 4 vectors such that $\overline{a}\cdot\overline{b}=0$, $|\overline{a}\times\overline{c}|=|\overline{a}||\overline{c}|$, $|\overline{a}\times\overline{d}|=|\overline{a}||\overline{d}|$, then $[\overline{b}\,\overline{c}\,\overline{d}]=$

(A) $|\overline{a}||\overline{b}||\overline{c}|$
(B) $|\overline{b}||\overline{c}||\overline{d}|$
(C) $\frac{1}{6}$
(D) 0

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

Q590 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If $\overline{a},\overline{b},\overline{c}$ are three non coplanar vectors and $\overline{d}$ is any unit vector, then $\left|(\overline{a}\cdot\overline{d})(\overline{b}\times\overline{c})+(\overline{b}\cdot\overline{d})(\overline{c}\times\overline{a})+(\overline{c}\cdot\overline{d})(\overline{a}\times\overline{b})\right|=$

EdLoop EAPCET

(A) $2\left[\overline{a}\,\overline{b}\,\overline{c}\right]$
(B) $\frac{1}{2}\left|\left[\overline{a}\,\overline{b}\,\overline{c}\right]\right|$
(C) $\left|\left[\overline{a}\,\overline{b}\,\overline{c}\right]\right|$
(D) $\frac{1}{6}\left|\left[\overline{a}\,\overline{b}\,\overline{c}\right]\right|$

Answer: (C) $\left|\left[\overline{a}\,\overline{b}\,\overline{c}\right]\right|$ · The council's preliminary key

---

Q591 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If the line $\overline{r}=\overline{a}+t\overline{b}$ is parallel to the plane $\overline{r}=\overline{c}+l\overline{d}+m\overline{e}$, then

(A) $\left[\overline{a}\,\overline{b}\,\overline{c}\right]=0$
(B) $\left[\overline{b}\,\overline{c}\,\overline{d}\right]=0$
(C) $\left[\overline{c}\,\overline{d}\,\overline{e}\right]=0$
(D) $\left[\overline{b}\,\overline{d}\,\overline{e}\right]=0$

Answer: (D) $\left[\overline{b}\,\overline{d}\,\overline{e}\right]=0$ · The council's preliminary key

---

Q592 TS EAMCET 2018 · 4 May · Shift 1 MCQ

Let $3\overline{i}+\overline{j}-\overline{k}$ be the position vector of a point B. Let A be a point on the line which is passing through B and parallel to the vector $2\overline{i}-\overline{j}+2\overline{k}$. If $|\overline{BA}|=18$, then the position vector of A is

(A) $-9\overline{i}+7\overline{j}-13\overline{k}$
(B) $-9\overline{i}+3\overline{j}+12\overline{k}$
(C) $9\overline{i}-3\overline{j}+2\overline{k}$
(D) $3\overline{i}-\overline{j}+7\overline{k}$

Answer: (A) $-9\overline{i}+7\overline{j}-13\overline{k}$ · The council's preliminary key

---

Q593 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The vector that is parallel to the vector $2\overline{i}-2\overline{j}-4\overline{k}$ and coplanar with the vectors $\overline{i}+\overline{j}$ and $\overline{j}+\overline{k}$ is

(A) $\overline{i}-\overline{k}$
(B) $\overline{i}+\overline{j}-\overline{k}$
(C) $\overline{i}-\overline{j}-2\overline{k}$
(D) $3\overline{i}+3j+6\overline{k}$

Answer: (C) $\overline{i}-\overline{j}-2\overline{k}$ · The council's preliminary key

---

Q594 TS EAMCET 2018 · 4 May · Shift 1 MCQ

If the position vectors of three points A, B, C respectively are $\overline{i}+2\overline{j}+\overline{k}$, $2\overline{i}-\overline{j}+2\overline{k}$ and $\overline{i}+\overline{j}+2\overline{k}$, then the perpendicular distance of the point C from the line AB is

EdLoop EAPCET

(A) $\sqrt{\frac{3}{11}}$
(B) $\sqrt{\frac{4}{11}}$
(C) $\sqrt{\frac{6}{11}}$
(D) $\sqrt{\frac{8}{11}}$

Answer: (C) $\sqrt{\frac{6}{11}}$ · The council's preliminary key

Q595 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The volume of a tetrahedron whose vertices are $4\bar{i}+5\bar{j}+\bar{k}$, $-\bar{j}+\bar{k}$, $3\bar{i}+9\bar{j}+4\bar{k}$ and $-2\bar{i}+4\bar{j}+4\bar{k}$ is (in cubic units)

(A) $\frac{14}{3}$
(B) 5
(C) 6
(D) 30

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

Q596 TS EAMCET 2018 · 4 May · Shift 1 MCQ

If the vectors $\bar{b},\bar{c},\bar{d}$ are not coplanar, then, the vector $(\bar{a}\times\bar{b})\times(\bar{c}\times\bar{d})+(\bar{a}\times\bar{c})\times(\bar{d}\times\bar{b})+(\bar{a}\times\bar{d})\times(\bar{b}\times\bar{c})$ is

(A) parallel to $\bar{a}$
(B) parallel to $\bar{b}$
(C) parallel to $\bar{c}$
(D) perpendicular to $\bar{a}$

Answer: (A) parallel to $\bar{a}$ · The council's preliminary key

Q597 TS EAMCET 2018 · 4 May · Shift 2 MCQ

If $\bar{a}=2\bar{i}+3\bar{j}+\bar{k}$, $\bar{b}=\bar{i}-3\bar{j}-5\bar{k}$ and $\bar{c}=3\bar{i}-4\bar{k}$ then match the items of List I with those of List II.
List I
a) Unit vector in the direction opposite to that of $\bar{a}-\bar{b}$ is
b) If $\overline{AB}=\bar{a}$, $\overline{BC}=\bar{b}$ then $\overline{CA}=$
c) If $\bar{a},\bar{b},\bar{c}$ are the position vectors of the vertices a triangle then, its centroid is
d) If $\bar{d}$ is a vector of magnitude $2\sqrt{14}$ and parallel to the vector $\bar{a}$, then $\bar{b}-\bar{d}=$
List II
i) $5\bar{i}+3\bar{j}-3\bar{k}$
ii) $2\bar{i}-\frac{8}{3}\bar{k}$
iii) $-3\bar{i}+4\bar{k}$

iv) $-\frac{\bar{i}}{\sqrt{73}}-\frac{6\bar{j}}{\sqrt{73}}-\frac{6\bar{k}}{\sqrt{73}}$
v) $\frac{3}{\sqrt{43}}\bar{i}+\frac{5}{\sqrt{43}}\bar{j}-\frac{3}{\sqrt{43}}\bar{k}$
The correct answer is

(A) a-iv, b-iii, c-ii, d-i
(B) a-iv, b-iii, c-ii, d-v
(C) a-iv, b-iii, c-i, d-ii
(D) a-i, b-ii, c-iii, d-v

Answer: (A) a-iv, b-iii, c-ii, d-i · The council's preliminary key

Q598 TS EAMCET 2018 · 4 May · Shift 2 MCQ

If $2\bar{i}-\bar{j}+3\bar{k}$, $-12\bar{i}-\bar{j}-3\bar{k}$, $-\bar{i}+2\bar{j}-4\bar{k}$ and $\lambda\bar{i}+2\bar{j}-\bar{k}$ are the position vectors of four coplanar points then $\lambda=$

(A) -2
(B) 6
(C) 3
(D) -6

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

Q599 TS EAMCET 2018 · 4 May · Shift 2 MCQ

If $\bar{a},\bar{b}$ and $\bar{c}$ are three vectors with magnitudes 1, 1 and 2 respectively and $\bar{a}\times(\bar{a}\times\bar{c})+\bar{b}=\bar{0}$, then the angle between $\bar{a}$ and $\bar{c}$ is

(A) $\frac{2\pi}{5}$
(B) $\frac{\pi}{3}$
(C) $\frac{\pi}{4}$
(D) $\frac{\pi}{6}$

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

Q600 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

In ΔABC, if D and E are the mid points of the sides BC and CA respectively, then $2\left(\overline{AD}+\overline{EB}\right)=$

(A) $3\overline{AB}$
(B) $\frac{3}{2}\overline{AB}$
(C) $2\overline{AB}$
(D) $3\overline{BC}$

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

EdLoop EAPCET

Q601 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If $\bar{a}, \bar{b}, \bar{c}$ are vectors of equal magnitude such that $(\bar{a}, \bar{b}) = \alpha$, $(\bar{b}, \bar{c}) = \beta$, $(\bar{c}, \bar{a}) = \gamma$ then the minimum value of $\cos\alpha + \cos\beta + \cos\gamma$ is

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

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

Q602 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

In ΔABC if $A(\bar{\alpha})$, $B(\bar{\beta})$ and $C(\bar{\gamma})$ are the position vectors of the vertices, then the length of the perpendicular from A to BC is

(A) $|\bar{\alpha} \times \bar{\beta}| + |\bar{\beta} \times \bar{\gamma}| + |\bar{\gamma} \times \bar{\alpha}|$
(B) $|\bar{\alpha} \times \bar{\beta} + \bar{\beta} \times \bar{\gamma} + \bar{\gamma} \times \bar{\alpha}|$
(C) $\frac{|\bar{\alpha}\times\bar{\beta}+\bar{\beta}\times\bar{\gamma}+\bar{\gamma}\times\bar{\alpha}|}{|\bar{\alpha}-\bar{\beta}|}$
(D) $\frac{|\bar{\alpha}\times\bar{\beta}+\bar{\beta}\times\bar{\gamma}+\bar{\gamma}\times\bar{\alpha}|}{|\bar{\gamma}-\bar{\beta}|}$

Answer: (D) $\frac{|\bar{\alpha}\times\bar{\beta}+\bar{\beta}\times\bar{\gamma}+\bar{\gamma}\times\bar{\alpha}|}{|\bar{\gamma}-\bar{\beta}|}$ · The council's preliminary key

Q603 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If $\bar{a}, \bar{b}, \bar{c}$ are three non-coplanar vectors, then match the items of List-I with those of List-II.
List - I
A) $[\bar{b} \times \bar{c} \;\; \bar{c} \times \bar{a} \;\; \bar{a} \times \bar{b}] =$
B) $[\bar{a} \times \bar{b} \;\; \bar{a} \times \bar{c} \;\; \bar{b}] =$
C) $[\bar{a} + \bar{b} \;\; \bar{b} + \bar{c} \;\; \bar{c} + \bar{a}] =$
D) For three mutually perpendicular unit vectors $\bar{a}, \bar{b}, \bar{c}$: $[(\bar{a} + \bar{b} + \bar{c}) \;\; \bar{b} \times \bar{c} \;\; \bar{c} \times \bar{a}] =$
List - II
I) $[\bar{a}\;\bar{b}\;\bar{c}]^2$
II) $2[\bar{a}\;\bar{b}\;\bar{c}]$
III) $[\bar{a}\;\bar{b}\;\bar{c}]$
IV) $[\bar{a}\;\bar{b}\;\bar{c}][\bar{a} \cdot \bar{b}]$
V) 0
The correct answer is

(A) A-III, B-IV, C-V, D-II
(B) A-IV, B-V, C-II, D-III
(C) A-I, B-IV, C-V, D-III
(D) A-I, B-IV, C-II, D-III

Answer: (D) A-I, B-IV, C-II, D-III · The council's preliminary key

EdLoop EAPCET

Q604 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

$\bar{a}, \bar{b}$ and $\bar{c}$ are three unit vectors such that no two of them are collinear. If $\bar{b} = 2\{\bar{a} \times (\bar{b} \times \bar{c})\}$ and α is the angle between $\bar{a}, \bar{c}$ and β is the angle between $\bar{a}, \bar{b}$ then $\cos(\alpha + \beta) =$

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

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

Q605 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If the position vectors of A, B, C, D are $\bar{i} + 2\bar{j} + 2\bar{k}$, $2\bar{i} - \bar{j}$, $\bar{i} + \bar{j} + 3\bar{k}$ and $4\bar{j} + 5\bar{k}$ respectively, then the quadrilateral ABCD is a

(A) Square
(B) Rectangle
(C) Rhombus
(D) Parallelogram

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

Q606 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If $(\bar{i} + \bar{j} + \bar{k}), (\bar{i} + 2\bar{j} + 3\bar{k})$ and $(2\bar{i} - \bar{j} + \bar{k})$ are the position vectors of the vertices A, B and C of Δ ABC respectively, then the vector equation of the altitude through A is

(A) $\bar{r} = \bar{i} + \bar{j} + \bar{k} + t(\bar{i} + 2\bar{j} + 3\bar{k})$ (t is a parameter)
(B) $\bar{r} = \bar{i} + \bar{j} + \bar{k} + t(2\bar{i} - \bar{j} + \bar{k})$ (t is a parameter)
(C) $\bar{r} = \bar{i} + \bar{j} + \bar{k} + t(\bar{i} - \bar{j} + 2\bar{k})$ (t is a parameter)
(D) $\bar{r} = \bar{i} + \bar{j} + \bar{k} + t(4\bar{i} + 2\bar{j} + 4\bar{k})$ (t is a parameter)

Answer: (C) $\bar{r} = \bar{i} + \bar{j} + \bar{k} + t(\bar{i} - \bar{j} + 2\bar{k})$ **(t is a parameter)** · The council's preliminary key

Q607 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If the adjacent sides of a rectangle are $\bar{a} = 5\bar{m} - 3\bar{n}$, $\bar{b} = -\bar{m} - 2\bar{n}$ and the adjacent sides of another rectangle are $\bar{c} = -4\bar{m} - \bar{n}$, $\bar{d} = -\bar{m} + \bar{n}$, then the angle between the vectors $\bar{x} = \frac{\bar{a}+\bar{c}+\bar{d}}{3}$ and $\bar{y} = \frac{\bar{c}+\bar{d}}{5}$ is

(A) $\frac{\pi}{2}$
(B) $\text{Cos}^{-1}\left(\frac{19}{5\sqrt{43}}\right)$
(C) $\text{Cos}^{-1}\left(\frac{19}{5\sqrt{43}}\right)+\pi$
(D) $\text{Sin}^{-1}\frac{19}{4\sqrt{43}}$

Answer: (B) $\text{Cos}^{-1}\left(\frac{19}{5\sqrt{43}}\right)$ · The council's preliminary key

Q608 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

The perpendicular distance from the point $3\overline{i}-2\overline{j}+\overline{k}$ to the line joining the points $\overline{i}-3\overline{j}+5\overline{k}$ and $2\overline{i}+\overline{j}-4\overline{k}$ is

(A) 7
(B) $7\sqrt{3}$
(C) $2\sqrt{3}$
(D) $\sqrt{3}$

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

Q609 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If $\overline{c}=2\overline{i}+\overline{j}-2\overline{k}$, $\overline{b}=\overline{i}+\overline{j}$ and $\overline{a}=3\overline{i}+\overline{j}-\overline{k}$, then $\left(\overline{a}\times(\overline{b}\times\overline{c})\right)\times\overline{c}=$

(A) $2\overline{i}-2\overline{j}+\overline{k}$
(B) $18\overline{i}-18\overline{j}-9\overline{k}$
(C) $-18\overline{i}+18\overline{j}-9\overline{k}$
(D) $18\overline{i}-18\overline{j}+9\overline{k}$

Answer: (C) $-18\overline{i}+18\overline{j}-9\overline{k}$ · The council's preliminary key

Q610 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

$\overline{a},\overline{b},\overline{c}$ are three vectors such that $|\overline{a}|=3$, $|\overline{b}|=5$, $|\overline{c}|=7$. If $\overline{a},\overline{b},\overline{c}$ are perpendicular to the vectors $\overline{b}+\overline{c}$, $\overline{c}+\overline{a}$, $\overline{a}+\overline{b}$ respectively, then $\sqrt{(\overline{a}+\overline{b}+\overline{c})^2-2}=$

(A) 15
(B) 9
(C) 22
(D) 25

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

Q611 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If $\overline{a},\overline{b},\overline{c}$ are non coplanar vectors, then the point of intersection of the line passing through the points $2\overline{a}+3\overline{b}-\overline{c}$, $3\overline{a}+4\overline{b}-2\overline{c}$ with the line joining the points $\overline{a}-2\overline{b}+3\overline{c}$, $\overline{a}-6\overline{b}+6\overline{c}$ is

EdLoop EAPCET

(A) $\overline{a}+\overline{b}+\overline{c}$
(B) $\overline{a}+2\overline{b}$
(C) $\overline{a}+\overline{c}$
(D) $\frac{\overline{a}+2\overline{b}+\overline{c}}{2}$

Answer: (B) $\overline{a}+2\overline{b}$ · The council's preliminary key

Q612 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If $\overline{a},\overline{b},\overline{c}$ are unit vectors and the maximum value of $|\overline{a}-\overline{b}|^2+|\overline{b}-\overline{c}|^2+|\overline{c}-\overline{a}|^2$ is k, then $k(2\overline{a}^2+3\overline{b}^2-4\overline{c}^2)=$

(A) 6
(B) 8
(C) 9
(D) 12

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

Q613 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

Let $\overline{a}=2\overline{i}+\overline{j}-2\overline{k}$ and $\overline{b}=\overline{i}+\overline{j}$ be two vectors. $\overline{c}$ is a vector such that $\overline{a}.\overline{c}=|\overline{c}|$ and $|\overline{c}-\overline{a}|=2\sqrt{2}$. If the angle between $\overline{a}\times\overline{b}$ and $\overline{c}$ is 30°, then $|(\overline{a}\times\overline{b})\times\overline{c}|$ is equal to

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

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

Q614 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If $\overline{a}=\overline{i}+\overline{j}+\overline{k}$, $\overline{b}=2\overline{i}-\overline{j}+3\overline{k}$ and $\overline{c}=\overline{i}-\overline{j}$ and if $6\overline{i}+2\overline{j}+3\overline{k}=\lambda_1(\overline{a}\times\overline{b})+\lambda_2(\overline{b}\times\overline{c})+\lambda_3(\overline{c}\times\overline{a})$, then $(\lambda_1,\lambda_2,\lambda_3)=$

(A) $\left(\frac{11}{5},\frac{4}{5},\frac{19}{5}\right)$
(B) $\left(\frac{4}{5},\frac{11}{5},\frac{19}{5}\right)$
(C) $\left(\frac{4}{5},\frac{19}{5},\frac{11}{5}\right)$
(D) $\left(\frac{19}{5},\frac{11}{5},\frac{4}{5}\right)$

Answer: (B) $\left(\frac{4}{5},\frac{11}{5},\frac{19}{5}\right)$ · The council's preliminary key

Q615 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If $\overline{a}=2\overline{i}+\overline{j}-3\overline{k}$, $\overline{b}=\overline{i}-2\overline{j}+\overline{k}$, $\overline{c}=-\overline{i}+\overline{j}-4\overline{k}$ and $\overline{d}=\overline{i}+\overline{j}+\overline{k}$, then $|(\overline{a}\times\overline{b})\times(\overline{c}\times\overline{d})|=$

EdLoop EAPCET

(A) $5\sqrt{114}$
(B) $5\sqrt{94}$
(C) $5\sqrt{124}$
(D) $5\sqrt{104}$

Answer: (A) $5\sqrt{114}$ · The council's preliminary key

Q616 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If the vertices of a ΔABC are $A=(2,3,5)$, $B=(-1,3,2)$, $C=(3,5,-2)$, then the area of the ΔABC (in sq. units) is

(A) $6\sqrt{2}$
(B) $8\sqrt{3}$
(C) $9\sqrt{2}$
(D) $8\sqrt{2}$

Answer: (C) $9\sqrt{2}$ · The council's preliminary key

Q617 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If $\overline{a}$ and $\overline{b}$ are two unit vectors such that $\overline{a}+\overline{b}$ is also a unit vector, then $|\overline{a}-\overline{b}|^2=$

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

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

Q618 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If A, B, C and D are four points in the plane such that $|\overline{AB}|^2+|\overline{CD}|^2=|\overline{BC}|^2+|\overline{DA}|^2=100$ then $\overline{AC}\cdot\overline{BD}=$

(A) 10
(B) 0
(C) $\frac{1}{10}$
(D) 1

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

Q619 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If $\overline{a}=\overline{i}+2\overline{j}+3\overline{k}$, $\overline{b}=2\overline{i}+3\overline{j}+2\overline{k}$ and $\overline{c}$ is a vector perpendicular to $\overline{b}$, then $\left|\left\{\frac{\overline{a}\cdot(\overline{b}\times\overline{c})}{|\overline{b}\times\overline{c}|^2}\right\}(\overline{b}\times\overline{c})+\left\{\frac{\overline{a}\cdot\overline{b}}{|\overline{b}|^2}\right\}\overline{b}+\left\{\frac{\overline{a}\cdot\overline{c}}{|\overline{c}|^2}\right\}\overline{c}\right|=$

EdLoop EAPCET

(A) $\sqrt{14}$
(B) 14
(C) 13
(D) $\sqrt{17}$

Answer: (A) $\sqrt{14}$ · The council's preliminary key

Q620 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If $\overline{a}, \overline{b}, \overline{c}$ are three vectors such that $|\overline{a}| = 1$, $|\overline{b}| = 2$, $|\overline{c}| = 3$ and $2\overline{a} \cdot \overline{b} = \overline{b} \cdot \overline{c} = \overline{c} \cdot \overline{a} = 2$ then $[\overline{a}\ \overline{b}\ \overline{c}]^2 =$

(A) 15
(B) 14
(C) 12
(D) 8

Answer: (A) 15 · The council's preliminary key

Q621 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If $\overline{a} = \overline{i} + \overline{j}$, $\overline{b} = \overline{j} + \overline{k}$, $\overline{c} = \overline{i} + \overline{k}$ then $\frac{[(\overline{b}\times\overline{c})\times(\overline{c}\times\overline{a})\quad(\overline{c}\times\overline{a})\times(\overline{a}\times\overline{b})\quad(\overline{a}\times\overline{b})\times(\overline{b}\times\overline{c})]}{[\overline{b}+\overline{c}\quad\overline{c}+\overline{a}\quad\overline{a}+\overline{b}][\overline{b}\times\overline{c}\quad\overline{c}\times\overline{a}\quad\overline{a}\times\overline{b}]} =$

(A) 0
(B) 1
(C) $\sqrt{3}$
(D) $\sqrt{2}$

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

Q622 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

Let $\vec{a}, \vec{b}$ and $\vec{c}$ be three non-coplanar vectors. The vector equation of a line which passes through the point of intersection of two lines, one joining the points $\vec{a} + 2\vec{b} - 5\vec{c}, -\vec{a} - 2\vec{b} - 3\vec{c}$ and the other joining the points $-4\vec{c}, 6\vec{a} - 4\vec{b} + 4\vec{c}$ is

(A) $\vec{r} = 2\vec{a} - 4\vec{b} + 3\vec{c} + \mu(\vec{a} - 6\vec{b} + 4\vec{c})$
(B) $\vec{r} = 3\vec{a} + 6\vec{b} - \vec{c} + \mu(\vec{a} + 2\vec{b} + \vec{c})$
(C) $\vec{r} = 2\vec{a} + 3\vec{b} - \vec{c} + \mu(\vec{a} + \vec{b} - \vec{c})$
(D) $\vec{r} = -2\vec{b} + 3\vec{c} + \mu(\vec{a} - 4\vec{b} + 3\vec{c})$

Answer: (B) $\vec{r} = 3\vec{a} + 6\vec{b} - \vec{c} + \mu(\vec{a} + 2\vec{b} + \vec{c})$ · The council's preliminary key

Q623 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

In ΔPQR, M is the mid-point of QR and C is the mid-point of PM. If QC when extended meets PR at N then $\frac{|\overline{QN}|}{|\overline{CN}|} =$

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

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

Q624 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $\overline{a}=\overline{i}-2\overline{j}-3\overline{k}, \overline{b}=2\overline{i}+\overline{j}-\overline{k}, \overline{c}=\overline{i}+3\overline{j}-2\overline{k}$, then
$\left[(\overline{a}\times\overline{b})\times(\overline{b}\times\overline{c}) \quad (\overline{b}\times\overline{c})\times(\overline{c}\times\overline{a}) \quad (\overline{c}\times\overline{a})\times(\overline{a}\times\overline{b})\right]=$

(A) 160000
(B) -8000
(C) 400
(D) -40

Answer: (A) 160000 · The council's preliminary key

Q625 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $\overline{a}=\overline{i}+2\overline{j}+3\overline{k}, \overline{b}=-\overline{i}+2\overline{j}+\overline{k}, \overline{c}=\overline{i}+2\overline{j}-2\overline{k}, \overline{n}$ is perpendicular to both $\overline{a}$ and $\overline{b}$, and θ is the angle between $\overline{c}$ and $\overline{n}$ then $\sin\theta=$

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

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

Q626 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $\overline{a}, \overline{b}$ and $\overline{c}$ are mutually perpendicular vectors of the same magnitude, then the cosine of the angle between $\overline{a}$ and $\overline{a}+\overline{b}+\overline{c}$ is

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

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

Q627 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $\overline{a}, \overline{b}$ and $\overline{c}$ are non-coplanar vectors and the four points with position vectors $2\overline{a}+3\overline{b}-\overline{c}$, $\overline{a}-2\overline{b}+3\overline{c}$, $3\overline{a}+4\overline{b}-2\overline{c}$ and $k\overline{a}-6\overline{b}+6\overline{c}$ are coplanar, then $k=$

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

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

Q628 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If P and Q are two points on the curve $y = 2^{x+2}$ such that $\overline{OP} \cdot \bar{i} = -1$ and $\overline{OQ} \cdot \bar{i} = 2$, then the magnitude of $(\overline{OQ} - 4\overline{OP})$ is

(A) 10
(B) 1
(C) 5
(D) 100

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

Q629 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

Let $\bar{m}$ be the unit vector orthogonal to the vector $\bar{i} - \bar{j} + \bar{k}$ and coplanar with the vectors $2\bar{i} + \bar{j}$ and $\bar{j} - \bar{k}$. If $\bar{a} = \bar{i} - \bar{k}$, then the length of the perpendicular from the origin to the plane $\bar{r} \cdot \bar{m} = \bar{a} \cdot \bar{m}$ is

(A) $\frac{1}{\sqrt{26}}$
(B) $\frac{1}{\sqrt{5}}$
(C) $\frac{5}{\sqrt{26}}$
(D) 1

Answer: (C) $\frac{5}{\sqrt{26}}$ · The council's preliminary key

Q630 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If $\bar{a}, \bar{b}, \bar{c}$ are non-coplanar unit vectors such that $\bar{a} \times (\bar{b} \times \bar{c}) = \frac{\bar{b} + \bar{c}}{\sqrt{2}}$, then the angle between $\bar{a}$ and $\bar{b}$ is

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

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

EdLoop EAPCET

Q631 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If $\bar{a}$ and $\bar{b}$ are two unit vectors such that $\bar{c} = (\bar{a} \times \bar{c}) + \bar{b}$, then the maximum value of $[\bar{a}\ \bar{b}\ \bar{c}]$

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

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

Q632 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

$\bar{\alpha}, \bar{\beta}$ and $\bar{\gamma}$ are non zero vectors such that $|\bar{\beta}| = |\bar{\gamma}| = 1$ and $|\bar{\alpha}| = 10$, then $(\bar{\alpha} \times (\bar{\beta} + \bar{\gamma})) \times (\bar{\beta} \times \bar{\gamma}) \cdot (\bar{\beta} - \bar{\gamma}) =$

(A) 10
(B) 1
(C) 0
(D) 12

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

Q633 TS EAMCET 2017 · 12 May · Offline MCQ

If $\vec{a}$ is a unit vector, then $|\vec{a} \times \hat{i}|^2 + |\vec{a} \times \hat{j}|^2 + |\vec{a} \times \hat{k}|^2 =$

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

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

Q634 TS EAMCET 2017 · 12 May · Offline MCQ

If $\vec{a} = x\hat{i} + y\hat{j} + z\hat{k}$, then $(\vec{a} \times \hat{i}) \cdot (\hat{i} + \hat{j}) + (\vec{a} \times \hat{j}) \cdot (\hat{j} + \hat{k}) + (\vec{a} \times \hat{k}) \cdot (\hat{k} + \hat{i}) =$

(A) $x - y + z$
(B) $x + y + z$
(C) $x + y - z$
(D) $-x + y + z$

Answer: (B) $x + y + z$ · The council's preliminary key

EdLoop EAPCET

Q635 TS EAMCET 2017 · 12 May · Offline MCQ

If $\vec{a}, \vec{b}$ and $\vec{c}$ are unit vectors such that $\vec{a}+\vec{b}+\vec{c}=\vec{0}$ and $(\vec{a},\vec{b})=\frac{2\pi}{3}$, then $|\vec{a}\times\vec{b}|+|\vec{b}\times\vec{c}|+|\vec{c}\times\vec{a}|=$

(A) $\frac{3}{2}$
(B) 0
(C) $\frac{3\sqrt{3}}{2}$
(D) 3

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

Q636 TS EAMCET 2017 · 12 May · Offline MCQ

If $\vec{a}$ and $\vec{b}$ are unit vectors and α is the angle between them, then $\vec{a}+\vec{b}$ is a unit vector when $\cos\alpha=$

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

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

Q637 TS EAMCET 2017 · 12 May · Offline MCQ

If the vectors $\vec{a}=\hat{i}+\hat{j}+\hat{k}, \vec{b}=\hat{i}-\hat{j}+2\hat{k}$ and $\vec{c}=x\hat{i}+(x-2)\hat{j}-\hat{k}$ are coplanar, then $x=$

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

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

Q638 TS EAMCET 2017 · 12 May · Offline MCQ

Let $\vec{a}=2\hat{i}+\hat{j}-3\hat{k}$ and $\vec{b}=\hat{i}+3\hat{j}+2\hat{k}$. Then the volume of the parallelopiped having coterminous edges as $\vec{a}$, $\vec{b}$ and $\vec{c}$, where $\vec{c}$ is the vector perpendicular to the plane of $\vec{a},\vec{b}$ and $|\vec{c}|=2$ is

EdLoop EAPCET

(A) $2\sqrt{195}$
(B) 24
(C) $\sqrt{200}$
(D) $\sqrt{195}$

Answer: (A) $2\sqrt{195}$ · The council's preliminary key

Q639 TS EAMCET 2017 · 12 May · Offline MCQ

If the magnitudes of $\vec{a}, \vec{b}$ and $\vec{a}+\vec{b}$ are respectively 3, 4 and 5, then the magnitude of $(\vec{a}-\vec{b})$ is

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

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

Q640 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

The triad (x, y, z) of real numbers such that $(3\bar{i}-\bar{j}+2\bar{k}) = (2\bar{i}+3\bar{j}-\bar{k})x + (\bar{i}-2\bar{j}+2\bar{k})y + (-2\bar{i}+\bar{j}-2\bar{k})z$, is

(A) $(2, -5, 3)$
(B) $(2, 5, -3)$
(C) $(-2, 5, 3)$
(D) $(2, 5, 3)$

Answer: (D) $(2, 5, 3)$ · The council's preliminary key

Q641 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

In $\triangle ABC$, L, M, N are points on BC, CA, AB respectively, dividing them in the ratios $1:2,\ 2:3,\ 3:5$. If the point K divides AB in the ratio $5:3$, then $\dfrac{|\overline{AL}+\overline{BM}+\overline{CN}|}{|\overline{CK}|} =$

(A) $\dfrac{1}{15}$
(B) $\dfrac{2}{5}$
(C) $\dfrac{5}{8}$
(D) $\dfrac{3}{5}$

Answer: (A) $\dfrac{1}{15}$ · The council's preliminary key

Q642 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If a non-zero vector $\bar{a}$ is parallel to the line of intersection of the plane determined by the vectors $\bar{j}-\bar{k},\ 3\bar{j}-2\bar{k}$ and the plane determined by the vectors $2\bar{i}+3\bar{j},\ \bar{i}-3\bar{j}$, then the angle between the vectors $\bar{a}$ and $\bar{i}+\bar{j}+\bar{k}$ is

(A) $\cos^{-1}\left(\pm\frac{1}{\sqrt{3}}\right)$

(B) $\sin^{-1}\left(\frac{2}{\sqrt{3}}\right)$

(C) $\tan^{-1}\sqrt{3}$

(D) $\cos^{-1}\left(\pm\frac{2}{\sqrt{3}}\right)$

Answer: (A) $\cos^{-1}\left(\pm\frac{1}{\sqrt{3}}\right)$ · The council's preliminary key

Q643 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If $\bar{a},\bar{b}$ and $\bar{c}$ are non-zero vectors such that $\bar{a}$ and $\bar{b}$ are not perpendicular to each other, then the vector $\bar{r}$ which is perpendicular to $\bar{a}$ and satisfying $\bar{r}\times\bar{b}=\bar{c}\times\bar{b}$ is

(A) $\frac{(\bar{b}\times\bar{c})\times\bar{a}}{\bar{a}\cdot\bar{b}}$

(B) $\frac{\bar{b}\times(\bar{a}\times\bar{c})}{\bar{b}\cdot\bar{c}}$

(C) $\frac{(\bar{c}\times\bar{b})\times\bar{a}}{\bar{a}\cdot\bar{c}}$

(D) $\frac{(\bar{a}\times\bar{b})\times\bar{c}}{\bar{c}\cdot\bar{a}}$

Answer: (A) $\frac{(\bar{b}\times\bar{c})\times\bar{a}}{\bar{a}\cdot\bar{b}}$ · The council's preliminary key

Q644 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If the volume of the tetrahedron formed by the coterminous edges $\bar{a},\bar{b}$ and $\bar{c}$ is 4, then the volume of the parallelopiped formed by the coterminous edges $\bar{a}\times\bar{b},\ \bar{b}\times\bar{c}$ and $\bar{c}\times\bar{a}$ is

(A) 144

(B) 16

(C) 48

(D) 576

Answer: (D) 576 · The council's preliminary key

Q645 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If the points having the position vectors $3\bar{i}-2\bar{j}-\bar{k},\ 2\bar{i}+3\bar{j}-4\bar{k},\ -\bar{i}+\bar{j}+2\bar{k}$ and $4\bar{i}+5\bar{j}+\lambda\bar{k}$ are coplanar, then $\lambda=$

(A) -8
(B) 8
(C) $\frac{146}{17}$
(D) $\frac{-146}{17}$

Answer: (D) $\frac{-146}{17}$ · The council's preliminary key

Q646 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

In Δ ABC, if 'S' is the circumcentre and 'O' is the orthocentre then $\overline{OA}+\overline{OB}+\overline{OC}=$

(A) $2(\overline{AS}+\overline{BS}+\overline{CS})$
(B) $\overline{OS}$
(C) $2\overline{SO}$
(D) $\overline{SO}$

Answer: (A) $2(\overline{AS}+\overline{BS}+\overline{CS})$ · The council's preliminary key

Q647 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Let $\bar{a},\bar{b}$ and $\bar{c}$ be non-coplanar vectors. If P, Q, R and S are four points with position vectors $-\bar{a}+4\bar{b}-3\bar{c}$, $3\bar{a}+2\bar{b}-5\bar{c}$, $-3\bar{a}+8\bar{b}-5\bar{c}$ and $-3\bar{a}+2\bar{b}+\bar{c}$ respectively then the ordered pair (x,y) of real numbers such that $\overline{PQ}=x\cdot\overline{PR}+y\cdot\overline{PS}$ is

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

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

Q648 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Let $\bar{a},\bar{b},\bar{c}$ be such that $\bar{a}\neq\bar{o}$, $\bar{b}\neq\bar{o}$, $\bar{a}\times\bar{c}=\bar{b}$ and $\bar{b}\times\bar{c}=\bar{a}$. Then

(A) $|\bar{c}|=|\bar{b}|$
(B) $|\bar{a}|=|\bar{c}|$
(C) $|\bar{b}|=|\bar{a}|$
(D) $\bar{c}=\bar{o}$

Answer: (C) $|\bar{b}|=|\bar{a}|$ · The council's preliminary key

Q649 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If $\bar{a},\bar{b}$ and $\bar{c}$ are vectors such that $|\bar{a}|=\left|\frac{\bar{b}}{2}\right|=\left|\frac{\bar{c}}{3}\right|=1$; $\bar{b}$ and $\bar{c}$ are perpendicular; and the projections of $\bar{b}$ and $\bar{c}$ on $\bar{a}$ are equal then $|\bar{a}-\bar{b}+\bar{c}|=$

(A) 4
(B) $\sqrt{14}$
(C) $2\sqrt{3}$
(D) $\sqrt{10}$

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

Q650 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If the vectors $\bar{p}, \bar{q}$ and $\bar{r}$ are such that $(\bar{q} \times \bar{r}) \times (\bar{r} \times \bar{p}) = 3\bar{r}$ then $[\bar{p} \times \bar{q} \;\; \bar{q} \times \bar{r} \;\; \bar{r} \times \bar{p}] =$

(A) 3
(B) 6
(C) 9
(D) 12

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

Q651 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If $\bar{p}, \bar{q}, \bar{r}$ are three mutually perpendicular vectors of equal magnitude and if a vector $\bar{x}$ satisfies the equation $\bar{p} \times ((\bar{x} - \bar{q}) \times \bar{p}) + \bar{q} \times ((\bar{x} - \bar{r}) \times \bar{q}) + \bar{r} \times ((\bar{x} - \bar{p}) \times \bar{r}) = \bar{o}$ then $\bar{x}$ is

(A) $\frac{1}{4}(\bar{p} - \bar{q} + \bar{r})$
(B) $\frac{2}{3}(\bar{p} + \bar{q} - \bar{r})$
(C) $\frac{3}{4}(\bar{p} + 2\bar{q} + \bar{r})$
(D) $\frac{1}{2}(\bar{p} + \bar{q} + \bar{r})$

Answer: (D) $\frac{1}{2}(\bar{p} + \bar{q} + \bar{r})$ · The council's preliminary key

Q652 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

A point C with position vector $\frac{3\bar{a}+4\bar{b}-5\bar{c}}{3}$ (where $\bar{a}, \bar{b}$ and $\bar{c}$ are non coplanar vectors) divides the line joining A and B in the ratio $2:1$. If the position vector of A is $\bar{a} - 2\bar{b} + 3\bar{c}$, then the position vector of B is

(A) $2\bar{a} + 3\bar{b} - 4\bar{c}$
(B) $2\bar{a} - 3\bar{b} + 4\bar{c}$
(C) $2\bar{a} + 3\bar{b} + 4\bar{c}$
(D) $\bar{a} + 3\bar{b} - 4\bar{c}$

Answer: (D) $\bar{a} + 3\bar{b} - 4\bar{c}$ · The council's preliminary key

EdLoop EAPCET

Q653 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

The line passing through the point $2\bar{a}+\bar{b}$ and parallel to the vector $\bar{b}-\bar{c}$ and the plane passing through the point $\bar{a}$ and parallel to the vectors $\bar{b}+\bar{c}$ and $\bar{a}+2\bar{b}-\bar{c}$ intersect at P. The position vector of P is

(A) $\bar{a}+3\bar{b}$
(B) $2\bar{a}+2\bar{b}-\bar{c}$
(C) $\bar{a}+\bar{b}-2\bar{c}$
(D) $2\bar{a}+\bar{c}$

Answer: (B) $2\bar{a}+2\bar{b}-\bar{c}$ · The council's preliminary key

Q654 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If $\bar{a}$ and $\bar{b}$ are not perpendicular to each other, $\bar{r}\times\bar{a}=\bar{b}\times\bar{a}$ and $\bar{r}.\bar{c}=0$ then $\bar{r}=$

(A) $\bar{a}-\bar{c}$
(B) $\bar{b}-\left(\frac{\bar{b}.\bar{c}}{\bar{a}.\bar{c}}\right)\bar{a}$
(C) $\bar{b}+\left(\frac{\bar{b}.\bar{c}}{\bar{a}.\bar{c}}\right)\bar{a}$
(D) $\bar{a}+\bar{c}$

Answer: (B) $\bar{b}-\left(\frac{\bar{b}.\bar{c}}{\bar{a}.\bar{c}}\right)\bar{a}$ · The council's preliminary key

Q655 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If the two diagonals of a parallelogram are $\bar{i}+2\bar{j}+3\bar{k}$ and $-2\bar{i}+\bar{j}-2\bar{k}$, then the area of the parallelogram in square units is

(A) $\frac{3}{2}\sqrt{5}$
(B) $5\sqrt{3}$
(C) $\sqrt{300}$
(D) $3\sqrt{\frac{5}{2}}$

Answer: (D) $3\sqrt{\frac{5}{2}}$ · The council's preliminary key

Q656 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

The minimum volume of the parallalopiped formed by the vectors $\bar{i}+a\bar{j}+\bar{k}$, $\bar{j}+a\bar{k}$ and $a\bar{i}+\bar{k}$ is

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

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

Q657 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If $\bar{a}=2\bar{i}+\bar{j}-3\bar{k}$, $\bar{b}=\bar{i}-2\bar{j}+\bar{k}$, $\bar{c}=-\bar{i}+\bar{j}-4\bar{k}$, $\bar{d}=\bar{i}+\bar{j}+p\bar{k}$, where p is a positive real number and $|(\bar{a}\times\bar{b})\times(\bar{c}\times\bar{d})|=5\sqrt{114}$, then a value of p is

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

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

Q658 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If $\bar{a},\bar{b}$ are two non-parallel unit vectors and the vector $\alpha\bar{a}+\bar{b}$ bisects the internal angle between $\bar{a}$ and $\bar{b}$, then α is equal to

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

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

Q659 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If $\overrightarrow{OA}=3\bar{i}+\bar{j}-\bar{k}$, $|\overrightarrow{AB}|=2\sqrt{6}$ and the direction ratios of $\overrightarrow{AB}$ are $1,-1,2$ then $|\overrightarrow{OB}|$ (sic)

(A) $\sqrt{41}$
(B) $\sqrt{35}$
(C) $\sqrt{26}$
(D) $\sqrt{55}$

Answer: (B) $\sqrt{35}$ · The council's preliminary key

Q660 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

Let $\bar{a},\bar{b},\bar{c}$ be three vectors such that $|\bar{a}|=|\bar{c}|=1$, $|\bar{b}|=4$, $|\bar{b}\times\bar{c}|=\sqrt{15}$. If $\lambda\bar{a}=\bar{b}-2$ [clipped] then the value of λ is

(A) ±1
(B) ±2
(C) ±3
(D) ±4

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

EdLoop EAPCET

Q661 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

Let $\bar{u}, \bar{v}, \bar{w}$ be vectors such that $|\bar{u}| = 1$, $|\bar{v}| = 2$, $|\bar{w}| = 3$. If the projection of $\bar{v}$ on $\bar{u}$ is equal to that of $\bar{w}$ on $\bar{u}$, and the vectors $\bar{v}, \bar{w}$ are perpendicular to each other, then $|\bar{u} - \bar{v} + \bar{w}| =$

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

Answer: (C) $\sqrt{14}$ · The council's preliminary key

Q662 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If the vectors $\bar{a}, \bar{b}, \bar{c}$ satisfy the condition $|\bar{a} - \bar{c}| = |\bar{b} - \bar{c}|$, then $(\bar{b} - \bar{a}) \cdot \left(\bar{c} - \frac{\bar{a} + \bar{b}}{2}\right) =$

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

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

Q663 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

For two given vectors $\bar{a}$ and $\bar{b}$ if the vectors $\bar{A}, \bar{B}$ are such that $\bar{A} + \bar{B} = \bar{a}$, $\bar{A} \times \bar{B} = \bar{b}$ and $\bar{A} \cdot \bar{a} = 1$, then $\bar{A} =$

(A) $\frac{(\bar{a} \times \bar{b}) + \bar{a}}{\bar{a}^2}$
(B) $\frac{(\bar{b} \times \bar{a}) + \bar{a}(\bar{a}^2 - 1)}{\bar{a}^2}$
(C) $\frac{\bar{a}(\bar{a}^2 - 1) + \bar{b}(\bar{b}^2 - 1)}{\bar{a}^2 + \bar{b}^2}$
(D) $\frac{(\bar{a} \times \bar{b}) + \bar{b}}{\bar{b}^2}$

Answer: (A) $\frac{(\bar{a} \times \bar{b}) + \bar{a}}{\bar{a}^2}$ · The council's preliminary key

Q664 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

The points with position vectors $\overline{a} + \overline{b}, \overline{a} - \overline{b}$ and $\overline{a} + k\overline{b}$ are collinear

(A) for exactly two values of k
(B) for exactly three values of k
(C) for no real value of k
(D) for all real values of k

Answer: (D) for all real values of k · Checked by our team

Q665 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

Given $\overline{a}=2\overline{i}+\overline{j}-2\overline{k}$ and $\overline{b}=\overline{i}+\overline{j}$. If $\overline{c}$ is a vector such that $\overline{a}\cdot\overline{c}=|\overline{c}|,\ |\overline{c}-\overline{a}|=2\sqrt{2}$ and the angle between $\overline{a}\times\overline{b}$ and $\overline{c}$ is 30°, then the value of $\left|(\overline{a}\times\overline{b})\times\overline{c}\right|^2$ is

(A) 9
(B) $\frac{4}{9}$
(C) $\frac{9}{4}$
(D) $\frac{27}{4}$

Answer: (C) $\frac{9}{4}$ · The council's preliminary key

Q666 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If in a right angled triangle ABC, the hypotenuse $|\overline{AB}|=p$ then $\overline{AB}\cdot\overline{AC}+\overline{BC}\cdot\overline{BA}+\overline{CA}\cdot\overline{CB}=$

(A) p^2
(B) $2p^2$
(C) $3p^2$
(D) $\frac{p^2}{2}$

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

Q667 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

Let $\overline{a}=2\overline{i}+\overline{j}-\overline{k}$ and $\overline{b}=\overline{i}+3\overline{k}$. If $\overline{c}$ is a unit vector, then the maximum value of $\left[\overline{a}\quad\overline{b}\quad\overline{c}\right]$ is

(A) $\sqrt{39}$
(B) $\sqrt{49}$
(C) $\sqrt{69}$
(D) $\sqrt{59}$

Answer: (D) $\sqrt{59}$ · The council's preliminary key

Q668 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

Let $\overline{a}=4\overline{i}+5\overline{j}-\overline{k},\ \overline{b}=\overline{i}-4\overline{j}+5\overline{k},\ \overline{c}=3\overline{i}+\overline{j}-\overline{k}$ and let $\overline{\alpha}$ be a vector perpendicular to both $\overline{a}$ and $\overline{b}$ such that $\overline{\alpha}\cdot\overline{c}=63$. Then $\overline{\alpha}=$

EdLoop EAPCET

(A) $7\bar{i}-7\bar{j}-7\bar{k}$
(B) $3\bar{i}-3\bar{j}-3\bar{k}$
(C) $21\bar{i}-21\bar{j}-21\bar{k}$
(D) $21\bar{i}-7\bar{j}-7\bar{k}$

Answer: (C) $21\bar{i}-21\bar{j}-21\bar{k}$ · The council's preliminary key

Q669 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

A vector of magnitude $\sqrt{51}$ which makes equal angles with the vectors $\bar{a}=\frac{1}{3}(\bar{i}-2\bar{j}+2\bar{k})$, $\bar{b}=\frac{1}{5}(-4\bar{i}-3\bar{k})$ and $\bar{c}=\bar{j}$, is

(A) $5\bar{i}-\bar{j}+5\bar{k}$
(B) $-5\bar{i}+\bar{j}-5\bar{k}$
(C) $-5\bar{i}+\bar{j}+5\bar{k}$
(D) $-\bar{i}-\bar{j}+7\bar{k}$

Answer: (C) $-5\bar{i}+\bar{j}+5\bar{k}$ · The council's preliminary key

Q670 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

A unit vector orthogonal to the vector $3\bar{i}+4\bar{j}+5\bar{k}$ and coplanar with the vectors $\bar{i}+\bar{j}+\bar{k}$ and $\bar{i}-\bar{j}+\bar{k}$ is

(A) $\frac{1}{5}(4\bar{i}-3\bar{j})$
(B) $\frac{1}{\sqrt{11}}(3\bar{i}-\bar{j}-\bar{k})$
(C) $\frac{1}{3}(2\bar{i}+\bar{j}-2\bar{k})$
(D) $\frac{1}{\sqrt{6}}(\bar{i}-2\bar{j}+\bar{k})$

Answer: (D) $\frac{1}{\sqrt{6}}(\bar{i}-2\bar{j}+\bar{k})$ · The council's preliminary key

Q671 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

Let $\bar{a}$ and $\bar{b}$ be two non-collinear unit vectors. If $\bar{u}=\bar{a}-(\bar{a}\cdot\bar{b})\bar{b}$ and $\bar{v}=\bar{a}\times\bar{b}$, then $|\bar{v}|=$

(A) $|\bar{u}|$
(B) $|\bar{a}|$
(C) $|\bar{b}|$
(D) $|\bar{a}||\bar{b}|$

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

EdLoop EAPCET

Q672 TS EAMCET 2016 · 15 May · Offline MCQ

$ABCDEF$ is a regular hexagon whose centre is O. Then $\overrightarrow{AB}+\overrightarrow{AC}+\overrightarrow{AD}+\overrightarrow{AE}+\overrightarrow{AF}$ is

(A) $2\overrightarrow{AO}$
(B) $3\overrightarrow{AO}$
(C) $5\overrightarrow{AO}$
(D) $6\overrightarrow{AO}$

Answer: (D) $6\overrightarrow{AO}$ · Official TGCHE final key

Q673 TS EAMCET 2016 · 15 May · Offline MCQ

$ABCD$ is a parallelogram and P is the mid point of the side AD. The line BP meets the diagonal AC in Q. Then the ratio $AQ : QC =$

(A) $1:2$
(B) $2:1$
(C) $1:3$
(D) $3:1$

Answer: (A) $1:2$ · Official TGCHE final key

Q674 TS EAMCET 2016 · 15 May · Offline MCQ

The vectors $2\bar{i}-3\bar{j}+\bar{k}$, $\bar{i}-2\bar{j}+3\bar{k}$, $3\bar{i}+\bar{j}-2\bar{k}$

(A) are linearly dependent
(B) are linearly independent
(C) form sides of a triangle
(D) are coplanar

Answer: (B) are linearly independent · Official TGCHE final key

Q675 TS EAMCET 2016 · 15 May · Offline MCQ

$\bar{a},\bar{b},\bar{c}$ are three vectors such that $|\bar{a}|=1$, $|\bar{b}|=2$, $|\bar{c}|=3$ and $\bar{b},\bar{c}$ are perpendicular. If projection of $\bar{b}$ on $\bar{a}$ is the same as the projection of $\bar{c}$ on $\bar{a}$, then $|\bar{a}-\bar{b}+\bar{c}|=$

(A) $\sqrt{2}$
(B) $\sqrt{7}$
(C) $\sqrt{14}$
(D) $\sqrt{21}$

Answer: (C) $\sqrt{14}$ · Official TGCHE final key

Q676 TS EAMCET 2016 · 15 May · Offline MCQ

If $\bar{a}, \bar{b}, \bar{c}$ are unit vectors satisfying the relation $\bar{a}+\bar{b}+\sqrt{3}\,\bar{c}=0$, then the angle between $\bar{a}$ and $\bar{b}$ is

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

Answer: (C) $\frac{\pi}{3}$ · Official TGCHE final key

Q677 TS EAMCET 2016 · 15 May · Offline MCQ

$\bar{a}$ is perpendicular to both $\bar{b}$ and $\bar{c}$. The angle between $\bar{b}$ and $\bar{c}$ is $\frac{2\pi}{3}$. If $|\bar{a}|=2$, $|\bar{b}|=3$, $|\bar{c}|=4$, then $\bar{c}\cdot(\bar{a}\times\bar{b})=$

(A) $18\sqrt{3}$
(B) $12\sqrt{3}$
(C) $8\sqrt{3}$
(D) $6\sqrt{3}$

Answer: (B) $12\sqrt{3}$ · Official TGCHE final key

Q678 AP EAMCET 2016 · 29 Apr · Offline MCQ

For three vectors $\overline{p}, \overline{q}$ and $\overline{r}$, if $\overline{r}=3\overline{p}+4\overline{q}$ and $2\overline{r}=\overline{p}-3\overline{q}$, then

(A) $|\overline{r}|<2|\overline{q}|$ and $\overline{r}, \overline{q}$ have the same direction
(B) $|\overline{r}|>2|\overline{q}|$ and $\overline{r}, \overline{q}$ have opposite directions
(C) $|\overline{r}|<2|\overline{q}|$ and $\overline{r}, \overline{q}$ have opposite directions
(D) $|\overline{r}|>2|\overline{q}|$ and $\overline{r}, \overline{q}$ have the same direction

Answer: (B) $|\overline{r}|>2|\overline{q}|$ and $\overline{r}, \overline{q}$ have opposite directions · The council's preliminary key

Q679 AP EAMCET 2016 · 29 Apr · Offline MCQ

If $\overline{a}=2\overline{i}+3\overline{j}-5\overline{k}$, $\overline{b}=m\overline{i}+n\overline{j}+12\overline{k}$ and $\overline{a}\times\overline{b}=\overline{0}$, then $(m,n)=$

(A) $\left(\frac{-24}{5}, \frac{-36}{5}\right)$
(B) $\left(\frac{-24}{5}, \frac{36}{5}\right)$
(C) $\left(\frac{24}{5}, \frac{-36}{5}\right)$
(D) $\left(\frac{24}{5}, \frac{36}{5}\right)$

Answer: (A) $\left(\frac{-24}{5}, \frac{-36}{5}\right)$ · The council's preliminary key

Q680 AP EAMCET 2016 · 29 Apr · Offline MCQ

If $|\overline{a}|=3$, $|\overline{b}|=4$ and the angle between $\overline{a}$ and $\overline{b}$ is 120°, then $|4\overline{a}+3\overline{b}|$ is equal to

(A) 25
(B) 7
(C) 13
(D) 12

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

Q681 AP EAMCET 2016 · 29 Apr · Offline MCQ

If $\overline{a}, \overline{b}, \overline{c}$ are non-zero vectors such that $(\overline{a} \times \overline{b}) \times \overline{c} = \frac{1}{3}|\overline{b}||\overline{c}|\overline{a}$, $\overline{c} \perp \overline{a}$ and θ is the angle between the vectors $\overline{b}, \overline{c}$ then $\sin\theta =$

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

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

---

Q682 AP EAMCET 2016 · 29 Apr · Offline MCQ

If $a(\overline{\alpha} \times \overline{\beta}) + b(\overline{\beta} \times \overline{\gamma}) + c(\overline{\gamma} \times \overline{\alpha}) = \overline{0}$ and atleast one of the scalars a, b, c is non-zero, then the vectors $\overline{\alpha}, \overline{\beta}, \overline{\gamma}$ are

(A) parallel
(B) non coplanar
(C) coplanar
(D) mutually perpendicular

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

Q683 AP EAMCET 2014 · 22 May · Offline MCQ

If x, y, z are non-zero real numbers, $\vec{a} = x\vec{i} + 2\vec{j}$, $\vec{b} = y\vec{j} + 3\vec{k}$ and $\vec{c} = x\vec{i} + y\vec{j} + z\vec{k}$ are such that $\vec{a} \times \vec{b} = z\vec{i} - 3\vec{j} + \vec{k}$ then $[\vec{a}\,\vec{b}\,\vec{c}] =$

(A) 3
(B) 10
(C) 9
(D) 6

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

Q684 AP EAMCET 2014 · 22 May · Offline MCQ

If $\vec{a}, \vec{b}$ and $\vec{c}$ are vectors with magnitudes 2, 3 and 4 respectively then the best upper bound of $|\vec{a} - \vec{b}|^2 + |\vec{b} - \vec{c}|^2 + |\vec{c} - \vec{a}|^2$ among the given values is

(A) 93
(B) 97
(C) 87
(D) 90

Answer: (C) 87 · The council's preliminary key

Q685 AP EAMCET 2014 · 22 May · Offline MCQ

If $\vec{a}, \vec{b}$ and $\vec{c}$ are non-coplanar vectors and if $\vec{d}$ is such that $\vec{d} = \frac{1}{x}(\vec{a} + \vec{b} + \vec{c})$ and $\vec{a} = \frac{1}{y}(\vec{b} + \vec{c} + \vec{d})$ where x and y are non-zero real numbers, then $\frac{1}{xy}(\vec{a} + \vec{b} + \vec{c} + \vec{d}) =$

(A) $3\vec{c}$
(B) $-\vec{a}$
(C) $\vec{0}$
(D) $2\vec{a}$

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

Q686 AP EAMCET 2014 · 22 May · Offline MCQ

Three non-zero non-collinear vectors $\vec{a}, \vec{b}, \vec{c}$ are such that $\vec{a} + 3\vec{b}$ is collinear with $\vec{c}$, while $3\vec{b} + 2\vec{c}$ is collinear with $\vec{a}$. Then $\vec{a} + 3\vec{b} + 2\vec{c} =$

(A) $\vec{0}$
(B) $2\vec{a}$
(C) $3\vec{b}$
(D) $4\vec{c}$

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

Q687 AP EAMCET 2013 · 10 May · Offline MCQ

The points whose position vectors are $2\vec{i} + 3\vec{j} + 4\vec{k}$, $3\vec{i} + 4\vec{j} + 2\vec{k}$ and $4\vec{i} + 2\vec{j} + 3\vec{k}$ are the vertices of

(A) an isosceles triangle
(B) right angled triangle
(C) equilateral triangle
(D) right angled isosceles triangle

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

Q688 AP EAMCET 2013 · 10 May · Offline MCQ

$\vec{a} \neq \vec{0}, \vec{b} \neq \vec{0}, \vec{c} \neq 0, \vec{a} \times \vec{b} = \vec{0}, \vec{b} \times \vec{c} = 0 \Rightarrow \vec{a} \times \vec{c} =$

EdLoop EAPCET

(A) $\vec{b}$
(B) $\vec{a}$
(C) $\vec{0}$
(D) $\vec{i}+\vec{j}+\vec{k}$

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

Q689 AP EAMCET 2013 · 10 May · Offline MCQ

A unit vector coplanar with $\vec{i}+\vec{j}+3\vec{k}$ and $\vec{i}+3\vec{j}+\vec{k}$ and perpendicular to $\vec{i}+\vec{j}+\vec{k}$ is

(A) $\frac{1}{\sqrt{2}}(\vec{j}+\vec{k})$
(B) $\frac{1}{\sqrt{3}}(\vec{i}-\vec{j}+\vec{k})$
(C) $\frac{1}{\sqrt{2}}(\vec{j}-\vec{k})$
(D) $\frac{1}{\sqrt{3}}(\vec{i}+\vec{j}-\vec{k})$

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

Q690 AP EAMCET 2013 · 10 May · Offline MCQ

If $\vec{a}$ and $\vec{b}$ are two non-zero perpendicular vectors, then a vector $\vec{y}$ satisfying equations $\vec{a}\cdot\vec{y}=c$ (c scalar) and $\vec{a}\times\vec{y}=\vec{b}$ is

(A) $|\vec{a}|^2(c\vec{a}-(\vec{a}\times\vec{b}))$
(B) $|\vec{a}|^2(c\vec{a}+(\vec{a}\times\vec{b}))$
(C) $\frac{1}{|\vec{a}|^2}(c\vec{a}-(\vec{a}\times\vec{b}))$
(D) $\frac{1}{|\vec{a}|^2}(c\vec{a}+(\vec{a}\times\vec{b}))$

Answer: (C) $\frac{1}{|\vec{a}|^2}(c\vec{a}-(\vec{a}\times\vec{b}))$ · The council's preliminary key

Q691 AP EAMCET 2012 · 12 May · Offline MCQ

If p^{th}, q^{th}, r^{th} terms of a geometric progression are the positive numbers a, b, c respectively, then the angle between the vectors $(\log a^2)\vec{i}+(\log b^2)\vec{j}+(\log c^2)\vec{k}$ and $(q-r)\vec{i}+(r-p)\vec{j}+(p-q)\vec{k}$ is

(A) $\frac{\pi}{3}$
(B) $\frac{\pi}{2}$
(C) $\sin^{-1}\frac{1}{\sqrt{a^2+b^2+c^2}}$
(D) $\frac{\pi}{4}$

Answer: (B) $\frac{\pi}{2}$ · Official APSCHE final key

EdLoop EAPCET

Q692 AP EAMCET 2012 · 12 May · Offline MCQ

The vectors $\overrightarrow{AB} = 3\vec{i} - 2\vec{j} + 2\vec{k}$ and $\overrightarrow{BC} = -\vec{i} - 2\vec{k}$ are the adjacent sides of a parallelogram. The angle between its diagonals is

(A) $\frac{\pi}{2}$
(B) $\frac{\pi}{3}$ or $\frac{2\pi}{3}$
(C) $\frac{3\pi}{4}$ or $\frac{\pi}{4}$
(D) $\frac{5\pi}{6}$ or $\frac{\pi}{6}$

Answer: (C) $\frac{3\pi}{4}$ or $\frac{\pi}{4}$ · Official APSCHE final key

Q693 AP EAMCET 2012 · 12 May · Offline MCQ

Let $\vec{a} = \vec{i} + 2\vec{j} + \vec{k}$, $\vec{b} = \vec{i} - \vec{j} + \vec{k}$ and $\vec{c} = \vec{i} + \vec{j} - \vec{k}$. A vector in the plane of $\vec{a}$ and $\vec{b}$ has projection $\frac{1}{\sqrt{3}}$ on $\vec{c}$. Then, one such vector is

(A) $4\vec{i} + \vec{j} - 4\vec{k}$
(B) $3\vec{i} + \vec{j} - 3\vec{k}$
(C) $4\vec{i} - \vec{j} + 4\vec{k}$
(D) $2\vec{i} + \vec{j} - 2\vec{k}$

Answer: (C) $4\vec{i} - \vec{j} + 4\vec{k}$ · Official APSCHE final key

Q694 AP EAMCET 2012 · 12 May · Offline MCQ

Let $\vec{a}, \vec{b}$ and $\vec{c}$ be three non-coplanar vectors and let $\vec{p}, \vec{q}$ and $\vec{r}$ be the vectors defined by $\vec{p} = \frac{\vec{b}\times\vec{c}}{[\vec{a}\,\vec{b}\,\vec{c}]}$, $\vec{q} = \frac{\vec{c}\times\vec{a}}{[\vec{a}\,\vec{b}\,\vec{c}]}$, $\vec{r} = \frac{\vec{a}\times\vec{b}}{[\vec{a}\,\vec{b}\,\vec{c}]}$. Then $(\vec{a}+\vec{b})\cdot\vec{p} + (\vec{b}+\vec{c})\cdot\vec{q} + (\vec{c}+\vec{a})\cdot\vec{r} =$

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

Answer: (D) 3 · Official APSCHE final key

Q695 AP EAMCET 2012 · 12 May · Offline MCQ

$\vec{a} = \vec{i} + \vec{j} - 2\vec{k} \Rightarrow \sum\{(\vec{a}\times\vec{i})\times\vec{j}\}^2 =$

(A) $\sqrt{6}$
(B) 6
(C) 36
(D) $6\sqrt{6}$

Answer: (B) 6 · Official APSCHE final key

EdLoop EAPCET

Q696 AP EAMCET 2011 · 8 May · Offline MCQ

The magnitude of the projection of the vector $\bar{a} = 4\bar{i} - 3\bar{j} + 2\bar{k}$ on the line which makes equal angles with the coordinate axes is

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

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

Q697 AP EAMCET 2011 · 8 May · Offline MCQ

If the vectors $\bar{i} - 2x\bar{j} - 3y\bar{k}$ and $\bar{i} + 3x\bar{j} + 2y\bar{k}$ are orthogonal to each other, then the locus of the point (x, y) is

(A) a circle
(B) an ellipse
(C) a parabola
(D) a straight line

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

Q698 AP EAMCET 2011 · 8 May · Offline MCQ

For any vector $\bar{r}$, $\bar{i} \times (\bar{r} \times \bar{i}) + \bar{j} \times (\bar{r} \times \bar{j}) + \bar{k} \times (\bar{r} \times \bar{k}) =$

(A) $\bar{0}$
(B) $2\bar{r}$
(C) $3\bar{r}$
(D) $4\bar{r}$

Answer: (B) $2\bar{r}$ · The council's preliminary key

Q699 AP EAMCET 2011 · 8 May · Offline MCQ

If the vectors $\overline{AB} = -3\bar{i} + 4\bar{k}$ and $\overline{AC} = 5\bar{i} - 2\bar{j} + 4\bar{k}$ are the sides of a triangle ABC, then the length of the median through A is

(A) $\sqrt{14}$
(B) $\sqrt{18}$
(C) $\sqrt{25}$
(D) $\sqrt{29}$

Answer: (B) $\sqrt{18}$ · The council's preliminary key

EdLoop EAPCET

Q700 AP EAMCET 2011 · 8 May · Offline MCQ

If $|\bar{a}| = 1$, $|\bar{b}| = 2$ and the angle between $\bar{a}$ and $\bar{b}$ is 120°, then $\{(\bar{a} + 3\bar{b}) \times (3\bar{a} - \bar{b})\}^2 =$

(A) 425
(B) 375
(C) 325
(D) 300

Answer: (D) 300 · The council's preliminary key

Q701 AP EAMCET 2011 · 8 May · Offline MCQ

Let $\bar{v} = 2\bar{i} + \bar{j} - \bar{k}$ and $\bar{w} = \bar{i} + 3\bar{k}$. If $\bar{u}$ is any unit vector then the maximum value of the scalar triple product $[\bar{u}\ \bar{v}\ \bar{w}]$ is

(A) 1
(B) $\sqrt{10} + \sqrt{6}$
(C) $\sqrt{59}$
(D) $\sqrt{60}$

Answer: (C) $\sqrt{59}$ · The council's preliminary key

Q702 AP EAMCET 2010 · 30 May · Offline MCQ

Let $\vec{a} = \vec{i} - 2\vec{j} + 3\vec{k}$, $\vec{b} = 2\vec{i} + 3\vec{j} - \vec{k}$ and $\vec{c} = \lambda\vec{i} + \vec{j} + (2\lambda - 1)\vec{k}$. If $\vec{c}$ is parallel to the plane containing $\vec{a}$, $\vec{b}$ then $\lambda =$

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

Answer: (A) 0 · Official APSCHE final key

Q703 AP EAMCET 2010 · 30 May · Offline MCQ

If three unit vectors $\vec{a}, \vec{b}, \vec{c}$ satisfy $\vec{a} + \vec{b} + \vec{c} = \vec{0}$ then the angle between $\vec{a}$ and $\vec{b}$ is :

(A) $\frac{2\pi}{3}$
(B) $\frac{5\pi}{6}$
(C) $\frac{\pi}{3}$
(D) $\frac{\pi}{6}$

Answer: (A) $\frac{2\pi}{3}$ · Official APSCHE final key

EdLoop EAPCET

Q704 AP EAMCET 2010 · 30 May · Offline MCQ

$(\vec{a}+2\vec{b}-\vec{c})\cdot(\vec{a}-\vec{b})\times(\vec{a}-\vec{b}-\vec{c})=$

(A) $-[\vec{a}\,\vec{b}\,\vec{c}]$

(B) $2[\vec{a}\,\vec{b}\,\vec{c}]$

(C) $3[\vec{a}\,\vec{b}\,\vec{c}]$

(D) $\vec{0}$

Answer: (C) $3[\vec{a}\,\vec{b}\,\vec{c}]$ · Official APSCHE final key

Q705 AP EAMCET 2010 · 30 May · Offline MCQ

$\vec{u}=\vec{a}-\vec{b}, \vec{v}=\vec{a}+\vec{b}, |\vec{a}|=|\vec{b}|=2 \Rightarrow |\vec{u}\times\vec{v}|=$

(A) $2\sqrt{16-(\vec{a}\cdot\vec{b})^2}$

(B) $\sqrt{16-(\vec{a}\cdot\vec{b})^2}$

(C) $2\sqrt{4-(\vec{a}\cdot\vec{b})^2}$

(D) $\sqrt{4-(\vec{a}\cdot\vec{b})^2}$

Answer: (A) $2\sqrt{16-(\vec{a}\cdot\vec{b})^2}$ · Official APSCHE final key

Q706 AP EAMCET 2010 · 30 May · Offline MCQ

If the angle θ between the vectors $\vec{a}=2x^2\vec{i}+4x\vec{j}+\vec{k}$ and $\vec{b}=7\vec{i}-2\vec{j}+x\vec{k}$ is such that $90^\circ<\theta<180^\circ$ then x lies in the interval :

(A) $\left(0,\frac{1}{2}\right)$

(B) $\left(\frac{1}{2},1\right)$

(C) $\left(1,\frac{3}{2}\right)$

(D) $\left(\frac{1}{2},\frac{3}{2}\right)$

Answer: (A) $\left(0,\frac{1}{2}\right)$ · Official APSCHE final key

Q707 AP EAMCET 2010 · 30 May · Offline MCQ

Let OA, OB, OC be the co-terminal edges of a rectangular parallelopiped of volume V and let P be the vertex opposite to O. Then $[\overrightarrow{AP}\,\overrightarrow{BP}\,\overrightarrow{CP}]=$

EdLoop EAPCET

(A) 2V

(B) 12V

(C) $3\sqrt{3}\,\mathrm{V}$

(D) 0

Answer: (A) 2V · Official APSCHE final key

EdLoop EAPCET