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MATHEMATICS · EAPCET (EAMCET)

Sets, Relations & Functions

Previous Year Questions with answers

386 questions · **148** papers · **2010–2026** · newest paper first

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

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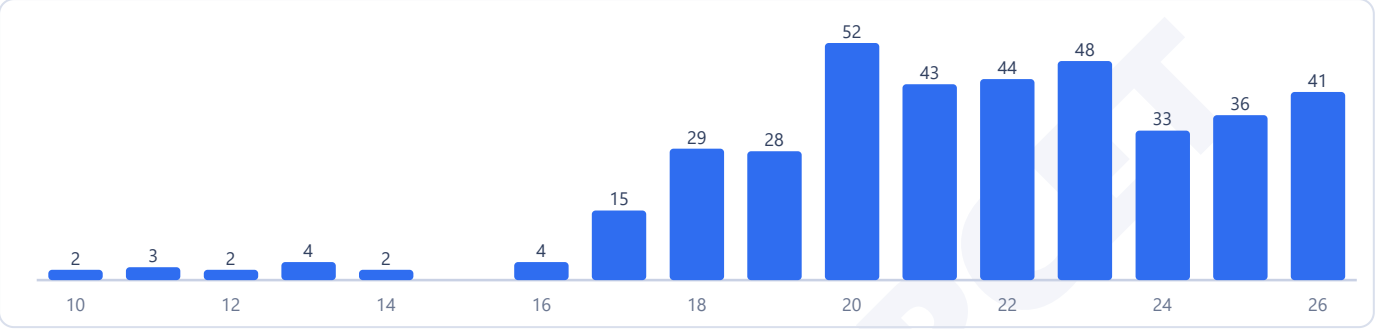
Chapter at a glance

3.3%	386	77 of 77	386 / 0
of Mathematics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 2.4 questions per paper in 2024–2026 against 3 in 2022–2023.

Questions per year



Counts are the questions we hold: 386 in 148 papers. 10 questions in this chapter came back in more than one paper.

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

Functions	377
Sets	6
Relations	3

How often it comes up

Sets, Relations & Functions serves as the indispensable structural bedrock of the senior secondary mathematics syllabus. Spanning the entire historical period from 2010 through 2026, the chapter supplied 386 questions across 149 evaluated examination papers, appearing in 148 of those tests to record an average of 2.6 questions per paper and a 3.2 percent subject share. In contemporary testing from 2022 to 2026, Sets, Relations & Functions maintained an unbroken record, appearing in every single paper across 77 sittings to contribute 202 questions (averaging 2.6 questions per paper and a 3.3 percent subject share). This consistent volume places the chapter at rank 15 among the 29 mathematics chapters.

Every recent exam session features multiple questions from this domain. During the latest three calendar cycles from 2024 to 2026, examiners set 110 questions across 46 papers (present in all 46 sittings, averaging 2.4 questions per test with a 3.0 percent share). In the previous era spanning 2010 to 2021, the chapter delivered 184 questions across 72 papers (present in 71 papers, averaging 2.6 per test and a 3.2 percent share). Measuring long-term distribution, comparing early testing with the last three years shows the share is about the same, while comparing recent testing with the last three years also shows the share is about the same. Across the two state boards between 2022 and 2026, Andhra Pradesh administered 124 questions across 48 papers (all 48 papers, 2.6 per test, 3.2 percent share), while Telangana administered 78 questions across 29 papers (all 29 papers, 2.7 per test, 3.4 percent share).

Most-asked topics

The vast majority of questions concentrate heavily on functional mapping, while set operations and abstract relations appear as occasional auxiliary topics:

- **Functions**: Generating 377 total questions, with 196 appearing in the recent window (last asked in 2026). Coverage spans domain and range determination for algebraic, logarithmic, modulus, and inverse trigonometric

expressions; floor and fractional part manipulations; injectivity, surjectivity, and bijectivity classifications; composite functions; inverse mappings; and classical functional equations.

- **Sets**: Comprising 6 questions overall, including 5 in recent papers (last tested in 2025). Focus areas include set-builder notation, cardinality calculations, union and intersection algebra, power sets, and De Morgan laws applied to continuous intervals.
- **Relations**: Totaling 3 historical questions, with 1 recent question (last set in 2023). Problems evaluate ordered pair counting, domain and range of integer relations, and verification of reflexivity, symmetry, and transitivity for equivalence relations.

What the questions look like

EAPCET questions from this chapter test exact algebraic rigor, interval arithmetic, and piecewise reasoning.

The single most frequent question type demands finding the real domain of a composite expression, typically combining an inverse trigonometric function with a nested logarithm or square root in the denominator. Candidates must solve simultaneous polynomial or logarithmic inequalities to locate the valid intersection interval. Other typical questions involve greatest integer brackets combined with quadratic forms, where candidates find pre-images of specific target values. Functional equations are also prominent, presenting symmetric identities and asking for function values at specific negative and positive arguments.

How to practise it

Begin by establishing absolute fluency with standard domain restrictions. Remember that square roots require non-negative radicands, denominators cannot equal zero, logarithmic arguments must be strictly positive with positive bases not equal to one, and standard inverse sine or cosine arguments must remain between negative one and positive one inclusive.

Next, practice solving piecewise equations involving absolute values and floor brackets by systematically splitting the real line into unit integer intervals. Pay close attention to injectivity and surjectivity checks: verify injectivity by showing that equal function outputs force equal inputs, or by inspecting derivative monotonicity across continuous domains. To confirm surjectivity, prove that every element of the specified codomain possesses at least one valid real pre-image.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

$f(x) = \frac{|x|-1}{|x-1|}$ is a real valued function from $R - \{1\}$ to B. If f is a surjection, then B =

(A) $\left[-\frac{1}{2}, \frac{1}{2}\right]$
(B) $[-2, 2]$
(C) $[0, 1]$
(D) $[-1, 1]$

Answer: (D) $[-1, 1]$ · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If the co domain of the function

$$f(x) = \begin{cases} 3\sin x - 4\cos x, & \text{for } x \in \left(\text{Tan}^{-1}\frac{4}{3} - \frac{\pi}{2},\ \text{Tan}^{-1}\frac{4}{3} + \frac{\pi}{2}\right) \\ \log(\sin x), & \text{for } x \in \left(\frac{5\pi}{6}, \pi\right) \end{cases}$$

is $(-\infty, 5)$, then f is

(A) an injection but not a surjection
(B) a surjection but not an injection
(C) a bijection
(D) neither an injection nor a surjection

Answer: (B) a surjection but not an injection · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 1 MCQ

The period of the function $f(x) = \log(\cos x) + \cot^4\left(\frac{x}{2}\right) + \sin(3x + 7)$ is

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

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

Q4 AP EAPCET 2026 · 18 May · Shift 2 MCQ

The domain of the real valued function $f(x) = log_{x-1}(3x + 1)$ is

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(A) $(1, \infty)$
(B) $\mathbb{R}$
(C) $(1, 2) \cup (2, \infty)$
(D) $\mathbb{R} - \{2\}$

Answer: (C) $(1, 2) \cup (2, \infty)$ · The council's preliminary key

Q5 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If $f : A \to B$, $g : B \to C$ are two functions such that $gof : A \to C$ is an onto function, then it is necessary that

(A) f is onto function
(B) g is onto function
(C) Both f and g are onto functions
(D) f is one one and g is onto

Answer: (B) g is onto function · The council's preliminary key

Q6 AP EAPCET 2026 · 15 May · Shift 1 MCQ

The complete range of the function $f(x) = [x]^2 + 5[x] + 6$ is
($[x]$ is greatest integer function)

(A) $N \cup \{0\}$
(B) Z
(C) $\{n/n = (k-1)k, k = 0, 1, 2, \dots\}$
(D) $\{n \in N/n = (2+k)(3+k), k = 0, 1, 2, \dots\}$

Answer: (C) $\{n/n = (k-1)k, k = 0, 1, 2, \dots\}$ · The council's preliminary key

Q7 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If a real valued function $f : (1, 2] \to B$ defined by $f(x) = \log_{10}(x - 1)$ is a bijection, then $B =$

(A) $[0, \infty)$
(B) $\mathbb{R}$
(C) $(-\infty, 0]$
(D) $(0, \infty)$

Answer: (C) $(-\infty, 0]$ · The council's preliminary key

Q8 AP EAPCET 2026 · 15 May · Shift 1 MCQ

The domain of $f(x) = \text{Cos}^{-1}[\log_2(x^2 + 5x + 8)]$ is

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

Answer: (B) $[-3,-2]$ · The council's preliminary key

Q9 AP EAPCET 2026 · 15 May · Shift 2 MCQ

The domain of the real valued function $f(x)=\text{Cos}^{-1}\left(\frac{2-|x|}{4}\right)+[\log(3-x)]^{-1}$ is

(A) $(-6,2)\cup(2,3)$
(B) $[-6,2)\cup(2,3)$
(C) $(-\infty,2)\cup(2,3)$
(D) $[-6,2)\cup(2,3]$

Answer: (B) $[-6,2)\cup(2,3)$ · The council's preliminary key

Q10 AP EAPCET 2026 · 15 May · Shift 2 MCQ

The function $f(x)=\sin\left(\log\left(x+\sqrt{x^2+1}\right)\right)$ is

(A) An even function
(B) An odd function
(C) Neither even nor odd
(D) A periodic function

Answer: (B) An odd function · The council's preliminary key

Q11 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If $n\in N$ and $a_n=\sqrt{7+\sqrt{7+\sqrt{7+\cdots n\text{ times}}}}$, then which one of the following is true?

(A) $a_n>7\ \forall n\geq 1$
(B) $a_n>3\ \forall n\geq 1$
(C) $a_n<3\ \forall n\geq 1$
(D) $a_n<4\ \forall n\geq 1$

Answer: (D) $a_n<4\ \forall n\geq 1$ · The council's preliminary key

Q12 AP EAPCET 2026 · 15 May · Shift 2 MCQ

If f is real valued function such that $f(0)=1,\ f(x+2y)=f(x)\,(f(y))^2$ for all $x,y\in\mathbb{R}$ and 'f' is derivable at $x=0$, then $f'(x)=$

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(A) $f(x)$
(B) $f(x)\, f'(0)$
(C) $\dfrac{f(x)}{f'(0)}$
(D) $f'(0) + f(x)$

Answer: (B) $f(x)\, f'(0)$ · The council's preliminary key

Q13 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If a real valued function $f : A \to B$ defined by $f(x) = |x| - [x]$ is a bijection, then A and B are respectively

(A) $[-\infty, 0]$ and $[0, \infty)$
(B) $[-3, -2)$ and $(5, 6]$
(C) $[1, 2)$ and $[3, 4)$
(D) $[0, \infty)$ and $[0, 1)$

Answer: (B) $[-3, -2)$ and $(5, 6]$ · The council's preliminary key

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Q14 AP EAPCET 2026 · 14 May · Shift 1 MCQ

If $f : (-\infty, 0) \to \mathbb{R}$ is defined by $f(x) = \frac{[x]}{|x|}$ then, $\{f(x) : x \in (-\infty, 0)\} =$

(A) $(-\infty, 0)$
(B) $[-1, 0)$
(C) $(-2, -1]$
(D) $(-\infty, -1]$

Answer: (D) $(-\infty, -1]$ · The council's preliminary key

Q15 AP EAPCET 2026 · 14 May · Shift 2 MCQ

The range of the real valued function $f(x) = -\sqrt{-x^2 - 6x - 5}$ is

(A) $[-\infty, 0]$
(B) $[-5, -1]$
(C) $[-2, 0]$
(D) $[-3, -2]$

Answer: (C) $[-2, 0]$ · The council's preliminary key

Q16 AP EAPCET 2026 · 14 May · Shift 2 MCQ

The function $f : [0, \infty) \to [0, \infty)$ defined by $f(x) = \frac{x}{1+x}$ is

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(A) one – one and onto
(B) one – one but not onto
(C) onto but not one – one
(D) neither one-one nor onto

Answer: (B) one – one but not onto · The council's preliminary key

Q17 AP EAPCET 2026 · 14 May · Shift 2 MCQ

If f is a derivable function and $2f(\sin x) + f(\cos x) = x$ for all $x \in R$, then $f'(x) =$

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

Answer: (D) $\dfrac{1}{\sqrt{1-x^2}}$ · The council's preliminary key

Q18 AP EAPCET 2026 · 13 May · Shift 1 MCQ

$A \subseteq \mathbb{R}$ and $f : A \to \mathbb{R}$ is a function defined by $f(x) = \frac{x-1}{x+1}$. If the domain of the function $f(2x)$ is B, then $A \cap B =$

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

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

Q19 AP EAPCET 2026 · 13 May · Shift 1 MCQ

Let f be a function with domain $[0, 7]$ and g be a function defined by $g(x) = |2x + 1|$. Then the domain of $(fog)(x)$ is

(A) $[0, 7]$
(B) $[-7, 0]$
(C) $[-4, 3]$
(D) $[-3, 4]$

Answer: (C) $[-4, 3]$ · The council's preliminary key

Q20 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If a real valued function $f : (0, \infty) \to A$ defined by $f(x) = \frac{[x]}{|x|}$ is a surjection, then $A =$

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

(A) $\{0\} \cup \left(\frac{1}{2}, 1\right]$
(B) $(0, 1]$
(C) $\left(\frac{1}{2}, 1\right]$
(D) $\left(0, \frac{1}{2}\right]$

Answer: (A) $\{0\} \cup \left(\frac{1}{2}, 1\right]$ · The council's preliminary key

Q21 AP EAPCET 2026 · 13 May · Shift 2 MCQ

If $f : \mathrm{R} \to \mathrm{R}$ and $g : \mathrm{R} \to \mathrm{R}$ are two functions defined by $f(x) = |x|$ and $g(x) = [x]$ then $\{x \in \mathrm{R} / (gof)(x) = (fog)(x)\} =$
(Here $[x]$ is the greatest integer function)

(A) R
(B) $[0, \infty)$
(C) $[0, \infty) \cup \{n / -n \in \mathbb{N}\}$
(D) Z

Answer: (C) $[0, \infty) \cup \{n / -n \in \mathbb{N}\}$ · The council's preliminary key

Q22 AP EAPCET 2026 · 13 May · Shift 2 MCQ

Let **p** denote the number of surjections from a set containing 6 elements to a set containing 2 elements. Let **q** denote the number of injections from a set containing 3 elements to a set containing 5 elements. Let **r** denote the number of bijections from a set containing 4 elements to itself. Then **p – q + r** =

(A) 22
(B) 98
(C) 26
(D) 146

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

Q23 AP EAPCET 2026 · 12 May · Shift 1 MCQ

$[x]$ represents the greatest integer less than or equal to x.

If a function $f : \mathbb{R} \to \mathbb{N}$ is defined by $f(x) = [x]^2 + [x] + 1$, then $\{x \in \mathbb{R} / f^{-1}(7) = x\} =$

(A) $[2, 3)$ only
(B) $[0, 7)$
(C) $[-3, 3) - [-2, 2)$
(D) $[-4, 4] - [-3, -2)$

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

Q24 AP EAPCET 2026 · 12 May · Shift 1 MCQ

A and B are respectively the domain and range of a real valued function $f(x) = \left[\mathrm{Sin}^{-1}\left(\frac{10x+6}{3}\right)\right]$, then the number of integers in $A \cup B$ is

($[y]$ represents the greatest integer less than or equal to y)

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

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

Q25 AP EAPCET 2026 · 12 May · Shift 1 MCQ

$[x]$ represent greatest integer function. The difference of the maximum and minimum values of the function

$f(x) = \sin\frac{[x]\pi}{2} + \cos 2[x]\pi$ is

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

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

Q26 AP EAPCET 2026 · 12 May · Shift 2 MCQ

$[x]$ denotes integral part of x.

For $n \in N$, if $f(x) = \begin{cases} \left[|x|\left[\frac{1}{|x|}\right]\right], & \text{for } |x| \neq \frac{1}{n} \\ 0, & \text{for } |x| = \frac{1}{n} \end{cases}$,

then for $|x| \neq \frac{1}{n}$, $f(x) =$

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

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

Q27 AP EAPCET 2026 · 12 May · Shift 2 MCQ

If f satisfies the relation $f(x+y) + f(x-y) = 2f(x)f(y)$ for all $x, y \in R$ and $f(0) \neq 0$, then $f(10) - f(-10) =$

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

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

Q28 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $f : \mathrm{R} - \left\{\frac{2a}{3}\right\} \to \mathrm{R}$ is a function defined by $f(x) = \frac{2x+a}{3x-2a}$ and $(f \circ f)(x) = x$ for all $x \in \mathrm{R} - \left\{\frac{2a}{3}\right\}$, then $f(3) =$

(A) 3
(B) 7
(C) 1
(D) 9

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

Q29 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $f : \mathrm{R} \to \mathrm{R}$, $g : \mathrm{R} \to \mathrm{R}$ are two functions defined by $f(x) = |x+1|$ and $g(x) = \begin{cases} e^{-x}, & x \leq 0 \\ x-1, & x > 0 \end{cases}$, then $(f \circ g)(-2) + (g \circ f)(2) =$

(A) $e^2 + 5$
(B) $e^{-2} + 3$
(C) $e^{-2} + 5$
(D) $e^2 + 3$

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

Q30 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If $f : \mathbb{R} - \{0\} \to \mathbb{R}$ is a differentiable function such that $\frac{1}{3}f(x) + 3f\left(\frac{1}{x}\right) = x - \frac{10}{3}$, then $f'(3) - f'\left(\frac{1}{3}\right) =$

(A) $\frac{12}{5}$
(B) $-\frac{80}{9}$
(C) 3
(D) 5

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

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Q31 TS EAPCET 2026 · 11 May · Shift 2 MCQ

The sum of all the integers in the domain of the real valued function $f(x)=\sqrt{\log_{1/3}\left(\frac{9x-30}{x-26}\right)}$ is

(A) 6
(B) 9
(C) 12
(D) 10

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

Q32 TS EAPCET 2026 · 11 May · Shift 2 MCQ

$f(x)$ is a linear polynomial such that $f(ax+by)=af(x)+bf(y)$ for all $x,y\in\mathbb{R}$. If $f(0)=7$ and $f'(0)=5$, then $\frac{f(1)+f(-1)}{a+b}=$

(A) 10
(B) 12
(C) 2
(D) 14

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

Q33 TS EAPCET 2026 · 10 May · Shift 1 MCQ

The function $f:R\to R$ defined by $f(x)=x|x+2|$ is

(A) one one but not onto
(B) onto but not one one
(C) both one one and onto
(D) neither one one nor onto

Answer: (B) onto but not one one · The council's preliminary key

Q34 TS EAPCET 2026 · 10 May · Shift 1 MCQ

If A and B are the entire domain and range of the real valued function $f(x)=\mathrm{Cos}^{-1}\left(\frac{2-x^2}{2+x^2}\right)$, then $A\cap B=$

(A) $[0,\sqrt{2})$
(B) $\left[0,\frac{\pi}{2}\right)$
(C) $[0,\pi)$
(D) $\left(-\frac{\pi}{2},\frac{\pi}{2}\right)$

Answer: (C) $[0,\pi)$ · The council's preliminary key

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Q35 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If A and B are the domain and range of a real valued function $f(x)=\frac{|x|}{\sqrt{1-|x|}}$, then $A\cup B=$

(A) $(1,\infty)$
(B) $[0,\infty)$
(C) $(-1,\infty)$
(D) $\mathbb{R}$

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

Q36 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If a real valued function $f:A\to B$ defined by $f(x)=\mathrm{Sin}^{-1}\left(\sqrt{x^2-4x+5}\right)$ is a bijection, then $A\cup B=$

(A) R
(B) $[0,1]\cup\left[0,\frac{\pi}{2}\right]$
(C) $[-1,1]\cup\left[-\frac{\pi}{2},\frac{\pi}{2}\right]$
(D) $\left\{2,\frac{\pi}{2}\right\}$

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

Q37 TS EAPCET 2026 · 9 May · Shift 1 MCQ

The domain of the real valued function $f(x)=\cos^{-1}\left(\log_5\left(\frac{x}{5}\right)\right)+\log_5\left(\cos^{-1}\left(\frac{x}{5}\right)\right)$ is

(A) $\left[\frac{1}{5},5\right]$
(B) $[1,25]$
(C) $\left[\frac{1}{5},1\right)$
(D) $[1,5)$

Answer: (D) $[1,5)$ · The council's preliminary key

Q38 TS EAPCET 2026 · 9 May · Shift 1 MCQ

If $f:\mathrm{R}\to\mathrm{R}$ is a function defined by $f(x)=|x|$ for all $x\in\mathrm{R}$ and A represents the interval $(0,1)$ then $f^{-1}(\mathrm{A})=$

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

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

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Q39 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If the domain and the range of the real valued function $f(x) = \frac{1}{\sqrt{|x| - [x]}}$ are A and B, then $A \cap B =$ (R^+ is set of positive real numbers and Z^+ is set of positive integers)

(A) $R^+ - Z^+$
(B) R^+
(C) $R - Z^+$
(D) $R - (Z^+ \cup \{0\})$

Answer: (A) $R^+ - Z^+$ · The council's preliminary key

Q40 TS EAPCET 2026 · 9 May · Shift 2 MCQ

A real valued function f defined by $f(x) = |x| - x$ is

(A) an injection but not surjection, if $[0, \infty)$ is its domain and $(-\infty, 0]$ is its codomain
(B) a bijection, if $(-\infty, 0]$ is its domain and also codomain
(C) a bijection, if $[0, \infty)$ is its domain and also codomain
(D) a surjection but not injection, if R is its domain and $[0, \infty)$ is its codomain

Answer: (D) a surjection but not injection, if R is its domain and $[0, \infty)$ is its codomain · The council's preliminary key

Q41 TS EAPCET 2026 · 9 May · Shift 2 MCQ

Let $S = \{2, 3, 5, 7, 11, 13\}$ be a set. Consider the set of all possible onto functions from S to S. If a function f is chosen from that set, then the probability that it satisfies the condition $f(3) > 3f(2)$ is

(A) $\frac{2}{3}$
(B) $\frac{2}{15}$
(C) $\frac{1}{6}$
(D) $\frac{1}{10}$

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

Q42 AP EAPCET 2025 · 27 May · Shift 1 MCQ

If $f : \mathbb{R} \to A$, defined by $f(x) = \cos x + \sqrt{3} \sin x - 1$, is an onto function then $A =$

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

Answer: (C) $[-3, 1]$ · The council's preliminary key

Q43 AP EAPCET 2025 · 27 May · Shift 1 MCQ

Let $g(x) = 1 + x - [x]$ and $f(x) = \begin{cases} -1, & x < 0 \\ 0, & x = 0 \\ 1, & x > 0 \end{cases}$, $[x]$ denotes the greatest integer less than or equal to x. Then for all x, $f(g(x)) =$

(A) 1
(B) x
(C) $f(x)$
(D) $g(x)$

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

Q44 AP EAPCET 2025 · 26 May · Shift 1 MCQ

The domain of the real valued function $f(x) = \frac{3}{4-x^2} + \log_{10}(x^3 - x)$ is

(A) $(1, 2) \cup (2, \infty)$
(B) $(-1, 0) \cup (1, 2)$
(C) $(-1, 0) \cup (1, 2) \cup (2, \infty)$
(D) $(-\infty, -1) \cup (1, 2) \cup (2, \infty)$

Answer: (C) $(-1, 0) \cup (1, 2) \cup (2, \infty)$ · The council's preliminary key

Q45 AP EAPCET 2025 · 26 May · Shift 1 MCQ

A real valued function $f : A \to B$ defined by $f(x) = \dfrac{4 - x^2}{4 + x^2}$ $\forall x \in A$ is a bijection.

If $-4 \in A$ then $A \cap B =$

(A) $(-1, 1]$
(B) $[0, 1]$
(C) $[0, \infty)$
(D) $(-1, 0]$

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

Q46 AP EAPCET 2025 · 26 May · Shift 2 MCQ

Let $[x]$ represent the greatest integer less than or equal to x, $\{x\} = x - [x]$, $\sqrt{2} = 1.414$ and $\sqrt{3} = 1.732$. If $f(x) = \left\{x + \left[\dfrac{x}{1 + x^2}\right]\right\}$ is a real valued function, then $f(\sqrt{2}) + f(-\sqrt{3}) =$

(A) 0.682
(B) 0.318
(C) 0.146
(D) 1.146

Answer: (A) 0.682 · The council's preliminary key

Q47 AP EAPCET 2025 · 26 May · Shift 2 MCQ

If the range of the function $f(x) = -3x - 3$ is $\{3, -6, -9, -18\}$, then which one of the following is not in the domain of f ?

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

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

Q48 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If $A = \left\{x \in \mathbb{R} / \sin^{-1}\left(\sqrt{x^2+x+1}\right) \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]\right\}$ and $B = \left\{y \in \mathbb{R} / y = \sin^{-1}\left(\sqrt{x^2+x+1}\right), x \in A\right\}$ then

(A) $A \cap B \neq \phi$
(B) $A \cap B^C = [0, 1]$
(C) $A^C \cap B = \left[\frac{\pi}{3}, \frac{\pi}{2}\right]$
(D) $A \cup B = \mathbb{R} - \left\{[-1, 0] \cup \left[\frac{\pi}{3}, \frac{\pi}{2}\right]\right\}$

Answer: (C) $A^C \cap B = \left[\frac{\pi}{3}, \frac{\pi}{2}\right]$ · The council's preliminary key

Q49 AP EAPCET 2025 · 24 May · Shift 1 MCQ

The domain of the function $f(x) = \sqrt{\log_e\left(\frac{1}{x^2-4x+4}\right)} + \sin^{-1}(x^2-2)$ is

(A) $[1, 3]$
(B) $[1, 3)$
(C) $[1, \sqrt{3}]$
(D) $[1, \sqrt{3})$

Answer: (C) $[1, \sqrt{3}]$ · The council's preliminary key

Q50 AP EAPCET 2025 · 23 May · Shift 1 MCQ

Consider the following statements

Statement-I : A function $f : A \to B$ is said to be one-one if and only if $f(x) \neq f(y) \Rightarrow x \neq y$

Statement-II : A relation $f : A \to B$ is said to be a function if $x \neq y \Rightarrow f(x) \neq f(y)$

Then which one of the following is true ?

(A) only statement-I is true
(B) only statement-II is true
(C) Both Statement-I and Statement-II are true
(D) Neither Statement-I nor Statement-II is true

Answer: (D) Neither Statement-I nor Statement-II is true · The council's preliminary key

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Q51 AP EAPCET 2025 · 23 May · Shift 2 MCQ

$[t]$ denotes the greatest integer function and $[t - m] = [t] - m$ when $m \in Z$. If $k = 2[2x - 1] - 1$ and $3[2x - 2] + 1 = 2[2x - 1] - 1$ then the range of $f(x) = [k + 5x]$ is

(A) $\{7, 8, 9\}$
(B) $\{4, 5, 6\}$
(C) $\{5, 6, 7\}$
(D) $\{6, 7, 8\}$

Answer: (D) $\{6, 7, 8\}$ · The council's preliminary key

Q52 AP EAPCET 2025 · 23 May · Shift 2 MCQ

If $f(x) = (x + 1)^2 - 1,\ x \geq -1$, then $\{x \mid f(x) = f^{-1}(x)\}$ is

(A) $\{0, -1\}$
(B) $\{-1, 0, 1\}$
(C) $\left\{-1, 0, \frac{-3 + \sqrt{3}i}{2}, \frac{-3 - \sqrt{3}i}{2}\right\}$
(D) an empty set

Answer: (A) $\{0, -1\}$ · The council's preliminary key

Q53 AP EAPCET 2025 · 22 May · Shift 1 MCQ

Let $f : N \to N$ be a function such that $f(x + y) = f(x) + f(y) + xy$ for every $x, y \in N$. If $f(1) = 2$, then $\sum_{k=0}^{10} f(k) =$

(A) 1650
(B) 275
(C) 550
(D) 1025

Answer: (B) 275 · The council's preliminary key

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Q54 AP EAPCET 2025 · 22 May · Shift 1 MCQ

If a real valued function $f : [-1, 2] \to B$ defined by

$$f(x) = \begin{cases} 1 - x, & \text{when } -1 \le x \le 1 \\ x - 1, & \text{when } 1 < x \le 2 \end{cases}$$

is a surjection, then B =

(A) $[-1, 2]$
(B) $[-1, 1]$
(C) $[0, 2]$
(D) $[0, 1]$

Answer: (C) $[0, 2]$ · The council's preliminary key

Q55 AP EAPCET 2025 · 22 May · Shift 1 MCQ

The sum of the least positive integer and the greatest negative integer in the range of the function $f(x) = \dfrac{x^2 - 5x + 7}{x^2 - 5x - 7}$ is

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

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

Q56 AP EAPCET 2025 · 22 May · Shift 2 MCQ

The set of all real values of x for which $f(x) = \sqrt{\dfrac{|x| - 2}{|x| - 3}}$ is a well defined function is

(A) $(-3, -2] \cup (2, 3]$
(B) $\mathbb{R} - [-3, -2) \cup (2, 3]$
(C) $\mathbb{R} - [-3, 3]$
(D) $(-3, 3)$

Answer: (B) $\mathbb{R} - [-3, -2) \cup (2, 3]$ · The council's preliminary key

Q57 AP EAPCET 2025 · 22 May · Shift 2 MCQ

$f(x)$ is a quadratic polynomial satisfying the condition $f(x) + f\left(\frac{1}{x}\right) = f(x) f\left(\frac{1}{x}\right)$. If $f(-1) = 0$, then the range of f is

(A) $[1, \infty)$
(B) $[-1, 1]$
(C) $(-\infty, 1]$
(D) $\mathbb{R}$

Answer: (C) $(-\infty, 1]$ · The council's preliminary key

Q58 AP EAPCET 2025 · 21 May · Shift 1 MCQ

The domain and range of a real valued function $f(x) = \cos x - 3$ are respectively.

(A) $R \setminus \{0\}$ and $[-1, 1]$
(B) R and $[-1, 1]$
(C) $R \setminus \{0\}$ and $[-4, -2]$
(D) R and $[-4, -2]$

Answer: (D) R and $[-4, -2]$ · The council's preliminary key

Q59 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If $f : R \to R$ and $g : R \to R$ are two functions defined by $f(x) = 2x - 3$ and $g(x) = 5x^2 - 2$, then the least value of the function $(gof)(x)$ is

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

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

Q60 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If $5f(x) + 3f\left(\frac{1}{x}\right) = x + 2$ and $y = xf(x)$, then $\frac{dy}{dx}$ at $x = 1$ is equal to

(A) 14
(B) $\frac{7}{8}$
(C) 1
(D) 7

Answer: (B) $\frac{7}{8}$ · The council's preliminary key

Q61 AP EAPCET 2025 · 21 May · Shift 2 MCQ

The set of all real values of x such that $f(x) = \sqrt{\frac{[x] - 1}{[x]^2 - [x] - 6}}$ is a real valued function is

(A) $[1, \infty)$
(B) $(-\infty, -2) \cup [4, \infty)$
(C) $[-1, 3)$
(D) $[-1, 2) \cup [4, \infty)$

Answer: (D) $[-1, 2) \cup [4, \infty)$ · The council's preliminary key

Q62 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If a function $f : \mathbb{Z} \to \mathbb{Z}$ is defined by $f(x) = x - (-1)^x$, then $f(x)$ is

(A) one-one, but not onto
(B) onto, but not one-one
(C) both one-one and onto
(D) neither one-one nor onto

Answer: (C) both one-one and onto · The council's preliminary key

Q63 TS EAPCET 2025 · 4 May · Shift 1 MCQ

The domain of the real valued function $f(x) = \log_{\sqrt{2}}\left(\sqrt{x^2 + x} + \sqrt{x^2 - x}\right)$ is

(A) $[-1, 1]$
(B) $(-\infty, -1] \cup [1, \infty)$
(C) $(-\infty, \infty)$
(D) $(0, \infty)$

Answer: (B) $(-\infty, -1] \cup [1, \infty)$ · The council's preliminary key

Q64 TS EAPCET 2025 · 4 May · Shift 2 MCQ

The domain and range of $f(x) = \dfrac{1}{\sqrt{|x| - x^2}}$ are A and B respectively. Then $A \cup B =$

(A) $\mathbb{R} - \{-1, 0, 1\}$
(B) $(-1, \infty) - \{0, 1\}$
(C) $(-1, 0) \cup (0, 1) \cup [2, \infty)$
(D) $(-1, 1) \cup [2, \infty)$

Answer: (C) $(-1, 0) \cup (0, 1) \cup [2, \infty)$ · The council's preliminary key

Q65 TS EAPCET 2025 · 4 May · Shift 2 MCQ

A function $f : \mathbb{R} \to \mathbb{R}$ defined by $f(x) = \begin{cases} 2x + 3, & x \leq \frac{4}{3} \\ -3x^2 + 8x, & x > \frac{4}{3} \end{cases}$ is

(A) One-one function
(B) not onto
(C) a bijective function
(D) constant function

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

Q66 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If $2^{4n+3}+3^{3n+1}$ is divisible by P for all natural numbers n, then P is

(A) an even integer
(B) an odd integer, not a prime
(C) an odd prime integer
(D) an integer less than 9

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

Q67 TS EAPCET 2025 · 4 May · Shift 2 MCQ

Let $f:[-1,2]\to\mathbb{R}$ be defined by $f(x)=\left[x^2-3\right]$ where $[\bullet]$ denotes greatest integer function, then the number of points of discontinuity for the function f in $(-1,2)$ is

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

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

Q68 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If $D\subseteq\mathbb{R}$ and $f:D\to\mathbb{R}$ defined by $f(x)=\dfrac{x^2+x+a}{x^2-x+a}$ is a surjection then 'a' lies in the interval

(A) $\mathbb{R}$
(B) $(0,\infty)$
(C) $(-\infty,0)$
(D) $(0,1)$

Answer: (C) $(-\infty,0)$ · The council's preliminary key

Q69 TS EAPCET 2025 · 3 May · Shift 1 MCQ

If the domain of the real valued function $f(x)=\dfrac{1}{\sqrt{\log_{\frac{1}{3}}\left(\dfrac{x-1}{2-x}\right)}}$ is (a,b), then $2b=$

(A) $a-1$
(B) a
(C) $a+1$
(D) $a+2$

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

Q70 TS EAPCET 2025 · 3 May · Shift 2 MCQ

Let $f:\mathbb{R}\to\mathbb{R}$ be defined by $f(x)=5^{-|x|}+\operatorname{sgn}(5^{-x})$, where $\operatorname{sgn} x$ denotes signum function of x. Then f is

(A) one-one but not onto
(B) onto but not one-one
(C) both one-one and onto
(D) neither one-one nor onto

Answer: (D) neither one-one nor onto · The council's preliminary key

Q71 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If the range of the real valued function $f(x)=\frac{x^2+x+k}{x^2-x+k}$ is $\left[\frac{1}{3},3\right]$, then $k=$

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

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

Q72 TS EAPCET 2025 · 3 May · Shift 2 MCQ

The value of the greatest integer k satisfying the inequation $2^{n+4}+12\geq k(n+4)$ for all $n\in\mathrm{N}$ is

(A) 7
(B) 8
(C) 9
(D) 10

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

Q73 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If $f(x)=\tan\left(\frac{\pi}{\sqrt{x+1}+4}\right)$ is a real valued function then the range of f is

(A) $[-1, 1]$
(B) $(0, 1]$
(C) $[-1, \infty)$
(D) $\mathbb{R}$

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

Q74 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The range of the real valued function $f(x) = \text{Sin}^{-1}\left(\sqrt{x^2 + x + 1}\right)$ is

(A) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
(B) $\left[0, \frac{\pi}{2}\right]$
(C) $\left[\frac{\pi}{6}, \frac{\pi}{2}\right]$
(D) $\left[\frac{\pi}{3}, \frac{\pi}{2}\right]$

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

Q75 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The period of the function $f(x) = \dfrac{2\sin\left(\frac{\pi x}{3}\right)\cos\left(\frac{2\pi x}{5}\right)}{3\tan\left(\frac{7\pi x}{2}\right) - 5\sec\left(\frac{5\pi x}{3}\right)}$ is

(A) 30
(B) 60
(C) 300
(D) 150

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

Q76 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If $f : \mathrm{R} - \{0\} \to \mathrm{R}$ is defined by $3f(x) + 4f\left(\frac{1}{x}\right) = \frac{2-x}{x}$ then $f(3) =$

(A) 6
(B) 12
(C) 9
(D) 3

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

Q77 TS EAPCET 2025 · 2 May · Shift 2 MCQ

The inverse of the function $y = \dfrac{10^x - 10^{-x}}{10^x + 10^{-x}} + 1$ is $x =$

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(A) $\log\left(\frac{y}{2-y}\right)$

(B) $\log_{10}\left(\frac{y}{2-y}\right)$

(C) $\frac{1}{10}\log\left(\frac{y}{1-y}\right)$

(D) $\frac{1}{2}\log_{10}\left(\frac{y}{2-y}\right)$

Answer: (D) $\frac{1}{2}\log_{10}\left(\frac{y}{2-y}\right)$ · The council's preliminary key

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Q78 AP EAPCET 2024 · 23 May · Shift 1 MCQ

If $A \subseteq Z$ and the function $f : A \to \mathbb{R}$ is defined by $f(x) = \frac{1}{\sqrt{64-(0.5)^{24+x-x^2}}}$ then the sum of all absolute values of elements of A is

(A) 36

(B) 5

(C) 25

(D) 11

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

Q79 AP EAPCET 2024 · 23 May · Shift 1 MCQ

Which of the following functions are odd?

I. $f(x) = x\left(\frac{e^x-1}{e^x+1}\right)$

II. $f(x) = k^x + k^{-x} + \cos x$

III. $f(x) = \log\left(x + \sqrt{x^2+1}\right)$

(A) II

(B) I, II

(C) III

(D) I

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

Q80 AP EAPCET 2024 · 22 May · Shift 1 MCQ

The domain of the real valued function $f(x) = \sqrt{9-\sqrt{x^2-144}}$, is

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(A) $[-15,-12]\cup[12,15]$
(B) $(-\infty,-12]\cup[12,\infty)$
(C) $[-15,15]$
(D) $[-12,12]$

Answer: (A) $[-15,-12]\cup[12,15]$ · The council's preliminary key

Q81 AP EAPCET 2024 · 22 May · Shift 1 MCQ

If set A has 5 elements, set B has 7 elements then the number of many one functions that can be defined from A to B is

(A) 7^5-7
(B) 5^7-5
(C) $5^7-{}^7P_5$
(D) $7^5-{}^7P_5$

Answer: (D) $7^5-{}^7P_5$ · The council's preliminary key

Q82 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The range of the real valued function $f(x)=\dfrac{15}{3\sin x+4\cos x+10}$ is

(A) $[0,3]$
(B) $[-1,3]$
(C) $[1,3]$
(D) $[-1,1]$

Answer: (C) $[1,3]$ · The council's preliminary key

Q83 AP EAPCET 2024 · 22 May · Shift 2 MCQ

Define the functions f, g and h from R to R such that $f(x)=x^2-1$, $g(x)=\sqrt{x^2+1}$ and $h(x)=\begin{cases}0, & \text{if } x\le 0\\ x, & \text{if } x\ge 0\end{cases}$ consider the following statements

(I) fog is invertible

(II) h is an identify function

(III) fog is not invertible

(IV) $(hofog)\,x=x^2$

Then which one of the following is true?

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

Answer: (C) III, IV · The council's preliminary key

Q84 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The domain of the real valued function $f(x) = \log_2 \log_3 \log_5(x^2 - 5x + 11)$ is

(A) $(2, \infty)$
(B) $(-\infty, 3)$
(C) $(2, 3)$
(D) $(-\infty, 2) \cup (3, \infty)$

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

Q85 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The range of the real valued function $f(x) = \frac{x^2+2x-15}{2x^2+13x+15}$ is

(A) $\mathbb{R} - \left\{-5, -\frac{3}{2}\right\}$
(B) $\mathbb{R} - \left\{-5, \frac{1}{2}\right\}$
(C) $\mathbb{R} - \left\{\frac{1}{2}, \frac{8}{7}\right\}$
(D) $\mathbb{R} - \left\{-\frac{3}{2}, \frac{8}{7}\right\}$

Answer: (C) $\mathbb{R} - \left\{\frac{1}{2}, \frac{8}{7}\right\}$ · The council's preliminary key

Q86 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If the period of the function $f(x) = \frac{\tan 5x \cos 3x}{\sin 6x}$ is α, then $f\left(\frac{\alpha}{8}\right) =$

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

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

Q87 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The real valued function $f : R \to \left[\frac{5}{2}, \infty\right)$ defined by $f(x) = |2x + 1| + |x - 2|$ is

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(A) One-one function but not onto
(B) Onto function but not one-one
(C) Bijection
(D) Neither one-one function nor onto

Answer: (B) Onto function but not one-one · The council's preliminary key

Q88 AP EAPCET 2024 · 21 May · Shift 2 MCQ

If $3f(x) - 2f\left(\frac{1}{x}\right) = x$ then $f'(2) =$

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

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

Q89 AP EAPCET 2024 · 20 May · Shift 1 MCQ

Let $f(x) = 3 + 2x$ and $g_n(x) = (f \circ f \circ f \circ \ldots\ n \text{ times})(x)$. $\forall n \in N$ if all the lines $y = g_n(x)$ pass through a fixed point (α, β), then $\alpha + \beta =$

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

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

Q90 AP EAPCET 2024 · 20 May · Shift 1 MCQ

Let $a > 1$ and $0 < b < 1$. If $f : \mathbb{R} \to [0, 1]$ is defined by $f(x) = \begin{cases} a^x, & -\infty < x < 0 \\ b^x, & 0 \le x < \infty \end{cases}$, then $f(x)$ is

(A) A bijection
(B) One-one but not onto
(C) Onto but not one-one
(D) Neither one-one nor onto

Answer: (D) Neither one-one nor onto · The council's preliminary key

Q91 AP EAPCET 2024 · 20 May · Shift 2 MCQ

$f : \mathbb{R} \to \mathbb{R}$ is defined by $f(x + y) = f(x) + 12y$, $\forall x, y \in \mathbb{R}$. If $f(1) = 6$, then

$$\sum_{r=1}^{n} f(r) =$$

(A) n^2
(B) $5n^2$
(C) $6n^2$
(D) $\frac{3n(n+1)}{2}$

Answer: (C) $6n^2$ · The council's preliminary key

Q92 AP EAPCET 2024 · 20 May · Shift 2 MCQ

The domain of the real valued function $f(x) = \sqrt{2+x} + \sqrt{3-x}$ is

(A) $(-2, 3)$
(B) $[-2, 3)$
(C) $(-2, 3]$
(D) $[-2, 3]$

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

Q93 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If a real valued function $f : [a, \infty) \to [b, \infty)$ defined by $f(x) = 2x^2 - 3x + 5$ is a bijection, then $3a + 2b =$

(A) 20
(B) 10
(C) 12
(D) 6

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

Q94 AP EAPCET 2024 · 19 May · Shift 2 MCQ

The domain of the real valued function $f(x) = \frac{1}{\sqrt{\log_{0.5}(2x-3)}} + \sqrt{4-9x^2}$ is

(A) $\left[\frac{2}{3}, \frac{3}{2}\right)$
(B) Null Set
(C) $\left[\frac{2}{3}, 2\right)$
(D) $\left[-\frac{2}{3}, \frac{2}{3}\right]$

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

Q95 AP EAPCET 2024 · 19 May · Shift 2 MCQ

If set A contains 8 elements then number of subsets of A which contain at least 6 elements is

(A) 28
(B) 73
(C) 37
(D) 82

Answer: (C) 37 · The council's preliminary key

Q96 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If a function $f : \mathrm{R} \to \mathrm{R}$ is defined by $f(x) = x^3 - x$, then f is

(A) one – one and onto
(B) one – one but not onto
(C) onto but not one – one
(D) neither one - one nor onto

Answer: (C) onto but not one – one · The council's preliminary key

Q97 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If $f(x) = \sqrt{x} - 1$ and $g\{f(x)\} = x + 2\sqrt{x} + 1$ then $g(x) =$

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

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

Q98 TS EAPCET 2024 · 11 May · Shift 1 MCQ

If $f(x)$ is a quadratic function such that $f(x)f\left(\frac{1}{x}\right) = f(x) + f\left(\frac{1}{x}\right)$, then $\sqrt{f\left(\frac{2}{3}\right) + f\left(\frac{3}{2}\right)} =$

(A) $\frac{25}{12}$
(B) $\frac{10}{3}$
(C) $\frac{13}{6}$
(D) $\frac{41}{20}$

Answer: (C) $\frac{13}{6}$ · The council's preliminary key

Q99 TS EAPCET 2024 · 11 May · Shift 1 MCQ

$f(x) = ax^2 + bx + c$ is an even function and $g(x) = px^3 + qx^2 + rx$ is an odd function. If $h(x) = f(x) + g(x)$ and $h(-2) = 0$, then $8p + 4q + 2r =$

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(A) $4a + 3b + 2c$
(B) $a + b + c$
(C) $4a + 2b + c$
(D) $8a + 4b + 2c$

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

Q100 TS EAPCET 2024 · 11 May · Shift 1 MCQ

A function $f : \mathrm{R} \to \mathrm{R}$ is such that $yf(x + y) + \cos mxy = 1 + yf(x)$. If $m = 2$, then $f'(x) =$

(A) $-2 \sin 2xy$
(B) $4x$
(C) $\dfrac{2 \sin 2xy}{y}$
(D) $2x^2$

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

Q101 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If the real valued function $f(x) = \sin^{-1}(x^2 - 1) - 3 \log_3(3^x - 2)$ is not defined for all $x \in (-\infty, a] \cup (b, \infty)$ then $3^a + b^2 =$

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

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

Q102 TS EAPCET 2024 · 10 May · Shift 1 MCQ

If f is a real valued function from A onto B defined by $f(x) = \dfrac{1}{\sqrt{|x - |x||}}$ then $A \cap B =$

(A) ϕ
(B) $(-\infty, 0)$
(C) $(0, \infty)$
(D) $(-\infty, \infty)$

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

Q103 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The domain of the real valued function $f(x) = \mathrm{Sin}^{-1}\left(\log_2\left(\frac{x^2}{2}\right)\right)$ is

(A) $[-2,0)\cup(1,2]$
(B) $[-2,-1]\cup[1,2]$
(C) $[-1,0]\cup[1,2]$
(D) $[1,\infty)\cup(-2,0)$

Answer: (B) $[-2,-1]\cup[1,2]$ · The council's preliminary key

Q104 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The range of the real valued function $f(x)=\log_3\left(5+4x-x^2\right)$ is

(A) $(0,2)$
(B) $[0,2]$
(C) $(-\infty,2]$
(D) $[-1,5]$

Answer: (C) $(-\infty,2]$ · The council's preliminary key

Q105 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The sum of the maximum and minimum values of the function $f(x)=\frac{x^2-x+1}{x^2+x+1}$ is

(A) $\frac{17}{4}$
(B) $\frac{5}{2}$
(C) $\frac{10}{3}$
(D) 0

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

Q106 TS EAPCET 2024 · 9 May · Shift 1 MCQ

If $f(x)=\dfrac{2x-3}{3x-2}$ and $f_n(x)=(f\,o\,f\,o\,f\,o\ldots\ldots\ n\,times)(x)$, then $f_{32}(x)=$

(A) $\dfrac{2x-3}{3x-2}$
(B) x
(C) $\dfrac{3x+2}{2x+3}$
(D) $f_{23}(x)$

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

Q107 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The domain of the real valued function $f(x)=\sqrt{\cos(\sin x)}+\mathrm{Cos}^{-1}\left(\dfrac{1+x^2}{2x}\right)$ is

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(A) $(-1, 1)$
(B) $[-1, 1]$
(C) $\mathrm{R} - (-1, 1)$
(D) $\{-1, 1\}$

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

Q108 TS EAPCET 2024 · 9 May · Shift 1 MCQ

If the period of the function $f(x) = 2\cos(3x + 4) - 3\tan(2x - 3) + 5\sin(5x) - 7$ is k, then

(A) $\sin\frac{k}{8} = \frac{1}{2}$
(B) $\cos\frac{k}{6} = \frac{1}{\sqrt{2}}$
(C) $\tan\frac{k}{3} = -\sqrt{3}$
(D) $\sec\frac{k}{2} = 2$

Answer: (C) $\tan\frac{k}{3} = -\sqrt{3}$ · The council's preliminary key

Q109 TS EAPCET 2024 · 9 May · Shift 2 MCQ

The domain of the real valued function $f(x) = \sqrt[3]{\frac{x-2}{2x^2 - 7x + 5}} + \log\left(x^2 - x - 2\right)$ is

(A) $(-\infty, -1) \cup \left(2, \frac{5}{2}\right) \cup \left(\frac{5}{2}, \infty\right)$
(B) $\mathrm{R} - \left\{1, \frac{5}{2}\right\}$
(C) $(-\infty, -1) \cup (2, \infty)$
(D) $(-1, 2)$

Answer: (A) $(-\infty, -1) \cup \left(2, \frac{5}{2}\right) \cup \left(\frac{5}{2}, \infty\right)$ · The council's preliminary key

Q110 TS EAPCET 2024 · 9 May · Shift 2 MCQ

f is a real valued function satisfying the relation $f\left(3x + \frac{1}{2x}\right) = 9x^2 + \frac{1}{4x^2}$. If $f\left(x + \frac{1}{x}\right) = 1$ then $x =$

(A) ± 2
(B) ± 1
(C) ± 3
(D) ± 6

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

Q111 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The range of the function $f(x)=\begin{cases}4x-1, & x>3\\ x^2-2, & -2\le x\le 3\\ 3x+4, & x<-2\end{cases}$ is

(A) $(-\infty,\infty)$
(B) $\mathbb{R}-(-3,3)$
(C) $\mathbb{R}-(7,11]$
(D) $(7,11]$

Answer: (C) $\mathbb{R}-(7,11]$ · The council's preliminary key

Q112 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The domain of the function $y=f(x)$, where x and y are related by $2^x+2^y=2$ is

(A) $(-\infty,\infty)$
(B) $(-\infty,1)$
(C) $(0,\infty)$
(D) $(1,\infty)$

Answer: (B) $(-\infty,1)$ · The council's preliminary key

Q113 AP EAPCET 2023 · 19 May · Shift 1 MCQ

If $f(x)$ is differentiable on $\mathbb{R}$, $f(x)f'(-x)-f(-x)f'(x)=0$, $f(0)=3$ and $f(3)=9$, then $(1+f(-3))^3+1=$

(A) 2
(B) 9
(C) 28
(D) 0

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

Q114 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If A is the domain and B is the range of the function $f(x)=\begin{cases}3x-1, & x>1\\ x^2+1, & x\le 1\end{cases}$, then $A-B=$

(A) $(1,\infty)$
(B) $(-\infty,1)$
(C) $\mathbb{R}-(-1,1)$
(D) $(-1,1)$

Answer: (B) $(-\infty,1)$ · The council's preliminary key

Q115 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If $f:\mathbb{R}\to\mathbb{R}$ and $g:\mathbb{R}\to\mathbb{R}$ are defined by $f(x)=x^3-x$ and $g(x)=\sin 2x$, then the value of $x\in(0,2\pi)$ that satisfy $f(g(x))>0$, lie in the interval

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

Answer: (C) $\left(\frac{\pi}{2},\frac{3\pi}{4}\right)\cup\left(\frac{3\pi}{4},\pi\right)$ · The council's preliminary key

Q116 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If $A=\left\{\begin{pmatrix}a_1 & b_1 & c_1\\ a_2 & b_2 & c_2\\ a_3 & b_3 & c_3\end{pmatrix}: a_i,b_i,c_i,(i=1,2,3)\right.$ are the binomial coefficients in the expansion of $(1+x)^{11}\Big\}$, then the number of elements in set A is

(A) 9^9
(B) 6^9
(C) 11^9
(D) 12^9

Answer: (B) 6^9 · The council's preliminary key

Q117 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If $f(x)$ and $g(x)$ are two real valued functions such that $f(g(x+y))=f(g(x))+f(g(y))$, $g(1)=2$ and $f(2)=1$, then the function $g(f(x))$ is discontinuous on the set

(A) $\mathbb{R}$
(B) $(0,\infty)$
(C) $(-\infty,0)$
(D) ϕ

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

Q118 AP EAPCET 2023 · 18 May · Shift 2 MCQ

The range of the real valued function $f(x)=\sqrt{9-x^2}$ is

(A) $[-3,3]$
(B) $[-3,0]$
(C) $[0,3]$
(D) $[-2,2]$

Answer: (C) $[0,3]$ · The council's preliminary key

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Q119 AP EAPCET 2023 · 18 May · Shift 2 MCQ

If $f : \mathbb{R} \setminus \{0\} \to \mathbb{R}$ is defined by $f(x) = x + \frac{1}{x}$, then the value of $(f(x))^2 =$

(A) $f(x) + f(0)$
(B) $f(x^2) + f(2)$
(C) $f(x^3) + f(0)$
(D) $f(x^2) + f(1)$

Answer: (D) $f(x^2) + f(1)$ · The council's preliminary key

Q120 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If a set A has n elements, then the number of functions defined from A to A that are not one-one is

(A) $(n)^{n^2}$
(B) $n! - ({}^nC_0 + {}^nC_1 + {}^nC_2 + \ldots + {}^nC_n)$
(C) $n^n - n!$
(D) n^n

Answer: (C) $n^n - n!$ · The council's preliminary key

Q121 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If $f(x)$ is the signum function, then in terms of $f(x)$, the constant function $g(x) = 1, \forall x \in \mathbb{R}$ is

(A) $g(x) = \begin{cases} 2 - f(x), & x < 0 \\ f(x), & x \geq 0 \end{cases}$
(B) $g(x) = \begin{cases} f(x) + f(-x), & x < 0 \\ f(x)f(-x), & x \geq 0 \end{cases}$
(C) $g(x) = \begin{cases} 1 + f(x), & x > 0 \\ 1 - f(x), & x \leq 0 \end{cases}$
(D) $g(x) = \begin{cases} f(x) + 2, & x < 0 \\ 1 + f(x), & x = 0 \\ f(x), & x > 0 \end{cases}$

Answer: (D) $g(x) = \begin{cases} f(x) + 2, & x < 0 \\ 1 + f(x), & x = 0 \\ f(x), & x > 0 \end{cases}$ · The council's preliminary key

Q122 AP EAPCET 2023 · 17 May · Shift 1 MCQ

The set $\left\{x \in \mathbb{R} : 16(2^x) > 16^{\frac{-1}{x}}\right\} =$

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(A) $\{x \in \mathbb{R} : x > 0\}$
(B) $\{x \in \mathbb{R} : x < 0\}$
(C) $\mathbb{R}$
(D) $\{x \in \mathbb{R} : x > 2\}$

Answer: (A) $\{x \in \mathbb{R} : x > 0\}$ · The council's preliminary key

Q123 AP EAPCET 2023 · 17 May · Shift 1 MCQ

The degree of the polynomial $\left(x + \sqrt{x^4 - 1}\right)^9 + \left(x - \sqrt{x^4 - 1}\right)^9$ is

(A) 14
(B) 15
(C) 16
(D) 17

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

Q124 AP EAPCET 2023 · 17 May · Shift 1 MCQ

If A and B are any two events of a sample space, then set-theoretic description for the event: "Exactly one of the events A, B to occur" is

(Here E^c denotes the compliment of the event E)

(A) $A \cap B^c$
(B) $(A - B) \cup (A \cup B)$
(C) $(A \cap B^c) \cup (A^c \cap B)$
(D) $(A \cap B)^c \cup (A^c \cap B^c)$

Answer: (C) $(A \cap B^c) \cup (A^c \cap B)$ · The council's preliminary key

Q125 AP EAPCET 2023 · 17 May · Shift 1 MCQ

Let $f(x)$ be a differentiable function such that $f(1) = 2$, $f(2) = 6$ and $f(x + y) = f(x) + kxy + \frac{4}{3}y^2$ $\forall x, y \in \mathbb{R}$, then $f(x) =$

(A) $4x - 2$
(B) $y - 4x^2 + 2x - 4$
(C) $\frac{8}{3}x^2 + \frac{4}{3}$
(D) $\frac{4}{3}x^2 + \frac{2}{3}$

Answer: (D) $\frac{4}{3}x^2 + \frac{2}{3}$ · The council's preliminary key

Q126 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If $f(0) = 0$, $f(1) = 1$, $f(2) = 2$ and $f(x) = f(x - 2) + f(x - 3)$ for $x = 3, 4, 5 \ldots$, then $f(10) =$

(A) 13
(B) 9
(C) 11
(D) 10

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

Q127 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If $f(x)=\frac{\cos^2 x+\sin^4 x}{\sin^2 x+\cos^4 x}\ \forall x\in R$, then $f(2023)=$

(A) 1
(B) 0
(C) 2
(D) π

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

Q128 AP EAPCET 2023 · 17 May · Shift 2 MCQ

If $A=\{(a,b):4a=5b;\ a,b\in\{1,2,3,\ldots 30\}\}$, then the number of such ordered pairs (a,b) is

(A) 4
(B) 6
(C) 8
(D) 10

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

Q129 AP EAPCET 2023 · 16 May · Shift 1 MCQ

Let $f:\mathbb{R}\to\mathbb{R}$ be a function defined by $f(x)=\frac{2x+1}{3}$. If α is an element in the domain of f whose image is $\frac{1}{\alpha}$, then the sum of all possible values of such α is

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

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

Q130 AP EAPCET 2023 · 16 May · Shift 1 MCQ

Let $f(x)=|x|$ and $g(x)=|x|+a$, $(a>0)$. For $0\le x\le b$, $\{(x,y)/g(x)\le y\le f(x)\}$ represents all the points in the interior of

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(A) a parallelogram
(B) a triangle
(C) a square
(D) a circle

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

Q131 AP EAPCET 2023 · 16 May · Shift 1 MCQ

In a committee of 25 members, each member is proficient either in Mathematics or in Statistics or in both. If 19 of them are proficient in Mathematics and 16 of them are proficient in Statistics, then the probability that a person selected at random from the committee is proficient in both is

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

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

Q132 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Let $A \subseteq \mathbb{R}$, $B \subseteq \mathbb{R}$ and $f : A \to B$ be defined by $f(x) = x^2 - 3x + 2$. If f is a bijection, then

(A) $A = (-\infty, 0]$, $B = \left(-\infty, \frac{-1}{4}\right]$
(B) $A = \left(-\infty, \frac{3}{2}\right]$, $B = \left[\frac{-1}{4}, \infty\right)$
(C) $A = \left[\frac{3}{2}, \infty\right)$, $B = \left(-\infty, \frac{-1}{4}\right]$
(D) $A = (-\infty, \infty)$, $B = \left[\frac{-1}{4}, \infty\right)$

Answer: (B) $A = \left(-\infty, \frac{3}{2}\right]$, $B = \left[\frac{-1}{4}, \infty\right)$ · The council's preliminary key

Q133 AP EAPCET 2023 · 16 May · Shift 2 MCQ

If $f : \mathbb{R} \to \mathbb{R}$ is defined by $f(x + y) = f(x) + f(y)\ \forall x, y \in \mathbb{R}$ and $f(1) = 7$, then $\sum_{r=1}^{n} f(r) =$

(A) $\frac{3n(n+2)}{4}$
(B) $\frac{n(n-1)}{2}$
(C) $\frac{7n(n+1)}{2}$
(D) $\frac{(n+1)(n+2)}{4}$

Answer: (C) $\frac{7n(n+1)}{2}$ · The council's preliminary key

Q134 AP EAPCET 2023 · 15 May · Shift 1 MCQ

If $f(x) = x^3 - x$ and $g(x) = \sin 2x$, then $f\left(g\left(\frac{\pi}{12}\right)\right) =$

(A) 0
(B) 1
(C) $-\frac{3}{8}$
(D) 2

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

Q135 AP EAPCET 2023 · 15 May · Shift 1 MCQ

For $x \in \mathbb{R}$ if $f(x) = \sqrt{\log_{10}\left(\frac{3-x}{x}\right)}$, then the domain of f is

(A) $\left[0, \frac{3}{2}\right]$
(B) $\left(0, \frac{3}{2}\right]$
(C) $[0, 1]$
(D) $(0, 1]$

Answer: (B) $\left(0, \frac{3}{2}\right]$ · The council's preliminary key

Q136 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If $f(a) = \log\left|\frac{1-a}{1+a}\right|$ for $a \neq \{-1, 1\}$, then the set of values of all 'a', for which $f\left(\frac{2a}{1+a^2}\right) > 0$ is

(A) $(0, \infty) - \{1\}$
(B) $(-\infty, 0) - \{-1\}$
(C) $(-\infty, \infty) - \{-1, 1\}$
(D) $(-1, 1)$

Answer: (B) $(-\infty, 0) - \{-1\}$ · The council's preliminary key

Q137 AP EAPCET 2023 · 15 May · Shift 2 MCQ

If a real valued function f is defined by $f(x) = \frac{ax+\sqrt{a^2-x^2}}{bx}$, then f is

(A) only one – one
(B) only onto
(C) both one – one and onto
(D) neither one – one nor onto

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

Q138 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If ${}^nC_r$ denotes the number of combinations of n distinct things taken r at a time, then the domain of the function $g(x) = {}^{(16-x)}C_{(2x-1)}$ is

(A) $\{1,2,3,4,5\}$
(B) $\{0,1,2,3,4\}$
(C) $\emptyset$
(D) $\{0\}$

Answer: (A) $\{1,2,3,4,5\}$ · The council's preliminary key

Q139 TS EAMCET 2023 · 14 May · Shift 1 MCQ

Let $X=\left\{\begin{bmatrix}a & b\\ c & d\end{bmatrix} / a,b,c,d\in\mathbb{R}\right\}$. If $f: X\to\mathbb{R}$ is defined by $f(A)=\det(A)\ \forall A\in X$, then f is

(A) one-one but not onto
(B) onto but not one-one
(C) one-one and onto
(D) neither one-one nor onto

Answer: (B) onto but not one-one · The council's preliminary key

Q140 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $f(x)$ is a function such that $f(x+y)=f(x)+f(y)$ and $f(1)=7$ then $\sum_{r=1}^{n} f(r)=$

(A) $\frac{7n}{2}$
(B) $\frac{7(n+1)}{2}$
(C) $7n(n+1)$
(D) $\frac{7n(n+1)}{2}$

Answer: (D) $\frac{7n(n+1)}{2}$ · The council's preliminary key

Q141 TS EAMCET 2023 · 14 May · Shift 1 MCQ

If $\mathbb{R}-(\alpha,\beta)$ is the range of $\frac{x+3}{(x-1)(x+2)}$, then the sum of the intercepts of the line $\alpha x+\beta y+1=0$ on the coordinate axes is

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

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

Q142 TS EAMCET 2023 · 14 May · Shift 1 MCQ

The period of the function $f(x)=e^{\log(\sin x)}+(\tan x)^3-\operatorname{cosec}(3x-5)$ is

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

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

Q143 TS EAMCET 2023 · 14 May · Shift 2 MCQ

Let $f : \mathbb{R} \to \mathbb{R}$ be a function defined by $f(x) = \begin{cases} x^2 - 4x + 3, & \text{if } x < 2 \\ x - 3, & \text{if } x \geq 2 \end{cases}$

Then the number of real numbers x for which $f(x) = 8$ is

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

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

Q144 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If $f(x)$ and $g(x)$ are two real valued functions such that $f(x) = 3x - 2$ and $g(x) = x^2 + 2$ then $[(g \circ f) + (f \circ g)](x) =$

(A) $2\,g(x) + 2f(x)$
(B) $12\,g(x) - 4f(x) - 22$
(C) $3\,g(x) + f(x) - 2$
(D) $2f(x) + 4g(x) - 32$

Answer: (B) $12\,g(x) - 4f(x) - 22$ · The council's preliminary key

Q145 TS EAMCET 2023 · 14 May · Shift 2 MCQ

If $f(x)$ is a real valued function defined by

$$f(x) = \frac{ax^{10} + bx^8 + cx^6 + dx^4 + ex^2 + 12x + 15}{x}$$

$(x \neq 0)$ and $f(4) = -4$, then $f(-4) =$

(A) 28
(B) 39
(C) 4
(D) 24

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

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Q146 TS EAMCET 2023 · 13 May · Shift 1 MCQ

If the function $f : R \to R$ is defined by $f(x) = \begin{cases} 2x-3, & \text{if } x < -2 \\ x^2-1, & \text{if } -2 \le x \le 2 \\ 3x+2, & \text{if } x > 2 \end{cases}$ then f is

(A) an injection but not a surjection
(B) a surjection but not an injection
(C) a bijection
(D) neither injection nor surjection

Answer: (D) neither injection nor surjection · The council's preliminary key

Q147 TS EAMCET 2023 · 13 May · Shift 1 MCQ

The domain of the real valued function $f(x) = \frac{\sqrt{\log_{10}\left(\frac{x}{x-2}\right)}}{\sqrt{[x]^2-5[x]+6}}$ is

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

(A) $(-\infty, 0) \cup (2, \infty)$
(B) $(2, \infty)$
(C) $(-\infty, 2) \cup (4, \infty)$
(D) $[4, \infty)$

Answer: (D) $[4, \infty)$ · The council's preliminary key

Q148 TS EAMCET 2023 · 13 May · Shift 1 MCQ

The range of the real valued function $f(x) = \frac{1}{x-|x|}$ is

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

Answer: (B) $(-\infty, 0)$ · The council's preliminary key

Q149 TS EAMCET 2023 · 13 May · Shift 2 MCQ

Which one of the following functions is a bijection?

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(A) $f : \mathbb{R} - \mathbb{Z} \to [0, 1]$ defined by $f(x) = \sqrt{x - [x]}$. (Here $[x]$ represents the greatest integer function)

(B) $f : \mathbb{R} \to (-\infty, 2)$ defined by $f(x) = 4x - x^2 - 3$

(C) $f : (5, \infty) \to \mathbb{R} - \{0\}$ defined by $f(x) = \dfrac{1}{\sqrt{x - 5}}$

(D) $f : [0, 4] \to [0, 4]$ defined by $f(x) = \sqrt{16 - x^2}$

Answer: (D) $f : [0, 4] \to [0, 4]$ **defined by** $f(x) = \sqrt{16 - x^2}$ · The council's preliminary key

Q150 TS EAMCET 2023 · 13 May · Shift 2 MCQ

The domain of the real valued function $f(x) = \dfrac{\sqrt{|x| - x}}{\sqrt{x - [x]}}$ is

(A) $\mathbb{Z}$

(B) ϕ

(C) $\mathbb{R} - \mathbb{Z}$

(D) $\mathbb{R}$

Answer: (C) $\mathbb{R} - \mathbb{Z}$ · The council's preliminary key

Q151 TS EAMCET 2023 · 13 May · Shift 2 MCQ

The range of the function defined by

$$f(x) = \begin{cases} 2x - 3, & \text{if } x < -1 \\ 1 - x^2, & \text{if } -1 \leq x \leq 1 \\ 3x^2 + 2, & \text{if } x > 1 \end{cases}$$

is

(A) $\mathbb{R}$

(B) $(-\infty, -5) \cup [0, 1] \cup (5, \infty)$

(C) $(-\infty, -1) \cup (1, \infty)$

(D) $(-\infty, -3) \cup (0, 1) \cup (3, \infty)$

Answer: (B) $(-\infty, -5) \cup [0, 1] \cup (5, \infty)$ · The council's preliminary key

Q152 TS EAMCET 2023 · 12 May · Shift 1 MCQ

The range of the function $f(x) = \log_{0.5}(x^4 - 2x^2 + 3)$ is

(A) $(-\infty, \infty)$

(B) $(-\infty, -1]$

(C) $[-1, \infty)$

(D) $[-1, 1]$

Answer: (B) $(-\infty, -1]$ · The council's preliminary key

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Q153 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If $f:[2,\infty)\to\mathbb{R}$ is defined by $f(x)=x^2-4x+5$, then the range of f is

(A) $\mathbb{R}$
(B) $[1,\infty)$
(C) $[4,\infty)$
(D) $[5,\infty)$

Answer: (B) $[1,\infty)$ · The council's preliminary key

Q154 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If $f(x)=-|x|$, then $(fofof)(x)+(fofof)(-x)=$

(A) $-2f(x)$
(B) $|f(x)|$
(C) $2f(x)$
(D) $-|f(x)|$

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

Q155 TS EAMCET 2023 · 12 May · Shift 2 MCQ

The domain of the function $f(x)=\mathrm{Sin}^{-1}\left(\log_2\left(\frac{x^2}{2}\right)\right)$ is

(A) $[-2,0)\cup(0,1)$
(B) $[1,\infty)\cap[-2,2]$
(C) $[-2,-1]\cup[1,2]$
(D) $(-\infty,1]\cap[-2,2]$

Answer: (C) $[-2,-1]\cup[1,2]$ · The council's preliminary key

Q156 TS EAMCET 2023 · 12 May · Shift 2 MCQ

The range of the function $f(x)=-\sqrt{-x^2-6x-5}$ is

(A) $[0,2]$
(B) $[-2,0]$
(C) $[-2,2]$
(D) $(-\infty,2]$

Answer: (B) $[-2,0]$ · The council's preliminary key

Q157 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If $f:\mathbb{R}\to\mathbb{R}$ is defined by $f(x)=2x+\sin x$, $x\in R$, then f is

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(A) one-one and onto
(B) one-one but not onto
(C) onto but not one-one
(D) neither one-one nor onto

Answer: (A) one-one and onto · The council's preliminary key

Q158 TS EAMCET 2023 · 12 May · Shift 2 MCQ

$f : \mathbb{R} \to \mathbb{R}$ is a function defined by $f(x) = \dfrac{1}{e^x + 2e^{-x}}$

Assertion (A): $f(c) = \dfrac{1}{3}$ for some values of $c \in R$

Reason (R): $0 < f(x) \leq \dfrac{1}{2\sqrt{2}}$ for all $x \in R$

Then which of the following options is correct?

(A) (A) and (R) are true. (R) is the correct explanation of (A)
(B) (A) and (R) are true, but (R) is not the correct explanation for (A)
(C) (A) is true but (R) is false
(D) (A) is false but (R) is true

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

Q159 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

The domain of the real valued function $f(x) = \sqrt{\dfrac{2x^2 - 7x + 5}{3x^2 - 5x - 2}}$ is

(A) $\left(-\infty, -\dfrac{1}{3}\right) \cup [1, 2) \cup \left[\dfrac{5}{2}, \infty\right)$
(B) $(-\infty, 1) \cup (2, \infty)$
(C) $\left(-\dfrac{1}{3}, \dfrac{5}{2}\right]$
(D) $\left(-\infty, \dfrac{-1}{3}\right] \cup \left[\dfrac{5}{2}, \infty\right)$

Answer: (A) $\left(-\infty, -\dfrac{1}{3}\right) \cup [1, 2) \cup \left[\dfrac{5}{2}, \infty\right)$ · The council's preliminary key

Q160 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

The range of the real valued function $f(x) = |x - 2| + |x - 3|$ is

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(A) $[3, \infty)$
(B) $[1, \infty)$
(C) $[2, \infty)$
(D) $(0, 2] \cup [3, \infty)$

Answer: (B) $[1, \infty)$ · The council's preliminary key

Q161 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If $[x]$ represents the greatest integer function, then the set of all real values of x for which $f(x) = \sqrt{\frac{[x]-x}{x-[x]}}$ is real is

(A) ϕ
(B) $\mathbb{R}$
(C) $\mathbb{Z}$
(D) $\mathbb{R} - \mathbb{Z}$

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

Q162 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

If $[x]$ denotes the greatest integer $\leq x$, then the range of the real valued function $f(x) = \frac{1}{\sqrt{x-[x]}}$ is

(A) $[0, 1)$
(B) $(0, 1)$
(C) $(1, \infty)$
(D) $[1, \infty)$

Answer: (C) $(1, \infty)$ · The council's preliminary key

Q163 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

The set of all real values of x for which $f(x) = \log_2(2^x - 2) + \sqrt{1-x}$ is also real is

(A) $\mathbb{R}$
(B) $(1, \infty)$
(C) $(-\infty, 1]$
(D) ϕ

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

Q164 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

Let $f(x) = 1 - x$, $g(x) = \frac{1}{1-x}$, $h(x) = \frac{1}{x}$ be three functions, for $x \neq 0, 1$. If a function $F(x)$ satisfies $f(F(h(x))) = g(x)$, then

(A) $F(2022) = f(2022)$
(B) $F(2022) = g(2022)$
(C) $F(2022) = h(2022)$
(D) $F(2022) = \frac{1}{2022} f(2022)$

Answer: (B) $F(2022) = g(2022)$ · The council's preliminary key

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Q165 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Let $f : A \to B$ be defined as $f(x) = \frac{1}{2} - \tan\left(\frac{\pi x}{2}\right)$ and $g : B \to C$ be defined as $g(x) = \sqrt{3 + 4x - 4x^2}$. If A, B, C are subsets of $\mathbb{R}$ and f is an onto function then the range of the function $f(x)$ is

(A) $(-\infty, \infty)$
(B) $[0, \infty)$
(C) $\left[-\frac{1}{2}, \frac{3}{2}\right]$
(D) $[-1, 1]$

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

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Q166 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If D is the domain and G is the range of the real valued function $f(x) = \sqrt{\frac{1-x^2}{1+x^2}}$, then $D \cap G =$

(A) $[0, \infty)$
(B) $[0, 1]$
(C) $\left[0, \frac{1}{2}\right]$
(D) $[-1, 1]$

Answer: (B) $[0, 1]$ · The council's preliminary key

Q167 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

If $f(x) = \frac{2x-3}{(x-2)(x-3)}$ is a real valued function then the value that $f(x)$ does not take is

(A) -10
(B) 2
(C) 1
(D) -2

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

Q168 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Let α be the period of $3\sin\frac{\pi x}{3} - \cos\frac{\pi x}{2} + \tan\frac{\pi x}{4}$, β be the period of $\sin^2\left(\frac{\pi}{7} + \frac{x}{4}\right) - \sin^2\left(\frac{\pi}{7} - \frac{x}{4}\right)$ and γ be the period of $\cos^4 x + \sin^4 x$. Then $\frac{\alpha\gamma}{\beta} =$

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

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

Q169 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

The domain of the real valued function $f(x) = \frac{\sqrt{6x^2+5x-6}}{\sqrt{4-x}-\sqrt{x+4}}$ is

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

Answer: (A) $\left[-4, -\frac{3}{2}\right] \cup \left[\frac{2}{3}, 4\right]$ · The council's preliminary key

Q170 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

If $[x]$ represents the greatest integer $\leq x$, then the range of the real valued function $f(x) = \frac{1}{\sqrt{[x]^2+[x]-2}}$ is

(A) $(-\infty, 0] \cup \left(\frac{1}{2}, \infty\right)$
(B) $\left(0, \frac{1}{2}\right]$
(C) $(-\infty, 0) \cup [2, \infty)$
(D) $(0, 2]$

Answer: (B) $\left(0, \frac{1}{2}\right]$ · The council's preliminary key

Q171 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

Let $\mathbb{R}$ be the set of all real numbers.
Statement I : The function $f : \left(-\frac{\pi}{2}, \frac{\pi}{2}\right) \to \mathbb{R}$ defined by $f(x) = \sec x + \tan x$ is a one - one function.
Statement II : The function $f : [0, \infty) \to \mathbb{R}$ defined by $f(x) = x^2$ is a one – one function.
Which of the above statements is(are) true?

(A) Statement I is true, but Statement II is false
(B) Statement II is true, but Statement I is false
(C) Both Statement I and Statement II are true
(D) Both Statement I and Statement II are false

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

Q172 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

Let $\mathbb{R}$ be the set of all real numbers. Let $f : \mathbb{R} \to \mathbb{R}$ be a function defined by

$$f(x) = \begin{cases} 2x - 5, & \text{if } x < -3 \\ x + 2, & \text{if } -3 \leq x < 5 \\ 3x + 1, & \text{if } x \geq 5 \end{cases}$$

Match the following

List – I:
A) $f(-5) + f(0) + f(-1) =$
B) $f(f(5) + 10f(-3)) =$
C) $f(|f(-4)|) =$
D) $f(f(f(1))) =$

List – II:
I) 16
II) 40
III) -32
IV) -12
V) 19

The correct match is

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

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

Q173 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

If $a\,f(x) + b\,f\left(\frac{1}{x}\right) = x + 1$, and $\frac{d}{dx}\left(x^2 f(x)\right) = 2x^2 + 2x + \frac{1}{3}$, then $a - b =$

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

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

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Q174 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

If $f : R \to R$ is defined as $f(x) = x^2 - 2x - 3$ then f is

(A) one-one but not onto
(B) onto but not one-one
(C) neither one-one nor onto
(D) a bijection

Answer: (C) neither one-one nor onto · The council's preliminary key

Q175 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

Let $f(x) = \sqrt{\frac{x+1}{x+3}}$ and $g(x) = \sqrt{\frac{2-x}{x+3}}$ be two real valued functions. Then the domain of f/g is

(A) $(-\infty, -3) \cup [-1, \infty)$
(B) $[-1, 2)$
(C) $(-3, 2)$
(D) $(-\infty, -3) \cup [2, \infty)$

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

Q176 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

If the function $f : \mathbf{R} \to \mathbf{R}$ is defined by $f(x) = x\,|x|$, then

(A) f is one-one but not onto
(B) f is onto but not one-one
(C) f is both one-one and onto
(D) f is neither one-one nor onto

Answer: (C) f **is both one-one and onto** · The council's preliminary key

Q177 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

The domain of the real valued function $f(x) = \sqrt{\frac{2 - |x|}{3 - |x|}}$ is

(A) $(-\infty, \infty)$
(B) $(-\infty, -3) \cup (2, \infty)$
(C) $(-\infty, -3] \cup (-2, 2) \cup [3, \infty)$
(D) $(-\infty, -3) \cup [-2, 2] \cup (3, \infty)$

Answer: (D) $(-\infty, -3) \cup [-2, 2] \cup (3, \infty)$ · The council's preliminary key

Q178 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

The range of the function $f(x) = \dfrac{x}{x^2 - 5x + 9}$ is

(A) $\left[\frac{1}{11}, 1\right]$
(B) $\left[\frac{-1}{11}, 1\right]$
(C) $\left[-1, \frac{-1}{11}\right]$
(D) $\left[-1, \frac{1}{11}\right]$

Answer: (B) $\left[\frac{-1}{11}, 1\right]$ · The council's preliminary key

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Q179 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

For x and y satisfying $|x| + |y| = |x - 3| + |y - 2|$, which of the following is correct?

(A) $x = \frac{1}{2}$ for $0 \leq x < 3$ and $1 \leq y < 2$
(B) $x + y = \frac{5}{2}$ for $x \geq 3$ and $y \geq 2$
(C) $x = \frac{1}{2}$ for $x \geq 2$ and $0 \leq y < 3$
(D) $x + y = \frac{5}{2}$ for $0 \leq x < 3,\ 0 \leq y < 2$

Answer: (D) $x + y = \frac{5}{2}$ for $0 \leq x < 3,\ 0 \leq y < 2$ · The council's preliminary key

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Q180 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

If a function f satisfies $f(x+1) + f(x-1) = \sqrt{2}\, f(x)$, then $f(x+2) + f(x-2) =$

(A) $2 \cdot f(x)$
(B) $f(x+1) - f(x-1)$
(C) $4 \cdot f(x)$
(D) 0

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

Q181 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The domain of the real valued function $f(x) = \frac{\sqrt{\log_{0.5}(x-3)}}{\sqrt{x-1}}$ is

(A) $(3, 4]$
(B) $[4, \infty)$
(C) $(1, \infty)$
(D) $(1, 3)$

Answer: (A) $(3, 4]$ · The council's preliminary key

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Q182 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The range of the function $f(x) = \dfrac{x^2 + x + 1}{x^2 - x + 1}$ is

(A) $[1/3, 3]$
(B) $[1/2, 2]$
(C) $[-1/2, -1/4]$
(D) $[-1/2, 2]$

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

Q183 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

If f is a relation from set of positive real numbers to the set of positive real numbers defined by $f(x) = 3x^2 - 2$ then f is

(A) one-one but not onto
(B) onto but not one-one
(C) a bijection
(D) not a function

Answer: (D) not a function · The council's preliminary key

Q184 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

Let $f : \mathbf{R} \to \mathbf{R}$ defined by $f(x) = 5x^4 + 2$. Then

(A) f is one-one but not onto
(B) f is onto but not one-one
(C) f is both one-one and onto
(D) f is neither one-one nor onto

Answer: (D) f **is neither one-one nor onto** · The council's preliminary key

Q185 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

Let f be a function defined by $f(xy) = \frac{f(x)}{y}$ for all positive real numbers x and y. If $f(30) = 20$, then $f(40) =$

(A) 10
(B) 15
(C) 25
(D) 17

Answer: (B) 15 · The council's preliminary key

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Q186 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

The domain of the real valued function $f(x)=\frac{\log_2(x+3)}{\sqrt{x^2+3x+2}}$ is

(A) $(-3,\infty)$
(B) $(-3,-1)\cup(-1,\infty)$
(C) $(-3,-2)\cup(-2,-1)\cup(-1,\infty)$
(D) $(-3,-2)\cup(-1,\infty)$

Answer: (D) $(-3,-2)\cup(-1,\infty)$ · The council's preliminary key

Q187 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

The domain of the real valued function $f(x)=\frac{\sqrt{2-x}+\sqrt{1+x}}{\sqrt{x+3}}$ is

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

Answer: (A) $[-1,2]$ · The council's preliminary key

Q188 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

$[\,.\,]$ represents the greatest integer function. At $x=-1$, $\frac{d}{dx}\sin\pi[x]=$

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

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

Q189 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

$f(x)=\log\left(\left(\frac{2x^2-3}{x}\right)+\sqrt{\frac{4x^4-11x^2+9}{x^2}}\right)$ is

(A) an odd function
(B) An even function
(C) A polynomial function
(D) not a function

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

Q190 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Let f: $\mathbf{R}-\left\{\frac{-1}{2}\right\} \rightarrow \mathbf{R}$ be defined by $f(x)=\frac{x-2}{2x+1}$. If α, β satisfy the equation $f(f(x))=-x$, then $4(\alpha^2+\beta^2)=$

(A) 17
(B) 12
(C) 24
(D) 34

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

Q191 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

205 students take an examination of whom 105 pass in English, 70 students pass in mathematics and 30 students pass in both. How many students fail in both subjects?

(A) 60
(B) 145
(C) 175
(D) 30

Answer: (A) 60 · The council's preliminary key

Q192 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

The range of the real valued function $f(x)=\frac{x^2+x+1}{x}$ is

(A) $(-\infty, 1) \cup (1, \infty)$
(B) $(-\infty, -1] \cup [1, \infty)$
(C) $(-\infty, -2] \cup [3, \infty)$
(D) $(-\infty, -1] \cup [3, \infty)$

Answer: (D) $(-\infty, -1] \cup [3, \infty)$ · The council's preliminary key

Q193 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

If a function $f: \mathbf{R}-\{l\} \rightarrow \mathbf{R}-\{m\}$ defined by $f(x)=\frac{x+3}{x-2}$ is a bijection, then $3l+2m=$

(A) 10
(B) 12
(C) 8
(D) 14

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

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Q194 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

The range of the real valued function $f(x)=\sqrt{\frac{x^2+2x+8}{x^2+2x+4}}$ is

(A) $\left[\sqrt{\frac{7}{3}},\infty\right)$

(B) $(0,\infty)$

(C) $(1,\infty)$

(D) $\left(1,\sqrt{\frac{7}{3}}\right]$

Answer: (D) $\left(1,\sqrt{\frac{7}{3}}\right]$ · The council's preliminary key

Q195 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

If $f(x)=\sqrt{4-x^2}$ and $g(x)=\log(1-x)$ are two real valued functions then the domain of the function (f+g)(x) is

(A) [-2, 2]

(B) [-2, 1)

(C) $(-\infty,1)$

(D) (1, 2]

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

Q196 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

If $f(x)=ax^2+bx+c$ for some a, b, c $\in\mathbb{R}$ with a + b + c = 3 and $f(x+y)=f(x)+f(y)+xy\ \forall x,y\in\mathbb{R}$. The $\sum_{n=1}^{10}f(n)=$

(A) 330

(B) 255

(C) 165

(D) 190

Answer: (A) 330 · The council's preliminary key

Q197 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

Let $f:R^+\to R^+$ be a function satisfying $f(x)-x=\lambda$ (constant), $\forall x\in R^+$ and $f(xf(y))=f(xy)+x,\ \forall x,y\in R^+$.

Then $\lim_{x\to0}\frac{(f(x))^{1/3}-1}{(f(x))^{1/2}-1}=$

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

Answer: (C) 2/3 · The council's preliminary key

Q198 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

\left\{x \in R / \frac{\sqrt{|x|^2-2|x|-8}}{\log(2-x-x^2)} is a real number\right\} =

(A) $(-\infty, -4] \cup [4, \infty)$
(B) ϕ
(C) $(-1, 2)$
(D) $(-\infty, -4] \cup (-1, 2) \cup [4, \infty)$

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

Q199 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

The domain of the real valued function $f(x) = \sin\left(\log\left(\frac{\sqrt{4-x^2}}{1-x}\right)\right)$ is

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

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

Q200 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If $f(f(0)) = 0$, where $f(x) = x^2 + ax + b$, $b \neq 0$ then $a + b =$

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

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

Q201 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If a set A has m- elements and the set B has n-elements, then the number of injections from A to B is

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(A) ${}^{n}C_{m}$ if $n \geq m$

(B) ${}^{n}P_{m}$ if $n \geq m$

(C) 0 if $n \geq m$

(D) $m.{}^{n}C_{m}$ if $n \geq m$

Answer: (B) ${}^{n}P_{m}$ if $n \geq m$ · The council's preliminary key

Q202

AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

If $x \neq 0$ and $f(x)$ satisfies $8f(x) + 6f\left(\frac{1}{x}\right) = x + 5$, then $\frac{d}{dx}\left(x^2 f(x)\right)$ at $x = 1$ is

(A) $\frac{-1}{14}$

(B) $\frac{25}{14}$

(C) $\frac{9}{14}$

(D) $\frac{19}{14}$

Answer: (D) $\frac{19}{14}$ · The council's preliminary key

Q203

AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

The function $g : Z \times Z \to Z \times Z$ defined by mapping $g(m, n) = (m + n, m + 2n)$ is _____

(A) Neither injective nor surjective

(B) Injective but not surjective nor surjective

(C) Surjective but nor injective

(D) Injective & surjective

Answer: (D) Injective & surjective · The council's preliminary key

Q204

AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Let $A = \{1, 2, 3, 4, 5, 6\}$ Number of functions 'f' from A to A such that $f(m) + f(n) = 7$ whenever $m + n = 7$ is _____

(A) 525

(B) 216

(C) 200

(D) 729

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

Q205

AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Let A be the set of all 3×3 scalar matrices with real entries. If $f : A \to R$ is defined by $f(m) = \det(m)\ \forall\ m \in A$, then '$f$' is _____

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(A) One – one but not onto
(B) Onto but not one – one
(C) Bijective
(D) Neither one – one nor onto

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

Q206 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The inverse of the function $y = \dfrac{10^x - 10^{-x}}{10^x + 10^{-x}}$ is

(A) $\dfrac{1}{2}\log_{10}\left(\dfrac{1+x}{1-x}\right)$
(B) $\dfrac{1}{2}\log_{10}\left(\dfrac{2+x}{2-x}\right)$
(C) $\dfrac{1}{2}\log_{10}\left(\dfrac{1-x}{1+x}\right)$
(D) $\dfrac{1}{2}\log_{10}\left(\dfrac{2-x}{2+x}\right)$

Answer: (A) $\dfrac{1}{2}\log_{10}\left(\dfrac{1+x}{1-x}\right)$ · The council's preliminary key

Q207 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The larger of $\cos(\log\theta)$ and $\log(\cos\theta)$ if $e^{-\pi/2} < \theta < \pi/2$ is

(A) $\cos(\log\theta)$
(B) $\log(\cos\theta)$
(C) None of function is larger
(D) One of the two function is undefined on domain even to compare

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

Q208 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If $f : R \to R$ is defined as $f(x+y) = f(x) + f(y)\ \forall\, x, y \in R$ and $f(1) = 5$, then find the value of the following: $\sum_{r=1}^{n} f(r) = ?$

(A) $\frac{5n(n+1)}{2}$
(B) $\frac{7n(n-1)}{2}$
(C) $\frac{5n(n-1)}{2}$
(D) $\frac{7n(n+1)}{2}$

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

Q209 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

What is the range the function $h(x) = \frac{x-2}{x+3}$?

(A) $(-\infty, 2) \cup (2, \infty)$
(B) $(-\infty, 1) \cup (1, \infty)$
(C) $(-\infty, -3) \cup (-3, \infty)$
(D) $(-\infty, -1) \cup (-1, \infty)$

Answer: (B) $(-\infty, 1) \cup (1, \infty)$ · The council's preliminary key

Q210 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

If $3f(x) - 2f\left(\frac{1}{x}\right) = x$, then $f'(2) =$ _____

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

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

Q211 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

Which of the following is false?

(A) If f is an even function from R to R then $f(o)$ must be equal to 0
(B) $f : R \to R$ defined by $f(x) = x - [x]\ \forall x \in R$, where $[x]$ is the greatest integer not greater than x, is a periodic function
(C) If $f : R \to R$ is an odd function, then $f(o) = 0$
(D) Number of onto functions from $\{1, 2, 3, 4, 5, 6\}$ to $\{1, 2\}$ is 62

Answer: (A) If f is an even function from R to R then $f(o)$ must be equal to 0 · The council's preliminary key

Q212 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The domain of defined of the function $f(x) = \sqrt{\frac{1 - |x|}{2 - |x|}}$ is _____

(A) $[-1, 1] \cup (-\infty, -2] \cup [2, \infty)$
(B) $[-1, 1] \cup (-\infty, -2) \cup (2, \infty)$
(C) $(\infty, 2) \cup (2, \infty)$
(D) R

Answer: (B) $[-1, 1] \cup (-\infty, -2) \cup (2, \infty)$ · The council's preliminary key

Q213 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

If $2f(x) - 3f\left(\frac{1}{x}\right) = x + 1$, then $f'(\sqrt{3}) =$ _____

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

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

Q214 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

$f : R \to R$ and $g : R \to R$ are two functions such that $f(x) = x^2$ and $g(x) = \frac{1}{x^2}$, then $x^4(f \circ g)(x)$ is equal to

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

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

Q215 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

The domain of the function $f(x) = \frac{1}{\sqrt{|x| - x}}$ is

(A) $(0, \infty)$
(B) $(-\infty, 0)$
(C) $(-\infty, \infty) \setminus \{0\}$
(D) $(-\infty, \infty)$

Answer: (B) $(-\infty, 0)$ · The council's preliminary key

Q216 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

$[.]$ represents greatest integer function. Let $g(x) = 1 + x - [x]$ and $f(x) = \begin{cases} -3, & x < 0 \\ 0, & x = 0 \\ 5, & x > 0 \end{cases}$ then $f(g(x))$ is

(A) $f(x)$
(B) -15
(C) 5
(D) -3

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

Q217 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If a set A has m elements and set B has n elements and the number of injections from A to B is 2520. Then m is equal to

(A) 2
(B) 7
(C) 6
(D) 5

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

Q218 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

Define $f : R \to R$ by $f(x) = \max\{x + 1,\ 1 - x,\ 2\}$. Then f is _____

(A) One – one but not onto
(B) Onto but not one – one
(C) Neither one – one nor onto
(D) Both one – one and onto

Answer: (C) Neither one – one nor onto · The council's preliminary key

Q219 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

The domain of the function defined by $f(x) = \dfrac{-5}{4x^2 + 1} + \sqrt{x^2 - 4}$ is

(A) R
(B) $(-\infty, -2)$
(C) $(-\infty, -2] \cup [2, \infty)$
(D) $(2, \infty)$

Answer: (C) $(-\infty, -2] \cup [2, \infty)$ · The council's preliminary key

Q220 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

The range of the function $f(x) = -\sqrt{-5 - 6x - x^2}$ is

(A) $[-2, 2]$
(B) $[-\infty, -2]$
(C) $[2, \infty]$
(D) $[-2, 0]$

Answer: (D) $[-2, 0]$ · The council's preliminary key

Q221 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

$f(x) = \sin x + \cos x,\ g(x) = x^2 - 1$ then $g(f(x))$ is invertible if

(A) $\frac{-\pi}{4} \leq x \leq \frac{\pi}{4}$
(B) $\frac{-\pi}{2} \leq x \leq 0$
(C) $\frac{-\pi}{2} \leq x \leq \pi$
(D) $0 \leq x \leq \frac{\pi}{2}$

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

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Q222 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

Let $f(x) = x^3$ and $g(x) = 3^x$, then the quadratic equation whose roots are solutions of the equation $(fog)(x) = (gof)(x)$ (for $x \neq 0$) is

(A) $x^2 - 6x + 3 = 0$
(B) $x^2 - 6x + 9 = 0$
(C) $x^2 - x + 3 = 0$
(D) $x^2 - 3 = 0$

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

Q223 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

Let $f(x) = (x+2)^2 - 2,\ x \geq -2$. Then $f^{-1}(x) =$

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

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

Q224 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If 'f' is the greatest integers function defined on R as $f(x) = [x]$ and 'g' is the modulus function defined on R as $g(x) = |x|$, then the value of $(g \circ f)\left(\frac{-5}{3}\right)$ is

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

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

Q225 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $f : R \to R$ and $g : R \to R$ are two functions defined by $f(x) = ax + b\ (a \neq 0)\ \forall x \in R$ and $g(x) = cx^3 + d\ (c \neq 0)\ \forall x \in R$, then $(f \circ g)^{-1}(x) =$

(A) $\left(\frac{x-ad+b}{ac}\right)^{\frac{1}{2}}$
(B) $\left(\frac{x+ad-b}{ac}\right)^{\frac{1}{3}}$
(C) $\left(\frac{x-ad-b}{ac}\right)^{\frac{1}{3}}$
(D) $\left(\frac{x+ad+b}{ac}\right)^{\frac{1}{3}}$

Answer: (C) $\left(\frac{x-ad-b}{ac}\right)^{\frac{1}{3}}$ · The council's preliminary key

Q226 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If $f(10-x)=3x^2+4x-5$ and $f(x)=px^2+qx+r$ then $p+q+r=$

(A) 272
(B) 274
(C) 275
(D) 273

Answer: (B) 274 · The council's preliminary key

Q227 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Let $f:R\to R$ and $g:R\to R$ be defined by $f(x)=2x+1$ & $g(x)=x^2-2$ determine $(gof)(x)=$

(A) $2x^2-3$
(B) $4x^2+4x-1$
(C) $4x^2+4x+1$
(D) $2x^2-4$

Answer: (B) $4x^2+4x-1$ · The council's preliminary key

Q228 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Given the function $f(x)=\frac{a^x+a^{-x}}{2}$, $(a>2)$ then $f(x+y)+f(x-y)$ is equal to

(A) $f(x)-f(y)$
(B) $f(y)$
(C) $2f(x)f(y)$
(D) $f(x)f(y)$

Answer: (C) $2f(x)f(y)$ · The council's preliminary key

Q229 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

If f is a function defined on $(0,1)$ by $f(x)=\min\{x-[x],-x-[x]\}$, then $(fofofof)(x)$ is equal to _____ ([.] greatest integer function)

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

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

Q230 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

The real valued function $f(x)=\frac{x}{e^x-1}+\frac{x}{2}+1$ defined on $R\setminus\{0\}$ is _____

(A) An odd function
(B) An even function
(C) Both even & odd function
(D) Neither even nor odd function

Answer: (B) An even function · The council's preliminary key

Q231 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

The domain of the function $f(x)=\frac{1}{[x]-1}$, where $[x]$ is greatest integer function of x is

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

Answer: (D) $R-[1,2)$ · The council's preliminary key

Q232 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Let $f:R\to R$ be a function defined by $f(x)=\frac{4^x}{4^x+2}$. what is the value of $f\left(\frac{1}{4}\right)+2f\left(\frac{1}{2}\right)+f\left(\frac{3}{4}\right)=$?

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

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

Q233 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

$f:[-2,2]\to[-2,2]$, $g:[-2,2]\to[0,4]$ are two functions defined as $f(x)=\begin{cases}-2, & -2\le x\le 0\\ x^2-2, & 0\le x\le 2\end{cases}$ and $g(x)=|f(x)|+f(|x|)$, then

(A) f and g are injective mappings
(B) f and g are surjective mappings
(C) f is bijective mapping and g is injective mapping
(D) f is not bijective mapping and g is surjective mapping

Options (2) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

Q234 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

The domain of the function $f(x) = \frac{1}{\sqrt{|x| - x}}$ is

(A) $\mathbb{R}$
(B) $(-\infty, 0)$
(C) $(0, \infty)$
(D) $(-\infty, 1)$

Answer: (B) $(-\infty, 0)$ · The council's preliminary key

Q235 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

The period of $\tan ky + \sin ky$, where $k = 1 + 4 + 9 + \ldots$ ..20 terms, is

(A) $\frac{\pi}{1435}$
(B) $\frac{2\pi}{1435}$
(C) π
(D) 2π

Answer: (A) $\frac{\pi}{1435}$ · The council's preliminary key

Q236 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

If $f : \mathbb{R} \setminus \{0\} \to \mathbb{R}$ is such that $2f(x) + f\left(\frac{1}{x}\right) = 4x$, and $S = \{x \in \mathbb{R} : f(x) = f(-x)\}$, then the number of elements in S is

(A) 0
(B) 1
(C) 2
(D) at least three

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

Q237 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

If a function $f : (-1, 1) \to B(\subseteq \mathbb{R})$ is defined as $f(x) = x + x^2 + x^3 + \ldots \infty$, then in order to have the inverse function of f, $B =$

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(A) $\left(-\infty, \frac{1}{2}\right)$
(B) $\left(\frac{-1}{2}, \infty\right)$
(C) $(-1, 1)$
(D) $\mathbb{R}$

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

Q238 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

A and B are subsets of $\mathbb{R}$. Every element x of A is mapped to an element of B by the rule $y(x) = \begin{cases} \frac{5x}{(x-3)(x+3)} & \text{if } x \neq -1 \\ -1 & \text{if } x = -1 \end{cases}$, then A $=$

(A) $\mathbb{R}/\{-3, +3, -0\}$
(B) $\mathbb{R}/\{-3, +3\}$
(C) $\mathbb{R}/\{-3, 3, 0, -1\}$
(D) $\mathbb{R}$

Answer: (B) $\mathbb{R}/\{-3, +3\}$ · The council's preliminary key

Q239 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

The domain and range of $y(x) = \cos x - 3$ are respectively

(A) $\mathbb{R}$ and $[-1, 1]$
(B) $\mathbb{R}$ and $[-4, -2]$
(C) $\mathbb{R}/\{0\}$ and $[0, 1]$
(D) $\mathbb{R}/\left\{(2n+1)\frac{\pi}{2}\right\}$ and $[-1, 1]$

Answer: (B) $\mathbb{R}$ and $[-4, -2]$ · The council's preliminary key

Q240 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

Let $f(x) = \frac{1}{2} - \tan\left(\frac{\pi x}{2}\right)$, $-1 < x < 1$ and $g(x) = \sqrt{3 + 4x - 4x^2}$ then the domain $(f + g)$ is

(A) $\left[\frac{1}{2}, 1\right)$
(B) $\left[\frac{-1}{2}, \frac{1}{2}\right)$
(C) $\left[-\frac{1}{2}, 1\right)$
(D) $\left[-\frac{1}{2}, -1\right]$

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

Q241 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

Let $a > 1$ be a constant. If $f : A \to A$ and $(x, y) \in f$ satisfy $a^x + a^y = a$, then $A =$

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(A) $(0, a]$
(B) $[0, a]$
(C) $(-\infty, 1)$
(D) $(-\infty, a+1)$

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

Q242 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If $f : \mathbb{R} \to \mathbb{R}$ is defined as $f(x+y) = f(x) + f(y)$, $\forall x, y \in \mathbb{R}$ and $f(1) = 10$, then $\sum_{r=1}^{n} (f(r))^2 =$

(A) $\frac{7}{2}n(n+1)$
(B) $5n(n+1)$
(C) $\frac{50}{3}n(n+1)(2n+1)$
(D) $\frac{100}{4}n^2(n+1)^2$

Answer: (C) $\frac{50}{3}n(n+1)(2n+1)$ · The council's preliminary key

Q243 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

If $f : \mathbb{R} \to \mathbb{R}$ is defined as $f(x) = \frac{3^x + 3^{-x}}{2}$, $\forall x \in \mathbb{R}$ and it satisfies $f(x+y) + f(x-y) = a\, f(x) f(y)$, then $a =$

(A) 2
(B) 1
(C) 4
(D) 8

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

Q244 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Let $f : A \to B$, $g : B \to A$ be defined as $f(x) = x^2\ \forall x \in A$ and $g(x) = x^{1/2}\ \forall x \in B$. $f(x)$ and $g(x)$ are inverse functions to each other when

(A) $A = B = \mathbb{R}$
(B) $A = \mathbb{R} \setminus \mathbb{R}^-;\ B = \mathbb{R} \setminus \mathbb{R}^+$
(C) $A = \mathbb{R};\ B = \mathbb{R} \setminus \mathbb{R}^-$
(D) $A = B = \mathbb{R} \setminus \mathbb{R}^-$

Answer: (D) $A = B = \mathbb{R} \setminus \mathbb{R}^-$ · The council's preliminary key

Q245 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

The function of $f(x) = \log\left(x + \sqrt{x^2+1}\right)$ is

(A) an even function
(B) an odd function
(C) a periodic function
(D) neither an even function nor an odd function

Answer: (B) an odd function · The council's preliminary key

Q246 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

The function $f(x)=\frac{e^{|x|}-e^{-x}}{e^{x}+e^{-x}}+\cos^{3}\left(\frac{x}{2}\right)$ from $\mathbf{R}$ to itself is

(A) An injective function
(B) A surjective function
(C) An even function
(D) Not bijective

Answer: (D) Not bijective · The council's preliminary key

Q247 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

Let $A=\{1,2,3,\ldots,n\}$ and $B=\{a,b\}$ if the number of onto functions from A to B is 62, then the number of subsets of A containing exactly three elements is

(A) 15
(B) 6
(C) 20
(D) 10

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

Q248 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

In the following statements _____
(i) Relation is a special case of function
(ii) Function is special case of relation
(iii) Both relation & function are same

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

Answer: (C) (ii) is True, (i) & (iii) are false · The council's preliminary key

Q249 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If $f:R\to R$ is defined as $f(x)=x-[x]+3, \forall\, x\in R$, then f is

(A) Not a function
(B) A periodic function with period π
(C) A periodic function with period 1
(D) An invertible function

Answer: (C) A periodic function with period 1 · The council's preliminary key

Q250 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If $f : R \to R$ is defined as $f(x) = (2020 - x^{2019})^{1/2019}$, $\forall\, x \in R$, find $(f \circ f \circ f \circ f)\left(\frac{2019}{2020}\right)$

(A) 1
(B) 0
(C) $\frac{2019}{2020}$
(D) $\frac{2020}{2019}$

Answer: (C) $\frac{2019}{2020}$ · The council's preliminary key

Q251 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If f is a continuous real valued function, then the range of the function is _____

(A) $[0, 1]$
(B) $[\text{Minimum}(f),\ \text{Maximum}(f)]$
(C) $[0, \infty)$
(D) $(-\infty, 0]$

Answer: (B) $[\text{Minimum}(f),\ \text{Maximum}(f)]$ · The council's preliminary key

Q252 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

For equality of functions f and g _____
(i) domain of f = domain of g
(ii) $f(x) = g(x)$
(iii) $x \in$ domain of f

(A) only (i) and (ii) are necessary
(B) only (ii) and (iii) are necessary
(C) only (i) and (iii) are necessary
(D) All (i), (ii) and (iii) are necessary

Answer: (D) All (i), (ii) and (iii) are necessary · The council's preliminary key

Q253 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

Let $f : N \times N \to N$ be a function such that $f((1, 1)) = 2$ and $f((m + 1, n)) = f((m, n)) + 2(m + n)$ and $f((m, n + 1)) = f((m, n)) + 2(m + n - 1)$, $\forall m, n \in N$, then find $f(2, 2)$

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(A) 8
(B) 7
(C) 9
(D) 10

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

Q254 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

For $f(x)=\sin\left(\frac{1}{|x|\sqrt{x^2-1}}\right)$ the domain and range of $f(x)$ in $\mathbf{R}$ are

(A) $\mathbf{R}-\{0,\pm1\}$ and $[-1,1]$, respectively
(B) $\mathbf{R}-[-1,1]$ and $[-1,1]$, respectively
(C) $\mathbf{R}-\{0,\pm1\}$ and $[0,1]$, respectively
(D) $\mathbf{R}-[-1,1]$ and $[0,1]$, respectively

Answer: (B) $\mathbf{R}-[-1,1]$ and $[-1,1]$, respectively · The council's preliminary key

Q255 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

The range of the function $f(x)=x^2+\frac{1}{x^2+1}$ is

(A) $[1,\infty)$
(B) $[2,\infty)$
(C) $\left[\frac{3}{2},\infty\right)$
(D) $(0,1]$

Answer: (A) $[1,\infty)$ · The council's preliminary key

Q256 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

The function $f(x)=\sin x-\cos x$ is _____

(A) Odd function
(B) Even function
(C) Neither even nor odd function
(D) $f(x)$ is not a function

Answer: (C) Neither even nor odd function · The council's preliminary key

Q257 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

If $f: N\times N\to N$ is defined by $f((m,n))=2^{m-1}(2n-1)$, $\forall(m,n)\in N\times N$, then f is

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(A) One-one but not onto
(B) Onto but not one-one
(C) Neither one-one nor onto
(D) Both one-one and onto

Answer: (D) Both one-one and onto · The council's preliminary key

Q258 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If $f : \mathbf{R} \to \mathbf{R}$ is defined as $f(x) = \frac{2020^x}{2020^x + \sqrt{2020}}$, $\forall x \in \mathbf{R}$, then $\sum_{r=1}^{4039} 2f\left(\frac{r}{4040}\right) =$

(A) 4040
(B) 4039
(C) 2020
(D) 1010

Answer: (B) 4039 · The council's preliminary key

Q259 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If $2f(\sin x) + f(\cos x) = x$ then $f'(x) =$

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

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

Q260 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If $f(x) = e^x$; $g(x) = \ln(x)$ for all $x \in [1, \infty)$, then $f \circ g$ is _____

(A) A one-one function
(B) An on-to function
(C) Not a function
(D) Bijective

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

Q261 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

The domain of $\sqrt{|x| - x}$ is

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(A) $(-\infty, 0)$
(B) $(0, \infty)$
(C) $(-\infty, \infty)$
(D) $R - \{0\}$

Answer: (C) $(-\infty, \infty)$ · The council's preliminary key

Q262 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Let $f(x) = \cos(ax) + \sin(x)$ be periodic. Then a must be

(A) Irrational
(B) Rational
(C) Positive real number
(D) Negative real number

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

Q263 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Let S be a finite set. Then a non-identity function $f : S \to S$ can be _____

(A) Injective but not surjective
(B) Surjective but not injective
(C) Bijective but it does not have an inverse function
(D) Data insufficient

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

Q264 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

If $(f(x))^2 = f(x^2) + f(1)$ holds good, then find $f(x)$

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

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

Q265 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Find $\sum_{t=1}^{39} f(t)$ if $f : R \to R$ is defined as $f(x + y) = f(x) + f(y)$, $x, y \in R$ and $f(1) = 7$

(A) 5187
(B) 5460
(C) 5740
(D) 5407

Answer: (B) 5460 · The council's preliminary key

Q266 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Find the function $g(t)$ if $f(t) = 3t - 2$ and $(gof)^{-1}(t) = t - 2$.

(A) $g(t) = \frac{(t-8)}{3}$
(B) $g(t) = \frac{(t+8)}{3}$
(C) $g(t) = \frac{(8-t)}{3}$
(D) $g(t) = 3t - 8$

Answer: (B) $g(t) = \frac{(t+8)}{3}$ · The council's preliminary key

Q267 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If $f : R \to R$ is defined as $f(x) = \frac{x^6}{x^6+2020}$, $\forall x \in R$, then the range of f is _____

(A) $[0, 1]$
(B) $[0, \infty)$
(C) $[0, 1)$
(D) $[0, \frac{1}{2020})$

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

Q268 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

Exactly how many functions $f : Q \to Q$ exist such that $f(x + y) = f(x) + f(y)$ and $f(xy) = f(x)f(y)$ for all $x, y \in Q$?

(A) One
(B) Two
(C) Three
(D) Infinitely many

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

Q269 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

Find the domain of the real valued function $f(x) = ([x]^2 - [x] - 2)^{-1/2}$, where $[.]$ is the greatest integer function

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(A) $R-(-1,3]$
(B) $R-[-1,3)$
(C) $R-(-1,3)$
(D) $R-[-1,3]$

Answer: (B) $R-[-1,3)$ · The council's preliminary key

Q270 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

Let a, b, c be real numbers. A set formed with a, b, c whose order of occurrence is preassigned is called _____

(A) An ordered triad
(B) An ordered pair
(C) Both ordered triad and ordered pair
(D) None of these options are correct

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

Q271 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If $3f(x)-2f\left(\frac{1}{x}\right)=x$, then $f'(2)$ is

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

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

Q272 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

How many bijections $f:\mathbb{Z}\to\mathbb{Z}$ are there such that $f(x+y)=f(x)+f(y)$ for all $x,y\in\mathbb{Z}$?

(A) One
(B) Two
(C) Three
(D) Infinitely many

Answer: (B) Two · Checked by our team

Q273 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If $[a,b]$ is the range of the function $\dfrac{x+2}{2x^2+3x+6}$ for $x\in\mathbf{R}$, then

(A) $a < 0,\ b < 0$
(B) $a < 0,\ b > 0$
(C) $a > 0,\ b > 0$
(D) $a > 0,\ b < 0$

Answer: (B) $a < 0,\ b > 0$ · The council's preliminary key

Q274 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The domain of $f(x) = \text{Cos}^{-1}\left(\frac{x-3}{2}\right) - \log_{10}(4-x)$ is _____

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

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

Q275 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

The function $f : \mathbf{R} \to \mathbf{R}$ defined by $f(x) = \frac{x}{\sqrt{1+x^2}}$ is _____

(A) Surjective but not injective
(B) Bijective
(C) Injective but not surjective
(D) Neither injective nor surjective

Answer: (C) Injective but not surjective · The council's preliminary key

Q276 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

How many functions $f : \mathbb{Z} \to \mathbb{Z}$ are there such that $f(x+y) = f(x) + f(y)$ for all $x, y \in \mathbb{Z}$?

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

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

Q277 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

For $f(x) = \frac{\sin \pi[x]}{1+[x]} + \frac{x}{2+3x}$, where $[x]$ denotes the greatest integer function, the domain and range in $\mathbf{R}$ are respectively _____

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(A) $\mathbf{R}-\{-1,\frac{-2}{3}\}$ & $\mathbf{R}-\{\frac{1}{3}\}$
(B) $\mathbf{R}-\{-1,\frac{-2}{3}\}$ & $[-1,1]$
(C) $\mathbf{R}-[-1,0)$ & $\mathbf{R}-\{\frac{1}{3}\}$
(D) $\mathbf{R}-[-1,0)$ & $[-1,1]$

Answer: (C) $\mathbf{R}-[-1,0)$ & $\mathbf{R}-\{\frac{1}{3}\}$ · The council's preliminary key

Q278 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Given that for any $n \in N$ there exist on odd integer q and a non- negative integer r such that, n can be written uniquely as $n = q \times 2^r$. Let $f : N \to N \times N$ be function defined by $f(n) = \left(r+1, \frac{q+1}{2}\right)$. Then,

(A) f is one-one but not onto
(B) f is onto but not one -one
(C) f is a bijection
(D) only $f^{-1}(1,1)$ does not exist because f is not a bijection

Answer: (C) f is a bijection · Official TGCHE final key

Q279 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

If $f : R \to R$ be defined by $f(x) = x + 2|x+1| + 2|x-1|$, then the element in the codomain, which has unique pre image in the domain is

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

Answer: (A) 3 · Official TGCHE final key

Q280 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

If $f : \mathbb{Z} \to \mathbb{N}$ is defined by $f(n) = \begin{cases} 2n, & \text{if } n > 0 \\ 1, & \text{if } n = 0 \\ -2n-1, & \text{if } n < 0 \end{cases}$ then f is

(A) one-one but not onto
(B) onto but not one -one
(C) both one-one and onto
(D) neither one-one nor onto

Answer: (B) onto but not one -one · Official TGCHE final key

Q281 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Domain of $\cos^{-1}\left[\log_5\left(x^2+7x+15\right)\right]$ is

(A) The set of all real numbers
(B) $(-\infty, -5] \cup [-2, \infty)$
(C) $\mathbb{R} - \{-5, -2\}$, where $\mathbb{R}$ is the set of real numbers
(D) $[-5, -2]$

Answer: (D) $[-5, -2]$ · Official TGCHE final key

Q282 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Match the items of List-I to the items of List-II
A) The period of $\sin^2 x$ is
B) Maximum value of $\frac{\pi}{3}\left(\sqrt{3}\cos 3x + \sin 3x\right)$
C) The period of $\sin\frac{x}{3} + \cos\frac{x}{2}$ is
D) Intersection points of $y = |\sin x|$ and $y = 1$ in $(0, \pi)$
I) $\frac{2\pi}{3}$
II) 12π
III) $\frac{\pi}{2}$
IV) $\frac{3\pi}{2}$
V) π
The correct match is

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

Answer: (A) A-V, B-I, C-II, D-III · Official TGCHE final key

Q283 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Let $f : \mathbb{R} \to \mathbb{R}$ be defined by $f\left(\frac{x+y}{2}\right) = \frac{f(x)+f(y)}{2}$ for all x and y. If $f'(0)$ exists and equals -1 and $f(0) = 1$, then $f(2) =$

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

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

Q284 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

If $f : [-3, 2] \to [0, \sqrt[3]{x}]$ is an onto function defined by $f(n) = \begin{cases} 2 + \sqrt[3]{n}, & -3 \le n \le -1 \\ n^{2/3}, & -1 \le n \le 2 \end{cases}$ then $x =$

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(A) 1
(B) 2
(C) 4
(D) 6

Answer: (C) 4 · Official TGCHE final key

Q285 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

Let $[x]$ denote the greatest integer not more than x. If A and B are the domains of the functions $f(x)=\frac{x-[x]}{\sqrt{|x|-x}}$ and $g(x)=\frac{x-[x]}{\sqrt{|x|+x}}$ respectively, then

(A) $A \cup B = R$
(B) $A \cap B = \phi$
(C) $A - B = (-\infty, 0)$
(D) $B - A = (0, \infty)$

Options (2) or (3) or (4) were accepted. More than one answer was accepted. · Official TGCHE final key

Q286 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

The period of $\frac{\sin x}{\cos 3x}+\frac{\sin 3x}{\cos 9x}+\frac{\sin 9x}{\cos 27x}+\frac{\sin 27x}{\cos 81x}$ is

(A) $\frac{2\pi}{3}$
(B) $\frac{\pi}{81}$
(C) 2π
(D) π

Answer: (D) π · Official TGCHE final key

Q287 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The number of bijective functions $f : \mathbb{Z} \to \mathbb{Z}$ such that $f(x+y) = f(x) + f(y)\ \forall\ x, y \in \mathbb{Z}$, is

(A) two
(B) four
(C) zero
(D) infinitely many

Answer: (A) two · Official TGCHE final key

Q288 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

For each $n \in \mathbb{N}$, let $A_n = \{(n+1)k / k \in \mathbb{N}\}$ and $X = \bigcup_{n\in\mathbb{N}} A_n$. A mapping $f : X \to \mathbb{N}$ defined by $f(x) = x,\ \forall\ x \in X$, is

(A) one – one and onto
(B) one – one but not onto
(C) onto but not one – one
(D) neither one – one nor onto

Answer: (B) one – one but not onto · Official TGCHE final key

Q289 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The period of $\cos(3x+5)+7$ is

(A) $\frac{2\pi}{5}$
(B) $\frac{2\pi}{3}$
(C) $\frac{2\pi}{15}$
(D) $\frac{2\pi}{7}$

Answer: (B) $\frac{2\pi}{3}$ · Official TGCHE final key

Q290 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

Let $f:[0,10]\to[1,20]$ be a function defined as $f(x)=\begin{cases}\frac{60-5x}{3}, & 0\le x\le 6\\ 10, & 6\le x\le 7\\ 31-3x, & 7\le x\le 10\end{cases}$, then f is

(A) bijective function
(B) one-one but not on to function
(C) onto but not one-one function
(D) neither one -one nor onto function

Answer: (C) onto but not one-one function · Official TGCHE final key

Q291 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

The domain of the function $f(x)=\sqrt{\log_{10}\left(\frac{5x-x^2}{4}\right)}$ is

(A) $[0,1]$
(B) $[1,4]$
(C) $[4,5]$
(D) $(-\infty,\infty)$

Answer: (B) $[1,4]$ · Official TGCHE final key

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Q292 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

If $f(x) = x - \frac{1}{x}$, $x \neq 0$, then $3f(x) =$

(A) $3[f(x)]^2 - f(x^2)$

(B) $[f(x)]^2 - f(x^3)$

(C) $f(x^3) - [f(x)]^3$

(D) $f(x^3) - f(x^2)$

Answer: (C) $f(x^3) - [f(x)]^3$ · Official TGCHE final key

Q293 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

Let $[\cdot]$ denote greatest integer function. If $f(x) = [x]$ and $g(x) = 3\left[\frac{x}{3}\right]$, then the set of all real x such that $f(x) = g(x)$ is

(A) $\mathbb{R}$

(B) $\{x \in \mathbb{R}/x = 3k, k \in \mathbb{Z}\}$

(C) $\{x \in \mathbb{R}/3k - 1 < x \leq 3k, k \in \mathbb{Z}\}$

(D) $\{x \in \mathbb{R}/3k \leq x < 3k + 1, k \in \mathbb{Z}\}$

Answer: (D) $\{x \in \mathbb{R}/3k \leq x < 3k + 1, k \in \mathbb{Z}\}$ · Official TGCHE final key

Q294 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

A function $f : \mathbb{R} \to \mathbb{R}$ is such that $f(1) = 2$ and $f(x + y) = f(x) \cdot f(y)\ \forall x, y$. The area (in square units) enclosed by the lines $2|x| + 5|y| \leq 4$ expressed interms of $f(1), f(2)$ and $f(4)$ is

(A) $\frac{f(4)}{f(1)+2f(2)}$

(B) $\frac{f(4)}{1+f(2)}$

(C) $\frac{2f(4)}{2f(1)+f(2)}$

(D) $\frac{f(4)}{2f(1)+f(2)}$

Answer: (B) $\frac{f(4)}{1+f(2)}$ · Official TGCHE final key

Q295 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

The function $f : \mathbb{R} \to \mathbb{R}$ defined by $f(x) = \frac{x}{\sqrt{1+x^2}}$ is

(A) surjective but not injective

(B) bijective

(C) injective but not surjective

(D) neither injective nor surjective

Answer: (C) injective but not surjective · Official TGCHE final key

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Q296 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

The set of values of α such that $f:\mathbb{R}\to\left[0,\frac{\pi}{2}\right)$ defined by $f(x)=\mathrm{Tan}^{-1}(x^2+x+\alpha^2)$ is onto is

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

(B) $\left(\frac{-1}{4},\frac{1}{4}\right)$

(C) $\left(-\infty,\frac{-1}{2}\right)\cup\left(\frac{1}{2},a\right)$

(D) $\left(-\infty,\frac{-1}{4}\right)\cup\left(\frac{1}{4},\infty\right)$

Answer: (C) $\left(-\infty,\frac{-1}{2}\right)\cup\left(\frac{1}{2},a\right)$ · Official TGCHE final key

Q297 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

If $\frac{x^2+ax+3}{x^2+x+1}$ takes real values for all real values of x then a lies in the interval

(A) $(-2-\sqrt{11},\ \sqrt{11}-2)$

(B) $(4,\ 3)$

(C) $(-2+\sqrt{2},\ 2+\sqrt{2})$

(D) $(-1,\ 0)$

Any attempt was accepted. Full marks for attempting. · Official TGCHE final key

Q298 TS EAMCET 2019 · 6 May · Shift 1 MCQ

Let $f:X\to Y$ be a function and $A_y=\{f^{-1}(y)/y\in Y\}$. Then $A_i\cap A_j=\phi\ (i\neq j)\ \forall\ i,j\in Y$ and $\bigcup_{y\in Y}A_y=X$, if

(A) f is onto function only

(B) f is one-one function only

(C) f is any function

(D) X and Y are finite sets only

Answer: (C) f is any function · Official TGCHE final key

Q299 TS EAMCET 2019 · 6 May · Shift 1 MCQ

If $[x]$ represent greatest integer $\leq x$ and $[\alpha,\beta]$ is the set of all real values of x for which the real function $f(x)=\frac{\sqrt{3+x}+\sqrt{3-x}}{\sqrt{[x]+2}}$ is defined, then $f^2(\alpha+1)+5f^2(\beta)=$

(A) 0
(B) $\frac{36}{5}$
(C) 12
(D) 1

Answer: (C) 12 · Official TGCHE final key

Q300 TS EAMCET 2019 · 4 May · Shift 1 MCQ

The domain of the function $f(x)=\sin^{-1}\left[\log_4\left(\frac{x}{4}\right)\right]+\sqrt{17x-x^2-16}$ is

(A) $[-1,1]$
(B) $[1,4]$
(C) $(0,16]$
(D) $[1,16]$

Answer: (D) $[1,16]$ · Official TGCHE final key

Q301 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If $f:[1,\infty)\to[0,\infty)$ is given by $f(x)=x-\frac{1}{x}$, then $f^{-1}(x)=$

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

Answer: (C) $\frac{1}{2}\left[x+\sqrt{x^2+4}\right]$ · Official TGCHE final key

Q302 TS EAMCET 2019 · 4 May · Shift 2 MCQ

The domain of the function $f(x)=\dfrac{1}{\sqrt{[x]^2-[x]-2}}$ is (Here $[x]$ denotes the greatest integer not exceeding the value of x)

(A) $(-\infty,-2)\cup(1,\infty)$
(B) $(-\infty,-2)\cup(0,\infty)$
(C) $(-\infty,-2)\cup(2,\infty)$
(D) $(-\infty,-1)\cup[3,\infty)$

Answer: (D) $(-\infty,-1)\cup[3,\infty)$ · Official TGCHE final key

Q303 TS EAMCET 2019 · 4 May · Shift 2 MCQ

Let $f:\mathbb{R}\to\mathbb{R}$ and $g:\mathbb{R}\to\mathbb{R}$ be the functions defined by $f(x)=\dfrac{x}{1+x^2},\ x\in\mathbb{R}$, $g(x)=\dfrac{x^2}{1+x^2},\ x\in\mathbb{R}$. Then, the correct statement(s) among the following is/are:
A: both f,g are one-one

B: both f, g are onto
C: both f, g are not one-one as well as not onto
D: f and g are onto but not one-one

(A) A
(B) A, B
(C) D
(D) C

Answer: (D) C · Official TGCHE final key

Q304 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Match the functions of List-I with their nature in List-II and choose the correct option.
List - I
A) $f : \mathbb{R} \to \mathbb{R}$ defined by $f(x) = \cos(112x - 37)$
B) $f : A \to B$ defined by $f(x) = x|x|$ when $A = [-2, 2]$ & $B = [-4, 4]$
C) $f : \mathbb{R} \to \mathbb{R}$ defined by $f(x) = (x - 2)(x - 3)(x - 5)$
D) $f : \mathbb{N} \to \mathbb{N}$ defined by $f(n) = n + 1$
List - II
I) Injection but not surjection
II) Surjection but not injection
III) Bijection
IV) Neither injection nor surjection
V) Composite function
Then the correct match is

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

Answer: (D) A-IV, B-III, C-II, D-I · Official TGCHE final key

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Q305 TS EAMCET 2019 · 3 May · Shift 1 MCQ

If $[x]$ denotes the greatest integer function, then the domain of the function $f(x) = \sqrt{\dfrac{x - [x]}{\log(x^2 - x)}}$ is

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(A) $(1, \infty)$

(B) $(1, \infty) - \mathbb{Z}$

(C) $\mathbb{R} - \left[\frac{1-\sqrt{5}}{2}, \frac{1+\sqrt{5}}{2}\right]$

(D) $\left[\frac{1-\sqrt{5}}{2}, \frac{\sqrt{5}+1}{2}\right]$

Answer: (C) $\mathbb{R} - \left[\frac{1-\sqrt{5}}{2}, \frac{1+\sqrt{5}}{2}\right]$ · Official TGCHE final key

Q306 TS EAMCET 2019 · 3 May · Shift 1 MCQ

The period of $\cos(x + 8x + 27x + \ldots + n^3x)$ is

(A) $\frac{2\pi}{n}$

(B) $\frac{2\pi}{n^2(n+1)^2}$

(C) $\frac{8\pi}{n^2(n+1)^2}$

(D) $\frac{8\pi}{n^3(n+1)^2}$

Answer: (C) $\frac{8\pi}{n^2(n+1)^2}$ · Official TGCHE final key

Q307 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If $[x]$ denotes the greatest integer $\leq x$, then the domain of the function $f(x) = \sqrt{\frac{4-x^2}{[x]+2}}$ is

(A) $(-\infty, -2] \cup [-1, 2)$

(B) $(-\infty, -2) \cup [-1, 2]$

(C) $(-\infty, -2) \cup (-1, 2)$

(D) $(-\infty, -1] \cup [1, 2]$

Answer: (B) $(-\infty, -2) \cup [-1, 2]$ · Official TGCHE final key

Q308 TS EAMCET 2019 · 3 May · Shift 2 MCQ

Let $f(x) = (x+1)^2 - 1,\ x \geq -1$. Then $\{x \mid f(x) = f^{-1}(x)\} =$

(A) $\{0, 1, -1\}$

(B) $\left\{-1, \frac{-3+i\sqrt{3}}{2}, \frac{-3-i\sqrt{3}}{2}\right\}$

(C) $\{0, -1\}$

(D) ϕ

Answer: (C) $\{0, -1\}$ · Official TGCHE final key

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Q309 TS EAMCET 2019 · 3 May · Shift 2 MCQ

The number of non-constant functions f from $X = \{0, 1, 2\}$ to $Y = \{1, 2, 3, 4, 5, 6, 7, 8\}$ such that $f(i) \leq f(j)$ for $i, j \in X$ and $i < j$ is

(A) 120
(B) 92
(C) 56
(D) 112

Answer: (D) 112 · Official TGCHE final key

Q310 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

Match the following
List - I
A) $f : \mathbb{R} \to \mathbb{R}$ is such that $f(x) = px + q,\ (p \neq 0)\ \forall x \in \mathbb{R}$
B) $f : \mathbb{R} \to \mathbb{R}^+ \cup \{0\}$ is such that $f(x) = x^2\ \forall x \in \mathbb{R}$
C) $f : \mathbb{N} \to \mathbb{N}$ is such that $f(n) = n^2 + 2n + 3\ \forall n \in \mathbb{N}$
D) $f : \mathbb{R} \to \mathbb{R}$ is such that $f(x) = 2(\cos^2 5x + \sin^2 5x)\ \forall x \in \mathbb{R}$
List - II
I) f is neither one-one nor onto
II) f is both one-one and onto
III) f is one-one but not onto
IV) f is onto but not one-one
V) f is a constant function and also a bijection
The correct answer is

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

Answer: (A) A-II, B-IV, C-III, D-I · Official APSCHE final key

Q311 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

The range of $f(x) = \sqrt{\dfrac{a - |x|}{(a+1) - |x|}},\ (a > 0)$ is

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(A) $[0, a]$

(B) $[0, \infty) - \left[-\sqrt{\frac{a}{a+1}}, \sqrt{\frac{a}{a+1}}\right]$

(C) $\left[0, \sqrt{\frac{a}{a+1}}\right] \cup (1, \infty)$

(D) $\left[0, \sqrt{\frac{a}{a+1}} + 1\right]$

Answer: (C) $\left[0, \sqrt{\frac{a}{a+1}}\right] \cup (1, \infty)$ · Official APSCHE final key

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Q312 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If $f : \mathbb{R} \to \mathbb{R}$ is defined by $f(x) = \begin{cases} |[x-5]| & \text{for } x < 5 \\ [|x-5|] & \text{for } x \geq 5 \end{cases}$ then $(f \circ f)\left(-\frac{7}{2}\right) =$ (Here $[x]$ is the greatest integer not exceeding x)

(A) $(f \circ f)\left(-\frac{11}{2}\right)$

(B) $(f \circ f)\left(-\frac{9}{2}\right)$

(C) $(f \circ f)(3)$

(D) $(f \circ f)\left(\frac{9}{2}\right)$

Answer: (D) $(f \circ f)\left(\frac{9}{2}\right)$ · Official APSCHE final key

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Q313 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

If $f : A \to B$ is an onto function such that $f(x) = \sqrt{|x| - x} + \frac{1}{\sqrt{|x|-x}}$, then A and B are respectively

(A) $(-\infty, \infty),\ (0, \infty)$

(B) $(-\infty, 0),\ [2, \infty)$

(C) $(0, \infty),\ (2, \infty)$

(D) $(-\infty, 0],\ (0, \infty)$

Answer: (B) $(-\infty, 0),\ [2, \infty)$ · Official APSCHE final key

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Q314 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

Let f be a function such that $f(xy) = \frac{f(x)}{y}$ for all positive real numbers x, y. If $f(20) = 15$, then $f(50) =$

(A) $\frac{75}{2}$

(B) 12

(C) 6

(D) 75

Answer: (C) 6 · Official APSCHE final key

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Q315 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If $f : A \to B$ is a function defined by $f(x) = \frac{x^2-x}{x^2+2x}$ then, which one of the following is true?

(A) $A = \mathbb{R} - \{0, -2\}$, $B = \mathbb{R}$ and $f(x)$ is decreasing function

(B) $A = \mathbb{R} - \{-2\}$, $B = \mathbb{R} - \{1\}$ and $f^{-1}(x)$ is decreasing function

(C) $A = \mathbb{R} - \{0, -2\}$, $B = \mathbb{R} - \{1\}$ and $f^{-1}(x)$ is increasing function

(D) Both $f(x)$ and $f^{-1}(x)$ are increasing functions

Answer: (C) $A = \mathbb{R} - \{0, -2\}$, $B = \mathbb{R} - \{1\}$ **and** $f^{-1}(x)$ **is increasing function** · Official APSCHE final key

Q316 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

If the periods of the functions $\sin(ax + b)$ and $\tan(cx + d)$ are respectively $\frac{4}{7}$ and $\frac{2}{5}$, then $\sin(|a| + |c|) + \cos(|a| - |c|) =$

(A) -1

(B) 0

(C) 1

(D) 2

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

Q317 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

Let $D = \mathbb{R} - \{0, 1\}$ and $f : D \to D$, $g : D \to D$ and $h : D \to D$ be three functions defined by $f(x) = \frac{1}{x}$; $g(x) = 1 - x$ and $h(x) = \frac{1}{1-x}$. If $j : D \to D$ is such that $(g \circ j \circ f)(x) = j(x)$ for all $x \in D$, then which one of the following is $j(x)$?

(A) $(f \circ g)(x)$

(B) $f(x)$

(C) $g(x)$

(D) $(g \circ h)(x)$

Options (1) or (4) were accepted. More than one answer was accepted. · Official APSCHE final key

Q318 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

If the number of elements in the sets G and A are 3 and 4 respectively, then match the items of List I with those of List II.

List - I

A) The number of non bijective functions from $G \times G$ to G

B) The number of bijective functions from A to A

C) The number of functions from G to $G \times A$

D) The number of surjective functions from A to $A \times A$

List - II

I) 24

II) 0
III) 1728
IV) 12
V) 19683
The correct match is

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

Answer: (A) A-V, B-I, C-III, D-II · Official APSCHE final key

Q319 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Let A and B be finite sets and P_A and P_B respectively denote their power sets. If P_B has 112 elements more than those in P_A then the number of functions from A to B which are injective is

(A) 224
(B) 56
(C) 120
(D) 840

Answer: (D) 840 · Official APSCHE final key

Q320 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

Let $D = \left\{ x \in \mathbb{R} : f(x) = \sqrt{\frac{x - |x|}{x - [x]}} \text{ is defined} \right\}$ and C be the range of the real function $g(x) = \frac{2x}{4 + x^2}$. Then $D \cap C =$

(A) $\left[-\frac{1}{2}, \frac{1}{2}\right]$
(B) $\left(0, \frac{1}{2}\right]$
(C) $\mathbb{R}^+$
(D) $\mathbb{R}^+ - \mathbb{Z}^+$

Answer: (B) $\left(0, \frac{1}{2}\right]$ · Official APSCHE final key

Q321 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

$f(x) = \frac{x}{e^x - 1} + \frac{x}{2} + 2\cos^3\frac{x}{2}$ on $R - \{0\}$ is

(A) One one function
(B) Bijection
(C) Algebraic function
(D) Even function

Answer: (D) Even function · Official APSCHE final key

Q322 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

Consider the following lists.
List - I
A) $f(x)=\frac{|x+2|}{x+2},\ x\neq -2$
B) $g(x)=|[x]|\ ,\ x\in R$
C) $h(x)=|x-[x]|,\ x\in R$
D) $f(x)=\frac{1}{2-\sin 3x},\ x\in R$
List - II
I) $\left[\frac{1}{3},1\right]$
II) Z
III) W
IV) $[0,1)$
V) $\{-1,1\}$
Match the functions in List - I with their ranges in List - II and choose the correct answer.

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

Answer: (C) A-V, B-III, C-IV, D-I · Official APSCHE final key

Q323 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

If $f:\mathbb{R}-\left\{\frac{3}{7}\right\}\to\mathbb{R}-\left\{\frac{3}{7}\right\}$ is given by $f(x)=\frac{3x+5}{7x-3}$, then the statement which is not true, is

(A) $f^{-1}(x)=f(x)$
(B) $(f\circ f)(x)=x$
(C) $(f\circ f\circ f)(x)=x$
(D) $(f\circ f\circ f\circ f)(x)=x$

Answer: (C) $(f\circ f\circ f)(x)=x$ · Official APSCHE final key

Q324 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

If $f:A\to B$, $g:B\to C$ are functions such that $g\circ f:A\to C$ is onto, then a necessary condition is

(A) f is onto
(B) g is onto
(C) both f, g are onto
(D) neither f nor g is onto

Answer: (B) g **is onto** · Official APSCHE final key

Q325 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

If $x \in \mathbb{R}$, then the range of $\frac{x}{x^2-5x+9}$ is

(A) $\left(-\frac{1}{11}, 1\right)$
(B) $\left(-\infty, \frac{-1}{11}\right) \cup (1, \infty)$
(C) $\left[\frac{-1}{11}, 1\right]$
(D) $\left[-1, \frac{1}{11}\right]$

Answer: (C) $\left[\frac{-1}{11}, 1\right]$ · Official APSCHE final key

Q326 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If $f : [0, \infty) \to [0, \infty)$ is defined by $f(x) = \dfrac{x}{1+x}$, then f is

(A) neither one-one not onto
(B) one-one but not onto
(C) onto but not one-one
(D) both one-one and onto

Answer: (B) one-one but not onto · The council's preliminary key

Q327 TS EAMCET 2018 · 7 May · Shift 1 MCQ

The range of the function $f(x) = -\sqrt{-x^2 - 6x - 5}$ is

(A) $[-2, 0]$
(B) $[0, 2]$
(C) $(-\infty, -2]$
(D) $[-2, 2]$

Answer: (A) $[-2, 0]$ · The council's preliminary key

Q328 TS EAMCET 2018 · 7 May · Shift 1 MCQ

Let $\mathbb{R} - (\alpha, \beta)$ be the range of $\dfrac{x+3}{(x-1)(x+2)}$. Then the sum of the intercepts of the line $\alpha x + \beta y + 1 = 0$ on the coordinate axis is

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

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

Q329 TS EAMCET 2018 · 5 May · Shift 1 MCQ

Let $X = \left\{ \begin{bmatrix} a & b \\ c & d \end{bmatrix} : a, b, c, d \in \mathbb{R} \right\}$. Define $f : X \to \mathbb{R}$ by $f(A) = \det(A)\ \forall A \in X$. Then f is

(A) one-one but not onto
(B) onto but not one-one
(C) one-one and onto
(D) neither one-one nor onto

Answer: (B) onto but not one-one · The council's preliminary key

Q330 TS EAMCET 2018 · 5 May · Shift 1 MCQ

Let $x \neq 0$, $|x| < \frac{1}{2}$ and $f(x) = 1 + 2x + 4x^2 + 8x^3 + \ldots$. Then $f^{-1}(x) =$

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

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

Q331 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If $f : [1, \infty) \to [5, \infty)$ is given by $f(x) = 3x + \frac{2}{x}$, then $f^{-1}(x) =$

(A) $\frac{1}{6}\left[x + \sqrt{x^2 - 24}\right]$
(B) $\frac{x}{3x^2 + 2}$
(C) $\frac{1}{6}\left[x - \sqrt{x^2 - 24}\right]$
(D) $\frac{1}{2}\left[1 + \sqrt{x^2 - 4}\right]$

Answer: (A) $\frac{1}{6}\left[x + \sqrt{x^2 - 24}\right]$ · The council's preliminary key

Q332 TS EAMCET 2018 · 5 May · Shift 2 MCQ

The domain of $f(x) = \log\left[(2.5)^{3-x^2} - (0.4)^{x+9}\right]$ is

(A) $(-4, 3)$
(B) $(-3, 4)$
(C) $(3, 4)$
(D) $(0, \infty)$

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

Q333 TS EAMCET 2018 · 5 May · Shift 2 MCQ

If the period of the function $f(x) = \sin 5x \cos 3x$ is α then $\cos \alpha =$

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

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

Q334 TS EAMCET 2018 · 4 May · Shift 1 MCQ

Let $f : \mathbb{R} \to \mathbb{R}$, $g : \mathbb{R} \to \mathbb{R}$ be differentiable functions such that $(f \circ g)(x) = x$. If $f(x) = 2x + \cos x + \sin^2 x$, then the value of $\sum_{n=1}^{99} g(1 + (2n-1)\pi)$ is

(A) 1250π
(B) $(99)^2 \frac{\pi}{2}$
(C) $(99)^2 \pi$
(D) 2500π

Answer: (B) $(99)^2 \frac{\pi}{2}$ · The council's preliminary key

Q335 TS EAMCET 2018 · 4 May · Shift 1 MCQ

If $f : [1, \infty) \to [1, \infty]$ is defined by $f(x) = \frac{1 + \sqrt{1 + 4\log_2 x}}{2}$ then $f^{-1}(3) =$

(A) 0
(B) 1
(C) 64
(D) $\frac{1+\sqrt{5}}{2}$

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

Q336 TS EAMCET 2018 · 4 May · Shift 2 MCQ

The set of all values of x and the set of all values of a for which the real valued function $f(x) = \sqrt{\log_a(x - [x])}$ is defined are respectively

(A) $\mathbb{R}-\mathbb{Z}$ & $(0,1)$
(B) $\mathbb{Z}$ & $\mathbb{R}-\{0,1\}$
(C) $\mathbb{Z}^{-}$ & $(1,\infty)$
(D) $\mathbb{R}$ & $\mathbb{R}$

Answer: (A) $\mathbb{R}-\mathbb{Z}$ & $(0,1)$ · The council's preliminary key

Q337 TS EAMCET 2018 · 4 May · Shift 2 MCQ

A function $f:\mathbb{R}-\{0\}\to\mathbb{R}$ is defined as $f(x)=\begin{cases}x^2+3x-7, & x>0\\ h(x), & x<0\end{cases}$ If $f(x)$ is an odd function then $h(x)=$

(A) x^2+3x+7
(B) x^2+3x-7
(C) $-x^2+3x+7$
(D) $-x^2-3x+7$

Answer: (C) $-x^2+3x+7$ · Checked by our team

Q338 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

The set of all real values of x for which the real valued function $f(x)=\left(1+\frac{1}{x}\right)^x$ is defined, is

(A) $(0,\infty)$
(B) $\mathbb{R}-\{0\}$
(C) $(-\infty,-1)\cup(0,\infty)$
(D) $\mathbb{R}-\{0,-1\}$

Answer: (C) $(-\infty,-1)\cup(0,\infty)$ · The council's preliminary key

Q339 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

Let $S_n=\sum_{k=1}^{n}(-1)^{k-1}\cdot k^2$ for $n\geq 1$. Given that $S_{2n}=-n(2n+1)$ for $n=1,2,3,\ldots$, then $S_{77}=$

(A) -3003
(B) 3003
(C) -2926
(D) 2926

Answer: (B) 3003 · The council's preliminary key

Q340 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

If $f:\mathbb{R}\to\mathbb{R}$ is a differentiable function such that $f(x+y)=f(x)\cdot f(y)$ for all $x,y\in\mathbb{R}$ and if $f'(4)=24$ and $f'(0)=3$, then $f(4)=$

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(A) 72
(B) 5
(C) 11
(D) 8

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

Q341 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

Match the following
List - I
A) $\frac{x}{e^x-1}+\frac{x}{2}+4;\ x\neq 0$
B) $\mathrm{Tan}^{-1}\left(\log\left(x+\sqrt{x^2+1}\right)\right),\ x>0$
C) For $3<x<5$: $|x-2|+|x-3|+|x-5|$
D) $\sin 2x+\sin^2 x+\cos 3x\ \ \forall x\in\mathbb{R}$
List - II
I) is neither odd nor even function
II) is an even function
III) is an odd function
IV) is the identity function
V) is a constant function
The correct answer is

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

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

Q342 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If $f(x)=\sqrt{2x-1}+5\mathrm{Cos}^{-1}\left(\frac{2x-1}{3}\right)$ then the domain of the function $f(x)$ is

(A) $\left[-1,\frac{1}{2}\right]$
(B) $\left[\frac{1}{2},2\right]$
(C) $[-1,2]$
(D) $\left[\frac{1}{2},\infty\right)$

Answer: (B) $\left[\frac{1}{2},2\right]$ · The council's preliminary key

Q343 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

If x is real, then the sum of the maximum and the minimum values of the expression $\frac{x^2+4x+1}{x^2+x+1}$ is

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

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

Q344 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If $f : A \to B$ and $g : B \to C$ are two functions such that $g \circ f : A \to C$ is a bijection, then which one of the following is always true?

(A) f and g are bijections
(B) f is an injection and g is a surjection
(C) f is a surjection and g is an injection
(D) f is a bijection but g is not a bijection

Answer: (B) f is an injection and g is a surjection · The council's preliminary key

Q345 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

If $f : \mathbb{R} \to \mathbb{R}$ is such that $f(x + y) = f(x) + f(y)$ for all $x, y \in \mathbb{R}$, $f(1) = 7$ and $\sum_{r=1}^{n} f(r) = 14112$, then $n =$

(A) 9
(B) 13
(C) 63
(D) 62

Answer: (C) 63 · The council's preliminary key

Q346 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If $g(x) = x^2 + x - 2$ and $\frac{1}{2}(g \circ f)(x) = 2x^2 - 5x + 2$, then one such function $f(x) =$

(A) $2x - 3$
(B) $2x + 3$
(C) $2 + 2x$
(D) $2x^2 - 3x - 1$

Answer: (A) $2x - 3$ · The council's preliminary key

Q347 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If $f : \mathbb{R} \to A$ defined by $f(x) = \frac{1}{x^2+2x+2}$ $\forall x \in \mathbb{R}$ is surjective, then $A =$

(A) $[1, \infty)$
(B) $(1, \infty)$
(C) $[0, 1]$
(D) $(0, 1]$

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

Q348 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If x is real, then the range of $\frac{x^2+2x+1}{x^2+2x+7}$ is

(A) $[0, 1)$
(B) $(-\infty, 0) \cup (1, \infty)$
(C) $(0, 1)$
(D) $\mathbb{R}$

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

Q349 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If $[x]$ denotes the greatest integer not exceeding x, then the values of x satisfying $[x]^2 - 7[x] + 12 \leq 0$ are

(A) $1 \leq x < 4$
(B) $3 \leq x < 5$
(C) $-5 < x \leq -3$
(D) $2 \leq x \leq 4$

Answer: (B) $3 \leq x < 5$ · The council's preliminary key

Q350 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If $f : \mathbb{R} \to \mathbb{R}$ is defined by $f(x) = [2x] - 2[x]$ for $x \in \mathbb{R}$, then the range of f is (Here $[x]$ denotes the greatest integer not exceeding x)

(A) $\mathbb{Z}$, the set of all integers
(B) $\mathbb{N}$, the set of all natural numbers
(C) $\mathbb{R}$, the set of all real numbers
(D) $\{0, 1\}$

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

Q351 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

Given that a, b and c are real numbers such that $b^2 = 4ac$ and $a > 0$. The maximal possible set $D \subseteq \mathbb{R}$ on which the function $f : D \to \mathbb{R}$ given by $f(x) = \log\{ax^3 + (a+b)x^2 + (b+c)x + c\}$ is defined, is

(A) $\mathbb{R}-\left\{-\frac{b}{2a}\right\}$
(B) $\mathbb{R}-\left(\left\{-\frac{b}{2a}\right\}\cup(-\infty,-1)\right)$
(C) $\mathbb{R}-\left(\left\{-\frac{b}{2a}\right\}\cup\{x:x\geq 1\}\right)$
(D) $\mathbb{R}-\left(\left\{-\frac{b}{2a}\right\}\cup(-\infty,-1]\right)$

Answer: (D) $\mathbb{R}-\left(\left\{-\frac{b}{2a}\right\}\cup(-\infty,-1]\right)$ · The council's preliminary key

Q352 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

If $f:\mathbb{R}\to[-1,1]$ and $g:\mathbb{R}\to A$ are two surjective mappings and $\sin\left(g(x)-\frac{\pi}{3}\right)=\frac{f(x)}{2}\sqrt{4-f^2(x)}$, then $A=$

(A) $\left[0,\frac{2\pi}{3}\right]$
(B) $[-1,1]$
(C) $\left(\frac{-\pi}{2},\frac{\pi}{2}\right)$
(D) $(0,\pi)$

Answer: (A) $\left[0,\frac{2\pi}{3}\right]$ · The council's preliminary key

Q353 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

The domain of the function $f(x)=\sqrt{\frac{4-x^2}{[x]+2}}$, where $[x]$ denotes the greatest integer not more than x, is

(A) $(-\infty,-2)\cup(1,2)$
(B) $(-\infty,-2)\cup(-1,2)$
(C) $(-\infty,-2)\cup[-1,2]$
(D) $(-\infty,-1)\cup(1,2)$

Answer: (C) $(-\infty,-2)\cup[-1,2]$ · The council's preliminary key

Q354 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

$f:\mathbb{R}\to\mathbb{R}$ is a function such that $f(0)=1$ and for all $x,y\in\mathbb{R}$, $f(xy+1)=f(x)f(y)-f(y)-x+2$ then $\frac{df}{dx}$ at $x=e$ is

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

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

Q355 TS EAMCET 2017 · 12 May · Offline MCQ

If f is differentiable, $f(x+y)=f(x)f(y)$ for all $x,y\in\mathbb{R}$, $f(3)=3$, $f'(0)=11$, then $f'(3)=$

(A) $\frac{3}{11}$
(B) $\frac{11}{3}$
(C) 8
(D) 33

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

Q356 TS EAMCET 2017 · 12 May · Offline MCQ

$f:(-\infty,0]\to[0,\infty)$ is defined as $f(x)=x^2$. The domain and range of its inverse is

(A) Domain of $(f^{-1})=[0,\infty)$, Range of $(f^{-1})=(-\infty,0]$
(B) Domain of $(f^{-1})=[0,\infty)$, Range of $(f^{-1})=(-\infty,\infty)$
(C) Domain of $(f^{-1})=[0,\infty)$, Range of $(f^{-1})=[0,\infty)$
(D) f^{-1} does not exist

Answer: (A) Domain of $(f^{-1})=[0,\infty)$, Range of $(f^{-1})=(-\infty,0]$ · The council's preliminary key

Q357 TS EAMCET 2017 · 12 May · Offline MCQ

If the range of the function $f(x)=-3x-3$ is $\{3,-6,-9,-18\}$, then which of the following elements is not in the domain of f?

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

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

Q358 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

Let $A=\{-4,-2,-1,0,3,5\}$ and $f:A\to\mathbb{R}$ be defined by

$$f(x)=\begin{cases}3x-1 & \text{for } x>3\\ x^2+1 & \text{for } -3\le x\le 3\\ 2x-3 & \text{for } x<-3\end{cases}$$

Then the range of f is

(A) $\{-11, -7, 2, 1, 8, 14\}$
(B) $\{-11, 5, 2, 1, 8, 14\}$
(C) $\{-11, 5, 2, 1, 10, 14\}$
(D) $\{-11, -7, -5, 1, 10, 14\}$

Answer: (C) $\{-11, 5, 2, 1, 10, 14\}$ · The council's preliminary key

Q359 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

Let $\mathbb{N}$ be the set of all natural numbers, $\mathbb{Z}$ be the set of all integers and $\sigma : \mathbb{N} \to \mathbb{Z}$ defined by

$$\sigma(n) = \begin{cases} \frac{n}{2}, & \text{if } n \text{ is even} \\ -\frac{n-1}{2}, & \text{if } n \text{ is odd} \end{cases}$$

Then

(A) σ is one-one but not onto
(B) σ is onto but not one-one
(C) σ is one-one and onto
(D) σ is neither one-one nor onto

Answer: (C) σ **is one-one and onto** · The council's preliminary key

Q360 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Let $f : A \to B$ and $g : B \to C$ be any two functions and $g \circ f : A \to C$ is one-one, then

(A) f and g are both one-one
(B) f is one-one and g need not be one-one
(C) g is one-one and f need not be one-one
(D) both f, g need not be one-one

Answer: (B) f **is one-one and** g **need not be one-one** · The council's preliminary key

Q361 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Match the following

Function / Range

i) $x - [x]$, $(x \in \mathbb{R})$
ii) $\sqrt{4 - x^2}$, $(|x| \leq 2)$
iii) $\frac{1}{2 - \cos 3x}$, $(x \in \mathbb{R})$
iv) $3 \sin x - 4 \cos x + 4$, $(x \in \mathbb{R})$

a) $[0, 2]$
b) $\left[\frac{1}{3}, 1\right]$
c) $[-1, 9]$
d) $[0, 1)$

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(A) i)→d, ii)→b, iii)→a, iv)→c
(B) i)→a, ii)→d, iii)→c, iv)→b
(C) i)→d, ii)→a, iii)→c, iv)→b
(D) i)→d, ii)→a, iii)→b, iv)→c

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

Q362 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

Let $\mathbb{N}$ be the set of all natural numbers and $f : \mathbb{N} \to \mathbb{N}$ be such that $1990 < f(1990) < 2100$ and satisfies the equation
$x - f(x) = 19\left[\frac{x}{19}\right] - 90\left[\frac{f(x)}{90}\right]$,
where $[y]$ denotes the greatest integer less than or equal to y. Then the number of possible values of $f(1990)$ is

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

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

Q363 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

The function $f : \mathbb{R} - \{1\} \to \mathbb{R} - \{4\}$ defined by $f(x) = \frac{4x-3}{x-1}$ for $x \in \mathbb{R} - \{1\}$ is

(A) One - one but not onto
(B) Onto but not one-one
(C) One-one and onto
(D) Neither one - one nor onto

Answer: (C) One-one and onto · The council's preliminary key

Q364 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If $[\cdot]$ denotes the greatest integer function and if $f : (5, 10) \to (7, 12)$ is a function defined by $f(x) = x + 2\left[\frac{x}{5}\right]$, then

(A) $f^{-1}(x) = x - 1$
(B) $f^{-1}(x) = x + 2$
(C) $f^{-1}(x) = x - 2$
(D) $f^{-1}(x)$ does not exist

Answer: (C) $f^{-1}(x) = x - 2$ · The council's preliminary key

EdLoop EAPCET

Q365 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

If $[\cdot]$ denotes the greatest integer function, then the domain and range of the function $f(x) = \frac{\sin[x]\pi + \tan[x]\pi}{1 + [x]^2 + [x]^4}$ are respectively

(A) $\mathbb{R} - \{0\}, \mathbb{R} - \{0\}$

(B) $\mathbb{R}^+, \{0\}$

(C) $\mathbb{R}^+, \mathbb{R}$

(D) $\mathbb{R}, \{0\}$

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

Q366 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

A function from $A = \{x : -1 \leq x \leq 1\}$ to itself which is not a bijection is

(A) $f(x) = x|x|$

(B) $f(x) = x^3$

(C) $f(x) = x^2$

(D) $f(x) = \sin\left(\frac{\pi x}{2}\right)$

Answer: (C) $f(x) = x^2$ · The council's preliminary key

Q367 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

If $f : \mathbb{R} - \{0\} \to \mathbb{R}$ is defined by $f(x) = x + \frac{1}{x}$ and if $f^k(x) = [f(x)]^k$ for $k \geq 1$ then $f^4(x) - f\left(x^4\right) - 4f^2(x) =$

(A) -2

(B) 2

(C) 1

(D) -1

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

Q368 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

The function $f : [0, \infty) \to [0, \infty)$ defined by $f(x) = \frac{x}{1 + x}$ is

(A) One - one and onto

(B) One-one but not onto

(C) Onto but not one-one

(D) Neither one-one nor onto

Answer: (B) One-one but not onto · The council's preliminary key

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Q369 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

The number of subsets of $\{1, 2, 3, \ldots, 9\}$ containing at least one odd number is

(A) 324
(B) 396
(C) 512
(D) 496

Answer: (D) 496 · The council's preliminary key

Q370 TS EAMCET 2016 · 15 May · Offline MCQ

If $f(x) = x^2 - 2x + 4$ then the set of values of x satisfying $f(x-1) = f(x+1)$ is

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

Answer: (C) $\{1\}$ · Official TGCHE final key

Q371 TS EAMCET 2016 · 15 May · Offline MCQ

The number of real linear functions $f(x)$ satisfying $f(f(x)) = x + f(x)$ is

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

Answer: (D) 2 · Official TGCHE final key

Q372 AP EAMCET 2016 · 29 Apr · Offline MCQ

The domain of the function $f(x) = \sqrt{\log_{0.5} x!}$

(A) $\{0, 1, 2, 3, \ldots\}$
(B) $\{1, 2, 3, \ldots\}$
(C) $(0, \infty)$
(D) $\{0, 1\}$

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

Q373 AP EAMCET 2016 · 29 Apr · Offline MCQ

If $f(x) = |x-1| + |x-2| + |x-3|$, $2 < x < 3$, then f is

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(A) an onto function but not one-one
(B) one-one function but not onto
(C) a bijection
(D) neither one-one nor onto

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

Q374 AP EAMCET 2014 · 22 May · Offline MCQ

If $\mathbb{R}$ is the set of all real numbers and if $f : \mathbb{R} - \{2\} \to \mathbb{R}$ is defined by $f(x) = \frac{2+x}{2-x}$ for $x \in \mathbb{R} - \{2\}$, then the range of f is

(A) $\mathbb{R} - \{-2\}$
(B) $\mathbb{R}$
(C) $\mathbb{R} - \{1\}$
(D) $\mathbb{R} - \{-1\}$

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

Q375 AP EAMCET 2014 · 22 May · Offline MCQ

Let Q be the set of all rational numbers in $[0, 1]$ and $f : [0, 1] \to [0, 1]$ be defined by

$$f(x) = \begin{cases} x & \text{for } x \in Q \\ 1 - x & \text{for } x \notin Q \end{cases}$$

Then the set $S = \{x \in [0, 1] : (f \circ f)(x) = x\}$ is equal to

(A) $[0, 1]$
(B) Q
(C) $[0, 1] - Q$
(D) $(0, 1)$

Answer: (A) $[0, 1]$ · The council's preliminary key

Q376 AP EAMCET 2013 · 10 May · Offline MCQ

If $f(x) = (p - x^n)^{1/n}$, $p > 0$ and n is a positive integer, then $f(f(x)) =$

(A) x
(B) x^n
(C) $p^{1/n}$
(D) $p - x^n$

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

Q377 AP EAMCET 2013 · 10 May · Offline MCQ

$\{x \in \mathbb{R} \mid \log[(1.6)^{1-x^2} - (0.625)^{6(1+x)}] \in \mathbb{R}\} =$

(A) $(-\infty, -1) \cup (7, \infty)$
(B) $(-1, 5)$
(C) $(1, 7)$
(D) $(-1, 7)$

Answer: (D) $(-1, 7)$ · The council's preliminary key

Q378 AP EAMCET 2013 · 10 May · Offline MCQ

The period of $f(x) = \cos\left(\frac{x}{3}\right) + \sin\left(\frac{x}{2}\right)$ is

(A) 2π
(B) 4π
(C) 8π
(D) 12π

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

Q379 AP EAMCET 2013 · 10 May · Offline MCQ

Let f be a non-zero real valued continuous function satisfying $f(x+y) = f(x) \cdot f(y)$ for all $x, y \in \mathbb{R}$. If $f(2) = 9$, then $f(6) =$

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

Answer: (B) 3^6 · The council's preliminary key

Q380 AP EAMCET 2012 · 12 May · Offline MCQ

If $f : \mathbb{R} \to \mathbb{R}^+$ and $g : \mathbb{R}^+ \to \mathbb{R}$ are such that $g(f(x)) = |\sin x|$ and $f(g(x)) = (\sin\sqrt{x})^2$, then a possible choice for f and g is

(A) $f(x) = x^2,\ g(x) = \sin\sqrt{x}$
(B) $f(x) = \sin x,\ g(x) = |x|$
(C) $f(x) = \sin^2 x,\ g(x) = \sqrt{x}$
(D) $f(x) = x^2,\ g(x) = \sqrt{x}$

Answer: (C) $f(x) = \sin^2 x,\ g(x) = \sqrt{x}$ · Official APSCHE final key

Q381 AP EAMCET 2012 · 12 May · Offline MCQ

If $f : \mathbb{Z} \to \mathbb{Z}$ is defined by

$$f(x) = \begin{cases} \frac{x}{2} & \text{if } x \text{ is even} \\ 0 & \text{if } x \text{ is odd} \end{cases}$$

then f is

(A) onto but not one to one
(B) one to one but not onto
(C) one to one and onto
(D) neither one to one nor onto

Answer: (A) onto but not one to one · Official APSCHE final key

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Q382 AP EAMCET 2011 · 8 May · Offline MCQ

If $f : [2, \infty) \to B$ defined by $f(x) = x^2 - 4x + 5$ is a bijection, then $B =$

(A) $[0, \infty)$
(B) $[1, \infty)$
(C) $[4, \infty)$
(D) $[5, \infty)$

Answer: (B) $[1, \infty)$ · The council's preliminary key

Q383 AP EAMCET 2011 · 8 May · Offline MCQ

If $f : \mathbb{R} \to \mathbb{R}$ is defined by $f(x) = \left[\frac{x}{5}\right]$ for $x \in \mathbb{R}$, where $[y]$ denotes the greatest integer not exceeding y, then $\{f(x) : |x| < 71\} =$

(A) $\{-14, -13, \ldots\ldots\ldots, 0, \ldots\ldots\ldots\ldots, 13, 14\}$
(B) $\{-14, -13, \ldots\ldots\ldots, 0, \ldots\ldots\ldots\ldots, 14, 15\}$
(C) $\{-15, -14, \ldots\ldots\ldots, 0, \ldots\ldots\ldots\ldots, 14, 15\}$
(D) $\{-15, -14, \ldots\ldots\ldots, 0, \ldots\ldots\ldots\ldots, 13, 14\}$

Answer: (D) $\{-15, -14, \ldots\ldots\ldots, 0, \ldots\ldots\ldots\ldots, 13, 14\}$ · The council's preliminary key

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Q384 AP EAMCET 2011 · 8 May · Offline MCQ

If $f : \mathbb{R} \to \mathbb{R}$ is defined by $f(x) = 7 + \cos(5x + 3)$ for $x \in \mathbb{R}$, then the period of f is

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

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

Q385 AP EAMCET 2010 · 30 May · Offline MCQ

Let $\mathbb{R}$ denote the set of all real numbers and $\mathbb{R}^+$ denote the set of all positive real numbers. For the subsets A and B of $\mathbb{R}$ define $f : A \to B$ by $f(x) = x^2$ for $x \in A$. Observe the two lists given below : List I

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(i) f is one-one and onto if
(ii) f is one-one but not onto if
(iii) f is onto but not one-one if
(iv) f is neither one-one nor onto if
List II
(a) $A = \mathbb{R}^+, B = \mathbb{R}$
(b) $A = B = \mathbb{R}$
(c) $A = \mathbb{R}, B = \mathbb{R}^+$
(d) $A = B = \mathbb{R}^+$
The correct matching of List I to List II is :

(A) (i)-(a), (ii)-(b), (iii)-(c), (iv)-(d)
(B) (i)-(d), (ii)-(b), (iii)-(a), (iv)-(c)
(C) (i)-(d), (ii)-(a), (iii)-(c), (iv)-(b)
(D) (i)-(d), (ii)-(b), (iii)-(c), (iv)-(a)

Answer: (C) (i)-(d), (ii)-(a), (iii)-(c), (iv)-(b) · Official APSCHE final key

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Q386 AP EAMCET 2010 · 30 May · Offline MCQ

The period of $\left(\tan\theta - \frac{1}{3}\tan^3\theta\right)\left(\frac{1}{3} - \tan^2\theta\right)^{-1}$, where $\tan^2\theta \neq \frac{1}{3}$ is :

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

Answer: (A) $\frac{\pi}{3}$ · Official APSCHE final key

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