Telangana State Council Higher Education

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	EngineeringEnglish 18th Jul 2022 Shift 1
Subject Name :	Engineering (English)
Creation Date :	2022-07-19 11:26:30
Duration :	180
Total Marks :	160
Display Marks:	No
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No

Engineering (English)

Group Number :	1
Group Id :	1056151
Group Maximum Duration :	0
Group Minimum Duration :	180
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	160
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

Mathematics

Section Id :	1056151
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory

Number of Questions :	80
Number of Questions to be attempted :	80
Section Marks :	80
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	1056151
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 1056151 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

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

Options :

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

1. ✔

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

2. ✖

$[-4,4]$

3. ✖

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

4. ✖

Question Number : 2 Question Id : 1056152 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

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

Options :

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

1. ✖

$\left(0, \frac{1}{2}\right]$

2. ✔

$(-\infty, 0) \cup [2, \infty)$

3. ✖

$(0, 2]$

4. ✖

Question Number : 3 Question Id : 1056153 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

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 :

7

1. ✖

-1

2. ✖

3

3. ✔

1

4. ✖

Question Number : 4 Question Id : 1056154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

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

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 Question Id : 1056155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

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 Question Id : 1056156 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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

Options :

1. 8 ✔

2. -6 ✖

3. 6 ✖

4. -10 ✖

Question Number : 7 Question Id : 1056157 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

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

Options :

$\pm(1+2i)$

1. ✖

$\pm(3+i)$

2. ✖

$\pm(1+7i)$

3. ✔

$\pm(7-i)$

4. ✖

Question Number : 8 Question Id : 1056158 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

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

Options :

2022

1. ✖

2024

2. ✖

2028

3. ✔

2026

4. ✖

Question Number : 9 Question Id : 1056159 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561511 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561512 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561513 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561514 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561515 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561517 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561519 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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

Options :

1. 1 ✖

2. 0 ✖

3. −1 ✔

4. 5 ✖

Question Number : 20 Question Id : 10561520 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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

Options :

1. 3 ✖

2

2. ✖

0

3. ✖

1

4. ✔

Question Number : 21 Question Id : 10561521 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561522 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561523 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✖ $\sqrt{2}$

2. ✔ $2\sqrt{2}$

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

3. ✖

$4\sqrt{2}$

4. ✖

Question Number : 24 Question Id : 10561524 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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 Question Id : 10561525 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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

Options :

$\sin h\, 2x$

1. ✔

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

2. ✖

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

3. ✖

$\cos h\, 2x$

4. ✖

Question Number : 26 Question Id : 10561526 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

In a triangle ABC, if $(b+c)^2 \sin^2 \frac{A}{2} + (b-c)^2 \cos^2 \frac{A}{2} = K(1-\cos 2A)$, then K =

Options :

R^2

1. ✖

$2R^2$

2. ✔

R

3. ✖

$2R$

4. ✖

Question Number : 27 Question Id : 10561527 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

In a triangle ABC, if $b = 7$, $c = 4\sqrt{3}$ and A= $\frac{\pi}{6}$ then $a \sin B \sin C =$

Options :

1. ✖ $\frac{\sqrt{13}}{12}$

2. ✖ $\frac{\sqrt{13}}{7\sqrt{3}}$

3. ✖ $\frac{12}{\sqrt{13}}$

4. ✔ $\frac{7\sqrt{3}}{\sqrt{13}}$

Question Number : 28 Question Id : 10561528 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

In triangle ABC, if BC is the hypotenuse, then $r_2 + r_3 =$

Options :

1. ✖ $r_1 + r$

2. ✔ a

3. ✖ $r - r_1$

$2(R+r)$

4. ✖

Question Number : 29 Question Id : 10561529 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

In a triangle ABC, D and E divide the sides BC and CA in the ratio 2:1 respectively. If P is the point of intersection of AD and BE then the ratio in which P divides AD is

Options :

$2:1$

1. ✖

$3:4$

2. ✔

$4:3$

3. ✖

$1:2$

4. ✖

Question Number : 30 Question Id : 10561530 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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

Options :

$\frac{-4}{19}$

1. ✖

$\frac{42}{19}$

2. ✔

$\frac{-42}{19}$

3. ✖

$\frac{4}{19}$

4. ✖

Question Number : 31 Question Id : 10561531 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If P is a point on the line parallel to the vector $2\bar{i}-3\bar{j}-6\bar{k}$ and passing through the point A whose position vector is $\bar{i}+2\bar{j}-2\bar{k}$ and AP = 21, then the position vector of P can be

Options :

$6\bar{i}-9\bar{j}-18\bar{k}$

1. ✖

$6\bar{i}+9\bar{j}-18\bar{k}$

2. ✖

$-5\bar{i}+11\bar{j}+16\bar{k}$

3. ✔

$5\bar{i}-11\bar{j}+16\bar{k}$

4. ✖

Question Number : 32 Question Id : 10561532 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $\bar{a}$ be a vector in the plane containing vectors $\bar{b}=\bar{i}+2\bar{j}+\bar{k}$ and $\bar{c}=2\bar{i}-\bar{j}+\bar{k}$. If $\bar{a}$ is perpendicular to $\bar{i}+\bar{j}+3\bar{k}$ and its projection on $\bar{b}$ is $3\sqrt{6}$, then $\left|\bar{a}\right|^2$ =

Options :

186

1. ✖

36

2. ✖

128

3. ✖

264

4. ✔

Question Number : 33 Question Id : 10561533 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The cartesian equation of the plane passing through the point $(1,-2,3)$ and perpendicular to the vector $-\bar{i}+2\bar{j}-3\bar{k}$, is

Options :

$-x+2y-3z=14$

1. ✖

$x-2y+3z=14$

2. ✔

$x+2y-3z=14$

3. ✖

$-x+2y+3z=14$

4. ✖

Question Number : 34 Question Id : 10561534 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $\bar{a}=\bar{i}+\bar{j}+\bar{k}$, $\bar{b}=\bar{i}-2\bar{j}+\bar{k}$, $\bar{c}=\bar{i}+3\bar{j}-2\bar{k}$, $\bar{d}=2\bar{i}+\bar{j}-\bar{k}$ be four vectors and let $l=\bar{b}\cdot\bar{c}$ and $m=\bar{c}\cdot\bar{a}$. Then $\left[m\bar{b}+l\bar{a}\quad\bar{b}\quad\bar{d}\right]=$

Options :

79

1. ✖

–63

2. ✔

0

3. ✖

1

4. ✖

Question Number : 35 Question Id : 10561535 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\bar{x}$ is the mean of n observations $x_1, x_2, ..., x_n$ then the mean of the absolute deviations of these observations from $\bar{x}$ is

Options :

the variance of the data

1. ✖

the mean proportion of the data

2. ✖

the standard deviation of the data

3. ✖

the mean deviation of the data

4. ✔

Question Number : 36 Question Id : 10561536 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

A cube having edge of length 5 cm is painted on all faces and then it is cut into equal cubes of unit volume. A small cube is selected at random and found that a face of it is painted, then the probability that two more faces of it are also painted is

Options :

$\frac{27}{125}$

1. ✖

$\frac{4}{49}$

2. ✔

$\frac{1}{8}$

3. ✖

$\frac{8}{125}$

4. ✖

Question Number : 37 Question Id : 10561537 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

A pair of dice is thrown twice in succession. The probability of getting prime numbers on both the dice in first throw and composite numbers on both the dice in second throw is

Options :

$\frac{1}{216}$

1. ✖

$\frac{1}{16}$

2. ✖

$\frac{1}{36}$

3. ✔

$\frac{1}{9}$

4. ✖

Question Number : 38 Question Id : 10561538 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

3 balls are drawn one after the other without replacement from an urn containing 4 red, 5 blue and 6 yellow balls. The probability of getting three different coloured balls is

Options :

$\frac{12}{91}$

1. ✖

$\frac{24}{91}$

2. ✔

$\frac{8}{225}$

3. ✖

$\frac{8}{75}$

4. ✖

Question Number : 39 Question Id : 10561539 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Two balls are drawn at random from a bag containing 5 black balls and 3 white balls. If the random variable X denotes the number of white balls drawn, then the mean of X is

Options :

$\frac{1}{2}$

1. ✖

$\frac{5}{8}$

2. ✖

$\frac{3}{4}$

3. ✔

$\frac{3}{8}$

4. ✖

Question Number : 40 Question Id : 10561540 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the mean and variance of a binomial distribution are 4 and $\frac{4}{3}$ respectively, then $P(X=2)=$

Options :

1. $\frac{20}{243}$ ✔

2. $\frac{40}{243}$ ✖

3. $\frac{28}{729}$ ✖

4. $\frac{8}{27}$ ✖

Question Number : 41 Question Id : 10561541 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $A(5,-3), B(3,-2), C(-1,5)$ be three points. If P is a point satisfying the condition $PA^2+2PB^2=3PC^2$, then a point that lies on the locus of P is

Options :

1. $\left(-\frac{1}{7},\frac{1}{2}\right)$ ✖

2. $\left(-\frac{5}{2},-2\right)$ ✖

$\left(-\frac{2}{21},\frac{31}{66}\right)$

3. ✖

$\left(2,\frac{37}{22}\right)$

4. ✔

Question Number : 42 Question Id : 10561542 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

When the coordinate axes are rotated about the origin in the positive direction through an angle $\frac{\pi}{4}$, if the equation $49x^2+25y^2=1225$ is transformed to $px^2+qxy+ry^2=t$ and the G.C.D of p, q, r, t is 1, then

Options :

$(p-q+r-32)^2=4t$

1. ✖

$(p-q-r+12)^2=t$

2. ✖

$(p+q+r-15)^2=t$

3. ✔

$(-p-q+r+13)^2=t$

4. ✖

Question Number : 43 Question Id : 10561543 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let the slope of a diameter AC of a circle of radius 25 units be $\frac{3}{4}$. If (3, 2) is the centre of the circle, $A=(x_1, y_1)$ and $C=(x_2, y_2)$ then $\frac{x_1x_2}{y_1y_2}=$

Options :

1. ✖ $\frac{-13}{23}$

2. ✖ $\frac{13}{23}$

3. ✖ $\frac{-23}{13}$

4. ✔ $\frac{23}{13}$

Question Number : 44 Question Id : 10561544 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If θ is the acute angle between the lines $\frac{x}{a}+\frac{y}{b}=1$, $\frac{x}{b}+\frac{y}{a}=1$ then $\sin\theta=$

Options :

1. ✖ $\left|\frac{2ab}{a^2+b^2}\right|$

2. ✖ $\left|\frac{a-b}{a+b}\right|$

$\left|\frac{a^2-b^2}{2ab}\right|$

3. ✖

$\left|\frac{a^2-b^2}{a^2+b^2}\right|$

4. ✔

Question Number : 45 Question Id : 10561545 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the line $x-y+1=0$ cuts the lines $2x+2y+3=0$ and $3x+3y+2=0$ at the points A and B respectively, then AB =

Options :

$\frac{5}{6\sqrt{2}}$

1. ✔

$\frac{1}{6\sqrt{2}}$

2. ✖

$\frac{5}{\sqrt{3}}$

3. ✖

$\frac{5}{6\sqrt{3}}$

4. ✖

Question Number : 46 Question Id : 10561546 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the incentre and the circumcentre of the triangle formed by the lines $x = 2$, $4x + 3y + 7 = 0$ and $y = 3$ are I and S respectively, then IS =

Options :

1. ✖ 5

2. ✔ $\sqrt{5}$

3. ✖ $4\sqrt{2}$

4. ✖ $2\sqrt{5}$

Question Number : 47 Question Id : 10561547 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$ax^2 - 4xy - 2y^2 = 0$ represents a pair of lines. If θ is the angle between these lines, $\cos\theta = \frac{1}{5}$ and the possible values of 'a' are a_1 and a_2 $(a_1 < a_2)$ then $a_1 + 3a_2 =$

Options :

1. ✔ 11

2. ✖ 10

3. ✖ -5

-6

4. ✖

Question Number : 48 Question Id : 10561548 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let L_1, L_2 be the lines represented by the equation $4x^2 - 5xy + 3y^2 = 0$. Let L_3, L_4 be two lines passing through the point (4, 3) such that L_3 and L_4 are perpendicular to L_1 and L_2 respectively. If the combined equation of L_3 and L_4 is $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$, then $af + bg + ch =$

Options :

144

1. ✖

66

2. ✖

78

3. ✖

216

4. ✔

Question Number : 49 Question Id : 10561549 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The equation $x^2 - y^2 + ax + b = 0$ represents a pair of lines for the ordered pair $(a,b) =$

Options :

$(2,6)$

1. ✖

$(3,4)$

2. ✖

$(4,8)$

3. ✖

$(6,9)$

4. ✔

Question Number : 50 Question Id : 10561550 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

A circle passes through the points (1, 2), (3, 4). If its centre lies on the line $x - y + 3 = 0$, then its radius is equal to

Options :

4

1. ✖

3

2. ✖

1

3. ✖

2

4. ✔

Question Number : 51 Question Id : 10561551 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

A line drawn through the point $A(5,7)$ cuts the circle $x^2+y^2-36=0$ at the points P and Q. Then, $AP \cdot AQ =$

Options :

1. ✖ 110

2. ✖ 60

3. ✔ 38

4. ✖ 12

Question Number : 52 Question Id : 10561552 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let P be any point on the circle $x^2+y^2-2x-1=0$ and C be its centre. Let AB be the chord of contact of P with respect to the circle $x^2+y^2-2x=0$. Then the locus of the circumcentre of the triangle CAB is

Options :

1. ✔ $2x^2+2y^2-4x+1=0$

2. ✖ $x^2+y^2-4x+2=0$

3. ✖ $x^2+y^2-4x+1=0$

$2x^2+2y^2-4x+3=0$

4. ✖

Question Number : 53 Question Id : 10561553 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If a circle C passing through $(4,0)$ touches the circle $x^2+y^2+4x-6y-12=0$ externally at the point $(1,-1)$, then the radius of C is

Options :

$\sqrt{12}$

1. ✖

4

2. ✖

$\sqrt{3}$

3. ✖

5

4. ✔

Question Number : 54 Question Id : 10561554 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the circles $C_1: x^2+y^2+2x+4y-20=0$, $C_2: x^2+y^2+6x-8y+9=0$ have n common tangents and the length of the tangent drawn from the centre of similitude to the circle C_2 is l then $\frac{l}{n^2}=$

Options :

$4\sqrt{39}$

1. ✖

2. ✔ $\sqrt{39}$

3. ✖ $\frac{\sqrt{39}}{4}$

4. ✖ $2\sqrt{39}$

Question Number : 55 Question Id : 10561555 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the common chord of the circles $x^2+y^2+4y=0$ and $x^2+y^2-4x-5=0$ is the diameter of the circle $S=0$ then the abscissa of the centre of the circle $S=0$ is

Options :

1. ✖ $\frac{-13}{8}$

2. ✔ $\frac{3}{8}$

3. ✖ $\frac{3}{4}$

4. ✖ $\frac{-13}{4}$

Question Number : 56 Question Id : 10561556 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

If $y^2 = 16x$ is the given parabola, then the point of intersection of the focal chord through the point $(2,2)$ and the double ordinate of length 24 is

Options :

$(3,1)$

1. ✖

$(9,-5)$

2. ✔

$(9,3)$

3. ✖

$(8,-4)$

4. ✖

Question Number : 57 Question Id : 10561557 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Let PQ and RT be two focal chords of the parabola $y^2 = 16x$. If P = (4, 8) and R = (16, 16) then QT =

Options :

5

1. ✔

$4\sqrt{5}$

2. ✖

$4\sqrt{13}$

3. ✖

13

4. ✖

Question Number : 58 Question Id : 10561558 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If the eccentricity and the length of the latus rectum of an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ are $\frac{\sqrt{3}}{2}$ and 1 respectively, then the sum of the lengths of major axis and minor axis of the ellipse is

Options :

6

1. ✔

3

2. ✖

10

3. ✖

8

4. ✖

Question Number : 59 Question Id : 10561559 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The parametric equations of the ellipse whose foci are $(-3,0)$, $(9,0)$ and eccentricity is $\frac{1}{3}$, are

Options :

$x = 3 + 12\sqrt{2}\cos\theta, y = 18\sin\theta$

1. ✖

$x = 3 + 18\cos\theta, y = 12\sqrt{2}\sin\theta$

2. ✔

$x = 18\cos\theta, y = 3 + 12\sqrt{2}\sin\theta$

3. ✖

$x = 3 + 4\sqrt{2}\cos\theta, y = 18\sin\theta$

4. ✖

Question Number : 60 Question Id : 10561560 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $\frac{x^2}{k-\frac{5}{2}} + \frac{y^2}{\frac{7}{3}-k} = 1$ (k is a real number) represents a hyperbola, then the set of all values of k is

Options :

$\left(-\infty, \frac{7}{3}\right) \cup \left(\frac{5}{2}, \infty\right)$

1. ✔

$\left(\frac{7}{3}, \frac{5}{2}\right)$

2. ✖

$\left(-1, \frac{7}{3}\right) \cup \left(\frac{5}{2}, 1\right)$

3. ✖

$R-\left(\frac{7}{3},\frac{5}{2}\right)$

4. ✖

Question Number : 61 Question Id : 10561561 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let A (θ_1) and B (θ_2) be two points on the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ and S be the focus of the hyperbola. If A, S, B are collinear and $a\cos\left(\frac{\theta_1+\theta_2}{2}\right)=k\cos\left(\frac{\theta_1-\theta_2}{2}\right)$ then $k=$

Options :

a^2+b^2

1. ✖

$\sqrt{a^2+b^2}$

2. ✔

a^2-b^2

3. ✖

$a+b$

4. ✖

Question Number : 62 Question Id : 10561562 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $A(1, 2, 3), B(-1, 4, 6), C(0, -6, 4)$ and $D(1, 1, 1)$ be the vertices of a tetrahedron, G be its centroid and G_1 be the centroid of its face BCD. Then $\frac{AG_1}{AG}=$

Options :

1. ✖ $\frac{5}{3}$

2. ✔ $\frac{4}{3}$

3. ✖ $\frac{7}{6}$

4. ✖ $\frac{5}{4}$

Question Number : 63 Question Id : 10561563 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If a line L is common to the planes $x-y+z+2=0$ and $2x+y-2z+5=0$ then the direction cosines of the line L are

Options :

1. ✔ $\left(\frac{1}{\sqrt{26}},\frac{4}{\sqrt{26}},\frac{3}{\sqrt{26}}\right)$

2. ✖ $\left(\frac{1}{3},\frac{2}{3},\frac{2}{3}\right)$

3. ✖ $\left(\frac{1}{\sqrt{3}},\frac{1}{\sqrt{3}},\frac{1}{\sqrt{3}}\right)$

$\left(\frac{-1}{6}, \frac{5}{6}, \frac{\sqrt{10}}{6}\right)$

4. ✖

Question Number : 64 Question Id : 10561564 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let the foot of the perpendicular drawn from the point $(1, 2, 3)$ to a plane be $(-1, 3, -2)$. Then the perpendicular distance from the origin to the plane is

Options :

$\frac{5}{\sqrt{30}}$

1. ✖

$\sqrt{\frac{15}{2}}$

2. ✔

$\frac{2}{\sqrt{15}}$

3. ✖

$\frac{1}{\sqrt{3}}$

4. ✖

Question Number : 65 Question Id : 10561565 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$$\lim_{x \to 3^-} \frac{x^3 - 3x^2 - 4x + 12}{2x^3 - 7x^2 + 2x + 3} =$$

Options :

0

1. ✖

∞

2. ✖

$\frac{5}{14}$

3. ✔

$\frac{6}{13}$

4. ✖

Question Number : 66 Question Id : 10561566 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$$\lim_{x\to 0}\frac{2^{2x}-2^{x+1}+2-\cos 2x}{x^2}=$$

Options :

$2+\log 2$

1. ✖

$2+(\log 2)^2$

2. ✔

$2+(\log 4)^2$

3. ✖

$2+\log 4$

4. ✖

Question Number : 67 Question Id : 10561567 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $f(x)=\begin{cases}\frac{x^2-16}{x-4} & \text{if } x>4 \\ 2x & \text{if } x\le 4\end{cases}$ then $f'(4^-)+f'(4^+)=$

Options :

1. ✖ 1

2. ✖ 2

3. ✔ 3

4. ✖ 4

Question Number : 68 Question Id : 10561568 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

If $f(x)=\log_e\left(e^{2x}\left(\frac{3x+5}{5-3x}\right)^{2/3}\right)$, $x\neq\frac{-5}{3},\frac{5}{3}$, then the value of $\frac{df}{dx}$ at $x=1$, is

Options :

1. ✖ $\frac{5}{4}$

2. ✖ $\frac{7}{4}$

3. ✖ $\frac{11}{4}$

$\frac{13}{4}$

4. ✔

Question Number : 69 Question Id : 10561569 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $x = \text{cosec}\ \theta - \sin\theta$, $y = \text{cosec}^{2022}\theta - \sin^{2022}\theta$ and $\left(\frac{dy}{dx}\right)^2 = \frac{k\left(y^2+4\right)}{g(x)}$ where $k \in \mathbb{R}$, then $10 + k - g(2022) =$

Options :

0

1. ✖

6

2. ✔

10

3. ✖

14

4. ✖

Question Number : 70 Question Id : 10561570 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The area of the triangle formed by the tangent and the normal drawn to the curve $y^2 = 4x$ at (1, 2) with Y-axis is (in square units)

Options :

4

1. ✖

3

2. ✖

2

3. ✖

1

4. ✔

Question Number : 71 Question Id : 10561571 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Consider two families of curves $y^2 = 4ax$ (a is a parameter) and $x^2 + \frac{y^2}{2} = c^2$ (c is parameter). If one curve from each family is chosen, then the angle between those two curves is

Options :

π

1. ✖

$\frac{\pi}{4}$

2. ✖

$\frac{3\pi}{4}$

3. ✖

$\frac{\pi}{2}$

4. ✔

Question Number : 72 Question Id : 10561572 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let a function $f(x)$ be continuous in an interval $[a, b]$. Let $\delta > 0$ be a very small real number. Let $c \in (a, b)$ be such that $f(c-\delta) < f(c)$ and $f(c+\delta) < f(c)$ for every $\delta > 0$. Let $(f(\alpha-\delta)-f(\alpha))(f(\alpha+\delta)-f(\alpha)) < 0 \ \forall \alpha \in (a, b)$ and $\alpha \neq c$. Then

Options :

$f(x)$ has a local maximum at c and a local minimum at α

1. ✖

$f(x)$ has a local maximum at α and a local minimum at c

2. ✖

$f(x)$ has only one local maximum at c

3. ✔

$f(x)$ has only one local minimum at c

4. ✖

Question Number : 73 Question Id : 10561573 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $f(x) = \int \frac{2x^3 - 3x^2 + 4x - 5}{x^2} dx$ and $f(1) = 1$. Then $f(5) =$

Options :

$10 + 4 \log 5$

1. ✖

$10 - 4 \log 5$

2. ✖

$9 + 4 \log 5$

3. ✔

$9 - 4\log 5$

4. ✖

Question Number : 74 Question Id : 10561574 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $x > 0$ and $x \neq (2n+1)\frac{\pi}{2}$ then $\int\left(x\sqrt{x} - e^{\log(\sec x \tan x)} + \frac{3x^2 - 2x + 1}{x^2}\right)dx =$

Options :

$x\sqrt{x} - \sec x + 3x - 2\log x - \frac{1}{x} + c$

1. ✖

$\frac{2}{5}x^2\sqrt{x} - \sec x + 3x + \frac{2}{x^2} - \frac{1}{x} + c$

2. ✖

$x\sqrt{x} - \sec x + 3x + \frac{2}{x^2} - \frac{1}{x} + c$

3. ✖

$\frac{2}{5}x^2\sqrt{x} - \sec x + 3x - 2\log x - \frac{1}{x} + c$

4. ✔

Question Number : 75 Question Id : 10561575 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$\int (2x-3)\sqrt{3x+2}\ dx =$

Options :

$$\frac{2}{135}(54x^2-123x+106)\sqrt{3x+2}+c$$

1. ✖

$$\frac{2}{135}(54x^2+123x-106)\sqrt{3x+2}+c$$

2. ✖

$$\frac{2}{135}(54x^2-123x-106)\sqrt{3x+2}+c$$

3. ✔

$$\frac{2}{135}(54x^2-195x-106)\sqrt{3x+2}+c$$

4. ✖

Question Number : 76 Question Id : 10561576 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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

Options :

$$\frac{79}{6}$$

1. ✔

$$\frac{643}{6}$$

2. ✖

$$\frac{321}{5}$$

3. ✖

64

4. ✖

Question Number : 77 Question Id : 10561577 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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

Options :

4

1. ✔

9

2. ✖

16

3. ✖

1

4. ✖

Question Number : 78 Question Id : 10561578 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The differential equation of the family of circles with fixed radius r units and centre on the line $y=3$, is

Options :

$$1+\left(\frac{dy}{dx}\right)^2=\frac{r^2}{(y-3)^2}$$

1. ✔

$$1+\left(\frac{dy}{dx}\right)^2=\frac{r^2}{y-3}$$

2. ✖

$$\left(\frac{dy}{dx}\right)^2=\frac{r^2}{(y-3)^2}$$

3. ✖

$$\left(\frac{dy}{dx}\right)^2=\frac{r^2}{y-3}$$

4. ✖

Question Number : 79 Question Id : 10561579 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

The degree of the differential equation $x\left(\frac{d^2y}{dx^2}\right)^{1/3}+2x^2\left(\frac{d^2y}{dx^2}\right)^{5/3}+7\frac{dy}{dx}+y=0$

Options :

15

1. ✖

5

2. ✔

12

3. ✖

3

4. ✖

Question Number : 80 Question Id : 10561580 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The curve that satisfies the differential equation $xydy-\left(1+y^2\right)dx=0$ passes through $(1,0)$ and intersects the curve $x^2+3y^2=3$ at an angle θ. Then $\frac{2\theta}{\pi}=$

Options :

1. 2 ✖

2. 0 ✖

3. 4 ✖

4. 1 ✔

Physics

Section Id :	1056152
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	40
Number of Questions to be attempted :	40
Section Marks :	40
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	1056152
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 10561581 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0