TS EAMCET Mathematics 2023 Model Questions for Practice

Question Number : 1

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

Options :

1. $\left[-4,-\frac{3}{2}\right]\cup\left[\frac{2}{3},4\right]$ ✔

2. $\left(-\infty,\frac{-3}{2}\right]\cup\left[\frac{2}{3},\infty\right)$

3. $[-4,4]$ ✖

4. $\left[-\frac{3}{2},\frac{2}{3}\right]$ ✖

Question Number : 2

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

Options :

1. $(-\infty, 0] \cup \left(\frac{1}{2}, \infty\right)$ ✖

2. $\left(0, \frac{1}{2}\right]$ ✔

3. $(-\infty, 0) \cup [2, \infty)$ ✖

4. $(0, 2]$ ✖

Question Number : 3

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

Options :

1. 7 ✖

2. -1 ✖

3. 3 ✔

1

4. ✖

Question Number : 4

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

Options :

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

1. ✖

$$a^2(b^3-c^3)+b^2(c^3-a^3)+c^2(a^3-b^3)$$

2. ✔

$$a^3(b^2-c^2)+b^3(c^2-a^2)+c^3(a^2-b^2)$$

3.

✖

$$ab(a^3-b^3)+bc(b^3-c^3)+ca(c^3-a^3)$$

4. ✖

Question Number : 5

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

Options :

1. A ✗

2. $-A$ ✗

3. $2A$ ✗

4. $-2A$ ✓

Question Number : 6

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

Options :

1. 8 ✓

2. -6 ✗

3. 6 ✗

4. -10 ✗

Question Number : 7

Correct Marks : 1 Wrong Marks : 0

$$\sqrt{(-3+4i)(8+6i)}=$$

Options :

1. $\pm(1+2i)$ ✖

2. $\pm(3+i)$ ✖

3. $\pm(1+7i)$ ✔

4. $\pm(7-i)$ ✖

Question Number : 8

$$\text{If } \left(\frac{\sqrt{3}+i}{\sqrt{3}-i}\right)^{m}=1,\ 2022<m<2029,\ \text{then } m=$$

Options :

1. 2022 ✖

2. 2024 ✖

3. 2028 ✔

2026

4. ✖

Question Number : 9

If $1, \omega, \omega^2$ are the cube roots of unity, $n \in \mathbb{N}$ and $n > 2$ then the least value of n such that $1+\omega$ is a root of $x^n - x = 0$ is

Options :

3

1. ✖

5

2. ✖

7

3. ✔

4

4. ✖

Question Number : 10

If $A = \left\{x \in \mathbb{R} / \sqrt{x^2 - 8x + 15} \in \mathbb{R}\right\}$ and $B = \left\{x \in \mathbb{R} / \frac{x-3}{2x-5} < \frac{x-6}{2x-11}\right\}$, then $A \cap B =$

Options :

ϕ

1. ✖

$\left(\frac{5}{2},3\right]\cup\left[5,\frac{11}{2}\right)$

2. ✔

$\left(\frac{5}{2},\frac{21}{4}\right)$

3. ✖

$\left(\frac{5}{2},\frac{11}{2}\right)$

4. ✖

Question Number : 11

If the extreme value of $3x-2x^2+1$ is k then the set of all real values of x for which $kx^2+2x+1>0$ is

Options :

$\left(\frac{1}{2},1\right)$

1. ✖

$\left(-\infty,\frac{1}{2}\right)\cup(1,\infty)$

2. ✖

$(-\infty,\infty)$

3. ✔

$\left(-\infty,\frac{17}{8}\right)$

4.

✖

Question Number : 12

If α, β, γ are the roots of the equation $x^3 - 5x^2 - 2x + 24 = 0$ then $\frac{\beta\gamma}{\alpha} + \frac{\gamma\alpha}{\beta} + \frac{\alpha\beta}{\gamma} =$

Options :

1. 244 ✖

2. $\frac{-1}{6}$ ✖

3. 61 ✖

4. $\frac{-61}{6}$ ✔

Question Number : 13

If α, β, γ are the roots of the equation $3x^3 - 26x^2 + 52x - 24 = 0$ such that α, β, γ are in geometric progression and $\alpha < \beta < \gamma$, then $3\alpha + 2\beta + \gamma =$

Options :

1. $\frac{68}{3}$ ✖

2. $\frac{56}{3}$ ✖

12

3. ✔

24

4. ✖

Question Number : 14

Let $p(x)$ be a quadratic polynomial with real coefficients. If $p(x) = 0$ has only purely imaginary roots, then the zeroes of the polynomial $p(p(x))$ are

Options :

only real numbers

1. ✖

only purely imaginary numbers

2. ✖

only rational numbers

3. ✖

only complex numbers of the form $a + ib$ with $a \neq 0$ and $b \neq 0$

4. ✔

Question Number : 15

If α, β, γ are the roots of the equation $4x^3+12x^2-7x+165=0$ and $\alpha+5, \beta+5, \gamma+5$ are the roots of the equation $ax^3+bx^2+cx+d=0$ then the product of the roots of the second equation is

Options :

1. ✖ 27

2. ✔ 0

3. ✖ -3

4. ✖ $3\sqrt{5}+4$

Question Number : 16

The number of 3–digit odd numbers divisible by 3 that can be formed using the digits 1, 2, 3, 4, 5, 6 when repetition is not allowed is

Options :

1. ✖ 18

2. ✖ 21

3. ✔ 24

36

4. ✖

Question Number : 17

Match the items of List -I to the items of List -II

List - I	List - II
A) The number of ways of not selecting $(n-r)$ things from n different things	I) $1+n+{}^{n}C_{2}+\ldots+{}^{n}C_{r}$
B) $(n-r+1)\cdot {}^{n}C_{r-1}$	II) $(r+1)\cdot {}^{n}C_{r+1}$
C) The number of ways of selecting atleast $(n-r)$ things from n different things	III) $r\cdot {}^{n}C_{r}$
D) $(n-r)\left((n-1)C_{r-1}+(n-1)C_{r}\right)$	IV) $2^{n}-1-n-{}^{n}C_{2}-\ldots-{}^{n}C_{r}$
	V) ${}^{n}C_{n-r}$

The correct match is:

Options :

A	B	C	D
V	III	IV	II

1. ✖

A	B	C	D
I	II	IV	III

2.

✖

A	B	C	D
V	III	I	II

3. ✔

A	B	C	D
I	V	IV	III

4. ✖

Question Number : 18

If L and M are respectively the coefficient of x^{-7} in $\left(ax+\frac{b}{x^2}\right)^{11}$ and the coefficient of x^7 in $\left(bx^2+\frac{a}{x}\right)^{11}$ then L + M =

Options :

$$\frac{1}{b}\left[\text{coefficient of } x^{-6} \text{ in}\left(ax+\frac{b}{x^2}\right)^{12}\right]$$

1. ✖

$$\frac{1}{a}\left[\text{coefficient of } x^{6} \text{ in}\left(ax^2+\frac{b}{x}\right)^{12}\right]$$

2. ✔

$$a\left[\text{coefficient of } x^{-10} \text{ in}\left(ax+\frac{b}{x^2}\right)^{11}\right]$$

3.

✖

$$b\left[\text{coefficient of } x^4 \text{ in}\left(ax^2+\frac{b}{x}\right)^{11}\right]$$

4. ✖

Question Number : 19

$$\text{If } \frac{x^2-3x+2}{(x-4)(x-3)^2}=\frac{A}{x-4}+\frac{B}{x-3}+\frac{C}{(x-3)^2} \text{ then } A+B+C=$$

Options :

1. ✖ 1

2. ✖ 0

3. ✔ -1

4. ✖ 5

Question Number : 20

$$\text{If } \frac{x^2+3}{(x^2+1)(x^2+2)}=\frac{Ax+B}{x^2+1}+\frac{Cx+D}{x^2+2} \text{ then } A+B+C+D=$$

Options :

1. ✖ 3

2

2. ✖

0

3. ✖

1

4. ✔

Question Number : 21

If A and B (A > B) are acute angles, $\sin(A-B)=\frac{16}{65}$ and $\sin B=\frac{5}{13}$ then $\tan A+\cot A=$

Options :

$\frac{25}{12}$

1. ✔

$\frac{12}{25}$

2. ✖

$\frac{5}{12}$

3. ✖

$\frac{12}{5}$

4. ✖

Question Number : 22

If $\tan A=\frac{2}{3}$, then $\sin 4A=$

Options :

1. $\frac{8}{27}$ ✖

2. $\frac{120}{169}$ ✔

3. $\frac{144}{169}$ ✖

4. $\frac{16}{27}$ ✖

Question Number : 23

$$\frac{\sqrt{2}\cos 45^\circ+\cos 56^\circ+\cos 58^\circ-\cos 66^\circ}{\sqrt{2}\cos 28^\circ\cos 29^\circ\sin 33^\circ}=$$

Options :

1. $\sqrt{2}$ ✖

2. $2\sqrt{2}$ ✔

$\frac{\sqrt{2}}{2}$

3. ✖

$4\sqrt{2}$

4. ✖

Question Number : 24

If $\theta = \frac{\pi}{12}$ and $x = \log\left(\cot\left(\frac{\pi}{4} + \theta\right)\right)$, then $\cosh x =$

Options :

$\frac{2}{\sqrt{3}}$

1. ✔

$\frac{-2}{\sqrt{3}}$

2.

✖

$\frac{\sqrt{3}}{2}$

3. ✖

$\frac{-\sqrt{3}}{2}$

4. ✖

Question Number : 25

$2 \cos h\,(x + y) \sin h(x - y) + \sin h\, 2y =$

Options :

$\sin h\, 2x$

3.

$$\frac{\sin h\, 2x + \sin h\, 2y}{2}$$

2.

$$\frac{\sin h\, 2x - \sin h\, 2y}{2}$$

3.

$\cos h\, 2x$

4.