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MATHEMATICS · EAPCET (EAMCET)

Definite Integration

Previous Year Questions with answers

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

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

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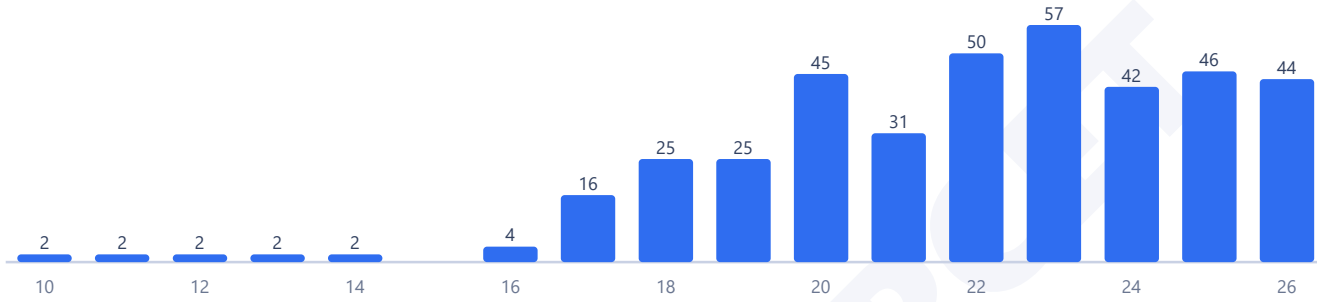
Chapter at a glance

3.9%	395	77 of 77	395 / 0
of Mathematics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 2.9 questions per paper in 2024–2026 against 3.5 in 2022–2023.

Questions per year



Counts are the questions we hold: 395 in 149 papers. 4 questions in this chapter came back in more than one paper.

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

Evaluation & Properties	280
Limit as a Sum & Estimation	70
Special Definite Integrals	45

How often it comes up

Definite Integration stands as a central pillar of analytical calculus that appears consistently in every test sitting. Spanning the entire historical record from 2010 through 2026, Definite Integration contributed 395 questions across 149 evaluated exam papers, appearing in all 149 papers to record an average of 2.7 questions per paper and a 3.3 percent subject share. In contemporary examinations from 2022 to 2026, the chapter sustained this comprehensive presence across all 77 sittings, supplying 239 questions (yielding an average of 3.1 questions per paper and a 3.9 percent subject share). This sustained volume places the chapter at rank 12 of 29 mathematics chapters.

Every paper in recent testing incorporates between two and four definite integral problems. Looking across the three most recent exam years from 2024 to 2026, candidates answered 132 questions across 46 sittings (present in all 46 papers, averaging 2.9 questions per test and a 3.6 percent share). In the previous examination era from 2010 to 2021, the chapter provided 156 questions across 72 sittings (appearing in all 72 papers, 2.2 per test, 2.7 percent share). Evaluating temporal progression, comparing early testing with the last three years shows the share is up, 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 169 questions across 48 papers (all 48 papers, 3.5 per test, 4.4 percent share), while Telangana administered 70 questions across 29 papers (all 29 papers, 2.4 per test, 3.0 percent share).

Most-asked topics

Questions in this unit fall into three core integration branches:

- **Evaluation & Properties**: Accounting for 280 total questions, with 181 appearing in recent testing (tested through 2026). Key concepts encompass the King property (substituting a plus b minus x for x), symmetric integrals of odd and even functions over symmetric intervals, periodic properties, piecewise integration of absolute value and floor expressions, and Leibniz integral rule.

- **Limit as a Sum & Estimation**: Supplying 70 total questions, with 31 set in modern examinations (tested through 2026). Coverage includes expressing infinite limits of Riemann sums as definite integrals, evaluating asymptotic sums of rational terms, and bounding integrals using inequality estimates.
- **Special Definite Integrals**: Delivering 45 total questions, with 27 emerging in recent cycles (tested through 2026). Problems explore Wallis formulas for trigonometric powers, beta and gamma integral transformations, and reduction evaluations.

What the questions look like

Examiners place heavy emphasis on symmetry properties, the King property, and Riemann sum conversions.

The single most frequent problem template asks candidates to evaluate a definite integral whose integrand becomes easily solvable after replacing x with the sum of the limits minus x. Adding the original integral to the transformed integral cancels the complicated denominator or numerator, reducing the problem to integrating a constant. Another recurring format involves infinite limits of sums, where candidates factor out one over n and replace r over n with x to convert the limit into a definite integral from zero to one. Questions also frequently present piecewise integrands involving greatest integer brackets or absolute value functions, requiring students to split the interval of integration at every integer or root.

How to practise it

Master the King property: integral of f of x from a to b equals the integral of f of a plus b minus x from a to b. If f of a plus b minus x plus f of x equals a constant k, the integral evaluates immediately to k times b minus a divided by two.

For converting infinite limits of sums to definite integrals, express the sum inside the limit as one over n times the summation of f of r over n from r equals one to n. Replace one over n with dx, replace r over n with x, and set the limits of integration from the limit of lower r over n to upper r over n. Master the Leibniz rule for differentiating under the integral sign: the derivative of an integral with variable limits equals the integrand evaluated at the upper limit times the derivative of the upper limit, minus the integrand evaluated at the lower limit times the derivative of the lower limit.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

$$\lim_{n\to\infty}\frac{1}{n}\left[\tan^2\frac{\pi}{4n}+\tan^2\frac{2\pi}{4n}+\cdots+\tan^2\frac{\pi}{4}\right]=$$

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

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

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

$$\int_0^{\pi/4}\frac{(\cos x-\sin x)}{9+5\sin 2x}\,dx=$$

(A) $\frac{1}{\sqrt{5}}\left(\mathrm{Tan}^{-1}\sqrt{10}-\mathrm{Tan}^{-1}\sqrt{5}\right)$
(B) $\frac{1}{2\sqrt{5}}\left(\mathrm{Tan}^{-1}\frac{\sqrt{10}}{2}-\mathrm{Tan}^{-1}\frac{\sqrt{5}}{2}\right)$
(C) $\frac{1}{2\sqrt{5}}\left(\mathrm{Tan}^{-1}\sqrt{10}+\mathrm{Tan}^{-1}\sqrt{5}\right)$
(D) $\frac{1}{\sqrt{5}}\left(\mathrm{Tan}^{-1}\sqrt{\frac{5}{2}}+\mathrm{Tan}^{-1}\frac{\sqrt{5}}{2}\right)$

Answer: (B) $\frac{1}{2\sqrt{5}}\left(\mathrm{Tan}^{-1}\frac{\sqrt{10}}{2}-\mathrm{Tan}^{-1}\frac{\sqrt{5}}{2}\right)$ · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 1 MCQ

$$\int_0^{\pi/2}\frac{x\sin 2x}{1+4\cos^2 2x}\,dx=$$

(A) $\frac{\pi}{8}(\mathrm{Tan}^{-1}2)$
(B) $\frac{\pi}{4}(\mathrm{Tan}^{-1}2)$
(C) $\frac{\pi}{2}(\mathrm{Tan}^{-1}2)$
(D) $\frac{\pi}{8}(\mathrm{Tan}^{-1}4)$

Answer: (A) $\frac{\pi}{8}(\mathrm{Tan}^{-1}2)$ · The council's preliminary key

Q4 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If $\int_{\pi/4}^{3\pi/4}\frac{x\sin x}{1+3\cos 2x}dx=k\int_{\pi/4}^{3\pi/4}\frac{\sin x}{1+3\cos 2x}dx$, then $\int_0^k \sin^{\pi/k}x\,dx=$

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

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

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Q5 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If $\int_0^3 x\left(\sqrt[5]{9-x^2}\right)dx = k\,3^{1/k}$, then $k =$

(A) $\frac{9}{5}$
(B) $\frac{5}{9}$
(C) $\frac{5}{12}$
(D) $\frac{12}{5}$

Answer: (C) $\frac{5}{12}$ · The council's preliminary key

Q6 AP EAPCET 2026 · 18 May · Shift 2 MCQ

$$\lim_{n\to\infty}\frac{1}{n}\sum_{r=1}^{n}\sin^k\left(\frac{\pi r}{2n}\right)\cos\left(\frac{\pi r}{2n}\right) =$$

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

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

Q7 AP EAPCET 2026 · 15 May · Shift 1 MCQ

$$\int_0^1 x^{5/2}(1-x)^{3/2}\,dx =$$

(A) $\frac{3\pi}{128}$
(B) $\frac{5\pi}{128}$
(C) $\frac{3\pi}{256}$
(D) $\frac{5\pi}{256}$

Answer: (C) $\frac{3\pi}{256}$ · The council's preliminary key

Q8 AP EAPCET 2026 · 15 May · Shift 1 MCQ

$$\int_0^{\pi}|x\cos 2x|\,dx =$$

(A) π
(B) $\pi - 2$
(C) $\pi + \frac{1}{4}$
(D) $\pi - \frac{1}{4}$

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

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Q9 AP EAPCET 2026 · 15 May · Shift 2 MCQ

$$\lim_{n\to\infty}\frac{1}{n^2}\sum_{r=1}^{n} r\,e^{r/n} =$$

(A) 0
(B) 1
(C) e
(D) $2e$

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

Q10 AP EAPCET 2026 · 15 May · Shift 2 MCQ

$$\int_{-\pi}^{\pi}\frac{\cos^2 x}{1+a^x}\,dx\,,\ (a>0) =$$

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

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

Q11 AP EAPCET 2026 · 15 May · Shift 2 MCQ

$$\int_{0}^{\pi/2}\sin^6 x\cos^4 x\,dx =$$

(A) $\frac{8}{693}$
(B) $\frac{\pi}{128}$
(C) $\frac{3\pi}{512}$
(D) $\frac{3\pi}{256}$

Answer: (C) $\frac{3\pi}{512}$ · The council's preliminary key

Q12 AP EAPCET 2026 · 14 May · Shift 1 MCQ

$$\lim_{n\to\infty}\sum_{r=n}^{2n}\left(\frac{n^3+r^3}{n^4}\right) =$$

(A) $\frac{19}{4}$
(B) $\frac{21}{4}$
(C) $\frac{23}{4}$
(D) $\frac{27}{4}$

Answer: (A) $\frac{19}{4}$ · The council's preliminary key

Q13 AP EAPCET 2026 · 14 May · Shift 1 MCQ

$$\int_{\frac{\pi}{2}}^{\frac{4051\pi}{2}} \frac{\cos^2 2x}{1+\sin 2x}\,dx =$$

(A) $2026\,\pi$
(B) $2047\,\pi$
(C) $2027\,\pi$
(D) $2025\,\pi$

Answer: (D) $2025\,\pi$ · The council's preliminary key

Q14 AP EAPCET 2026 · 14 May · Shift 1 MCQ

$$\int_{-2\pi}^{2\pi} (1+\cos x)^3(1-\cos x)^4\,dx =$$

(A) 0
(B) 5π
(C) $\frac{5\pi}{2}$
(D) $\frac{5\pi}{4}$

Answer: (D) $\frac{5\pi}{4}$ · The council's preliminary key

Q15 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If $f(x) = \frac{1}{x^2}\int_3^x (2t - 3f'(t))\,dt$, then $f'(3) =$

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

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

Q16 AP EAPCET 2026 · 14 May · Shift 2 MCQ

$$\int_{1/e}^{e^2} \left|\frac{\log_e x}{x}\right| dx =$$

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

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

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Q17 AP EAPCET 2026 · 14 May · Shift 2 MCQ

$$\int_{-2}^{0} \left(x^3 + 3x^2 + 3x + 3 + (x+1)\cos(x+1)\right) dx =$$

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

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

Q18 AP EAPCET 2026 · 13 May · Shift 1 MCQ

$f : \mathbb{R}^+ \to \mathbb{R}$ is such that $f(e) = \frac{7}{4},\ f'(x^2) = \frac{3\log x}{x^2}$ then $f(e^2) =$

(A) $\frac{5}{4}$
(B) 4
(C) 10
(D) $\frac{49}{16}$

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

Q19 AP EAPCET 2026 · 13 May · Shift 1 MCQ

$$\sum_{n=1}^{\infty} \int_0^1 x^3(1-x^2)^n dx =$$

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

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

Q20 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If $f(x)$ is a twice differentiable function and $f'(0) = 0$, then

$$\int_0^{\pi/2} (f(x) + f''(x)) \cos x \, dx =$$

(A) $f\left(\frac{\pi}{2}\right)$
(B) $f'\left(\frac{\pi}{2}\right)$
(C) 1
(D) 0

Answer: (A) $f\left(\frac{\pi}{2}\right)$ · The council's preliminary key

Q21 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If $f(x) = \left|\frac{x}{3} - 3^{-x}\right|$ and $\int_0^5 f(x)\,dx = K + \frac{3^n+1}{3^5 \log 3}$, then $nK =$

(A) $\frac{46}{3}$
(B) $\frac{23}{6}$
(C) $\frac{54}{5}$
(D) $\frac{28}{9}$

Answer: (A) $\frac{46}{3}$ · The council's preliminary key

Q22 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If $\int_{\sin x}^1 t^2 f(t)\,dt = 1 - \sin x$, then $f\left(\frac{1}{\sqrt{3}}\right) =$

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

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

Q23 AP EAPCET 2026 · 13 May · Shift 2 MCQ

$$\int_{-3\pi/2}^{-\pi/2} \left((x+\pi)^3 + \cos^2(x+3\pi)\right) dx =$$

(A) $\frac{\pi}{8}$
(B) $\frac{\pi}{2}$
(C) $\frac{\pi}{4} - 1$
(D) $\frac{\pi^4}{32}$

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

Q24 AP EAPCET 2026 · 13 May · Shift 2 MCQ

$$\lim_{n\to\infty} \left(\frac{1}{n+1} + \frac{1}{n+2} + \cdots + \frac{1}{2n}\right) =$$

(A) $\log 2$
(B) $-\log 2$
(C) 0
(D) e

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

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Q25 AP EAPCET 2026 · 12 May · Shift 1 MCQ

$$\int_{\log 2}^{\log 3} \frac{e^{3x} - 3e^{x}}{e^{2x} - 1}\, dx =$$

(A) $\log\left(\frac{2e}{3}\right)$
(B) $\log\left(\frac{4e}{3}\right)$
(C) $\frac{2e}{3}$
(D) $\frac{4e}{3}$

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

Q26 AP EAPCET 2026 · 12 May · Shift 1 MCQ

$\int_0^{\pi/2} \frac{\sin 6x}{\sin x}\, dx =$

(A) $\frac{26}{15}$
(B) $\frac{256}{15}$
(C) $\frac{64}{15}$
(D) $\frac{17}{15}$

Answer: (A) $\frac{26}{15}$ · The council's preliminary key

Q27 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If $\int_0^{2\pi} \sin^m x \cos^n x\, dx = k \int_0^{\pi/2} \sin^m x \cos^n x\, dx$, then

(A) k divides (mn)
(B) k divides $(m+n)$
(C) When (mn) is divided by k, it leaves the reminder 1
(D) When $(m+n)$ is divided by k, it leaves the reminder 3

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

Q28 AP EAPCET 2026 · 12 May · Shift 2 MCQ

$\int_0^5 x(5-x)^{20}\, dx =$

(A) $\frac{5^{20}}{441}$
(B) $\frac{5^{21}}{441}$
(C) $\frac{5^{21}}{462}$
(D) $\frac{5^{22}}{462}$

Answer: (D) $\frac{5^{22}}{462}$ · The council's preliminary key

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Q29 AP EAPCET 2026 · 12 May · Shift 2 MCQ

$$\lim_{n\to\infty}\sum_{r=1}^{n}\frac{1}{n}\sqrt{\frac{n+r}{n-r}}=$$

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

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

Q30 AP EAPCET 2026 · 12 May · Shift 2 MCQ

$$\int_0^{\frac{\pi}{2}}\frac{200\sin x+100\cos x}{\sin x+\cos x}dx=$$

(A) 50π
(B) 25π
(C) 75π
(D) 150π

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

Q31 AP EAPCET 2026 · 12 May · Shift 2 MCQ

$\int_0^{\pi/2}\frac{\sin^3 x}{\sin x+\cos x}dx=$

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

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

Q32 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $\int_2^3\frac{3\log x}{3\log x+\log(125-75x+15x^2-x^3)}dx=k$, then $4k^2+2k+1=$

(A) 9
(B) 3
(C) 25
(D) $\frac{9}{4}$

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

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Q33 TS EAPCET 2026 · 11 May · Shift 1 MCQ

$$\int_0^{\pi} \sqrt{1+4\cos\frac{x}{2}\left(\cos\frac{x}{2}-1\right)}\,dx =$$

(A) $4\sqrt{3}-4-\frac{\pi}{3}$
(B) $4\sqrt{3}-4-\frac{4\pi}{3}$
(C) $\frac{4\pi}{3}-4\sqrt{3}+4$
(D) $\frac{\pi}{3}-4\sqrt{3}+4$

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

Q34 TS EAPCET 2026 · 11 May · Shift 1 MCQ

$$\int_{-\frac{\pi}{3}}^{\frac{\pi}{3}} \frac{x+\frac{\pi}{2}}{2-\sin^2 x}\,dx =$$

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

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

Q35 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If $f(x)=\frac{x^3}{1-3x+3x^2}$, then $\lim_{n\to\infty}\frac{2}{n}\sum_{r=1}^{n} f\left(\frac{r}{n}\right) =$

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

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

Q36 TS EAPCET 2026 · 11 May · Shift 2 MCQ

Let $f:\mathbb{R}\to\mathbb{R}$ be an odd function and $\int_{-1}^{1} x^3 f''(x)\,dx=\frac{8}{5}$. If $g(x)=xf(x)$, $g'(1)=\frac{8}{3}$ and $\int_0^1 g(x)\,dx=\frac{2}{15}$, then $f(1)=$

(A) $\frac{1}{2}$
(B) $\frac{2}{3}$
(C) $\frac{3}{4}$
(D) $\frac{4}{5}$

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

Q37 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If $[x]$ denotes the greatest integer function, then $\int_0^5 [x-2]\,dx =$

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

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

Q38 TS EAPCET 2026 · 10 May · Shift 1 MCQ

$$\int_0^2 x^3(4-x^2)^{5/2}\,dx =$$

(A) $\frac{256}{63}$
(B) $\frac{2048}{63}$
(C) $\frac{512}{63}$
(D) $\frac{1024}{63}$

Answer: (D) $\frac{1024}{63}$ · The council's preliminary key

Q39 TS EAPCET 2026 · 10 May · Shift 2 MCQ

$$\int_0^2 |2x^2-9x+9|\,dx =$$

(A) $\frac{27}{4}$
(B) $\frac{171}{4}$
(C) $\frac{16}{3}$
(D) $\frac{71}{12}$

Answer: (D) $\frac{71}{12}$ · The council's preliminary key

Q40 TS EAPCET 2026 · 10 May · Shift 2 MCQ

$$\int_0^8 x^{5/3}\left(4-x^{2/3}\right)^{3/2}\,dx =$$

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(A) $\frac{2^{16}}{385}$
(B) $\frac{2^{13}}{385}$
(C) $\frac{2^{12}}{385}$
(D) $\frac{2^{15}}{385}$

Answer: (D) $\frac{2^{15}}{385}$ · The council's preliminary key

Q41 TS EAPCET 2026 · 9 May · Shift 1 MCQ

Let $f:[0,1]\to\mathbb{R}$ be a function defined as $f(x)+f(1-x)=1$. Then $\int_0^1 f(x)\,dx=$

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

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

Q42 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If $[t]$ denotes greatest integer function, $\int_{-2}^{2}\left[\frac{x^2+[x+1]}{1+x^2}\right]dx=$

(A) $2\mathrm{Tan}^{-1}2$
(B) 0
(C) 2
(D) $\mathrm{Tan}^{-1}2$

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

Q43 TS EAPCET 2026 · 9 May · Shift 2 MCQ

$$\int_{\pi/4}^{3\pi/4}\frac{x\sin x}{1+\cos 2x}\,dx=$$

(A) $\frac{\pi}{\sqrt{2}}$
(B) $-\frac{\pi}{\sqrt{2}}$
(C) $\sqrt{2}\pi$
(D) $-\sqrt{2}\pi$

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

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Q44 TS EAPCET 2026 · 9 May · Shift 2 MCQ

$$\int_{\pi/6}^{\pi/3} \frac{dx}{\sin 2x\left(\tan^4 x - \cot^4 x\right)} =$$

(A) $\frac{1}{8}\log\frac{4}{5}$
(B) $2\mathrm{Tan}^{-1}\left(\frac{4}{5}\right)$
(C) 0
(D) 1

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

Q45 AP EAPCET 2025 · 27 May · Shift 1 MCQ

$\int_0^1 \frac{2x+5}{x^2+3x+2}\,dx =$

(A) $\log\left(\frac{16}{3}\right)$
(B) 0
(C) $\log\left(\frac{3}{16}\right)$
(D) $4\log 2 - 2\log 3$

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

Q46 AP EAPCET 2025 · 27 May · Shift 1 MCQ

$\int_0^1 x^{5/2}(1-x)^{3/2}\,dx =$

(A) $\frac{5\pi}{256}$
(B) $\frac{3\pi}{256}$
(C) $\frac{3\pi}{128}$
(D) $\frac{5\pi}{128}$

Answer: (B) $\frac{3\pi}{256}$ · The council's preliminary key

Q47 AP EAPCET 2025 · 27 May · Shift 1 MCQ

$$\lim_{n\to\infty}\left[\frac{1}{n^2}\sec^2\frac{1}{n^2} + \frac{2}{n^2}\sec^2\frac{4}{n^2} + \frac{3}{n^2}\sec^2\frac{9}{n^2} + \ldots + \frac{1}{n^2}\sec^2 1\right] =$$

(A) $\mathrm{Tan}^{-1}1$
(B) $\frac{1}{2}\mathrm{Tan}^{-1}1$
(C) $\frac{1}{2}\tan 1$
(D) $\frac{1}{2}\sec 1$

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

Q48 AP EAPCET 2025 · 26 May · Shift 1 MCQ

$\int_0^1 x\sin^{-1}x\,dx =$

(A) $\frac{\pi}{8}$
(B) $\frac{\pi}{4}$
(C) $\frac{\pi}{12}$
(D) $\frac{\pi}{3}$

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

Q49 AP EAPCET 2025 · 26 May · Shift 1 MCQ

$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin(x-[x])\,dx =$$

(Here $[x]$ is the greatest integer function)

(A) 0
(B) $3(1-\cos 1)+\sin 2-\sin 1$
(C) $3(1-\cos 1)+\cos 2-\sin 1$
(D) $\cos 2-\sin 2$

Answer: (B) $3(1-\cos 1)+\sin 2-\sin 1$ · The council's preliminary key

Q50 AP EAPCET 2025 · 26 May · Shift 1 MCQ

$$\int_0^2 x^2(2-x)^5\,dx =$$

(A) $\frac{128}{21}$
(B) $\frac{64}{7}$
(C) $\frac{32}{21}$
(D) $\frac{16}{7}$

Answer: (C) $\frac{32}{21}$ · The council's preliminary key

Q51 AP EAPCET 2025 · 26 May · Shift 1 MCQ

If $f(x)=\text{Max}\{x^3-4, x^4-4\}$, and $g(x)=\text{Min}\{x^2, x^3\}$, then $\int_{-1}^{1}(f(x)-g(x))\,dx =$

(A) $-\frac{151}{20}$
(B) $\frac{9}{20}$
(C) $\frac{131}{22}$
(D) $-\frac{67}{9}$

Answer: (A) $-\frac{151}{20}$ · The council's preliminary key

Q52 AP EAPCET 2025 · 26 May · Shift 2 MCQ

$$\lim_{n\to\infty}\frac{\pi}{2n}\left[\sin\frac{\pi}{2n}+\sin\frac{2\pi}{2n}+\sin\frac{3\pi}{2n}+\ldots+\sin\frac{\pi}{2}\right] =$$

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(A) 1
(B) 0
(C) 4
(D) 3

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

Q53 AP EAPCET 2025 · 26 May · Shift 2 MCQ

$$\int_0^{\pi} \left(\sin^5 x \cos^3 x + \sin^4 x \cos^4 x + \sin^3 x \cos^4 x\right) dx =$$

(A) $\frac{873}{2240}$
(B) $\frac{3\pi}{128} + \frac{12}{35}$
(C) $\frac{1641}{4480}$
(D) $\frac{3\pi}{128} + \frac{4}{35}$

Answer: (D) $\frac{3\pi}{128} + \frac{4}{35}$ · The council's preliminary key

Q54 AP EAPCET 2025 · 26 May · Shift 2 MCQ

$$\int_0^1 \frac{x^4+1}{x^6+1} dx =$$

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

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

Q55 AP EAPCET 2025 · 24 May · Shift 1 MCQ

$$\int_{-2\pi}^{2\pi} \sin^4(2x)\cos^6(2x)\, dx =$$

(A) $\frac{3\pi}{64}$
(B) $\frac{9\pi}{64}$
(C) $\frac{9\pi}{35}$
(D) $\frac{9\pi}{280}$

Answer: (A) $\frac{3\pi}{64}$ · The council's preliminary key

Q56 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If $f(t) = \int_0^t \tan^{(2n-1)} x\, dx$, $n \in N$, then $f(t+\pi) =$

(A) $f(t)f(\pi)$
(B) $f(t)-f(\pi)$
(C) $f(t)+f(\pi)$
(D) $\dfrac{f(t)}{f(\pi)}$

Answer: (C) $f(t)+f(\pi)$ · The council's preliminary key

Q57 AP EAPCET 2025 · 24 May · Shift 1 MCQ

$$\int_0^2 x^8\left(\frac{4}{x^2}-1\right)^{5/2}dx=$$

(A) $\frac{2^{15}}{63}$
(B) $\frac{2^{16}}{315}$
(C) $\frac{2^{16}}{189}$
(D) $\frac{2^{10}}{63}$

Answer: (D) $\frac{2^{10}}{63}$ · The council's preliminary key

Q58 AP EAPCET 2025 · 23 May · Shift 1 MCQ

$\int_{\pi/6}^{\pi/3}\cos^{-4}x\,dx=$

(A) $\frac{64}{9\sqrt{3}}$
(B) $\frac{52\sqrt{3}}{9}$
(C) $\frac{62\sqrt{3}}{9}$
(D) $\frac{44}{9\sqrt{3}}$

Answer: (D) $\frac{44}{9\sqrt{3}}$ · The council's preliminary key

Q59 AP EAPCET 2025 · 23 May · Shift 1 MCQ

$$\int_0^{3\pi/2}\frac{\cos^3 x}{\cos^3 x+\sin^3 x}dx=$$

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

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

Q60 AP EAPCET 2025 · 23 May · Shift 2 MCQ

$$\int_{-\pi/2}^{\pi/2}\sin^2 x\cos^2 x(\sin x+\cos x)\,dx=$$

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(A) 0
(B) $\frac{2}{15}$
(C) $\frac{4}{15}$
(D) $\frac{2}{5}$

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

Q61 AP EAPCET 2025 · 23 May · Shift 2 MCQ

$$\int_{1/5}^{1/2} \frac{\sqrt{x-x^2}}{x^3}\,dx =$$

(A) $\frac{21}{2}$
(B) $\frac{14}{3}$
(C) $\frac{7}{3}$
(D) $\frac{7}{2}$

Answer: (B) $\frac{14}{3}$ · The council's preliminary key

Q62 AP EAPCET 2025 · 23 May · Shift 2 MCQ

$$\int_{0}^{400\pi} \sqrt{1-\cos 2x}\,dx =$$

(A) $100\sqrt{2}$
(B) $200\sqrt{2}$
(C) $400\sqrt{2}$
(D) $800\sqrt{2}$

Answer: (D) $800\sqrt{2}$ · The council's preliminary key

Q63 AP EAPCET 2025 · 22 May · Shift 1 MCQ

$$\int_{-\pi/4}^{\pi/3} \left|\tan\left(x-\frac{\pi}{6}\right)\right| dx =$$

(A) $\log \frac{\sqrt{3}-1}{\sqrt{6}}$
(B) $\log(2\sqrt{2}(\sqrt{3}+1))$
(C) $\log \frac{\sqrt{3}+1}{\sqrt{6}}$
(D) $\log(2\sqrt{2}(\sqrt{3}-1))$

Answer: (B) $\log(2\sqrt{2}(\sqrt{3}+1))$ · The council's preliminary key

Q64 AP EAPCET 2025 · 22 May · Shift 1 MCQ

$$\int_{0}^{\pi} \frac{x\sin x}{\sin^2 x + 2\cos^2 x}\,dx =$$

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

Answer: (C) $\frac{\pi^2}{4}$ · The council's preliminary key

Q65 AP EAPCET 2025 · 22 May · Shift 1 MCQ

$$\lim_{n\to\infty}\left(\frac{1}{1^2+n^2}+\frac{2}{2^2+n^2}+\frac{3}{3^2+n^2}+\ldots+\frac{n}{n^2+n^2}\right)=$$

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

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

Q66 AP EAPCET 2025 · 22 May · Shift 2 MCQ

If $k \in N$ then $\lim_{n\to\infty}\left[\frac{1}{n+1}+\frac{1}{n+2}+\frac{1}{n+3}+\ldots+\frac{1}{kn}\right]=$

(A) $\log(k+1)$
(B) $\log k$
(C) $\log(k+5)$
(D) $\log(k+1)-\log 6$

Answer: (B) $\log k$ · The council's preliminary key

Q67 AP EAPCET 2025 · 22 May · Shift 2 MCQ

$$\int_{-1}^{4}\sqrt{\frac{4-x}{x+1}}\,dx=$$

(A) 0
(B) $\frac{\pi}{2}$
(C) $\frac{3\pi}{2}$
(D) $\frac{5\pi}{2}$

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

Q68 AP EAPCET 2025 · 22 May · Shift 2 MCQ

$$\int_{0}^{\pi/4}\frac{\cos^2 x}{\cos^2 x+4\sin^2 x}\,dx=$$

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(A) $\frac{\pi}{2}-\frac{1}{3}\mathrm{Tan}^{-1}2$
(B) $-\frac{\pi}{4}-\frac{4}{3}\mathrm{Tan}^{-1}2$
(C) $\frac{\pi}{6}+\frac{2}{3}\mathrm{Tan}^{-1}2$
(D) $-\frac{\pi}{12}+\frac{2}{3}\mathrm{Tan}^{-1}2$

Answer: (D) $-\frac{\pi}{12}+\frac{2}{3}\mathrm{Tan}^{-1}2$ · The council's preliminary key

Q69 AP EAPCET 2025 · 22 May · Shift 2 MCQ

$$\int_{5\pi}^{25\pi}|\sin 2x+\cos 2x|\,dx=$$

(A) $20\sqrt{2}$
(B) $10\sqrt{2}$
(C) $40\sqrt{2}$
(D) $80\sqrt{2}$

Answer: (C) $40\sqrt{2}$ · The council's preliminary key

Q70 AP EAPCET 2025 · 21 May · Shift 1 MCQ

$$\int_{\pi/4}^{\pi/3}\frac{\cos x-\sin x}{\sin 2x}\,dx=$$

(A) $\frac{1}{2}\log\left[\frac{(3+2\sqrt{2})(2-\sqrt{3})}{\sqrt{3}}\right]$
(B) $\frac{1}{2}\log\left[\frac{(3-2\sqrt{2})(2+\sqrt{3})}{\sqrt{3}}\right]$
(C) $\log\left[\frac{(3-2\sqrt{2})(2-\sqrt{3})}{\sqrt{3}}\right]$
(D) $\log\left[\frac{(3+2\sqrt{2})(2-\sqrt{3})}{\sqrt{3}}\right]$

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

Q71 AP EAPCET 2025 · 21 May · Shift 1 MCQ

$$\int_{0}^{\pi/2}\frac{\sin x}{1+\cos x+\sin x}\,dx=$$

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

Answer: (B) $\frac{\pi}{4}-\frac{1}{2}\log 2$ · The council's preliminary key

Q72 AP EAPCET 2025 · 21 May · Shift 1 MCQ

$$\lim_{n\to\infty}\left[\frac{n+1}{n^2+1^2}+\frac{n+2}{n^2+2^2}+\frac{n+3}{n^2+3^2}+\ldots+\frac{n+2n}{n^2+4n^2}\right]=$$

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(A) $\mathrm{Tan}^{-1}2+\frac{1}{2}\log 3$
(B) $\frac{\pi}{4}+\frac{1}{2}\log 3$
(C) $\mathrm{Tan}^{-1}2+\frac{1}{2}\log 5$
(D) $\frac{\pi}{4}+\frac{1}{2}\log 5$

Answer: (C) $\mathrm{Tan}^{-1}2+\frac{1}{2}\log 5$ · The council's preliminary key

Q73 AP EAPCET 2025 · 21 May · Shift 1 MCQ

$$\int_0^{\pi}\frac{x\sin x}{1+\cos^2 x}\,dx=$$

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

Answer: (A) $\frac{\pi^2}{4}$ · The council's preliminary key

Q74 AP EAPCET 2025 · 21 May · Shift 2 MCQ

$$\int_0^{\pi/2}\log|\tan x+\cot x|\,dx=$$

(A) $\pi\log 2$
(B) $-\pi\log 2$
(C) $\frac{\pi}{2}\log 2$
(D) $2\pi\log 2$

Answer: (A) $\pi\log 2$ · The council's preliminary key

Q75 AP EAPCET 2025 · 21 May · Shift 2 MCQ

$\int_0^{\pi}x\cdot\sin^5 x\cdot\cos^6 x\,dx=$

(A) $\frac{16\pi}{693}$
(B) $\frac{8\pi}{693}$
(C) $\frac{4\pi}{693}$
(D) $\frac{2\pi}{693}$

Answer: (B) $\frac{8\pi}{693}$ · The council's preliminary key

Q76 AP EAPCET 2025 · 21 May · Shift 2 MCQ

$$\int_{1/2}^{1/\sqrt{2}}\frac{1}{\left(x+\sqrt{1-x^2}\right)\left(1-x^2\right)}\,dx=$$

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

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

Q77 TS EAPCET 2025 · 4 May · Shift 1 MCQ

$$\int_{-4}^{5} \frac{1}{\sqrt{20+x-x^2}}\,dx =$$

(A) $\frac{81\pi}{8}$
(B) $\frac{9\pi}{2}$
(C) π
(D) $\frac{\pi}{10}$

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

Q78 TS EAPCET 2025 · 4 May · Shift 1 MCQ

$$\int_{0}^{\pi/2} \frac{dx}{\cos x - \sqrt{3}\sin x} =$$

(A) 0
(B) $\frac{1}{2}\log\left(2-\sqrt{3}\right)$
(C) $\frac{1}{2}\log\left(2+\sqrt{3}\right)$
(D) $\frac{1}{2}\log\left(2\sqrt{3}-3\right)$

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

Q79 TS EAPCET 2025 · 4 May · Shift 1 MCQ

$\int_0^{\pi/2} \sqrt{\tan x}\,dx =$

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

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

Q80 TS EAPCET 2025 · 4 May · Shift 2 MCQ

$$\lim_{n\to\infty} \frac{(2n(2n-1)\ldots(n+2)(n+1))^{1/n}}{n} =$$

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(A) $\int_0^1 \log x\, dx$
(B) $\int_0^1 x \log x\, dx$
(C) $\int_0^1 (x+1)\log(x+1)\, dx$
(D) $\int_0^1 \log(1+x)\, dx$

Answer: (D) $\int_0^1 \log(1+x)\, dx$ · The council's preliminary key

Q81 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If $\int_0^{\pi/2} \tan^{14}\left(\frac{x}{2}\right) dx = 2\left[\sum_{n=1}^{7} f(n) - \frac{\pi}{4}\right]$, then $f(n) =$

(A) $\frac{(-1)^n}{n-1}$
(B) $\frac{(-1)^n}{2n+1}$
(C) $\frac{(-1)^{n+1}}{2n-1}$
(D) $\frac{(-1)^{n+1}}{n+1}$

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

Q82 TS EAPCET 2025 · 3 May · Shift 1 MCQ

$$\int_0^{\pi/4} \frac{1}{5\cos^2 x + 16\sin^2 x + 8\sin x \cos x}\, dx =$$

(A) $\mathrm{Tan}^{-1}\left(\frac{4}{5}\right)$
(B) $2\,\mathrm{Tan}^{-1}\left(\frac{3}{5}\right)$
(C) $\frac{1}{8}\mathrm{Tan}^{-1}\left(\frac{8}{9}\right)$
(D) $\frac{1}{4}\mathrm{Tan}^{-1}\left(\frac{7}{8}\right)$

Answer: (C) $\frac{1}{8}\mathrm{Tan}^{-1}\left(\frac{8}{9}\right)$ · The council's preliminary key

Q83 TS EAPCET 2025 · 3 May · Shift 1 MCQ

$$\int_8^{18} \frac{1}{(x+2)\sqrt{x-3}}\, dx =$$

(A) $\frac{\pi}{6\sqrt{5}}$
(B) $\frac{\pi}{6}$
(C) $\frac{\pi}{3}$
(D) $\frac{\pi}{3\sqrt{5}}$

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

Q84 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If $[\cdot]$ denotes the greatest integer function, then $\int_1^2 [x^2]\, dx =$

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

Answer: (C) $5-\sqrt{2}-\sqrt{3}$ · The council's preliminary key

Q85 TS EAPCET 2025 · 3 May · Shift 2 MCQ

$$\int_{-1}^{1} \frac{\log 2-\log(1+x)}{\sqrt{1-x^2}}\,dx =$$

(A) $\frac{\pi}{8}\log 2$
(B) $-\frac{\pi}{2}\log 2$
(C) $-\frac{\pi}{4}\log 2$
(D) $2\pi\log 2$

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

Q86 TS EAPCET 2025 · 3 May · Shift 2 MCQ

$$\int_{0}^{\pi/4} \frac{\sec x}{3\cos x+4\sin x}\,dx =$$

(A) $\log\left(\frac{7}{3}\right)$
(B) $\frac{1}{4}\log\left(\frac{7}{3}\right)$
(C) $\frac{1}{4}\log 7$
(D) $\log 7$

Answer: (B) $\frac{1}{4}\log\left(\frac{7}{3}\right)$ · The council's preliminary key

Q87 TS EAPCET 2025 · 3 May · Shift 2 MCQ

$\int_{-2}^{4}\left|2-x^2\right|dx =$

(A) $\frac{8\sqrt{2}}{3}-3$
(B) $\frac{16\sqrt{2}}{3}+12$
(C) $\frac{16\sqrt{2}}{3}-3$
(D) $\frac{8\sqrt{2}}{3}+12$

Answer: (B) $\frac{16\sqrt{2}}{3}+12$ · The council's preliminary key

Q88 TS EAPCET 2025 · 2 May · Shift 1 MCQ

$\int_{-2\pi}^{2\pi}\sin^4 x\cos^6 x\,dx =$

(A) $\frac{3\pi}{128}$
(B) $\frac{9\pi}{32}$
(C) $\frac{9\pi}{64}$
(D) $\frac{3\pi}{64}$

Answer: (D) $\frac{3\pi}{64}$ · The council's preliminary key

Q89 TS EAPCET 2025 · 2 May · Shift 2 MCQ

$$\lim_{n\to\infty}\frac{1}{n^2}\left[e^{1/n}+2e^{2/n}+3e^{3/n}+\ldots\cdots+2ne^{2}\right]=$$

(A) e^2-1
(B) e^2+1
(C) $2e^2-2$
(D) $2e^2+1$

Answer: (B) e^2+1 · The council's preliminary key

Q90 TS EAPCET 2025 · 2 May · Shift 2 MCQ

Let m, n, p, q be four positive integers. If $\int_0^{2\pi}\sin^m x\cos^n x\,dx=4\int_0^{\pi/2}\sin^m x\cos^n x\,dx$, $\int_0^{2\pi}\sin^p x\cos^n x\,dx=0$, $\int_0^{\pi}\sin^p x\cos^q x\,dx=0$, $a=m+n+p$ and $b=m+n+q$, then

(A) a is even number and b is odd number
(B) a is odd number and b is even number
(C) Both a and b are even numbers
(D) Both a and b are odd numbers

Answer: (D) Both a and b are odd numbers · The council's preliminary key

Q91 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If $\int_0^{2\pi}(\sin^4 x+\cos^4 x)\,dx=K\int_0^{\pi}\sin^2 x\,dx+L\int_0^{\frac{\pi}{2}}\cos^2 x\,dx$ and $K,L\in N$, then the number of possible ordered pairs (K,L) is

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

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

Q92 AP EAPCET 2024 · 23 May · Shift 1 MCQ

$$\int_0^{\pi}\frac{x\sin x}{4\cos^2 x+3\sin^2 x}\,\mathrm{d}x=$$

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

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

Q93 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If $A = \int_0^{\infty} \frac{1+x^2}{1+x^4}\,dx$, $B = \int_0^{1} \frac{1+x^2}{1+x^4}\,dx$, then

(A) $2A = B$
(B) $A = B$
(C) $2B = A$
(D) $2B + A = 0$

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

Q94 AP EAPCET 2024 · 22 May · Shift 1 MCQ

$$\int_0^{\pi/4} \log(1+\tan x)\,dx =$$

(A) $\pi \log 2 + 1$
(B) $\frac{\pi}{2}\log 2 + 1$
(C) $\frac{\pi}{4}\log 2$
(D) $\frac{\pi}{8}\log 2$

Answer: (D) $\frac{\pi}{8}\log 2$ · The council's preliminary key

Q95 AP EAPCET 2024 · 22 May · Shift 1 MCQ

$$\lim_{n\to\infty}\left(\frac{1}{\sqrt{n^2}} + \frac{1}{\sqrt{n^2-1}} + \cdots + \frac{1}{\sqrt{n^2-(n-1)^2}}\right) =$$

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

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

Q96 AP EAPCET 2024 · 22 May · Shift 1 MCQ

$$\int_{-\pi}^{\pi} \frac{x\sin x}{1+\cos^2 x}\,dx =$$

(A) $\frac{3\pi^2}{4}$
(B) $\frac{\pi}{2}+1$
(C) $\frac{\pi^2}{4}$
(D) $\frac{\pi^2}{2}$

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

Q97 AP EAPCET 2024 · 22 May · Shift 2 MCQ

$$\int_0^1 \sqrt{\frac{2+x}{2-x}}\,dx =$$

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

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

Q98 AP EAPCET 2024 · 22 May · Shift 2 MCQ

If $M=\int_0^{\infty}\frac{\log t}{1+t^3}\,dt$ and $N=\int_{-\infty}^{\infty}\frac{e^{2t}\,t}{1+e^{3t}}\,dt$, then

(A) $N=2M$
(B) $N=M$
(C) $N=3M$
(D) $N=-M$

Answer: (D) $N=-M$ · The council's preliminary key

Q99 AP EAPCET 2024 · 22 May · Shift 2 MCQ

$$\int_{-2}^{2}(4-x^2)^{\frac{5}{2}}\,dx =$$

(A) 40π
(B) 20π
(C) 10π
(D) $\frac{5\pi}{32}$

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

Q100 AP EAPCET 2024 · 22 May · Shift 2 MCQ

$$\lim_{x\to\infty}\left[\left(1+\frac{1}{n^3}\right)^{\frac{1}{n^3}}\left(1+\frac{8}{n^3}\right)^{\frac{4}{n^3}}\left(1+\frac{27}{n^3}\right)^{\frac{9}{n^3}}\ldots(2)^{\frac{1}{n}}\right]=$$

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(A) $\log 2 - \frac{1}{2}$
(B) $e^{\left(\log 2 - \frac{1}{2}\right)}$
(C) $e^{\left(\frac{2\log 2 - 1}{3}\right)}$
(D) $\frac{1}{3}(2\log 2 - 1)$

Answer: (C) $e^{\left(\frac{2\log 2-1}{3}\right)}$ · The council's preliminary key

Q101 AP EAPCET 2024 · 22 May · Shift 2 MCQ

$$\int_{-5\pi}^{5\pi} (1 - \cos 2x)^{\frac{5}{2}}\, dx =$$

(A) $\frac{64\sqrt{2}}{5}$
(B) $\frac{128\sqrt{2}}{5}$
(C) $\frac{256\sqrt{2}}{3}$
(D) $\frac{128\sqrt{2}}{3}$

Answer: (D) $\frac{128\sqrt{2}}{3}$ · The council's preliminary key

Q102 AP EAPCET 2024 · 21 May · Shift 1 MCQ

$$\lim_{n\to\infty} \frac{1^{77} + 2^{77} + \ldots + n^{77}}{n^{78}} =$$

(A) $\frac{1}{77}$
(B) 1
(C) 76
(D) $\frac{1}{78}$

Answer: (D) $\frac{1}{78}$ · The council's preliminary key

Q103 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If $f(x) = \begin{cases} \frac{6x^2+1}{4x^3+2x+3}, & 0 < x < 1 \\ x^2 + 1, & 1 \le x < 2 \end{cases}$ then $\int_0^2 f(x)\, dx =$

(A) $\frac{1}{2}\log 3 + \frac{10}{3}$
(B) $\frac{1}{2}\log 3 - \frac{10}{3}$
(C) $\frac{1}{2}\log 3 + \frac{13}{3}$
(D) $\frac{1}{2}\log 3 + \frac{20}{3}$

Answer: (A) $\frac{1}{2}\log 3 + \frac{10}{3}$ · The council's preliminary key

Q104 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If $\int_1^n [x]\, dx = 120$, then $n =$

(A) 15
(B) 16
(C) 14
(D) 12

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

Q105 AP EAPCET 2024 · 21 May · Shift 2 MCQ

$$\int_0^{\pi/4} \frac{x^2}{(x\sin x+\cos x)^2}\,dx =$$

(A) $\frac{2-\pi}{2+\pi}$
(B) $\frac{4-\pi}{4+\pi}$
(C) $\frac{6-\pi}{6+\pi}$
(D) $\frac{8-\pi}{8+\pi}$

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

Q106 AP EAPCET 2024 · 21 May · Shift 2 MCQ

$\int_0^1 \frac{x}{(1-x)^{3/4}}\,dx =$

(A) $\frac{4}{5}$
(B) $\frac{8}{15}$
(C) $\frac{14}{5}$
(D) $\frac{16}{5}$

Answer: (D) $\frac{16}{5}$ · The council's preliminary key

Q107 AP EAPCET 2024 · 21 May · Shift 2 MCQ

$$\int_{-1}^{1}\left(\sqrt{1+x+x^2}-\sqrt{1-x+x^2}\right)dx =$$

(A) 2
(B) 4
(C) 0
(D) 8

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

Q108 AP EAPCET 2024 · 21 May · Shift 2 MCQ

$\int_1^5 (|x-3|+|1-x|)\,dx =$

(A) 4
(B) 8
(C) 12
(D) 24

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

Q109 AP EAPCET 2024 · 20 May · Shift 1 MCQ

$$\int_{-\pi}^{\pi} \frac{x \sin^3 x}{4 - \cos^2 x}\, dx =$$

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

Answer: (B) $2\pi\left(1 - \frac{3}{4}\log 3\right)$ · The council's preliminary key

Q110 AP EAPCET 2024 · 20 May · Shift 1 MCQ

$\int_{-3}^{3} |2 - x|\, dx =$

(A) 12
(B) 16
(C) 13
(D) 25

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

Q111 AP EAPCET 2024 · 20 May · Shift 1 MCQ

$$\int_{1/\sqrt[5]{31}}^{1/\sqrt[5]{242}} \frac{1}{\sqrt[5]{x^{30} + x^{25}}}\, dx =$$

(A) $\frac{65}{4}$
(B) $\frac{-75}{4}$
(C) $\frac{75}{4}$
(D) $\frac{-65}{4}$

Answer: (D) $\frac{-65}{4}$ · The council's preliminary key

Q112 AP EAPCET 2024 · 20 May · Shift 2 MCQ

$$\int_{-1/24}^{1/24} \sec x \, \log\left(\frac{1 - x}{1 + x}\right) dx =$$

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(A) $\frac{\pi}{2}$
(B) π
(C) 1
(D) 0

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

Q113 AP EAPCET 2024 · 20 May · Shift 2 MCQ

If $[x]$ is the greatest integer function, then $\int_0^5 [x]\,dx =$

(A) 15
(B) 2
(C) 3
(D) 10

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

Q114 AP EAPCET 2024 · 20 May · Shift 2 MCQ

$\int_0^{\pi/2} \frac{1}{1+\sqrt{\tan x}}\,dx =$

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

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

Q115 AP EAPCET 2024 · 20 May · Shift 2 MCQ

$$\int_0^{\pi} \frac{x \sin x}{1+\cos^2 x}\,dx =$$

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

Answer: (D) $\frac{\pi^2}{4}$ · The council's preliminary key

Q116 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If $\lim_{n\to\infty} \left[\left(1+\frac{1}{n^2}\right)\left(1+\frac{4}{n^2}\right)\left(1+\frac{9}{n^2}\right)\ldots\left(1+\frac{n^2}{n^2}\right)\right]^{\frac{1}{n}} = ae^b$, then $a+b =$

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(A) $\pi - 2$

(B) π

(C) $\pi + 2$

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

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

Q117 AP EAPCET 2024 · 19 May · Shift 2 MCQ

$$\int_0^{\pi} x \sin^4 x \cos^6 x \, dx =$$

(A) $\frac{3\pi^2}{512}$

(B) $\frac{3\pi^2}{256}$

(C) $\frac{\pi^2}{256}$

(D) $\frac{\pi^2}{512}$

Answer: (A) $\frac{3\pi^2}{512}$ · The council's preliminary key

Q118 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If $I_n = \int_0^{\pi/4} \tan^n x \, dx$, then $I_{13} + I_{11} =$

(A) $\frac{1}{13}$

(B) $\frac{1}{12}$

(C) $\frac{1}{10}$

(D) $\frac{1}{11}$

Answer: (B) $\frac{1}{12}$ · The council's preliminary key

Q119 AP EAPCET 2024 · 18 May · Shift 1 MCQ

$$\lim_{n\to\infty} n^4 \left[\frac{1}{n^5} + \frac{1}{(n^2+1)^{\frac{5}{2}}} + \frac{1}{(n^2+4)^{\frac{5}{2}}} + \frac{1}{(n^2+9)^{\frac{5}{2}}} + \ldots + \frac{1}{4\sqrt{2}n^5}\right] =$$

(A) $\frac{3}{4\sqrt{2}}$

(B) $\frac{3\sqrt{2}}{4}$

(C) $\frac{5}{6\sqrt{2}}$

(D) $\frac{5\sqrt{2}}{6}$

Answer: (C) $\frac{5}{6\sqrt{2}}$ · The council's preliminary key

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Q120 AP EAPCET 2024 · 18 May · Shift 1 MCQ

$$\int_{\log 4}^{\log 5} \frac{e^{2x}+e^{x}}{e^{2x}-5e^{x}+6}\,dx =$$

(A) $\log\left(\frac{64}{9}\right)$
(B) $\log\left(\frac{256}{81}\right)$
(C) $\log\left(\frac{32}{3}\right)$
(D) $\log\left(\frac{128}{27}\right)$

Answer: (D) $\log\left(\frac{128}{27}\right)$ · The council's preliminary key

Q121 AP EAPCET 2024 · 18 May · Shift 1 MCQ

$\int_1^2 \frac{x^4-1}{x^6-1}\,dx =$

(A) $\frac{1}{\sqrt{3}}Tan^{-1}\left(\frac{\sqrt{3}}{2}\right)$
(B) $\frac{121}{6}$
(C) $\sqrt{2}-1$
(D) $\frac{1}{\sqrt{2}}Tan^{-1}\left(\frac{2}{\sqrt{3}}\right)$

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

Q122 TS EAPCET 2024 · 11 May · Shift 1 MCQ

$$\int_{\pi/5}^{3\pi/10} \frac{dx}{\sec^2 x+(\tan^{2022} x-1)(\sec^2 x-1)} =$$

(A) $\frac{\pi}{20}$
(B) $\frac{2\pi}{5}$
(C) $\frac{3\pi}{20}$
(D) $\frac{3\pi}{5}$

Answer: (A) $\frac{\pi}{20}$ · The council's preliminary key

Q123 TS EAPCET 2024 · 11 May · Shift 1 MCQ

$$\int_{-\pi/15}^{\pi/15} \frac{\cos 5x}{1+e^{5x}}\,dx =$$

(A) $\frac{1}{5}$
(B) $\frac{\sqrt{3}}{10}$
(C) $\frac{1}{15}$
(D) $\frac{1}{10}$

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

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Q124 TS EAPCET 2024 · 10 May · Shift 1 MCQ

$$\int_0^{\pi} \left(\sin^3 x + \cos^2 x\right)^2 dx =$$

(A) $\frac{15\pi}{16} + \frac{8}{15}$
(B) $\frac{11\pi}{16} + \frac{8}{15}$
(C) $\frac{15\pi}{16} + \frac{4}{15}$
(D) $\frac{11\pi}{16} + \frac{4}{15}$

Answer: (B) $\frac{11\pi}{16} + \frac{8}{15}$ · The council's preliminary key

Q125 TS EAPCET 2024 · 10 May · Shift 1 MCQ

$$\int_{-\pi/8}^{\pi/8} \frac{\sin^4(4x)}{1+e^{4x}}\, dx =$$

(A) $\frac{3\pi}{128}$
(B) $\frac{3\pi}{256}$
(C) $\frac{3\pi}{64}$
(D) $\frac{3\pi}{32}$

Answer: (C) $\frac{3\pi}{64}$ · The council's preliminary key

Q126 TS EAPCET 2024 · 10 May · Shift 2 MCQ

$$\frac{3}{25}\int_0^{25\pi} \sqrt{|\cos x - \cos^3 x|}\, dx =$$

(A) 8
(B) 4
(C) 1
(D) 0

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

Q127 TS EAPCET 2024 · 10 May · Shift 2 MCQ

If m, l, r, s, n are integers such that, $9 > m > l > s > n > r > 2$ and

$$\int_{-2\pi}^{2\pi} \sin^m x \cos^n x\, dx = 4\int_0^{\pi} \sin^m x \cos^n x\, dx, \quad \int_{-\pi}^{\pi} \sin^r x \cos^s x\, dx = 4\int_0^{\pi/2} \sin^r x \cos^s x\, dx$$

and

$$\int_{-\pi/2}^{\pi/2} \sin^l x \cos^m x\, dx = 0,$$

then

(A) $(s-2)(l-2)=mr$
(B) $(s-2)(l+2)=rm+5$
(C) $(s-2)(s+2)=ln-3$
(D) $(l-2)(l+2)=ms-5$

Answer: (C) $(s-2)(s+2)=ln-3$ · The council's preliminary key

Q128 TS EAPCET 2024 · 9 May · Shift 1 MCQ

$$\lim_{n\to\infty}\left[\left(1+\frac{1}{n^2}\right)\left(1+\frac{4}{n^2}\right)\left(1+\frac{9}{n^2}\right)\ldots(2)\right]^{1/n}=$$

(A) $16e^{-1}$
(B) $2e^{\left(\frac{\pi-4}{2}\right)}$
(C) $2\log 2-1$
(D) $2+e^{\left(\frac{\pi-4}{2}\right)}$

Answer: (B) $2e^{\left(\frac{\pi-4}{2}\right)}$ · The council's preliminary key

Q129 TS EAPCET 2024 · 9 May · Shift 1 MCQ

$\int_{-2}^{2}x^4\left(4-x^2\right)^{\frac{7}{2}}dx=$

(A) 4π
(B) $\frac{\pi}{16}$
(C) 28π
(D) $\frac{3\pi}{128}$

Answer: (C) 28π · The council's preliminary key

Q130 TS EAPCET 2024 · 9 May · Shift 2 MCQ

$$\int_{-3/4}^{(\pi-6)/8}\log(\sin(4x+3))\,dx=$$

(A) $-\frac{\pi}{2}\log 2$
(B) $-\frac{\pi}{8}\log 2$
(C) $-\frac{\pi}{14}\log 2$
(D) $-\frac{\pi}{28}\log 2$

Answer: (B) $-\frac{\pi}{8}\log 2$ · The council's preliminary key

Q131 TS EAPCET 2024 · 9 May · Shift 2 MCQ

$\int_{0}^{16}\frac{\sqrt{x}}{1+\sqrt{x}}dx=$

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(A) $8 + 2\log 2$
(B) $8 + \log 2$
(C) $8 + 2\log 5$
(D) $4 + \log 5$

Answer: (C) $8 + 2\log 5$ · The council's preliminary key

Q132 TS EAPCET 2024 · 9 May · Shift 2 MCQ

$$\int_0^{32\pi} \sqrt{1 - \cos 4x}\, dx =$$

(A) $16\sqrt{2}$
(B) $32\sqrt{2}$
(C) $128\sqrt{2}$
(D) $64\sqrt{2}$

Answer: (D) $64\sqrt{2}$ · The council's preliminary key

Q133 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If $S_n = \int_0^{\pi/2} \frac{\sin(2n-1)x}{\sin x}\, dx$ and n is an integer, then $S_{n+1} - S_n =$

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

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

Q134 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If $a = 2n$ and $b = 2m + 1$ for all $m, n \in \mathbb{N}$, then $\int_{-\pi}^{\pi} e^{\sin^a x} \cot^b(2n+1)x\, dx =$

(A) 0
(B) 1
(C) -1
(D) π

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

Q135 AP EAPCET 2023 · 19 May · Shift 1 MCQ

Consider the following statements (A) and (B)

(A): $\int_a^b \frac{d}{dx}(f(x))dx = \frac{d}{dx}\int_a^b f(x)dx$

(B): $\frac{d}{dx}\left(\int f(x)dx\right) = f(x) + C$

Which one of the following is True?

(A) Only (A) is true
(B) Only (B) is true
(C) Both (A) and (B) are true
(D) Both (A) and (B) are false

Answer: (D) Both (A) and (B) are false · The council's preliminary key

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Q136 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If $\int_n^{n+1} g(x)\,dx = n^2, \forall n \in \mathbb{Z}$, then the value of $\int_{-3}^{3} g(x)\,dx$ is

(A) 19
(B) 28
(C) 9
(D) 27

Answer: (A) 19 · The council's preliminary key

Q137 AP EAPCET 2023 · 19 May · Shift 1 MCQ

$$\int_0^{\pi/2} \frac{\sum_{n=0}^{4} \sin\left(\frac{n\pi}{4} + x\right)}{\cos x + \sin x}\,dx =$$

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

Answer: (D) $(\sqrt{2}+1)\frac{\pi}{4}$ · The council's preliminary key

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Q138 AP EAPCET 2023 · 18 May · Shift 1 MCQ

Let $f : \mathbb{R} \to \mathbb{R}$ be a differentiable function such that $|f(x) - f(4)| \leq 2|x - y|^{\frac{3}{2}}\ \forall x, y \in \mathbb{R}$. If $f(0) = 1$, then $\int_0^1 f^2(x)\,dx =$

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

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

Q139 AP EAPCET 2023 · 18 May · Shift 1 MCQ

$$\int_0^{\pi} x \sin^3 x \cos^2 x\,dx =$$

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(A) $\frac{2\pi}{15}$
(B) $\frac{4\pi}{15}$
(C) $\frac{\pi}{30}$
(D) $\frac{2\pi}{5}$

Answer: (A) $\frac{2\pi}{15}$ · The council's preliminary key

Q140 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If $\int_0^{2\pi} |x \sin x|\, dx = k\pi$, then $k =$

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

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

Q141 AP EAPCET 2023 · 18 May · Shift 2 MCQ

Assertion (A) : $\int_{\pi/2}^{3\pi/2} [2\sin x]\, dx = 0$, where $[.]$ denotes the greatest integer function

Reason (R) : $2\sin x$ is a decreasing function in $\left[\frac{\pi}{2}, \frac{3\pi}{2}\right]$

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

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

Q142 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $[.]$ denotes the greatest integer function, then $\int_0^{1000} e^{x-[x]} dx =$

(A) $\frac{e^{1000}-1}{1000}$
(B) $1000(e-1)$
(C) $\frac{e^{1000}-1}{e-1}$
(D) $\frac{e-1}{1000}$

Answer: (B) $1000(e-1)$ · The council's preliminary key

Q143 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $I = \int_1^3 \sqrt{3+x+x^2}\, dx$, then I lies in the interval

(A) $(2\sqrt{5}, 2\sqrt{15})$
(B) $(\sqrt{3}, 2\sqrt{5})$
(C) $(\sqrt{23}, \sqrt{33})$
(D) $(2\sqrt{15}, \sqrt{23})$

Answer: (A) $(2\sqrt{5}, 2\sqrt{15})$ · The council's preliminary key

Q144 AP EAPCET 2023 · 18 May · Shift 2 MCQ

$$\int_{-4\pi}^{4\pi} \tan^9 x \sin^6 x \cos^3 x \, dx =$$

(A) $16 \times \frac{\pi}{2}$
(B) $8 \times \frac{2}{3}$
(C) $16 \times \frac{14}{17} \times \frac{12}{15} \times \ldots \times \frac{2}{3}$
(D) 0

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

Q145 AP EAPCET 2023 · 18 May · Shift 2 MCQ

Given that $\frac{d}{dx}\int_0^{\phi(x)} f(t)\,dt = f(\phi(x))\,\phi'(x)$. For all $x \in \left(0, \frac{\pi}{2}\right)$, if $\int_1^{\cos x} t^2 f(t)\,dt = \cos 2x$, then $f\left(\frac{1}{\sqrt{2}}\right) =$

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

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

Q146 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If $a \in \mathbb{Z}^+$, $[x]$ is greatest integer not more than x and $\int_0^a 2^{[x]}\,dx = 127$, then $a =$

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

Answer: (B) 7 · Checked by our team

Q147 AP EAPCET 2023 · 17 May · Shift 1 MCQ

$$\int_{-\pi}^{\frac{\pi}{2}} \sin x \cdot \sin^2(\cos x)\,dx =$$

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(A) $\frac{1-\sin 2}{4}$
(B) $-\left(\frac{1+\sin 2}{4}\right)$
(C) $\frac{\sin 2-2}{4}$
(D) $-\left(\frac{2+\sin 2}{4}\right)$

Answer: (C) $\frac{\sin 2-2}{4}$ · Checked by our team

Q148 AP EAPCET 2023 · 17 May · Shift 1 MCQ

The positive value of x satisfying the equation $\int_x^1 (1-t)\,dt = \frac{1}{2}$ is

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

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

Q149 AP EAPCET 2023 · 17 May · Shift 2 MCQ

$$\int_{\pi/6}^{\pi/3} \frac{1}{1+\sqrt{\cot x}}\,dx =$$

(A) $\frac{\pi}{4}$
(B) $\frac{\pi}{2}$
(C) $\frac{\pi}{6}$
(D) $\frac{\pi}{12}$

Answer: (D) $\frac{\pi}{12}$ · The council's preliminary key

Q150 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If $m \in Z^+$, $n = 2m$ and $\int_0^{\pi/2} \sin^m x \cos^n x\,dx = K(m)\int_0^{\pi/2} \sin^m x\,dx$, then $\frac{2^{m-1}(m-1)!}{(2m-1)!}K(m) =$

(A) $\frac{1}{m+2}\,\frac{1}{m+4}\,\frac{1}{m+r}\cdots\frac{1}{3m}$
(B) $\frac{1}{2m+2}\,\frac{1}{2m+4}\cdots\frac{1}{3m}$
(C) $\frac{\pi}{2}\,\frac{1}{m+2}\,\frac{1}{m+4}\,\frac{1}{m+r}\cdots\frac{1}{3m}$
(D) $\frac{\pi}{2}\,\frac{1}{2m+2}\,\frac{1}{2m+4}\cdots\frac{1}{3m}$

Answer: (A) $\frac{1}{m+2}\,\frac{1}{m+4}\,\frac{1}{m+r}\cdots\frac{1}{3m}$ · The council's preliminary key

Q151 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If $5f(x)+3f\left(\frac{1}{x}\right) = 2-\frac{1}{x},\ x \neq 0$, then $\int_1^2 f\left(\frac{1}{x}\right)dx =$

(A) $\frac{6\log 2-7}{32}$
(B) $\frac{6\log 2-17}{32}$
(C) $\frac{6\log 2-1}{32}$
(D) $\frac{6\log 2-7}{16}$

Answer: (A) $\frac{6\log 2-7}{32}$ · The council's preliminary key

Q152 AP EAPCET 2023 · 16 May · Shift 1 MCQ

$$f(x)=\begin{cases}x^2, & 0\le x<1\\ \sqrt{x}, & 1\le x\le 2\end{cases}\Rightarrow \int_0^2 f(x)\,dx=$$

(A) $\frac{4\sqrt{2}-1}{3}$
(B) $\frac{4\sqrt{2}+1}{3}$
(C) $\frac{4\sqrt{2}-1}{6}$
(D) $\frac{4\sqrt{2}+1}{6}$

Answer: (A) $\frac{4\sqrt{2}-1}{3}$ · The council's preliminary key

Q153 AP EAPCET 2023 · 16 May · Shift 1 MCQ

$$\int_0^{1/2}\frac{x\sin^{-1}x}{\sqrt{1-x^2}}\,dx=$$

(A) $\left(\frac{1}{2}+\frac{\sqrt{3}}{12}\pi\right)$
(B) $\left(\frac{1}{2}-\frac{\sqrt{3}}{12}\pi\right)$
(C) $\left(-\frac{1}{2}+\frac{\sqrt{3}}{12}\pi\right)$
(D) $\left(-\frac{1}{2}-\frac{\sqrt{3}}{12}\pi\right)$

Answer: (B) $\left(\frac{1}{2}-\frac{\sqrt{3}}{12}\pi\right)$ · The council's preliminary key

Q154 AP EAPCET 2023 · 16 May · Shift 1 MCQ

Given that $\frac{d}{dx}\left[\int_0^{\phi(x)} f(t)\,dt\right]=\phi'(f(x))f'(x)$. If $\int_0^{x^3} f(t)\,dt=x^2\sin 2\pi x$, then the value of $f(8)$ is

(A) $\frac{2\pi}{3}$
(B) $\frac{4\pi}{3}$
(C) $\frac{\pi}{3}$
(D) $\frac{\pi}{12}$

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

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Q155 AP EAPCET 2023 · 16 May · Shift 1 MCQ

$$\lim_{n\to\infty}\frac{1}{n}\left(\frac{1}{e^{1/n}}+\frac{1}{e^{2/n}}+\frac{1}{e^{3/n}}+\ldots+\frac{1}{e^{2}}\right)=$$

(A) $1-e^{-2}$
(B) $1+e^{-2}$
(C) $e^{2}-1$
(D) $e^{2}+1$

Answer: (A) $1-e^{-2}$ · The council's preliminary key

Q156 AP EAPCET 2023 · 16 May · Shift 1 MCQ

If $\int_0^{2024\pi}\frac{2023^{\sin^2 x}}{2023^{\sin^2 x}+2023^{\cos^2 x}}\,dx=k$, then $\left(\frac{2k}{\pi}+1\right)=$

(A) 2023
(B) 2025
(C) 2022
(D) 2024

Answer: (B) 2025 · The council's preliminary key

Q157 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Assertion (A) : $\int_0^{\pi/2}(\sin^6 x+\cos^6 x)\,dx$ lies in the interval $\left(\frac{\pi}{8},\frac{\pi}{2}\right)$

Reason (R) : $\sin^6 x+\cos^6 x$ is a periodic function with period $\frac{\pi}{2}$

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

Answer: (B) Both A and R are true but R is not the correct explanation of A · The council's preliminary key

Q158 AP EAPCET 2023 · 16 May · Shift 2 MCQ

$$\int_0^{\pi}\frac{\cos x}{\sqrt{1-\sin^2 x}}\,dx=$$

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

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

Q159 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If $\int_3^b \frac{x-1}{2x-x^2}\,dx = \frac{1}{2}$, then $(b-1)^2 =$

(A) 2

(B) $\sqrt{2}$

(C) $1+\frac{3}{e}$

(D) $\sqrt{\frac{3}{e}-1}$

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

Q160 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If $u(n) = \int_0^{\pi/2}(1+\sin t)^n \sin 2t\,dt$, $n \in N$, then $u(4) =$

(A) $\frac{28\pi}{5}$

(B) $\frac{128}{35}$

(C) $\frac{129}{15}$

(D) $\frac{68\pi}{15}$

Answer: (C) $\frac{129}{15}$ · The council's preliminary key

Q161 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $I = \int_{-a}^{a}(x^4-2x^2)\,dx$, then I is minimum at $a =$

(A) 2

(B) $-\sqrt{2}$

(C) $\sqrt{2}$

(D) -2

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

Q162 AP EAPCET 2023 · 15 May · Shift 1 MCQ

Assertion (A): $\int_{\pi/6}^{\pi/3} \frac{(\sin x)^{\sqrt{2}}\,dx}{(\sin x)^{\sqrt{2}}+(\cos x)^{\sqrt{2}}} = \frac{\pi}{12}$

Reason (R) : $\int_{\pi/6}^{\pi/3} \frac{f(x)\,dx}{f(x)+f\left(\frac{\pi}{2}-x\right)} = \frac{\pi}{12}$

(A) A is true, R is true and R is the correct explanation of A

(B) A is true, R is true but R is not the correct explanation of A

(C) A is true, R is false

(D) A is false , R is true

Answer: (A) A is true, R is true and R is the correct explanation of A · The council's preliminary key

Q163 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $[x]$ is the greatest integer not exceeding x, then $\int_{-0.5}^{1.5} x^2[x]\,dx =$

(A) $\frac{4.5}{4}$
(B) $\frac{3}{4}$
(C) $\frac{3.5}{4}$
(D) $\frac{2.375}{2}$

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

Q164 AP EAPCET 2023 · 15 May · Shift 1 MCQ

$$\int_0^{50\pi} \sqrt{1-\cos 2x}\,dx =$$

(A) $-100\sqrt{2}$
(B) $100\sqrt{2}$
(C) $50\sqrt{2}$
(D) $-50\sqrt{2}$

Answer: (B) $100\sqrt{2}$ · The council's preliminary key

Q165 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $f(x) = \frac{x^3+5}{\sqrt{12+x}}$ and $\int_{-5}^{5} f(x)\,dx = \int_0^5 (f(x)+g(x))\,dx$, then $g(x) =$

(A) $\frac{5-x^3}{\sqrt{12-x}}$
(B) $-\left(\frac{5+x^3}{\sqrt{12+x}}\right)$
(C) $\frac{-x^3+5}{\sqrt{12+x}}$
(D) $\frac{5+x^3}{\sqrt{12-x}}$

Answer: (A) $\frac{5-x^3}{\sqrt{12-x}}$ · The council's preliminary key

Q166 AP EAPCET 2023 · 15 May · Shift 2 MCQ

$$\int_0^{\pi/4} \frac{\cos^2 x}{\cos^2 x + 4\sin^2 x}\,dx =$$

(A) $\frac{\pi}{4}+\frac{2}{3}\mathrm{Tan}^{-1}2$
(B) $-\frac{\pi}{3}-\frac{2}{3}\mathrm{Tan}^{-1}3$
(C) $-\frac{\pi}{12}+\frac{2}{3}\mathrm{Tan}^{-1}2$
(D) $\frac{\pi}{6}-\frac{2}{3}\mathrm{Tan}^{-1}4$

Answer: (C) $-\frac{\pi}{12}+\frac{2}{3}\mathrm{Tan}^{-1}2$ · The council's preliminary key

Q167 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If $f(x)=\int_0^x\left[(a+1)(t+1)^2-(a-1)(t^2+t+1)\right]dt$, then a possible positive value of 'a', for which $f'(x)=0$ has equal roots, is

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

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

Q168 AP EAPCET 2023 · 15 May · Shift 2 MCQ

$$\int_0^{\pi/2}\frac{\sin\left(\frac{\pi}{4}+x\right)+\sin\left(\frac{3\pi}{4}+x\right)}{\cos x+\sin x}dx=$$

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

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

Q169 TS EAMCET 2023 · 14 May · Shift 1 MCQ

$$\lim_{n\to\infty}\frac{1}{n^3}\sum_{k=1}^{n}\left(k^2x\right)=$$

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

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

Q170 TS EAMCET 2023 · 14 May · Shift 1 MCQ

$\int_{-1}^{1}x|x|\,dx=$

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

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

Q171 TS EAMCET 2023 · 14 May · Shift 1 MCQ

$$\int_{-\pi/2}^{\pi/2} \sin^2 x \cos^2 x \,(\sin x + \cos x)\, dx =$$

(A) $\frac{2}{3}$
(B) $\frac{3}{10}$
(C) $\frac{4}{15}$
(D) $\frac{5}{18}$

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

Q172 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $\int_0^3 (3x^2 - 4x + 2)\, dx = k$, then an integer root of $3x^2 - 4x + 2 = \frac{3k}{5}$ is

(A) 1
(B) 0
(C) 15
(D) -1

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

Q173 TS EAMCET 2023 · 14 May · Shift 2 MCQ

$$\int_0^{\pi/2} \frac{x \tan x \sec^2 x}{\tan^4 x + 1}\, dx =$$

(A) $\frac{\pi^2}{16}$
(B) $\frac{\pi^2}{4}$
(C) $\frac{\pi^2}{8}$
(D) $\frac{\pi^2}{32}$

Answer: (A) $\frac{\pi^2}{16}$ · The council's preliminary key

Q174 TS EAMCET 2023 · 14 May · Shift 2 MCQ

$$\int_3^6 \frac{\sqrt{x}}{\sqrt{9-x} + \sqrt{x}}\, dx =$$

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

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

Q175 TS EAMCET 2023 · 14 May · Shift 2 MCQ

$$\lim_{n\to\infty}\left[\left(1+\frac{1}{n^2}\right)\left(1+\frac{2^2}{n^2}\right)\ldots(2)\right]^{\frac{1}{n}} =$$

(A) $2e^{\pi-4}$
(B) $e^{\frac{\pi-4}{2}}$
(C) $2e^{\frac{\pi-4}{2}}$
(D) $\frac{1}{2}e^{\frac{\pi-4}{2}}$

Answer: (C) $2e^{\frac{\pi-4}{2}}$ · The council's preliminary key

Q176 TS EAMCET 2023 · 13 May · Shift 1 MCQ

$\int_0^3 |x^2-3x+2|\,dx =$

(A) $\frac{11}{6}$
(B) $\frac{5}{6}$
(C) $\frac{3}{2}$
(D) $\frac{2}{3}$

Answer: (A) $\frac{11}{6}$ · The council's preliminary key

Q177 TS EAMCET 2023 · 13 May · Shift 1 MCQ

$$\int_{-\frac{\pi}{8092}}^{\frac{\pi}{8092}} \frac{\sec(2023x)}{1+(2023)^{(2023x)}}\,dx =$$

(A) $\frac{1}{2023\sqrt{2}}+c$
(B) $\frac{\log(\sqrt{2}+1)}{2023}+c$
(C) $\frac{\log 2}{4046}+c$
(D) $\frac{\sqrt{2}}{2023}+c$

Answer: (B) $\frac{\log(\sqrt{2}+1)}{2023}+c$ · The council's preliminary key

Q178 TS EAMCET 2023 · 13 May · Shift 1 MCQ

$$\int_0^2 x^{\frac{5}{2}}\sqrt{2-x}\,dx =$$

(A) $\frac{5\pi}{16}$
(B) $\frac{5}{4}$
(C) $\frac{5\pi}{8}$
(D) $\frac{5}{8}$

Answer: (C) $\frac{5\pi}{8}$ · The council's preliminary key

Q179 TS EAMCET 2023 · 13 May · Shift 2 MCQ

$$\int_0^{\pi} \frac{x\cos^2 x}{1+\sin x}\,dx =$$

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

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

Q180 TS EAMCET 2023 · 13 May · Shift 2 MCQ

If $[x]$ represents greatest integer function then $\int_{-2}^{2}[2-x]\,dx =$

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

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

Q181 TS EAMCET 2023 · 13 May · Shift 2 MCQ

$$\int_0^{2} \frac{x}{(2-x)^{\frac{3}{4}}}\,dx =$$

(A) $\frac{24}{5}\,2^{\frac{1}{4}}$
(B) $\frac{5}{24}\,2^{\frac{3}{4}}$
(C) $\frac{32}{5}\,2^{\frac{1}{4}}$
(D) $\frac{5}{12}\,2^{\frac{3}{4}}$

Answer: (C) $\frac{32}{5}\,2^{\frac{1}{4}}$ · The council's preliminary key

Q182 TS EAMCET 2023 · 13 May · Shift 2 MCQ

$$\int_0^{2} x^3(2-x)^4\,dx =$$

(A) $\frac{128}{105}$
(B) $\frac{16}{35}$
(C) $\frac{256}{105}$
(D) $\frac{32}{35}$

Answer: (D) $\frac{32}{35}$ · The council's preliminary key

Q183 TS EAMCET 2023 · 12 May · Shift 1 MCQ

$\int_{1/2}^{2} |\log_{10} x|\, dx =$

(A) $\log_{10}\left(\frac{8}{e}\right)$
(B) $\frac{1}{2}\log_{10}\left(\frac{8}{e}\right)$
(C) $\log_{10}\left(\frac{2}{e}\right)$
(D) $\log_{e}\left(\frac{3}{e}\right)$

Answer: (B) $\frac{1}{2}\log_{10}\left(\frac{8}{e}\right)$ · The council's preliminary key

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Q184 TS EAMCET 2023 · 12 May · Shift 1 MCQ

$$\int_{0}^{\pi/2} \frac{\sin^2 x}{\sin x + \cos x}\, dx =$$

(A) $\sqrt{2}\log\left(\sqrt{2}+1\right)$
(B) $\frac{1}{\sqrt{2}}\log\left(\sqrt{2}+1\right)$
(C) $\log\left(\sqrt{2}+1\right)$
(D) $\frac{1}{\sqrt{2}}\log\left(\sqrt{2}-1\right)$

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

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Q185 TS EAMCET 2023 · 12 May · Shift 1 MCQ

$[\cdot]$ is the greatest integer function then $\int_{0}^{2\pi} [|\sin x| + |\cos x|]\, dx =$

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

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

Q186 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If f is defined on $\mathbb{R}$ such that $f(x)f(-x) = 9$, then $\int_{-23}^{23} \frac{dx}{3+f(x)} =$

(A) $\frac{51}{3}$
(B) $\frac{49}{3}$
(C) $\frac{46}{3}$
(D) $\frac{46}{6}$

Answer: (D) $\frac{46}{6}$ · The council's preliminary key

Q187 TS EAMCET 2023 · 12 May · Shift 2 MCQ

$$\lim_{n\to\infty}\left[\frac{1}{n^2}\sec^2\frac{1}{n^2}+\frac{2}{n^2}\sec^2\frac{4}{n^2}+\ldots+\frac{1}{n}\sec^2 1\right]=$$

(A) $\frac{1}{2}\sec(1)$
(B) $\frac{1}{2}\text{cosec}(1)$
(C) $\tan(1)$
(D) $\frac{1}{2}\tan(1)$

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

Q188 TS EAMCET 2023 · 12 May · Shift 2 MCQ

$\int_2^5 \sqrt{\frac{5-x}{x-2}}\,dx =$

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

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

Q189 TS EAMCET 2023 · 12 May · Shift 2 MCQ

$\int_0^{\pi/2}\sin^6 x\cos^4 x\,dx =$

(A) $\frac{\pi}{256}$
(B) $\frac{\pi}{512}$
(C) $\frac{3\pi}{512}$
(D) $\frac{5\pi}{512}$

Answer: (C) $\frac{3\pi}{512}$ · The council's preliminary key

Q190 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Given that $\lim_{n\to\infty}\frac{1}{n}\sum_{r=1}^{np} f\left(\frac{r}{n}\right)=\int_0^p f(x)\,dx$. If $f:\mathbb{R}\to\mathbb{R}$ is defined by $f(x)=x^2+2$, then $\lim_{n\to\infty}\frac{3}{n}\left[f\left(\frac{7}{n}\right)+f\left(\frac{14}{n}\right)+f\left(\frac{21}{n}\right)+\ldots+f(7)\right]=$

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(A) 55
(B) 57
(C) 104
(D) 7

Answer: (A) 55 · The council's preliminary key

Q191 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

$\int_0^4 |\,|x-2|-x\,|\,dx =$

(A) 2
(B) 3
(C) 6
(D) 12

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

Q192 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If $\int_{-a}^{a} f(x)dx = \int_0^a f(x)dx + \int_0^a g(x)dx$ then $g(x) =$

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

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

Q193 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

It is given that $\frac{d}{dt}(t\log t - t) = \log t$ then $\exp\left(\int_0^1 2x\log(1+x^2)\,dx\right) =$

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

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

Q194 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

$\int_0^{2a} f(x)\,dx =$

(A) $2\int_0^a f(x)\,dx$

(B) $\int_0^a (f(x)+f(x+a))\,dx$

(C) 0

(D) $\int_0^{2a} f(2a+x)\,dx$

Answer: (B) $\int_0^a (f(x)+f(x+a))\,dx$ · The council's preliminary key

Q195 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

$\int_0^3 \left(\sin\left(\frac{\pi}{3}x\right)-\cos\left(\frac{\pi}{3}x\right)\right)dx =$

(A) $\frac{-6}{\pi}$

(B) 0

(C) $\frac{-3}{\pi}$

(D) $\frac{6}{\pi}$

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

Q196 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

$\int_0^{\pi/2} \sin^4\theta\cos^3\theta\,d\theta =$

(A) $\frac{1}{35}$

(B) $\frac{2}{35}$

(C) $\frac{4}{35}$

(D) $\frac{8}{35}$

Answer: (B) $\frac{2}{35}$ · The council's preliminary key

Q197 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

$\int_1^4 \left(x+\sqrt{x}+\frac{1}{x}\right)dx - \int_1^{2\log 2} dx =$

(A) $\frac{79}{6}$

(B) $\frac{643}{6}$

(C) $\frac{321}{5}$

(D) 64

Answer: (A) $\frac{79}{6}$ · The council's preliminary key

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Q198 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Let $I=\int_{-\pi/4}^{\pi/4}\frac{1}{2-\cos 2x}\left(\frac{3}{\pi}+\log\left(\frac{4+\sin x}{4-\sin x}\right)\right)dx$. Given that $\int\frac{dx}{1+kx^2}=\frac{1}{\sqrt{k}}\mathrm{Tan}^{-1}(\sqrt{k}\,x)+c$, $\mathrm{Tan}^{-1}(0)=0$ and $\mathrm{Tan}^{-1}(\sqrt{3})=\frac{\pi}{3}$. Then $3I^2=$

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

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

Q199 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

$\int_1^2 x\sqrt{4-x^2}\,dx=$

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

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

Q200 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If $[x]$ denotes the greatest integer function of x and $\int_{-3/2}^{3/2}[2x-3]\,dx=k$, then $\left|k+\frac{1}{2}\right|=$

(A) 7
(B) 8
(C) 10
(D) 12

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

Q201 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

$\int_{\pi/11}^{9\pi/22}\frac{dx}{1+\sqrt{\tan x}}=$

(A) $\pi/4$
(B) $\pi/22$
(C) $\pi/11$
(D) $7\pi/44$

Answer: (D) $7\pi/44$ · The council's preliminary key

Q202 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

$\int_0^{2\pi} \cos mx \cos nx \, dx + \int_{-\pi}^{\pi} \sin mx \cos nx \, dx =$

(A) 0, if $m = n$ and $m, n \in \mathbf{Z}$

(B) π if $m = n, m, n \in \mathbf{Z}$

(C) π if $m \neq n, m, n \in \mathbf{Z}$

(D) $2\pi \; \forall \; m, n \in \mathbf{R}$

Answer: (B) π if $m = n, m, n \in \mathbf{Z}$ · The council's preliminary key

Q203 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

$\int_2^5 \sqrt{x + 2\sqrt{x-1}} + \sqrt{x - 2\sqrt{x-1}} \, dx =$

(A) $16/3$

(B) $32/3$

(C) $28/3$

(D) $4/3$

Answer: (C) $28/3$ · The council's preliminary key

Q204 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

$\lim_{n\to\infty} \frac{1}{\sqrt{n}} \left[1 + \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}} + \frac{1}{\sqrt{4}} + \cdots + \frac{1}{\sqrt{n}}\right] =$

(A) $\sqrt{2}$

(B) 2

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

(D) $2\sqrt{2}$

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

Q205 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

$\int_o^{\infty} \left(x^{12} + x^{-12}\right) \frac{\log x}{x} \, dx =$

(A) 0

(B) 1

(C) $\log 2$

(D) e^2

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

Q206 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

$\int_{-1}^{2} \tan^{-1}\left(\frac{x}{x^2+1}\right) + \tan^{-1}\left(\frac{x^2+1}{x}\right) dx =$

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

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

Q207 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

$$\int_{-\pi/2}^{2\pi} \sin^{-1}(\sin x)\,dx =$$

(A) $15\pi^2/8$
(B) $-\pi^2/8$
(C) $-7\pi^2/8$
(D) $7\pi^2/8$

Answer: (B) $-\pi^2/8$ · Checked by our team

Q208 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

$$\int_9^x \frac{f(y)}{y^2}\,dy = 2\sqrt{x} - 6 \;\Rightarrow\; f(x) =$$

(A) $\sqrt{x}$
(B) $x\sqrt{x}$
(C) $x^2\sqrt{x}$
(D) $x + \sqrt{x}$

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

Q209 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

$$\lim_{n\to\infty}\left(\frac{1^2}{n^3+1^3} + \frac{2^2}{n^3+2^3} + \ldots + \frac{1}{2n}\right) =$$

(A) $\log 2$
(B) $2\log 2$
(C) $\frac{1}{2}\log 2$
(D) $\log \sqrt[3]{2}$

Answer: (D) $\log \sqrt[3]{2}$ · The council's preliminary key

Q210 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

If $\int f(x)\,dx = F(x) + C$, then $\frac{d}{dt}\int_{g(t)}^{h(t)} f(x)\,dx =$

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(A) $f(h(t))-f((t))$
(B) $F(h(t))-F(g(t))$
(C) $F(h(t))h'(t)-F(g(t))g'(t)$
(D) $f(h(t))h'(t)-f(g(t))g'(t)$

Answer: (D) $f(h(t))h'(t)-f(g(t))g'(t)$ · The council's preliminary key

Q211 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

$\int_0^{\pi/2} \sin^m x \cos^4 x\, dx = \frac{7\pi}{2048} \Rightarrow m =$

(A) 8
(B) 6
(C) 10
(D) 12

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

Q212 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

$\int_{-\pi}^{\pi} \frac{\cos^{2022} x}{1+(2022)^x}\, dx =$

(A) $\frac{(2022)!}{2^{2022}((1011)!)^2}\pi$
(B) $\left({}^{2022}C_{1011}\right)\pi$
(C) $\left({}^{2022}C_{1011}\right)\frac{\pi}{2^{1011}}$
(D) $\frac{(2022)!}{(1011)!\,2^{2022}}\pi$

Answer: (A) $\frac{(2022)!}{2^{2022}((1011)!)^2}\pi$ · The council's preliminary key

Q213 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

$\int_{-\pi/4}^{\pi/4} \cos^{-8} x\, dx =$

(A) $\frac{14}{15}$
(B) $\frac{174}{35}$
(C) $\frac{192}{35}$
(D) $\frac{198}{35}$

Answer: (C) $\frac{192}{35}$ · The council's preliminary key

Q214 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

$\int_{\alpha-1}^{\alpha} \frac{e^x(\alpha-x)}{(x-\alpha+1)^2}\, dx =$

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(A) $2e^{\alpha}+e$
(B) $\frac{2e^{\alpha+2}}{e-2}$
(C) $e^{\alpha}\frac{(e+2)}{2}$
(D) $e^{\alpha}\left(\frac{e-2}{2}\right)$

Answer: (D) $e^{\alpha}\left(\frac{e-2}{2}\right)$ · The council's preliminary key

Q215 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

For $n \in N$, If $I_n=\int \frac{\sin nx}{\sin x}\,dx=\frac{2}{n-1}\sin(n-1)x+I_{n-2}$ and $\int_0^{\pi}\frac{\sin nx}{\sin x}\,dx=\frac{k\pi}{2}$ then $k=$

(A) $(-1)^n-1$
(B) $1-(-1)^n$
(C) $(-1)^n$
(D) $(-1)^{n+1}$

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

Q216 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If $f(x)=\sin(\tan^{-1}x)$, then $\int_0^1 xf''(x)\,dx=$

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

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

Q217 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

$\int_{-a}^{a}f(x)\,dx-\int_0^a f(-x)\,dx=$

(A) $\int_{-a}^{a}f(a-x)\,dx$
(B) $\int_{-a}^{a}f(x)+f(a-x)\,dx$
(C) $\int_0^a f(x)+f(a-x)\,dx$
(D) $\int_0^a f(a-x)\,dx$

Answer: (D) $\int_0^a f(a-x)\,dx$ · The council's preliminary key

Q218 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

$\int_0^{\pi}\frac{x}{\sin x}\left(3\cos^2x+2\sin x+\sin^3x-3\right)dx=$

(A) $\frac{\pi(5\pi-12)}{4}$
(B) $\frac{\pi}{2}$
(C) $\frac{\pi}{2}(5\pi-6)$
(D) $\frac{\pi(5\pi-12)}{6}$

Answer: (A) $\frac{\pi(5\pi-12)}{4}$ · The council's preliminary key

Q219 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

If $[\,.\,]$ represents greatest integer function, then $\int_{3\pi/4}^{\pi}\left[\sin x+\left[\frac{4x}{\pi}\right]\right]dx=$

(A) $\pi/4$
(B) $\pi/2$
(C) $3\pi/4$
(D) π

Answer: (C) $3\pi/4$ · The council's preliminary key

Q220 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

$\int_0^{\pi}\left(\cos^2\left(\frac{3\pi}{8}-\frac{x}{4}\right)-\cos^2\left(\frac{11\pi}{8}+\frac{x}{4}\right)\right)dx=$

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

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

Q221 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

If f is continuous function and $f(x+T)=f(x),\forall x\in\mathbf{R}$, it is given that $\int_0^{NT}f(t)dt=N\int_0^{T}f(t)dt$ (N is a natural number). Then $\int_0^{50\pi}\sqrt{1-\cos 2x}\,\mathrm{dx}=$

(A) $50\sqrt{2}$
(B) $100\sqrt{2}$
(C) $\frac{50}{\sqrt{2}}$
(D) $\frac{100}{\sqrt{2}}$

Answer: (B) $100\sqrt{2}$ · The council's preliminary key

Q222 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

If $\int_0^{\pi}\frac{dx}{1+2\sin^2 x}=k$, then greatest integer less than or equal to k is

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

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

Q223 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

$$\int_0^{\pi^2/4} \left(2\sin\sqrt{x} + \sqrt{x}\cos\sqrt{x}\right) dx =$$

(A) $\pi/2$
(B) π
(C) $\pi^2/2$
(D) π^2

Answer: (C) $\pi^2/2$ · The council's preliminary key

Q224 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Let $T > 0$ be a fixed number. $f : \mathbf{R} \to \mathbf{R}$ is a continuous function such that $f(x+T) = f(x)$, $x \in \mathbf{R}$. If $I = \int_0^T f(x)\,dx$, then $\int_0^{5T} f(2x)\,dx =$

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

Answer: (C) $5\,I$ · The council's preliminary key

Q225 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

$\int_1^3 x\sqrt[n]{x^2-1}\,dx = 6$ then $n =$

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

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

Q226 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

$[\cdot]$ represents greatest integer function, then $\int_{-1}^{1}(x[1+\sin\pi x]+1)\,dx =$

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(A) 1
(B) 2
(C) 5/2
(D) 3/2

Answer: (C) 5/2 · The council's preliminary key

Q227 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

$\lim_{n\to\infty}\left[\frac{n}{(n+1)\sqrt{2n+1}}+\frac{n}{(n+2)\sqrt{2(2n+2)}}+\frac{n}{(n+3)\sqrt{3(2n+3)}}+\cdots n \text{ terms}\right]=\int_0^1 f(x)\,dx$, then $f(x)=$

(A) $\frac{1}{(1+x)\sqrt{x^2+2x}}$
(B) $\frac{1}{(1+x)\sqrt{x+2}}$
(C) $\frac{1}{(1+x)\sqrt{x^2+x+1}}$
(D) $\frac{1}{(1+x)\sqrt{x^2-2x}}$

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

Q228 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

$[\,.\,]$ represents a greatest integer function. If $\int_{\sqrt{3}}^{\sqrt{18}}[x]dx=a+b\sqrt{2}+c\sqrt{3}$, then $a+b+c=$

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

Answer: (D) 2 · Checked by our team

Q229 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

$\int_0^4 \frac{x+2}{\sqrt{4x-x^2}}dx=$

(A) 2π
(B) 0
(C) π
(D) $\pi/2$

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

Q230 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

$\int_{-\pi}^{\pi}\frac{2x(1+\sin x)}{1+\cos^2 x}dx=$

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(A) 2π

(B) π^2

(C) $\pi + 2$

(D) $\pi/2$

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

Q231 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

$\int_{-1}^{1} \frac{\sin x - x^2}{3 - |x|} dx =$

(A) $7 + 18 \log 3/2$

(B) $18 \log 9/4$

(C) $7 + 9 \log 9/4$

(D) $7 - 18 \log 3/2$

Answer: (D) $7 - 18 \log 3/2$ · The council's preliminary key

Q232 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

$\int_0^1 a^k x^k \, dx =$

(A) $\lim_{n\to\infty} \frac{a^k(1 + 2^k + 3^k \ldots + n^k)}{n^{k+1}}$

(B) $\lim_{n\to\infty} \frac{a^k + a^k + \cdots + a^k}{n^{k+1}}$

(C) $\lim_{n\to\infty} \frac{1}{n} \sum \left(\frac{r}{n}\right)^k$

(D) $\lim_{n\to\infty} \frac{1}{n} \sum \left(\frac{2r}{n}\right)^k$

Answer: (A) $\lim_{n\to\infty} \frac{a^k(1 + 2^k + 3^k \ldots + n^k)}{n^{k+1}}$ · The council's preliminary key

Q233 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

Let α and β $(\alpha < \beta)$ are roots of $18x^2 - 9\pi x + \pi^2 = 0$, $f(x) = x^2$, $g(x) = \cos x$. Then $\int_\alpha^\beta x \, (g \circ f(x)) \, dx =$

(A) $\frac{\sqrt{3}-1}{4}$

(B) $\frac{\sqrt{3}}{4}$

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

(D) $\frac{1}{2}\left(\sin\frac{\pi^2}{9}-\sin\frac{\pi^2}{36}\right)$

Answer: (D) $\frac{1}{2}\left(\sin\frac{\pi^2}{9}-\sin\frac{\pi^2}{36}\right)$ · The council's preliminary key

Q234 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

$\int_0^{\pi} x\left(\sin^2(\sin x)+\cos^2(\cos x)\right)dx =$

(A) π^2

(B) $\pi^2/2$

(C) 2π

(D) $\pi/4$

Answer: (B) $\pi^2/2$ · The council's preliminary key

Q235 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

$\lim_{n\to\infty}\left(\frac{1}{1+n^5}+\frac{2^4}{2^5+n^5}+\frac{3^4}{3^5+n^5}+\ldots+\frac{n^4}{n^5+n^5}\right) =$

(A) $\frac{1}{5}\log 3$

(B) $\frac{1}{3}\log 5$

(C) $\frac{1}{2}\log 5$

(D) $\log\sqrt[5]{2}$

Answer: (D) $\log\sqrt[5]{2}$ · The council's preliminary key

Q236 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If $I_n=\int_0^{\pi/4}\tan^n x\,dx$, then $\frac{1}{I_2+I_4}+\frac{1}{I_3+I_5}+\frac{1}{I_4+I_6} =$

(A) $\frac{1}{I_9+I_{11}}$

(B) $\frac{1}{I_{10}+I_{12}}$

(C) $\frac{1}{I_{12}+I_{14}}$

(D) $\frac{1}{I_{11}+I_{13}}$

Answer: (D) $\frac{1}{I_{11}+I_{13}}$ · The council's preliminary key

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Q237 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

$\int_0^{\pi/4} e^{\tan^2\theta}\sin^2\theta\tan\theta\,d\theta =$

(A) $\frac{1}{2}\left(\frac{e}{2}-1\right)$

(B) $\frac{e}{2}-1$

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

(D) $2\left(\frac{\pi}{2}-e\right)$

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

Q238 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

$\int_{\pi/4}^{5\pi/4}(|\cos t|\sin t+|\sin t|\cos t)dt =$

(A) 0

(B) 1

(C) $1/2$

(D) $\sqrt{3}/2$

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

Q239 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If $f(x)=\text{Max}\{\sin x,\cos x\}$ and $g(x)=\text{Min}\{\sin x,\cos x\}$, then $\int_0^{\pi} f(x)dx+\int_0^{\pi} g(x)dx =$

(A) $2\sqrt{2}+2$

(B) $2\sqrt{2}-2$

(C) 2

(D) $2\sqrt{2}$

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

Q240 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

$\int_e^{e^2}\frac{dx}{x\log x} =$

(A) $-1+\log 2$

(B) $-2+\log 3$

(C) $-\log 3$

(D) $\log 2$

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

Q241 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

$\int_1^3\frac{\log x}{x}\,dx =$

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

Answer: (C) $\frac{1}{2}(\log 3)^2$ · The council's preliminary key

Q242 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

If $\int_a^b x^3\,dx = 0$ and $\int_a^b x^2\,dx = \frac{2}{3}$ then _____

(A) $a = -1$ & $b = 1$
(B) $a = 1$ & $b = -1$
(C) $a = 2$ & $b = -2$
(D) $a = -2$ & $b = 2$

Answer: (A) $a = -1$ & $b = 1$ · The council's preliminary key

Q243 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If $\int_1^4 x\sqrt{x^2-1}\,dx = \alpha(k)^\beta$, then $\alpha\beta =$ _____

(A) $\frac{9}{2}$
(B) $\frac{1}{2}$
(C) $\frac{1}{3}$
(D) $\frac{3}{2}$

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

Q244 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

$\int_0^\pi \frac{x\tan x}{\sec x + \tan x}\,dx =$

(A) $\frac{\pi(\pi-2)}{2}$
(B) $\frac{\pi+2}{2}$
(C) $\frac{\pi(\pi+2)}{2}$
(D) $\frac{\pi-2}{2}$

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

Q245 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If $b > a$, then $\int_a^b \frac{dx}{\sqrt{(x-a)(b-x)}} =$

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

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

Q246 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

$\int_{-\pi/4}^{\pi/4} x \tan\left(1+x^2\right) dx =$

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

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

Q247 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

If $I = \int_0^{\pi} x\left\{\sin^2(\sin x) + \cos^2(\cos x)\right\} dx$, then $[I] =$ _____. Here $[.]$ denotes G.I.F

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

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

Q248 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If $\int_0^1 f(x)\,dx = 1$, $\int_0^1 xf(x)\,dx = a$, $\int_0^1 x^2 f(x)\,dx = a^2$ then $\int_0^1 (x-a)^2 f(x)\,dx =$ _____

(A) a^2
(B) a^2+1
(C) a^2-1
(D) 0

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

Q249 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

$\int_{-1}^{1} \frac{|x|}{x} dx =$

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

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

Q250 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

$$\int_{2/e}^{1/e} \frac{1}{x(\log x)^{1/3}}\,dx =$$

(A) $\frac{3}{2}\left\{1+(\log(2)-1)^{2/3}\right\}$
(B) 1
(C) $\frac{3}{2}\left\{1+(\log(2)+1)^{3/2}\right\}$
(D) $\frac{3}{2}\left\{1-(\log(2)-1)^{2/3}\right\}$

Answer: (D) $\frac{3}{2}\left\{1-(\log(2)-1)^{2/3}\right\}$ · The council's preliminary key

Q251 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If $\int_0^a \frac{dx}{4+x^2} = \frac{\pi}{8}$, then the value of $a =$ _____

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

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

Q252 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

$$\int_1^2 \frac{x^3-1}{x^2}\,dx =$$

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

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

Q253 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $\int_0^{\pi} \log(\sin x)\,dx = 8k$, then $\int_0^{\pi/4} \log(1+\tan x)\,dx =$ _____

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

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

Q254 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $\int_0^1 x^m(1-x)^n\,dx = k\int_0^1 x^n(1-x)^m\,dx$, then the value of k equals _____

(A) m
(B) n
(C) $\frac{1}{mn}$
(D) 1

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

Q255 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

$$\int_2^4 \{|x-2|+|x-3|\}\,dx =$$

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

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

Q256 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

$$\int_{-1/2}^{1/2}\left\{[x]+\log\left(\frac{1+x}{1-x}\right)\right\}dx =$$

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

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

Q257 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

If $\int_0^{\pi/2}\tan^n(x)\,dx = k\int_0^{\pi/2}\cot^n(x)\,dx$, then _____

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(A) $k = 1$

(B) $k = 2$

(C) $k = \frac{1}{2}$

(D) $k = 3$

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

Q258 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

$\int_0^2 xe^x \, dx =$

(A) $e^2 + 1$

(B) $e^2 - 1$

(C) $e^{-1} - 1$

(D) $e^{-1} + 1$

Answer: (A) $e^2 + 1$ · The council's preliminary key

Q259 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

$\int_{\pi/4}^{3\pi/4} \frac{dx}{1 + \cos x} =$

(A) $\pi - 2$

(B) $\pi + 2$

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

(D) $2 \sin \frac{\pi}{2}$

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

Q260 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

$\int_0^{\pi} x \, f(\sin x) \, dx =$

(A) $2\pi \int_0^{\pi/4} f(\sin x) \, dx$

(B) $\pi \int_0^{\pi/4} f(\sin x) \, dx$

(C) $2\pi \int_0^{\pi/2} f(\sin x) \, dx$

(D) $\pi \int_0^{\pi/2} f(\sin x) \, dx$

Answer: (D) $\pi \int_0^{\pi/2} f(\sin x) \, dx$ · The council's preliminary key

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Q261 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

$\int_0^{\pi/2} \frac{\pi \sin x}{1+\cos^2 x}\, dx =$

(A) π^2

(B) $\frac{\pi^2}{2}$

(C) $\frac{\pi^2}{4}$

(D) $\frac{\pi^2}{6}$

Answer: (C) $\frac{\pi^2}{4}$ · The council's preliminary key

Q262 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

$\int_0^{\pi} \sqrt{1+4\sin^2\frac{x}{2}+4\sin\frac{x}{2}}\, dx =$

(A) π

(B) $\pi+2$

(C) $\pi+4$

(D) 0

Answer: (C) $\pi+4$ · The council's preliminary key

Q263 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

$\lim_{n\to\infty} \frac{1}{n} \log\left(\frac{(2n)!}{n^n \cdot n!}\right) = \int_1^2 f(x)\, dx$, then $f(x) =$

(A) $\log(1+x)$

(B) $\log\left(\frac{1}{x}\right)$

(C) $\log x$

(D) $\log\left(\frac{x+1}{x}\right)$

Answer: (C) $\log x$ · The council's preliminary key

Q264 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

$\int_{-\pi/2}^{\pi/2} \sin(x-[x])\, dx =$

(A) $3(1-\cos 1)+\sin 2-\sin 1$

(B) $\cos 2-\sin 2$

(C) $3(1-\cos 1)+\cos 2-\sin 1$

(D) 0

Answer: (A) $3(1-\cos 1)+\sin 2-\sin 1$ · The council's preliminary key

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Q265 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

Let $\{x\}$ denotes the fractional part of a real number x. Then $\int_0^2 \{x\}\,dx =$

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

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

Q266 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

$\int_0^2 \left|1-x^2\right| dx =$

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

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

Q267 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

$\int_5^9 \frac{\log 3x^2}{\log 3x^2+\log(588-84x+3x^2)}\,dx =$

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

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

Q268 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

$\int_{-1}^1 \frac{\log(1+x)}{1+x^2}\,dx = \int_0^1 \frac{\log(1+x)}{1+x^2}\,dx + \int_0^1 f(x)\,dx$ then $f(x) =$

(A) $\frac{\log(1+x)}{1+x^2}$
(B) $-\frac{\log(1+x)}{1+x^2}$
(C) $\frac{\log(1-x)}{1+x^2}$
(D) 0

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

Q269 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

$\lim_{n\to\infty} \frac{1}{n}\left[\sin\frac{\pi}{4} + \sin\frac{\pi}{12}\left(3+\frac{1}{n}\right) + \sin\frac{\pi}{12}\left(3+\frac{2}{n}\right) + \cdots\cdots + \sin\frac{\pi}{3}\right] =$

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(A) $\frac{\sqrt{2}-1}{2\sqrt{2}}$

(B) $\frac{6(\sqrt{2}-1)}{\pi}$

(C) $\frac{\sqrt{2}-1}{6\pi}$

(D) 0

Answer: (B) $\frac{6(\sqrt{2}-1)}{\pi}$ · The council's preliminary key

Q270 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

$$\int_0^{\pi/2} \frac{\sin^{3/2} x}{\sin^{3/2} x + \cos^{3/2} x}\, dx =$$

(A) π

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

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

(D) 0

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

Q271 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

$$\int_0^{\pi/2} \frac{2\sin(x) + 3\cos(x)}{\sin(x) + \cos(x)}\, dx =$$

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

(B) $\frac{3\pi}{4}$

(C) $\frac{5\pi}{4}$

(D) 0

Answer: (C) $\frac{5\pi}{4}$ · The council's preliminary key

Q272 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

$$\int_0^{2a} f(x)\, dx - \int_a^{2a} f(x)\, dx = ____$$

(A) $\int_0^a f(x)\,dx$

(B) $-\int_0^a f(x)\,dx$

(C) $-\int_0^{2a} f(x)\,dx$

(D) $\int_0^{a/2} f(x)\,dx$

Answer: (A) $\int_0^a f(x)\,dx$ · The council's preliminary key

Q273 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

$$\int_0^{\pi/2} \frac{x+\sin x}{1+\cos x}\,dx =$$

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

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

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

(D) $\frac{\pi}{6}$

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

Q274 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If the value of $\int_0^{\pi/2} \sin^4(x)\cdot\cos^2(x)\,dx = \frac{\pi}{32}$ then the value of $\int_0^{\pi/2} \cos^4(x)\cdot\sin^2(x)\,dx =$

(A) $\frac{\pi}{32}$

(B) $\frac{\pi}{64}$

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

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

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

Q275 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

$$\int_{-a}^{a} \sqrt{\frac{a-x}{a+x}}\,dx =$$

(A) $\frac{a\pi}{2}$

(B) 1

(C) $2a\pi$

(D) $a\pi$

Answer: (D) $a\pi$ · The council's preliminary key

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Q276 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

$$\int_0^{\pi/2} \frac{1}{1+\tan^{2020}(x)}\,dx =$$

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

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

Q277 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

$$\int_{-\pi/2}^{\pi/2} (2\sin|x| + \cos|x|)\,dx =$$

(A) 3
(B) 6
(C) 8
(D) 2

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

Q278 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

$$\int_0^{2\pi} \frac{x\cos(x)}{1+\cos(x)}\,dx =$$

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

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

Q279 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Choose the correct option regarding the following definite integrals

A) $\int_0^{\pi/2} \sin^m(x)\cos(x)\,dx = \frac{1}{m+1}$

B) $\int_0^{\pi/2} \sin(x)\cos^n(x)\,dx = \frac{1}{n+1}$

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(A) A is true, B is false
(B) A is false, B is true
(C) Both A and B are false
(D) Both A and B are true

Answer: (D) Both A and B are true · The council's preliminary key

Q280 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

$\int_{\pi/6}^{\pi/3} \frac{1}{1+\sqrt{\cot x}}\,dx =$

(A) $\frac{\pi}{12}$
(B) $\frac{\pi}{6}$
(C) $\frac{\pi}{4}$
(D) $\frac{\pi}{13}$

Answer: (A) $\frac{\pi}{12}$ · The council's preliminary key

Q281 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

The value of $f(1)$, given the equation $\int_0^{x^2} x f(t)\,dt = x^5 - x^3$ is

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

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

Q282 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If $I_1 = \int_0^{\pi/2} \frac{x}{\sin x}\,dx$, and $I_2 = \int_0^1 \frac{\mathrm{Tan}^{-1}x}{x}\,dx$, then $I_1 : I_2$ is

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

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

Q283 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

$\int_0^{\pi/4} \tan^2(x)\,dx =$

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

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

Q284 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

$$\int_0^{\pi/2} |\sin t - \cos t|\, dt =$$

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

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

Q285 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Suppose that f and g are integrable on $[a, b]$, then $f + g$ is integrable on _____

(A) (a, b)
(B) Cannot comment
(C) $[a, b]$
(D) Range of $f + g$

Answer: (C) $[a, b]$ · The council's preliminary key

Q286 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

$$\int_0^{\pi/4} \frac{dx}{\cos^3(x) \cdot \sqrt{2\sin(2x)}} =$$

(A) $\frac{6}{5}$
(B) $\frac{3}{5}$
(C) $\frac{4}{5}$
(D) $\frac{8}{5}$

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

Q287 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

$$\int_{-1}^{2} |x|\, dx =$$

(A) 1
(B) 2
(C) $\frac{5}{2}$
(D) $\frac{3}{2}$

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

Q288 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Find the value of 'k', if it is given that $\int_0^{b-c} f(x+c)\,dx = k\int_c^b f(x)\,dx$

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

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

Q289 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

$\int_0^{\pi/2} e^{\sin x}\cdot\cos x\,dx =$

(A) $1-e$
(B) $1+e$
(C) $e-1$
(D) e

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

Q290 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If $I_n = \int_0^{\pi/2}\sin^n(x)\,dx$ and $I_n = (k)I_{n-2}$ then what will be the value of k ?

(A) $\frac{n}{n-1}$
(B) $\frac{n-1}{n}$
(C) $\frac{n+1}{n}$
(D) $\frac{n}{n+1}$

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

Q291 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

$\int_0^{\pi/4}(\tan^2 x+\tan^4 x)\,dx =$

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

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

Q292 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If f is integrable on $[0, a]$, then the function h defined on $[0, a]$ as $h(x) =$ ___ $\forall x \in [0, a]$ is integrable on $[0, a]$

(A) $f(a - x)$
(B) $f(x - a)$
(C) $f(x)$
(D) $f(a)$

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

Q293 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

$\int_0^k (\sqrt{k} - \sqrt{t})^2 \, dt =$

(A) $\frac{k^2}{2}$
(B) $\frac{k^2}{4}$
(C) $\frac{k^2}{6}$
(D) $\frac{k^2}{8}$

Answer: (C) $\frac{k^2}{6}$ · The council's preliminary key

Q294 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

$\int_1^{e^2} \frac{dx}{x(1 + \log x)^2} =$

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

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

Q295 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The value of x that satisfies the equation $\int_{\sqrt{2}}^{x} \frac{dt}{|t|\sqrt{t^2 - 1}} = \frac{\pi}{12}$ is

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

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

Q296 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

$\int_{-\pi}^{\pi} x^2(\sin x)\,dx =$

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

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

Q297 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

$\int_0^1 \text{Sin}^{-1}\left(\frac{2x}{1+x^2}\right)dx =$

(A) $\pi - \log 2$
(B) $\pi + \log 2$
(C) $\frac{\pi}{2} - \log 2$
(D) $\frac{\pi}{2} + \log 2$

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

Q298 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

$\int_0^1 \frac{8\log(1+x)}{1+x^2}\,dx =$

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

Answer: (A) $\pi \log 2$ · The council's preliminary key

Q299 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

$\int_{-\pi/4}^{\pi/4} x^3 \sin^4(x)\,dx =$

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(A) 0

(B) π

(C) 1

(D) 2π

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

Q300 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

$\lim_{n\to\infty}\left[\frac{n^{3/2}}{n^{5/2}}-\frac{n^{1/2}}{n^{3/2}}+\frac{n^{3/2}}{(n+2)^{5/2}}-\frac{n^{1/2}}{(n+3)^{3/2}}+\frac{n^{3/2}}{(n+4)^{5/2}}-\frac{n^{1/2}}{(n+6)^{3/2}}+\cdots+\frac{n^{3/2}}{(n+2(n-1))^{5/2}}-\frac{n^{1/2}}{(n+3(n-1))^{3/2}}\right]=$

(A) $\frac{-\sqrt{2}}{3}$

(B) $\frac{-1}{9\sqrt{3}}$

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

(D) $\frac{1}{9\sqrt{3}}$

Answer: (B) $\frac{-1}{9\sqrt{3}}$ · Official TGCHE final key

Q301 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

$\lim_{n\to\infty}\left[\frac{n+3}{n^2+1^2}+\frac{n+6}{n^2+2^2}+\frac{n+9}{n^2+3^2}+\cdots\cdots+\frac{2}{n}\right]=$

(A) $\frac{\pi}{4}+\frac{3}{2}\ln 2$

(B) $\frac{\pi}{2}+\frac{3}{4}\ln 2$

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

(D) $\frac{\pi}{4}+\frac{1}{2}\ln 2$

Answer: (A) $\frac{\pi}{4}+\frac{3}{2}\ln 2$ · Official TGCHE final key

Q302 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If $f(x)=\frac{1}{x^3}\int_5^x\left(2u^2-uf'(u)\right)du$, then $f'(5)=$

(A) $\frac{13}{2}$

(B) $\frac{2}{13}$

(C) $\frac{13}{5}$

(D) $\frac{5}{13}$

Answer: (D) $\frac{5}{13}$ · Official TGCHE final key

Q303 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Assertion(A): $\int_{-a}^{a}f(x)\,dx=\int_0^a\left(f(x)+f(-x)\right)dx$

Reason (R): $\int_a^b f(x)\,dx=\int_{g(a)}^{g(b)}f(g(u))\,g'(u)\,du$

The correct option among the following is

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(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: (C) (A) is true but (R) is false · Official TGCHE final key

Q304 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

The positive integer $n \leq 5$ for which $\int_0^1 e^x(x-1)^n dx = 16 - 6e$ is

(A) 5

(B) 4

(C) 3

(D) 2

Answer: (C) 3 · Official TGCHE final key

Q305 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

If $f(x) = \sin^6 x + \cos^6 x + 2\sin^3 x \cos^3 x$, then $\int_0^{\pi/4} \frac{\sin^2 2x}{f(x)} dx =$

(A) 2

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

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

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

Answer: (B) $\frac{2}{3}$ · Official TGCHE final key

Q306 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

$\int_3^5 (x-3)^3(5-x)^5 dx =$

(A) $\frac{64}{63}$

(B) $\frac{25}{7}$

(C) $\frac{3}{32}$

(D) $\frac{16}{25}$

Answer: (A) $\frac{64}{63}$ · Official TGCHE final key

Q307 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

$\lim_{n\to\infty} \frac{1}{n}\left[\frac{1}{n}\text{Sin}^{-1}\frac{1}{n} + \frac{2}{n}\text{Sin}^{-1}\frac{2}{n} + \ldots\cdots + \frac{\pi}{2}\right] =$

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

Answer: (C) $\frac{\pi}{8}$ · Official TGCHE final key

Q308 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

$$\lim_{n\to\infty}\left[\left(1+\frac{1}{n^2}\right)\left(1+\frac{2^2}{n^2}\right)\cdots\left(1+\frac{n^2}{n^2}\right)\right]^{1/n} =$$

(A) e
(B) $2e$
(C) $2e^{\frac{\pi-2}{2}}$
(D) $2e^{\frac{\pi-4}{2}}$

Answer: (D) $2e^{\frac{\pi-4}{2}}$ · Official TGCHE final key

Q309 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

$$\int_{\pi/4}^{\pi/2}\frac{3\,dx}{1+e^{\sqrt{8}\sin\left(x-\frac{3\pi}{8}\right)}} =$$

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

Answer: (D) $\frac{3}{8}\pi$ · Official TGCHE final key

Q310 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

$$\mathrm{Lt}_{n\to\infty}\frac{\pi}{2n}\left[\sin\frac{\pi}{2n}+\sin\frac{2\pi}{2n}+\ldots\ldots+\sin\frac{\pi}{2}\right] =$$

(A) 1
(B) 0
(C) 4
(D) 3

Answer: (A) 1 · Official TGCHE final key

Q311 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

$$\int_0^{\pi/2}\frac{dx}{4+5\sin x} =$$

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

Answer: (B) $\frac{1}{3}\log 2$ · Official TGCHE final key

Q312 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

$\int_0^{\pi/2} x^3 \sin x\, dx =$

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

Answer: (D) $\frac{3\pi^2}{4} - 6$ · Official TGCHE final key

Q313 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

$\underset{n\to\infty}{Lt} \prod_{r=1}^{n} \left(1 + \frac{r^2}{n^2}\right)^{\frac{2r}{n^2}} =$

(A) $\log\left(\frac{4}{e}\right)$
(B) $\log\left(\frac{2}{e}\right)$
(C) $\frac{2}{e}$
(D) $\frac{4}{e}$

Answer: (D) $\frac{4}{e}$ · Official TGCHE final key

Q314 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

If $I_n = \int_0^a \frac{x^n}{\sqrt{a^2 - x^2}}\, dx$, then $\frac{I_8}{I_4} =$

(A) $\frac{48}{35a^2}$
(B) $\frac{35}{48}a^4$
(C) $\frac{19}{72}a^6$
(D) $\frac{29}{56}a^4$

Answer: (B) $\frac{35}{48}a^4$ · Official TGCHE final key

Q315 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

$\int_{-5}^{5} x^4(25 - x^2)^{5/2}\, dx =$

(A) $\frac{5^9}{2} \cdot \frac{\pi}{2}$
(B) $\frac{16(5^9)}{63}$
(C) $\frac{3(5^{10})}{256}\pi$
(D) $\frac{16(5^{10})}{693}$

Answer: (C) $\frac{3(5^{10})}{256}\pi$ · Official TGCHE final key

Q316 TS EAMCET 2019 · 6 May · Shift 1 MCQ

$\int_0^{\pi/4} \frac{\cos^2 x}{\cos^2 x + 4\sin^2 x} dx =$

(A) $\frac{\pi}{4} + \frac{2}{3}\text{Tan}^{-1}2$
(B) $\frac{-\pi}{3} - \frac{2}{3}\text{Tan}^{-1}3$
(C) $\frac{-\pi}{12} + \frac{2}{3}\text{Tan}^{-1}2$
(D) $\frac{\pi}{6} - \frac{2}{3}\text{Tan}^{-1}4$

Answer: (C) $\frac{-\pi}{12} + \frac{2}{3}\text{Tan}^{-1}2$ · Official TGCHE final key

Q317 TS EAMCET 2019 · 6 May · Shift 1 MCQ

$\lim_{n\to\infty}\left[\frac{n}{n^2+1} + \frac{n}{2^2+n^2} + \cdots + \frac{1}{2n}\right] =$

(A) $\frac{\pi}{4}$
(B) $\log 2$
(C) 0
(D) 1

Answer: (A) $\frac{\pi}{4}$ · Official TGCHE final key

Q318 TS EAMCET 2019 · 4 May · Shift 1 MCQ

$\int_{\pi/4}^{\pi/2} \cot^9 x\, dx =$

(A) $\frac{-7}{24} + \frac{1}{2}\log 2$
(B) $\frac{7}{24} - \frac{1}{2}\log 2$
(C) $\frac{25}{24} + \frac{1}{2}\log 2$
(D) $\frac{1}{24} + 2\log 2$

Answer: (A) $\frac{-7}{24} + \frac{1}{2}\log 2$ · Official TGCHE final key

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Q319 TS EAMCET 2019 · 4 May · Shift 1 MCQ

Let $f(x)$ be an even function with period 2 and $f(x)$ be integrable on every interval. If $g(x) = \int_0^x f(t)\,dt$, then $g(x+2) =$

(A) $g(x)\,g(2)$
(B) $g(x) + g(2)$
(C) $g(x)$
(D) $g(2)$

Answer: (B) $g(x) + g(2)$ · Official TGCHE final key

Q320 TS EAMCET 2019 · 4 May · Shift 1 MCQ

Let $[x]$ be greatest integer function. Then $\int_{-1}^{1}[x + 2[x + 2[x]]]\,dx =$

(A) 0
(B) -5
(C) -7
(D) 10

Answer: (C) -7 · Official TGCHE final key

Q321 TS EAMCET 2019 · 4 May · Shift 2 MCQ

$\int_{1/3}^{3} \frac{1}{x}\sin\left(\frac{1}{x} - x\right)dx =$

(A) 0
(B) $\frac{4}{3}$
(C) $\frac{5}{3}$
(D) $\frac{8}{3}$

Answer: (A) 0 · Official TGCHE final key

Q322 TS EAMCET 2019 · 4 May · Shift 2 MCQ

$\int_{-1}^{3/2} |x\sin(\pi x)|\,dx =$

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

Answer: (D) $\frac{3}{\pi} + \frac{1}{\pi^2}$ · Official TGCHE final key

Q323 TS EAMCET 2019 · 3 May · Shift 1 MCQ

$\lim_{n\to\infty} \sum_{k=1}^{n} \frac{k}{n^2+k^2} =$

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

Answer: (A) $\frac{1}{2}\log 2$ · Official TGCHE final key

Q324 TS EAMCET 2019 · 3 May · Shift 1 MCQ

$\int_0^{10}\left(5-\sqrt{10x-x^2}\right)dx =$

(A) $50-25\pi$
(B) $(100-25\pi)$
(C) $\frac{1}{2}(100-25\pi)$
(D) $\frac{1}{4}(100-25\pi)$

Answer: (C) $\frac{1}{2}(100-25\pi)$ · Official TGCHE final key

Q325 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If $\int_0^3 (3x^2-4x+2)\,dx = k$, then a root of $3x^2-4x+2=\frac{3k}{5}$ that lies in the interval $[0,3]$ is

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

Answer: (B) $\frac{7}{3}$ · Official TGCHE final key

Q326 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If $\int_0^{2a} x^2\sqrt{2ax-x^2}\,dx = ka^4$, then $k:\pi =$

(A) $1:8$
(B) $3:8$
(C) $5:8$
(D) $9:8$

Answer: (C) $5:8$ · Official TGCHE final key

Q327 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

$\lim_{n\to\infty}\frac{1}{n}\left[(n+1)(n+2)\ldots(2n)\right]^{\frac{1}{n}} =$

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

Answer: (D) $\frac{4}{e}$ · Official APSCHE final key

Q328 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

$\int_0^{\frac{\pi}{2}} \frac{\sin^2 x}{\sin x + \cos x}\, dx =$

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

Answer: (B) $\frac{1}{\sqrt{2}} \log\left(\sqrt{2}+1\right)$ · Official APSCHE final key

Q329 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If $A_n = \int_{\frac{\pi}{2}}^{\infty} e^{-x} \cdot \cos^n x\, dx$, then $\frac{A_4 - A_6}{A_4} =$

(A) $\frac{3}{2}$
(B) $\frac{7}{37}$
(C) $\frac{5}{37}$
(D) $\frac{2}{7}$

Answer: (B) $\frac{7}{37}$ · Official APSCHE final key

Q330 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

$\lim_{n\to\infty} \left\{\frac{1}{n+m} + \frac{1}{n+2m} + \frac{1}{n+3m} + \ldots + \frac{1}{n+nm}\right\} =$

(A) $\frac{\log_e(m)}{m}$
(B) $\frac{\log_e(1+m)}{1+m}$
(C) $\frac{\log_e(1+m)}{m}$
(D) $\frac{\log_e(1+m)}{1-m}$

Answer: (C) $\frac{\log_e(1+m)}{m}$ · Official APSCHE final key

Q331 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

$\mathrm{Tan}^{-1}\left[\int_{\frac{-\pi}{2}}^{\frac{\pi}{2}} \frac{\cos x}{1+e^x}\, dx\right] =$

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

Answer: (A) $\frac{\pi}{4}$ · Official APSCHE final key

Q332 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

$$\lim_{n\to\infty} \frac{1+32+243+\ldots+n^5}{n^6} =$$

(A) $\frac{1}{5}$
(B) $\frac{1}{11}$
(C) $\frac{1}{6}$
(D) $\frac{1}{2}$

Answer: (C) $\frac{1}{6}$ · Official APSCHE final key

Q333 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

Let $a > 1$ and $b > 1$. If $f(t)$ is a periodic function of period T and $\int_0^{\infty} a^{-bt} f(t)\,dt = k\int_0^{T} a^{-bt} f(t)\,dt$, then $k =$

(A) $\frac{a^{bT}}{T+1}$
(B) $\frac{a^{-bT}}{a^{-bT}+1}$
(C) $\frac{a^{bT}}{b^{aT}+1}$
(D) $\frac{a^{bT}}{a^{bT}-1}$

Answer: (D) $\frac{a^{bT}}{a^{bT}-1}$ · Official APSCHE final key

Q334 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If $\lim_{n\to\infty}\left[\left(1+\frac{1}{n^2}\right)\left(1+\frac{2^2}{n^2}\right)\ldots\left(1+\frac{n^2}{n^2}\right)\right]^{1/n} = k$, then $\log k =$

(A) $\log 4 + \frac{\pi}{2} - 1$
(B) $\log 2 + \frac{\pi}{2} + 1$
(C) $\log 2 + \frac{\pi}{2} - 2$
(D) $\log 2 + \frac{\pi}{2} - 1$

Answer: (C) $\log 2 + \frac{\pi}{2} - 2$ · Official APSCHE final key

Q335 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

$$\int_0^{\pi/2} \frac{\sin^3 x \cos x\,dx}{\sin^4 x + \cos^4 x} =$$

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(A) π

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

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

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

Answer: (D) $\frac{\pi}{8}$ · Official APSCHE final key

Q336 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

$\lim_{n\to\infty} \frac{\sqrt{1}+\sqrt{2}+\ldots+\sqrt{n}}{n^{3/2}} =$

(A) 0

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

(C) 1

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

Answer: (B) $\frac{2}{3}$ · Official APSCHE final key

Q337 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

$\int_0^{\infty} e^{-x} \sin^6 x \, dx =$

(A) $\frac{24}{85}$

(B) $\frac{124}{285}$

(C) $\frac{136}{529}$

(D) $\frac{144}{629}$

Answer: (D) $\frac{144}{629}$ · Official APSCHE final key

Q338 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

$\int_0^1 \frac{\log_e(1+x)}{1+x^2} dx =$

(A) $\frac{\pi}{4}\log_e 2$

(B) $\frac{\pi}{6}\log_e 6$

(C) $\frac{\pi}{2}\log_e 8$

(D) $\frac{\pi}{8}\log_e 2$

Answer: (D) $\frac{\pi}{8}\log_e 2$ · Official APSCHE final key

Q339 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

$\lim_{n\to\infty} \left[\frac{1}{n} + \frac{n^2}{(n+1)^3} + \frac{n^2}{(n+2)^3} + \frac{n^2}{(n+3)^3} + \cdots + \frac{1}{125n}\right] =$

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(A) $\frac{3}{8}$
(B) $\frac{15}{32}$
(C) $\frac{12}{25}$
(D) $\frac{35}{72}$

Answer: (C) $\frac{12}{25}$ · Official APSCHE final key

Q340 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

$\int_{e^{-1}}^{e^2} \left|\frac{\log x}{x}\right| dx =$

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

Answer: (D) $\frac{5}{2}$ · Official APSCHE final key

Q341 TS EAMCET 2018 · 7 May · Shift 1 MCQ

$\int_0^{1/2} |\sin 4\pi x|\, dx =$

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

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

Q342 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If $f(n) = \frac{1}{n}\left[(n+1)(n+2)(n+3)\ldots(2n)\right]^{1/n}$, then $\lim_{n\to\infty} f(n) =$

(A) $\frac{4}{e}$
(B) $\log\left(\frac{4}{e}\right)$
(C) $\frac{2}{e}$
(D) $\log\left(\frac{2}{e}\right)$

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

Q343 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $f(x) = \int_1^x \frac{1}{2+t^4} dt$, then

(A) $\frac{1}{18} < f(2) < \frac{1}{3}$
(B) $f(2) < \frac{1}{2}$ (or) $f(2) > 2$
(C) $f(2) < \frac{1}{3}$
(D) $f(2) > \frac{1}{3}$

Answer: (A) $\frac{1}{18} < f(2) < \frac{1}{3}$ · The council's preliminary key

Q344 TS EAMCET 2018 · 5 May · Shift 1 MCQ

If $I_n = \int_{\pi/2}^{\infty} e^{-x} \cos^n x \, dx$, then $\frac{I_{2018}}{I_{2016}} =$

(A) $\frac{2018 \times 2019}{(2017)^2+1}$
(B) $\frac{2018 \times 2017}{(2018)^2+1}$
(C) $\frac{(2018)(2016)}{(2017)^2+1}$
(D) $\frac{(2018)(2017)}{(2019)^2+1}$

Answer: (B) $\frac{2018 \times 2017}{(2018)^2+1}$ · The council's preliminary key

Q345 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If $f(x) = \frac{|\log x|}{x^2}$, then $\int_{1/e}^{e} f(x)\, dx =$

(A) e
(B) $1 - \frac{1}{e}$
(C) $e^2\left(1 - \frac{1}{e}\right)$
(D) $2\left(1 - \frac{1}{e}\right)$

Answer: (D) $2\left(1 - \frac{1}{e}\right)$ · The council's preliminary key

Q346 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If $I = \int_0^{\pi/2} \frac{dx}{5 + 3\sin x} = \lambda \operatorname{Tan}^{-1}\left(\frac{1}{2}\right)$, then $\lambda =$

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

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

Q347 TS EAMCET 2018 · 4 May · Shift 1 MCQ

$\int_0^{\pi/2} \frac{dx}{1+(\tan x)^{\sqrt{2018}}} =$

(A) π

(B) $\frac{3\pi}{4}$

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

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

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

Q348 TS EAMCET 2018 · 4 May · Shift 1 MCQ

$\int_0^{\pi/2} \frac{\cos^3 x}{\sin x + \cos x} dx =$

(A) $\frac{\pi - 1}{2}$

(B) $\frac{\pi - 1}{4}$

(C) $\frac{1+\pi}{4}$

(D) $\frac{\pi - 3}{4}$

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

Q349 TS EAMCET 2018 · 4 May · Shift 1 MCQ

$\int_0^3 (2 + x^2) dx =$

(A) $\lim_{n\to\infty} \frac{1}{n}\left[2n + \frac{1^2 + 2^2 + \ldots + (3n)^2}{n^2}\right]$

(B) $\lim_{n\to\infty} \frac{1}{n}\left[3n + \frac{1^2 + 2^2 + \ldots + 6n^2}{n^2}\right]$

(C) $\lim_{n\to\infty} \frac{1}{n}\left[6n + \frac{1^2 + 2^2 + \ldots + 9n^2}{n^2}\right]$

(D) $\lim_{n\to\infty} \frac{1}{n}\left[3n + \frac{1^2 + 2^2 + \ldots + 3n^2}{n^2}\right]$

Answer: (C) $\lim_{n\to\infty} \frac{1}{n}\left[6n + \frac{1^2 + 2^2 + \ldots + 9n^2}{n^2}\right]$ · The council's preliminary key

Q350 TS EAMCET 2018 · 4 May · Shift 2 MCQ

If $\lim_{n\to\infty} \sum_{r=1}^{n} \frac{4r^3}{r^4 + n^4} = p$, then $e^p =$

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

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

Q351 TS EAMCET 2018 · 4 May · Shift 2 MCQ

$e^{\int_0^{\pi/2} \sqrt{\frac{1-\sin 2x}{1+\sin 2x}}\, dx} =$

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

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

Q352 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

$\lim_{n\to\infty} \left[\left(1+\frac{1}{n^2}\right)\left(1+\frac{2^2}{n^2}\right)\cdots\left(1+\frac{n^2}{n^2}\right)\right]^{\frac{1}{n}} =$

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

Answer: (C) $2e^{\frac{\pi-4}{2}}$ · The council's preliminary key

Q353 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

$\int_0^{\frac{\pi}{2}} \frac{\cos x\, dx}{\sqrt{1+\cos x \sin x}} =$

(A) $\sqrt{2}\,\mathrm{Cos}^{-1}\left(\frac{1}{\sqrt{3}}\right)$
(B) $\frac{1}{\sqrt{2}}\mathrm{Sin}^{-1}\left(\frac{1}{\sqrt{3}}\right)$
(C) $\sqrt{2}\,\mathrm{Sin}^{-1}\left(\frac{1}{\sqrt{3}}\right)$
(D) $\sqrt{2}\,\mathrm{Sin}^{-1}(\sqrt{3})$

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

Q354 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

$\lim_{n\to\infty} \sum_{n=5}^{5n+5} \frac{n^2}{(n^2+r^2)^{\frac{3}{2}}} =$

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(A) $\frac{1}{\sqrt{2}}$
(B) $\frac{1}{3}\log 2$
(C) $\frac{\pi}{4}$
(D) $\frac{5}{\sqrt{26}}$

Answer: (D) $\frac{5}{\sqrt{26}}$ · The council's preliminary key

Q355 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If $a_n = \int_0^{\frac{\pi}{2}} \frac{\sin^2 nx}{\sin x} dx$, then $a_2 - a_1,\ a_3 - a_2,\ a_4 - a_3$ are in

(A) Arithmetic progression
(B) Geometric progression
(C) Harmonic progression
(D) Arithmetico-geometric progression

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

Q356 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If a and b are positive integers such that $b > a$, then $\lim_{n\to\infty}\left[\frac{1}{na} + \frac{1}{na+1} + \frac{1}{na+2} + \ldots + \frac{1}{nb}\right] =$

(A) $\log\left(\frac{b}{a}\right)$
(B) $\log\left(\frac{a}{b}\right)$
(C) $\log(ab)$
(D) $\log(a+b)$

Answer: (A) $\log\left(\frac{b}{a}\right)$ · The council's preliminary key

Q357 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

$\int_0^{\pi} \frac{x\tan x}{\sec x + \tan x}\, dx =$

(A) $\frac{\pi-2}{2}$
(B) $\frac{\pi+2}{2}$
(C) $\frac{\pi(\pi+2)}{2}$
(D) $\frac{\pi(\pi-2)}{2}$

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

Q358 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

$\lim_{n\to\infty} \frac{1}{n}\left\{\sin^5\left(\frac{\pi}{6n}\right) + \sin^5\left(\frac{2\pi}{6n}\right) + \sin^5\left(\frac{3\pi}{6n}\right) + \ldots + \sin^5\left(\frac{\pi}{2}\right)\right\} =$

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(A) $\frac{8}{15\pi}$
(B) $\frac{8}{5\pi}$
(C) $\frac{32}{5\pi}$
(D) $\frac{16}{5\pi}$

Answer: (D) $\frac{16}{5\pi}$ · The council's preliminary key

Q359 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

$\int_0^{\pi/2} \log_e(\sin 2x)dx$

(A) $\pi \log 2$
(B) $-\pi \log 2$
(C) $\frac{\pi}{2} \log 2$
(D) $-\frac{\pi}{2} \log 2$

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

Q360 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $[x]$ denotes the greatest integer $\leq x$, then $\lim_{n\to\infty} \frac{1}{n^3}\left\{[1^2x] + [2^2x] + [3^2x] + \ldots + [n^2x]\right\} =$

(A) $\frac{x}{2}$
(B) $\frac{x}{3}$
(C) $\frac{x}{6}$
(D) 0

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

Q361 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

$\lim_{n\to\infty} \left(\frac{\sqrt{1}+2\sqrt{2}+3\sqrt{3}+\ldots+n\sqrt{n}}{n^{5/2}}\right) =$

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

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

Q362 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

$\int_0^{\alpha/3} \frac{f(x)}{f(x)+f\left(\frac{\alpha-3x}{3}\right)}dx =$

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

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

Q363 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

For $n \geq 2$, let $I_n = \int_0^{\pi/4} \tan^n x \, dx$ and $F_n = I_n + I_{n-2}$. Then $F_n - F_{n+1} =$

(A) $\frac{1}{n}$
(B) $\frac{1}{n-1}$
(C) $\frac{1}{n(n-1)}$
(D) $1+n$

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

Q364 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

$\lim_{n\to\infty} n\left[\frac{1}{3n^2+8n+4} + \frac{1}{3n^2+16n+16} + \ldots + \frac{1}{15n^2}\right] =$

(A) $\frac{1}{2}\log\frac{9}{5}$
(B) $\frac{1}{4}\log\frac{9}{5}$
(C) $2\log\frac{9}{5}$
(D) $\frac{1}{4}\log\frac{5}{9}$

Answer: (B) $\frac{1}{4}\log\frac{9}{5}$ · The council's preliminary key

Q365 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

$\int_0^3 \left|x^2 - 3x + 2\right| dx =$

(A) $\frac{3}{2}$
(B) $\frac{1}{6}$
(C) $\frac{11}{6}$
(D) $\frac{11}{2}$

Answer: (C) $\frac{11}{6}$ · The council's preliminary key

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Q366 TS EAMCET 2017 · 12 May · Offline MCQ

Match the following.

List I

I) $\int_{-1}^{1} x|x|\,dx$

II) $\int_{0}^{\pi/2} \left(1+\log\left(\frac{4+3\sin x}{4+3\cos x}\right)\right) dx$

III) $\int_{0}^{a} f(x)\,dx$

IV) $\int_{-a}^{a} f(x)\,dx$

List II

a) $\frac{\pi}{2}$

b) $\int_{0}^{a/2} f(x)\,dx$

c) $\int_{0}^{a} [f(x)+f(-x)]\,dx$

d) 0

e) $\int_{0}^{a} f(a-x)\,dx$

(A) I-d, II-a, III-e, IV-c

(B) I-d, II-a, III-c, IV-b

(C) I-d, II-c, III-a, IV-e

(D) I-a, II-d, III-b, IV-c

Answer: (A) I-d, II-a, III-e, IV-c · The council's preliminary key

Q367 TS EAMCET 2017 · 12 May · Offline MCQ

$$\int_{0}^{\pi} \frac{x\,dx}{4\cos^2 x + 9\sin^2 x} =$$

(A) $\frac{\pi^2}{12}$

(B) $\frac{\pi^2}{4}$

(C) $\frac{\pi^2}{6}$

(D) $\frac{\pi^2}{3}$

Answer: (A) $\frac{\pi^2}{12}$ · The council's preliminary key

Q368 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

$$\lim_{n\to\infty}\left[\frac{1^k+2^k+3^k+\cdots+n^k}{n^{k+1}}\right] =$$

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

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

Q369 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

If $\int_0^{10} f(x)\,dx = 5$, then $\sum_{k=1}^{10} \int_0^1 f(k-1+x)\,dx =$

(A) 50
(B) 20
(C) 10
(D) 5

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

Q370 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

$\lim_{n\to\infty}\left\{\frac{1}{\sqrt{4n^2-1^2}}+\frac{1}{\sqrt{4n^2-2^2}}+\frac{1}{\sqrt{4n^2-3^2}}+---+\frac{1}{\sqrt{4n^2-n^2}}\right\} =$

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

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

Q371 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

If $\int_{-1}^{4} f(x)dx = 4$ and $\int_2^4 (3-f(x))dx = 7$ then $\int_{-1}^{2} f(x)dx =$

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

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

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Q372 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

$\lim_{n\to\infty} \frac{1}{n} \sum_{r=1}^{2n} \frac{r}{\sqrt{n^2+r^2}} =$

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

Answer: (B) $-1+\sqrt{5}$ · The council's preliminary key

Q373 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

$\int_0^{\pi/2} \mathrm{Sin}^8 x \, dx =$

(A) $\frac{15\pi}{256}$
(B) $\frac{25\pi}{256}$
(C) $\frac{35\pi}{256}$
(D) $\frac{35}{256}$

Answer: (C) $\frac{35\pi}{256}$ · The council's preliminary key

Q374 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

$$\int_{-1}^{3/2} |x \sin \pi x| \, dx =$$

(A) $\frac{2}{\pi}+\frac{1}{\pi^2}$
(B) $\frac{3}{\pi}+\frac{1}{\pi^2}$
(C) $\frac{4}{\pi}+\frac{1}{\pi^2}$
(D) $\frac{1}{\pi}+\frac{2}{\pi^2}$

Answer: (B) $\frac{3}{\pi}+\frac{1}{\pi^2}$ · The council's preliminary key

Q375 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

By the definition of the definite integral, the value of

$$\lim_{n\to\infty}\left[\frac{1^2}{1^3+n^3}+\frac{2^2}{2^3+n^3}+\ldots+\frac{r^2}{r^3+n^3}+\ldots+\frac{1}{2n}\right] =$$

(A) $\sqrt[4]{\log 2}$
(B) $\log \sqrt[3]{2}$
(C) $\sqrt{\log 2}$
(D) $\log \sqrt[3]{3}$

Answer: (B) $\log \sqrt[3]{2}$ · The council's preliminary key

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Q376 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

$\int_0^{\pi} x \sin^7 x \cos^6 x \, dx =$

(A) $\frac{8\pi}{1002}$

(B) $\frac{18\pi}{1003}$

(C) $\frac{16\pi}{3003}$

(D) $\frac{6\pi}{3003}$

Answer: (C) $\frac{16\pi}{3003}$ · The council's preliminary key

Q377 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

$\lim_{n\to\infty} \left[\frac{1}{n} + \frac{1}{n+1} + \frac{1}{n+2} + \cdots + \frac{1}{3n}\right] =$

(A) $\log 2$

(B) $\log 3$

(C) $\log 4$

(D) $\log 5$

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

Q378 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

$\int_{-2}^{3} \left|1 - x^2\right| dx =$

(A) $\frac{28}{3}$

(B) $\frac{14}{3}$

(C) $\frac{7}{3}$

(D) $\frac{1}{3}$

Answer: (A) $\frac{28}{3}$ · The council's preliminary key

Q379 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

$\int_0^{\pi} \frac{x \sin x}{1+\cos^2 x} dx =$

(A) $\frac{\pi^2}{4}$

(B) $\frac{\pi^2}{2}$

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

(D) π^2

Answer: (A) $\frac{\pi^2}{4}$ · The council's preliminary key

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Q380 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

$$\lim_{n\to\infty}\left[\frac{\sqrt{n^2-1^2}}{n^2}+\frac{\sqrt{n^2-2^2}}{n^2}+\frac{\sqrt{n^2-3^2}}{n^2}+\ldots \text{ to } n \text{ terms}\right]=$$

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

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

Q381 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If $\int_3^5 \sqrt{8x-x^2-15}\,dx = p$, then $\sin p + \operatorname{cosec} p =$

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

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

Q382 TS EAMCET 2016 · 15 May · Offline MCQ

$\int_0^{\pi/4} \frac{\sin x+\cos x}{7+9\sin 2x}\,dx =$

(A) $\frac{\log 3}{4}$
(B) $\frac{\log 3}{36}$
(C) $\frac{\log 7}{12}$
(D) $\frac{\log 7}{24}$

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

Q383 TS EAMCET 2016 · 15 May · Offline MCQ

$\int_0^{\pi/4} \left[\sqrt{\tan x}+\sqrt{\cot x}\right] dx =$

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

Answer: (A) $\frac{\pi}{\sqrt{2}}$ · Official TGCHE final key

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Q384 AP EAMCET 2016 · 29 Apr · Offline MCQ

By the definition of the definite integral, the value of $\lim_{n\to\infty}\left(\frac{1}{\sqrt{n^2-1}}+\frac{1}{\sqrt{n^2-2^2}}+\cdots+\frac{1}{\sqrt{n^2-(n-1)^2}}\right)$ is equal to

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

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

Q385 AP EAMCET 2016 · 29 Apr · Offline MCQ

$\int_{-\pi/4}^{\pi/4}\left(\frac{x+\frac{\pi}{4}}{2-\cos 2x}\right)dx =$

(A) $\frac{8\pi\sqrt{3}}{5}$
(B) $\frac{2\pi\sqrt{3}}{9}$
(C) $\frac{4\pi^2\sqrt{3}}{9}$
(D) $\frac{\pi^2}{6\sqrt{3}}$

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

Q386 AP EAMCET 2014 · 22 May · Offline MCQ

By the definition of the definite integral, the value of $\lim_{n\to\infty}\left(\frac{1^4}{1^5+n^5}+\frac{2^4}{2^5+n^5}+\frac{3^4}{3^5+n^5}+\ldots\cdots+\frac{n^4}{n^5+n^5}\right)$ is

(A) $\log 2$
(B) $\frac{1}{5}\log 2$
(C) $\frac{1}{4}\log 2$
(D) $\frac{1}{3}\log 2$

Answer: (B) $\frac{1}{5}\log 2$ · The council's preliminary key

Q387 AP EAMCET 2014 · 22 May · Offline MCQ

$\int_0^{\pi/6}\cos^4 3\theta\cdot\sin^2 6\theta\,d\theta =$

(A) $\frac{\pi}{96}$
(B) $\frac{5}{192}$
(C) $\frac{5\pi}{256}$
(D) $\frac{5\pi}{192}$

Answer: (D) $\frac{5\pi}{192}$ · The council's preliminary key

Q388 AP EAMCET 2013 · 10 May · Offline MCQ

If $\int_0^b \frac{dx}{1+x^2} = \int_b^\infty \frac{dx}{1+x^2}$, then $b =$

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

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

Q389 AP EAMCET 2013 · 10 May · Offline MCQ

The approximate value of $\int_1^3 \frac{dx}{2+3x}$ using Simpson's Rule and dividing the interval $[1,3]$ into two equal parts is

(A) $\frac{1}{3}\log\left(\frac{11}{5}\right)$
(B) $\frac{107}{110}$
(C) $\frac{29}{110}$
(D) $\frac{119}{440}$

Answer: (C) $\frac{29}{110}$ · The council's preliminary key

Q390 AP EAMCET 2012 · 12 May · Offline MCQ

$a > 0$, $\int_{-\pi}^{\pi} \frac{\sin^2 x}{1+a^x} dx =$

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

Answer: (A) $\frac{\pi}{2}$ · Official APSCHE final key

Q391 AP EAMCET 2012 · 12 May · Offline MCQ

The value of the integral $\int_0^4 \frac{dx}{1+x^2}$ obtained by using Trapezoidal rule with $h = 1$ is

(A) $\frac{63}{85}$
(B) $\tan^{-1}(4)$
(C) $\frac{108}{85}$
(D) $\frac{113}{85}$

Answer: (D) $\frac{113}{85}$ · Official APSCHE final key

Q392 AP EAMCET 2011 · 8 May · Offline MCQ

If $I_n = \int_0^{\pi/4} \tan^n \theta \, d\theta$ for $n = 1, 2, 3, \ldots\ldots$ then $I_{n-1} + I_{n+1} = \ldots$

(A) 0
(B) 1
(C) $\frac{1}{n}$
(D) $\frac{1}{n+1}$

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

Q393 AP EAMCET 2011 · 8 May · Offline MCQ

Let $f(0) = 1,\ f(0.5) = \frac{5}{4},\ f(1) = 2,\ f(1.5) = \frac{13}{4}$ and $f(2) = 5$. Using Simpson's rule, $\int_0^2 f(x)\,dx =$

(A) $\frac{14}{3}$
(B) $\frac{7}{6}$
(C) $\frac{14}{9}$
(D) $\frac{7}{9}$

Answer: (A) $\frac{14}{3}$ · The council's preliminary key

Q394 AP EAMCET 2010 · 30 May · Offline MCQ

If $\mathrm{I}_n = \int_0^{\pi/4} \tan^n x \, dx$, then $\mathrm{I}_2 + \mathrm{I}_4, \mathrm{I}_3 + \mathrm{I}_5, \mathrm{I}_4 + \mathrm{I}_6, \ldots\ldots\ldots$ are in :

(A) arithmetic progression
(B) geometric progression
(C) harmonic progression
(D) arithmetico-geometric progression

Answer: (C) harmonic progression · Official APSCHE final key

Q395 AP EAMCET 2010 · 30 May · Offline MCQ

The values of a function $f(x)$ at different values of x are as follows :
x : 0, 1, 2, 3, 4, 5
$f(x)$: 2, 3, 6, 11, 18, 27
Then the approximate area (in square units) bounded by the curve $y = f(x)$ and X-axis between $x = 0$ and 5, using the Trapezoidal rule, is :

(A) 50
(B) 75
(C) 52.5
(D) 62.5

Answer: (C) 52.5 · Official APSCHE final key

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