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 :

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 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 $\leq x$, 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 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 :

1. ✖ 7

2. ✖ -1

3. ✔ 3

4. ✖ 1

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 :

A

1. ✖

$-A$

2. ✖

$2A$

3. ✖

$-2A$

4. ✔

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 :

1. ✖ $\pm(1+2i)$

2. ✖ $\pm(3+i)$

3. ✔ $\pm(1+7i)$

4. ✖ $\pm(7-i)$

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

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

1. ✖ 3

2. ✖ 5

3. ✔ 7

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 :

1. ✖ $\left(\frac{1}{2}, 1\right)$

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

3. ✔ $(-\infty, \infty)$

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

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. ✖ $\frac{56}{3}$

3. ✔ 12

4. ✖ 24

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 :

1. ✖ only real numbers

2. ✖ only purely imaginary numbers

3. ✖ only rational numbers

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

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

4. ✖ 36

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 ✖

3. 0 ✖

4. 1 ✔

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 :

1. ✔ $\frac{25}{12}$

2. ✖ $\frac{12}{25}$

3. ✖ $\frac{5}{12}$

4. ✖ $\frac{12}{5}$

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. ✔ $2\sqrt{2}$

3. ✖ $\frac{\sqrt{2}}{2}$

4. ✖ $4\sqrt{2}$

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 :

1. $\frac{2}{\sqrt{3}}$ ✔

2. $\frac{-2}{\sqrt{3}}$ ✖

3. $\frac{\sqrt{3}}{2}$ ✖

4. $\frac{-\sqrt{3}}{2}$ ✖

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 :

1. $\sin h\, 2x$ ✔

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

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

4. $\cos h\, 2x$ ✖

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 :

1. R^2 ✖

2. $2R^2$ ✔

3. R ✖

4. $2R$ ✖

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. ✖ $r - r_1$

4. ✖ $2(R + r)$

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 :

1. $\frac{-4}{19}$ ✖

2. $\frac{42}{19}$ ✔

3. $\frac{-42}{19}$ ✖

4. $\frac{4}{19}$ ✖

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 :

1. $6\bar{i}-9\bar{j}-18\bar{k}$ ✖

2. $6\bar{i}+9\bar{j}-18\bar{k}$ ✖

3. $-5\bar{i}+11\bar{j}+16\bar{k}$ ✔

4. $5\bar{i}-11\bar{j}+16\bar{k}$ ✖

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 :

1. ✖ 186

2. ✖ 36

3. ✖ 128

4. ✔ 264

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 :

1. 79 ✖

2. –63 ✔

3. 0 ✖

4. 1 ✖

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 :

1. ✖ the variance of the data

2. ✖ the mean proportion of the data

3. ✖ the standard deviation of the data

4. ✔ the mean deviation of the data

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 :

1. $\frac{27}{125}$ ✖

2. $\frac{4}{49}$ ✔

3. $\frac{1}{8}$ ✖

4. $\frac{8}{125}$ ✖

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 :

1. ✖ $\frac{1}{216}$

2. ✖ $\frac{1}{16}$

3. ✔ $\frac{1}{36}$

4. ✖ $\frac{1}{9}$

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 :

1. $\frac{12}{91}$ ✖

2. $\frac{24}{91}$ ✔

3. $\frac{8}{225}$ ✖

4. $\frac{8}{75}$ ✖

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 :

1. ✖ $\frac{1}{2}$

2. ✖ $\frac{5}{8}$

3. ✔ $\frac{3}{4}$

4. ✖ $\frac{3}{8}$

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. ✖ $\left(-\frac{5}{2}, -2\right)$

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

4. ✔ $\left(2, \frac{37}{22}\right)$

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 $px^2+q\,xy+r\,y^2=t$ and the G.C.D of p, q, r, t is 1, then

Options :

1. $(p-q+r-32)^2=4t$ ✖

2. $(p-q-r+12)^2=t$ ✖

3. $(p+q+r-15)^2=t$ ✔

4. $(-p-q+r+13)^2=t$ ✖

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 $\frac{x_1 x_2}{y_1 y_2} =$

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. $\left|\frac{a-b}{a+b}\right|$ ✖

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

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

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 :

5

1. ✖

$\sqrt{5}$

2. ✔

$4\sqrt{2}$

3. ✖

$2\sqrt{5}$

4. ✖

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 :

11

1. ✔

10

2. ✖

−5

3. ✖

−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. ✖ $x^2+y^2-4x+1=0$

4. ✖ $2x^2+2y^2-4x+3=0$

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 :

1. ✖ $\sqrt{12}$

2. ✖ 4

3. ✖ $\sqrt{3}$

4. ✔ 5

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 :

1. $4\sqrt{39}$ ✖

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 :

1. ✔ 5

2. ✖ $4\sqrt{5}$

3. ✖ $4\sqrt{13}$

4. ✖ 13

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 :

1. ✔ 6

2. ✖ 3

3. ✖ 10

4. ✖ 8

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 :

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

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

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

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

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

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

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 :

1. $\frac{5}{\sqrt{30}}$ ✖

2. $\sqrt{\frac{15}{2}}$ ✔

3. $\frac{2}{\sqrt{15}}$ ✖

4. $\frac{1}{\sqrt{3}}$ ✖

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 :

1. ✖ 0

2. ✖ ∞

3. ✔ $\frac{5}{14}$

4. ✖ $\frac{6}{13}$

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 :

1. ✖ $2+\log 2$

2. ✔ $2+(\log 2)^2$

3. ✖ $2+(\log 4)^2$

4. ✖ $2+\log 4$

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. ✖ $\frac{11}{4}$

4. ✔ $\frac{13}{4}$

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 $x = \cos ec\ \theta - \sin\theta,\ y = \cos ec^{2022}\theta - \sin^{2022}\theta$ 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 :

1. ✖ 0

2. ✔ 6

3. ✖ 10

4. ✖ 14

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 :

1. ✖ 4

2. ✖ 3

3. ✖ 2

4. ✔ 1

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 :

1. ✖ π

2. ✖ $\frac{\pi}{4}$

3. ✖ $\frac{3\pi}{4}$

4. ✔ $\frac{\pi}{2}$

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 :

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

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

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

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

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 :

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

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

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 :

1. $\frac{79}{6}$ ✔

2. $\frac{643}{6}$ ✖

3. $\frac{321}{5}$ ✖

4. 64 ✖

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

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

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

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

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 :

1. 15 ✖

2. 5 ✔

3. 12 ✖

4. 3 ✖

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

Choose the correct statement from following.

Options :

1. ✖ Not all basic laws of physics are universal

2. ✔ Conservation laws have a deep connection with symmetries of nature

3. ✖ There are four to six fundamental forces in nature that govern the diverse phenomena of the world

Physics can generate new technology but new physics cannot come out from technology

4. ✖

Question Number : 82 Question Id : 10561582 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 E and E_0 denote energies at time t and t_0 respectively, and L and L_0 distance from some point at t and t_0 respectively, then which of the following equations can be declared to be incorrect on dimensional grounds

A) $E = \frac{2E_0 L}{L_0}$

B) $E = E_0 e^{-2L/L_0}$

C) $E = 2L\,e^{-L/E_0}$

D) $E = 2\left(E_0 / L_0\right) \times e^{-L/L_0}$

Options :

A, B only

1. ✖

A, C only

2. ✖

A, C, D only

3. ✖

C, D only

4. ✔

Question Number : 83 Question Id : 10561583 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 body starts from the rest and acquires a velocity of 10 m/s in 2s. What is the acceleration of the body and the distance travelled

Options :

$5\ m/s^2$ and 10 m

1. ✔

$5\ m/s^2$ and 5 m

2. ✖

$5\ m/s^2$ and 6 m

3. ✖

$6\ \text{m/s}^2$ and 5 m

4. ✖

Question Number : 84 Question Id : 10561584 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 bullet fired into a target losses one-third of its velocity after travelling a distance x meter into the target. If the bullet comes to rest by travelling a further distance x', then the ratio $\frac{x'}{x}$ is

Options :

1. $\frac{2}{3}$ ✖

2. $\frac{1}{3}$ ✖

3. $\frac{4}{5}$ ✔

$\frac{4}{9}$

4. ✖

Question Number : 85 Question Id : 10561585 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

An ant starts from the origin and crawls 10 cm along the x – axis and then 20 cm along the y – axis. The dot product of the ant's displacement vector with the position vector of a point that makes 45° with the x – axis and has a magnitude of $\sqrt{2}$ cm is

Options :

30 cm

1. ✔

$30\sqrt{2}$ cm

2. ✖

$\frac{30}{\sqrt{2}}$ cm

3. ✖

15 cm

4. ✖

Question Number : 86 Question Id : 10561586 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 projectile is launched with an initial speed of 40 m/s at an angle 30° above the ground. The projectile lands on a hillside 2.0 s later. The net displacement from where the projectile was launched to where it hits the target is
(Take g = 10 m/s^2)

Options :

$20\sqrt{3}$ m

1. ✖

$30\sqrt{2}$ m

2. ✖

40 m

3. ✖

$20\sqrt{13}$ m

4. ✔

Question Number : 87 Question Id : 10561587 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 blocks of masses 1 kg and 2 kg connected by a light rod and the system is slipping down a rough incline angle 45° with the horizontal. The frictional coefficient at both the contacts is 0.4. If the acceleration of the system is $\alpha\sqrt{2}$,the value of α is
(Use g = 10m/s^2)

Options :

4

1. ✖

3

2. ✔

2

3. ✖

6

4. ✖

Question Number : 88 Question Id : 10561588 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 potential energy of an object is $U(x) = \left(5x^2 - 4x^3\right)$ J, where x is the position in meter. The position at which the force becomes zero is

Options :

$\frac{1}{2}$ m

1. ✖

$\frac{5}{6}$ m

2. ✔

$\frac{1}{3}$ m

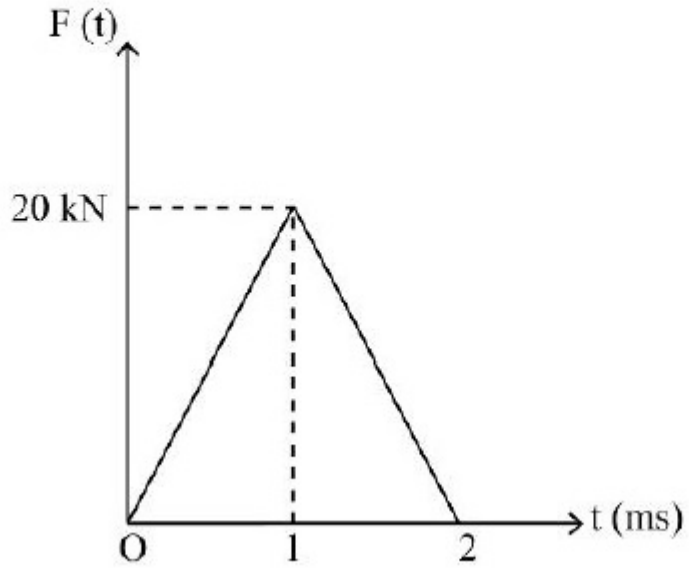
3. ✖

$\frac{2}{3}$m

4. ✖

Question Number : 89 Question Id : 10561589 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 time varying force acts on a ball of mass 100 g for 2 ms. The force versus time curve is shown below. If the initial speed of the ball is 10 m/s, then the speed of ball after 2 ms is



Options :

210 m/s

1. ✖

410 m/s

2. ✔

200 m/s

3. ✖

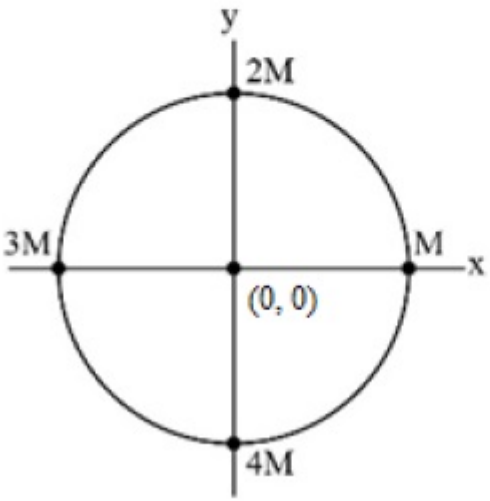
400 m/s

4. ✖

Question Number : 90 Question Id : 10561590 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

Four masses are arranged along a circle of radius 1 m as shown in the figure. The center of mass of this system of masses is at



Options :

$$-\frac{1}{5}\hat{i}-\frac{1}{5}\hat{j}$$

1. ✔

$$\frac{1}{5}\hat{i}+\hat{j}$$

2. ✖

$\hat{i}-\frac{1}{5}\hat{j}$

3. ✖

$\frac{1}{5}\hat{i}+\frac{1}{5}\hat{j}$

4. ✖

Question Number : 91 Question Id : 10561591 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 body starting at t = 0 from origin and oscillates simple harmonically with a period of 4s. After what time will its kinetic energy be 75% of its total energy

Options :

1/2 s

1. ✖

1/3 s

2. ✔

1/4 s

3. ✖

1 s

4. ✖

Question Number : 92 Question Id : 10561592 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

Three particles, each of mass M, situated at the vertices of an equilateral triangle of side length '*l*'. The only forces acting on the particles are their mutual gravitational forces. It is desired that each particle moves in a circle while maintaining the original separation '*l*'. The initial speed that should be given to each particle is

Options :

1. ✖ $\sqrt{\frac{2GM}{l}}$

$$\sqrt{\frac{GM}{2l}}$$

2. ✖

$$\sqrt{\frac{GM}{l}}$$

3. ✔

$$\sqrt{\frac{3GM}{l}}$$

4. ✖

Question Number : 93 Question Id : 10561593 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 following

Column-I		Column-II	
A)	Shear modulus	I)	Resistance to change in volume
B)	Shearing stress	II)	Proportionality constant
C)	Elastic fatigue	III)	Tangential stress
D)	Modulus of elasticity	IV)	Temporary loss of elastic property
		V)	Resistance to change against deformation force

The correct match is

Options :

A	B	C	D
II	V	I	III

1. ✖

A	B	C	D
V	III	IV	II

2. ✔

A	B	C	D
III	IV	II	V

3. ✖

A	B	C	D
V	II	IV	I

4. ✖

Question Number : 94 Question Id : 10561594 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 large storage tank, open to the atmosphere at top and filled with water, develops a small hole in its side at a point 20.0 m below the water level. If the rate of flow from the hole is 3.08×10^{-5} m^3/s, then the diameter of the hole is
[Take $g = 10$ m/s^2]

Options :

1.0 mm

1. ✖

1.2 mm

2. ✖

1.4 mm

3. ✔

1.6 mm

4. ✖

Question Number : 95 Question Id : 10561595 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

An air bubble of radius 1 mm is at a depth of 8 cm below the free surface of a liquid column. If the surface tension and density of the liquid is 0.1 N/m and 2000 Kg/m^3, respectively, by what amount is the pressure inside the bubble greater than the atmospheric pressure?
(Take $g = 10\ m/s^2$)

Options :

1500 N/m^2

1. ✖

$1800\ N/m^2$

2. ✔

$1600\ N/m^2$

3. ✖

$1700\ N/m^2$

4. ✖

Question Number : 96 Question Id : 10561596 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

Find the ratio of the length of a steel rod and a copper rod if the steel rod is 4 cm longer than the copper rod at any temperature.
[The coefficient of linear expansion for steel and copper are 1.1×10^{-5} / °C and 1.7×10^{-5} / °C respectively]

Options :

$\frac{17}{11}$

1. ✔

$\frac{11}{17}$

2. ✖

$\frac{11}{4}$

3. ✖

$\frac{17}{4}$

4. ✖

Question Number : 97 Question Id : 10561597 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

An object cools from $100\,^{\circ}C$ to $40\,^{\circ}C$ in 10 minutes, when the surrounding temperature is $10\,^{\circ}C$. Then the time taken by the object to cool from $70\,^{\circ}C$ to $20\,^{\circ}C$ is
[Take $\ln 2 = 0.7, \ln 3 = 1.1, \ln 6 = 1.8$]

Options :

30 min

1. ✖

8.5 min

2. ✖

22.4 min

3. ✖

16.3 min

4. ✔

Question Number : 98 Question Id : 10561598 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

1.00 kg of liquid water at 100 °C undergoes a phase change into steam at 100 °C at 1.0 atm (take it to be 1.00×10^5 Pa). The initial volume of the liquid water was 1.00×10^{-3} m^3 which is changed to 2.001 m^3 of steam. Find the change in the internal energy of the system.
[Use heat of vaporization $\simeq 2000\,kJ/kg$]

Options :

1800 kJ

1. ✔

200 kJ

2. ✖

2000 kJ

3. ✖

180 kJ

4. ✖

Question Number : 99 Question Id : 10561599 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 monoatomic gas does 100 J of work when it is expanded isobarically. How much of heat is given to the gas in the process

Options :

150 J

1. ✖

200 J

2. ✖

250 J

3. ✔

300 J

4. ✖

Question Number : 100 Question Id : 105615100 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 root mean square (rms) speed of nitrogen molecules at room temperature is 100 m/s, then the rms speed of Helium molecule at the same temperature is

Options :

$100\sqrt{7}$ m/s

1. ✔

350 m/s

2. ✖

$50\sqrt{14}$ m/s

3. ✖

100 m/s

4. ✖

Question Number : 101 Question Id : 105615101 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 waves of amplitudes A_1 and A_2 respectively are superimposed. The ratio between the maximum and minimum intensities of the resultant waves is 9: 4. The value of $\frac{A_2}{A_1}$ is [Assume $A_1 > A_2$]

Options :

0.66

1. ✖

0.20

2. ✔

0.75

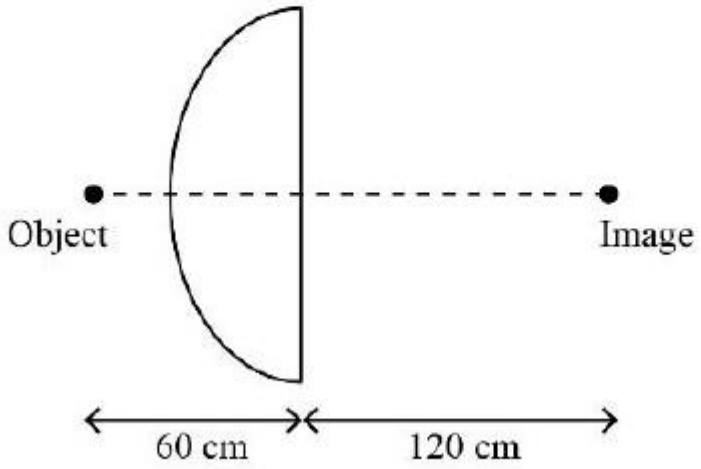
3. ✖

0.44

4. ✖

Question Number : 102 Question Id : 105615102 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 lens is made of glass having an index of refraction 1.5. One side of the lens is flat and the other side is convex with a radius R. If an object is placed 60 cm, towards the convex side of the lens, the image is formed at 120 cm on the other side of the lens. The value of R is



Options :

1. $20\ \text{cm}$ ✔

2. $\frac{40}{3}\ \text{cm}$ ✖

3. $33\ \text{cm}$ ✖

4. $18\ \text{cm}$ ✖

Question Number : 103 Question Id : 105615103 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 Young's double slit experiment apparatus has slits separated by 0.2 mm and a screen 60 cm away from the slits. The whole apparatus is immersed in a liquid medium of refractive index $\frac{11}{9}$ and the slits are illuminated with green light ($\lambda = 550\,nm$ in vacuum). Find the fringe width of the pattern formed on the screen.

Options :

1. ✖ 0.95 mm

2. ✖ 1.25 mm

3. ✔ 1.35 mm

4. ✖ 1.45 mm

Question Number : 104 Question Id : 105615104 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

An electron is released from a distance of 4 m from a stationary point charge 20 nC. What will be the speed of the electron when it is 2 m away from the point charge?
[Charge of electron = 1.6×10^{-19} C, mass of electron = 9×10^{-31} kg,

$\frac{1}{4\pi\varepsilon_0} = 9 \times 10^9$ S.I unit]

Options :

1. 2×10^6 m/s ✖

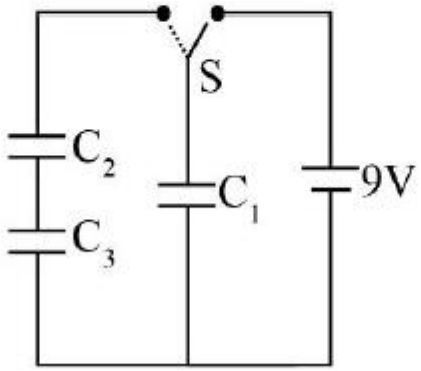
2. 4×10^6 m/s ✔

3. 1.6×10^6 m/s ✖

4. 2.4×10^6 m/s ✖

Question Number : 105 Question Id : 105615105 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 following figure shows a 9 V battery and 3 uncharged capacitors of capacitances $C_1 = C_2 = C_3 = 1\ \mu F$. The switch is thrown to the right side until capacitor C_1 is fully charged, then the switch is thrown to the left. The final charge on capacitor C_2 is



Options :

1. ✖ 1 μC

2. ✖ 2 μC

3. ✔ 3 μC

4. ✖ 4 μC

Question Number : 106 Question Id : 105615106 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 metal wire of length L and radius r has a resistance R. If a wire of the same metal of length 2L and radius 3r is taken, then what will be its resistance?

Options :

1. $\frac{2}{9}R$ ✔

2. $\frac{2}{3}R$ ✖

3. $\frac{2}{9\pi}R$ ✖

4. $\frac{2}{3\pi}R$ ✖

Question Number : 107 Question Id : 105615107 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

Balancing point of a potentiometer shifts from a length of 60 cm to 40 cm by shunting the cell with a 4 ohm resistance. What is the internal resistance of the cell?

Options :

1 Ω

1. ✖

2 Ω

2. ✔

4 Ω

3. ✖

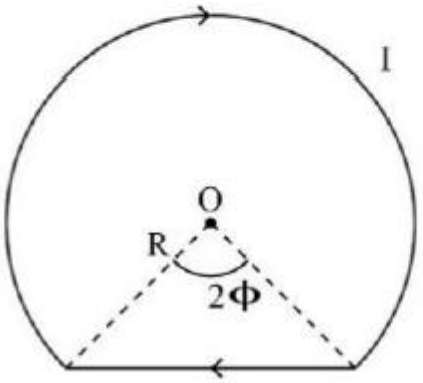
6 Ω

4. ✖

Question Number : 108 Question Id : 105615108 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 current I = 5A flows along a thin wire shaped as shown in figure. The radius of curved part of the wire is equal to R = 100 mm, the angle $2\phi = 90°$. The magnitude of magnetic field at the point O is approximately

$\left[\text{Use } \frac{\mu_0}{4\pi} = 10^{-7}\,\text{TmA}^{-1}\right]$



Options :

1. $33.6\ \mu\text{T}$ ✔

2. $38.4\ \mu\text{T}$ ✖

3. $48.7\ \mu\text{T}$ ✖

$25.2\ \mu T$

4. ✖

Question Number : 109 Question Id : 105615109 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 toroid has a core (non-ferro magnetic) of inner radius 24 cm and outer radius 26 cm around which 2000 turns of a wire is wound. If the current in the wire is 12 A, the magnetic field inside the core of the toroid is

Options :

$1.92\times10^{-2}\ T$

1. ✔

$1.88\times10^{-2}\ T$

2. ✖

$2.12\times10^{-2}\ T$

3. ✖

1.98×10^{-2} T

4. ✖

Question Number : 110 Question Id : 105615110 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 planet has magnetic dipole moment of 27×10^{22} Am^2. If the radius of the planet is 300 km, what would be the magnetic field at its equator?

$\frac{\mu_0}{4\pi} = 10^{-7}$

Options :

1 T

1. ✔

27 T

2. ✖

11 T

3. ✖

30 T

4. ✖

Question Number : 111 Question Id : 105615111 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 long solenoid has 20 turns per cm. A small loop of area $\frac{4}{\pi}\text{cm}^2$ is placed inside the solenoid normal to its axis. If the current carried by the solenoid changes steadily from 1.0 A to 3.0A in 0.2 s, what is the magnitude of the induced emf in the loop while the current is changing?

Options :

2.4 μV

1. ✖

3.2 μV

2. ✔

7.2 μV

3. ✖

$4.8\ \mu V$

4. ✖

Question Number : 112 Question Id : 105615112 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

An AC current is given by the expression, $I(t) = 50 \sin (200 \pi t)$ in amperes. The frequency and r.m.s value of the current respectively are

Options :

100 Hz, $50\sqrt{2}$ A

1. ✖

100 Hz, $25\sqrt{2}$ A

2. ✔

200 Hz, $50\sqrt{2}$ A

3. ✖

200 Hz, $25\sqrt{2}$ A

4. ✖

Question Number : 113 Question Id : 105615113 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

An electromagnetic wave is propagating in vacuum along $-\hat{j}$ direction. The magnetic field of the wave is given by $\vec{B} = (2\times10^{-8})\cos\left[\pi\times10^{15}\left(t+\frac{y}{c}\right)\right]\hat{k}\ T$. The electric field $\vec{E}$ of this wave is
($c \equiv$ speed of light)

Options :

$$\vec{E} = (4)\cos\left[\pi\times10^{15}\left(t+\frac{y}{c}\right)\right]\hat{j}\quad V/m$$

1. ✖

$$\vec{E} = (6)\cos\left[\pi\times10^{15}\left(t+\frac{y}{c}\right)\right]\hat{i}\quad V/m$$

2. ✔

$$\vec{E} = (6)\cos\left[\pi\times10^{15}\left(t-\frac{y}{c}\right)\right]\hat{j}\quad V/m$$

3. ✖

$$\vec{E} = (4)\cos\left[\pi \times 10^{15}\left(t - \frac{y}{c}\right)\right]\hat{i} \quad V/m$$

4. ✖

Question Number : 114 Question Id : 105615114 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

For photoelectric effect which of the following statements are true.

I) The kinetic energies of the photoelectrons do not depend on the frequency of light
II) Photoelectric effect will always occur for highly intense light
III) The maximum kinetic energy of photoelectron does not depend upon the intensity of the light
IV) The escaping electron's kinetic energy is larger for larger frequency

Options :

I and II only

1. ✖

II and III only

2. ✖

III and IV only

3. ✔

IV and I only

4. ✖

Question Number : 115 Question Id : 105615115 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

Which of the following statements is NOT true?

Options :

Electromagnetic radiation is made up of particles called photons

1. ✖

Each photon moves with the speed of light

2. ✖

Photon energy is dependent on the intensity of radiation

3. ✔

Photons are not deflected by electric and magnetic field

4. ✖

Question Number : 116 Question Id : 105615116 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 light emitted in the transition n = 3 to n = 2 (where n is the principal quantum number of the state) in hydrogen is called H_α-light. Find the maximum work function that a metal can have so that H_α-light can emit photoelectrons from it.

Options :

1.5 eV

1. ✖

2.89 eV

2. ✖

1.89 eV

3. ✔

3.5 eV

4. ✖

Question Number : 117 Question Id : 105615117 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

As the mass number A increases, which of the following quantities related to a nucleus does not change?

Options :

1. ✖ mass

2. ✖ volume

3. ✔ density

4. ✖ binding energy

Question Number : 118 Question Id : 105615118 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 p-type semiconductor, which of the following statement is true?

Options :

1. ✔ Holes are majority carriers and trivalent atoms are the dopants

2. ✖ Electrons are minority carriers and pentavalent atoms are the dopants

3. ✖ Electrons are majority carriers and trivalent atoms are the dopants

4. ✖ Holes are minority carriers and pentavalent atoms are the dopants

Question Number : 119 Question Id : 105615119 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 NAND Gate, A and B are inputs and Y is the output, then the correct option is

Options :

$A = 0, B = 0; Y = 0$

1. ✖

$A = 0, B = 1; Y = 0$

2. ✖

$A = 1, B = 0; Y = 0$

3. ✖

$A = 1, B = 1; Y = 0$

4. ✔

Question Number : 120 Question Id : 105615120 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 TV transmission antenna is 40 m tall. How much service area it can cover if the receiving antenna is at the ground level?
(radius of the Earth = 6400 km)

Options :

$640\pi \times 10^6 \text{m}^2$

1. ✖

$512\pi \times 10^6 \text{ m}^2$

2. ✔

$480\pi \times 10^6 \text{ m}^2$

3. ✖

$440\ \pi \times 10^6 \text{ m}^2$

4. ✖

Chemistry

Section Id :	1056153
Section Number :	3
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 :	1056153
Question Shuffling Allowed :	Yes

Question Number : 121 Question Id : 105615121 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 hydrogen atom, the minimum energy required to excite an electron from 2^{nd} orbit to the 3^{rd} orbit is

Options :

1. 2.2 eV ✖

2. 2.7 eV ✖

3. 1.9 eV ✔

4. 7 eV ✖

Question Number : 122 Question Id : 105615122 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 velocity (V) of de Broglie wave is given by

υ = Frequency
m = mass
C = Velocity of light

Options :

1. ✖ mC^2

2. ✖ $\upsilon\lambda$

3. ✔ $\frac{h\upsilon}{mC}$

4. ✖ $\frac{C^2}{\upsilon}$

Question Number : 123 Question Id : 105615123 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

How many of the following statements are correct?

a) 'He' is the second most abundant element in the universe.
b) the symbol for the element with atomic number 110 is Ds.
c) Osmium has the highest density among all elements.
d) Francium is the most electropositive element in the periodic table.

Options :

1. ✖ 3

2. ✖ 2

3. ✔ 4

4. ✖ 1

Question Number : 124 Question Id : 105615124 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 correct order of the first ionization enthalpies of the following elements is

Options :

1. ✔ $Li < B < Be < N$

2. ✖ $Li < Be < B < N$

3. ✖ $N < Be < B < Li$

4. ✖ $N < B < Be < Li$

Question Number : 125 Question Id : 105615125 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 correct order of C–O bond length is

Options :

1. ✖ $CO_3^{2-} < CO_2 < CO$

2. ✖ $CO_2 < CO_3^{2-} < CO$

3. ✖ $CO < CO_3^{2-} < CO_2$

4. ✔ $CO < CO_2 < CO_3^{2-}$

Question Number : 126 Question Id : 105615126 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

How many of the following species have the bond order 2 ?
$C_2, B_2^{2-}, N_2^{2+}, CN^+, NO^-, O_2, C_2^+$

Options :

1. 3 ✖

2. 4 ✖

3. 6 ✔

4. 5 ✖

Question Number : 127 Question Id : 105615127 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

Gases deviate from ideal behaviour at high pressures because the gas molecules

Options :

1. attract each other ✔

2. repel each other ✖

3. show Brownian motion ✖

4. obey Tyndall effect ✖

Question Number : 128 Question Id : 105615128 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

According to kinetic molecular theory of gases, which of the following statements are correct?

a) The actual volume of the molecules is negligible in comparison to the empty space between them.
b) Collisions of gas molecules are inelastic.
c) At any particular time, different particles in the gas have same speed and same kinetic energies.
d) Pressure is exerted by the gas as a result of collision of the particles with the walls of the container.

Options :

a and b only

1. ✖

a, b and c only

2. ✖

a and d only

3. ✔

a, b, c and d

4. ✖

Question Number : 129 Question Id : 105615129 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 amount of 50 % (w/w) solution of hydrochloric acid required to react with 200 g of $CaCO_3$ would be

Options :

73 g

1. ✖

292 g

2. ✔

146 g

3. ✖

100 g

4. ✖

Question Number : 130 Question Id : 105615130 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

Identify the pair of reactions undergoing disproportionation from the following.

Options :

$2H_2O_2 \rightarrow 2H_2O + O_2$ and $Cl_2 + 2NaOH \rightarrow NaCl + NaOCl + H_2O$

1. ✔

$P_4 + 3NaOH + 3H_2O \rightarrow PH_3 + 3NaH_2PO_4$ and $Cl_2 + 2NO \rightarrow 2NaCl$

2. ✖

$Cl_2 + 2KBr \rightarrow 2KCl + Br_2$ and $5Cl_2 + I_2 + 6H_2O \rightarrow 2IO_3^- + 10Cl^- + 2H^+$

3. ✖

$Pb_3O_4 + 8HCl \rightarrow 3PbCl_2 + Cl_2 + H_2O$ and $P_4 + 3NaOH \rightarrow 3H_2O + PH_3 + 3NaH_2PO_4$

4. ✖

Question Number : 131 Question Id : 105615131 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 92 g Na reacts with water in open vessel at 300 K. What is the value of work done?
[Assume ideal nature of the gaseous product]

Options :

1. ✖ 0.0

2. ✔ – 4988.4 J

3. ✖ – 2494.2 J

4. ✖ – 9976.8 J

Question Number : 132 Question Id : 105615132 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

For a reaction $A(s) \rightleftharpoons B(s) + C(g)$ the set of all correct statements are

a) K is independent of [A].
b) K is dependent on partial pressure of C at a given temperature.
c) ΔH will be independent of temperature.
d) ΔH is independent of the catalyst addition.

Options :

a, b, c, d

1. ✖

a, b only

2. ✖

a, b, d only

3. ✔

a, b, c only

4. ✖

Question Number : 133 Question Id : 105615133 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 pH of pure water at 80 °C is

Options :

1. ✖ 7.0

2. ✖ ∞

3. ✖ > 7.0

4. ✔ < 7.0

Question Number : 134 Question Id : 105615134 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

On passing electric current over molten ionic hydrides of s-block elements,

Options :

1. ✔ H_2 is liberated at the anode

2. ✖ H_2 is liberated at the cathode

No reaction takes place

3. ✖

Metal oxidises at the cathode

4. ✖

Question Number : 135 Question Id : 105615135 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

Lithium nitrate on heating gives

Options :

1. ✖ $Li_2O + NO_2$

2. ✔ $Li_2O + NO_2 + O_2$

3. ✖ $LiNO_2 + O_2$

4. ✖ $Li_2O_2 + NO_2 + O_2$

Question Number : 136 Question Id : 105615136 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

Aluminium when treated with aqueous NaOH, liberates a gaseous molecule majorly. The gas is

Options :

1. H_2 ✔

2. O_2 ✖

3. D_2 ✖

4. O_3 ✖

Question Number : 137 Question Id : 105615137 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 relative order of electronegativity of C, Ge, and Pb is

Options :

1. ✖ C > Ge > Pb

2. ✖ Ge > C > Pb

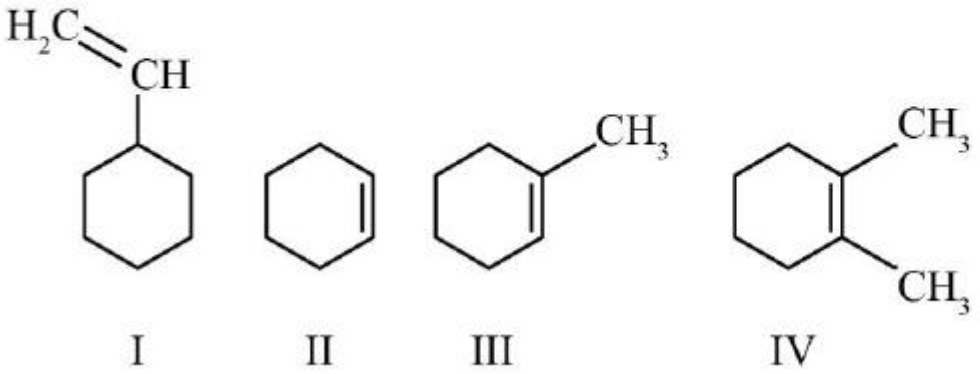
3. ✖ Pb > C > Ge

4. ✔ C > Pb > Ge

Question Number : 138 Question Id : 105615138 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 correct order of the stability of the following compounds based on hyperconjugation is



Options :

1. ✔ IV > III > II > I

2. ✖ IV > II > I > III

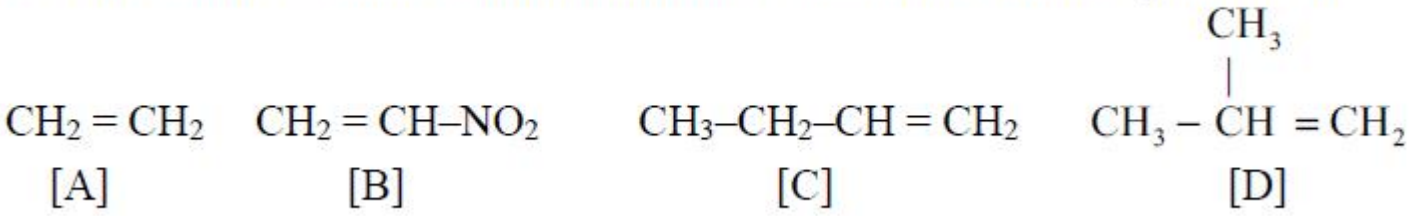
3. ✖ IV > II > III > I

4. ✖ IV > I > III > II

Question Number : 139 Question Id : 105615139 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 correct order of rates of addition of Br_2/water to the following alkenes is



[A] [B] [C] [D]

Options :

1. [D] > [C] > [A] > [B] ✔

2. [D] > [C] > [B] > [A] ✖

3. [A] > [B] > [C] > [D] ✖

4. [A] > [B] > [D] > [C] ✖

Question Number : 140 Question Id : 105615140 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 major products P and Q formed in the following reactions schemes are

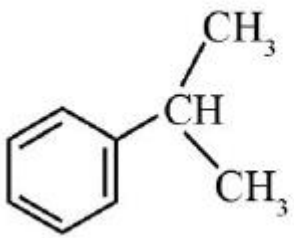
(A)  $+ CH_3CH_2CH_2Cl \xrightarrow{AlCl_3\ (anhyd.)} P$

(B)  $\xrightarrow[ii)\ Br_2, h\upsilon]{i)\ CH_3Cl/AlCl_3\ (anhyd.)} Q$

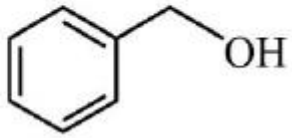
iii) aq. KOH

Options :

P



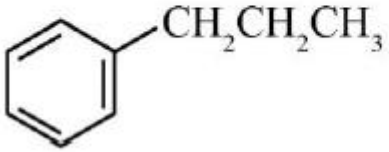
Q



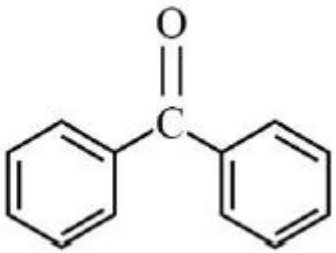
1. ✔

2. ✖

P

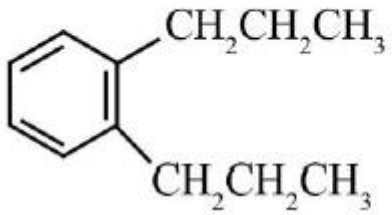


Q

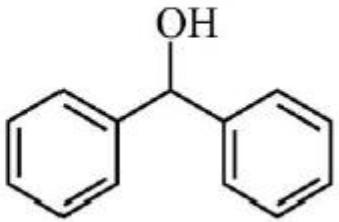


3. ✖

P

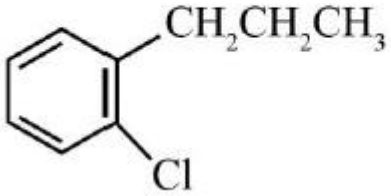


Q

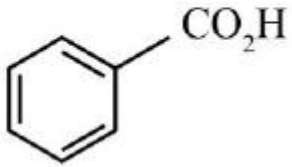


4. ✖

P



Q



Question Number : 141 Question Id : 105615141 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

Iron crystalizes in FCC with an edge length of 400 pm. If it contains 0.1 % Schottky defects, calculate its approximate density [AW of Fe = 56 g/mol]

Options :

1. ✔ $5.8\ g/cm^3$

2. ✖ $1.5\ g/cm^3$

3. ✖ $2.9\ g/cm^3$

4. ✖ $8.5\ g/cm^3$

Question Number : 142 Question Id : 105615142 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

Which of the following are correct for an ideal solution?

a) $\Delta V_{mix} = 0$

b) $V_{solvent} + V_{solute} = V_{solution}$

c) $\Delta H_{mix} = 0$

d) $H_2O + CO_2 \rightarrow H_2CO_3$ is an example of ideal solution.

Options :

1. ✖ a, b only

2. ✖ b, c only

3. ✔ a, b, c only

4. ✖ a, b, c, d

Question Number : 143 Question Id : 105615143 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

At 0 °C, urea solution has an osmotic pressure of 400 mm. On dilution by x times, its osmotic pressure decreased to 100 mm at 20 °C. The dilution factor x is approximately

Options :

1. ✔ 4.3

2. ✖ 2

3. ✖ 5

4. ✖ 6.8

Question Number : 144 Question Id : 105615144 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 electric charge for electrode deposition of one equivalent of a substance is equal to

Options :

1 A/s

1. ✖

193000 coulombs

2. ✖

$$\frac{96500}{(\text{Atomic weight of the substance})}$$

3. ✖

Charge on 1 mole of electrons

4. ✔

Question Number : 145 Question Id : 105615145 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 definition of the temperature coefficient of the reaction holds good for a reaction between 27 °C and 37 °C, the activation energy for the reaction in $kJ.mol^{-1}$ is

Options :

102

1. ✖

53.5

2. ✔

∞

3. ✖

141.5

4. ✖

Question Number : 146 Question Id : 105615146 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

For As_2S_3 sol, the most effective coagulating agent is

Options :

$CaCO_3$

1. ✖

NaCl

2. ✖

$FeCl_3$

3. ✔

Clay

4. ✖

Question Number : 147 Question Id : 105615147 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 which of the following reactions there is no liberation of nitrogen gas

Options :

1. ✖ $NO_2^-(aq) + NH_4^+(s) \xrightarrow{\Delta}$

2. ✖ $CO(NH_2)_2(s) + HNO_2(l) \longrightarrow$

3. ✔ $NH_3(g) + NaOCl(aq) \xrightarrow{\text{gelatine}}$

4. ✖ $(NH_4)_2Cr_2O_7(s) \xrightarrow{\Delta}$

Question Number : 148 Question Id : 105615148 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 correct order of boiling points of H_2O, H_2S, H_2Se and H_2Te respectively is

Options :

1. ✖ $H_2O > H_2S = H_2Se = H_2Te$

2. ✖ $H_2O < H_2S < H_2Se < H_2Te$

3. ✖ $H_2O > H_2S > H_2Se > H_2Te$

4. ✔ $H_2O > H_2Te > H_2Se > H_2S$

Question Number : 149 Question Id : 105615149 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

Which of the following is not a mineral of fluorine?

Options :

1. ✖ Fluorspar

Cryolite

2. ✖

Fluoroapatite

3. ✖

Carnallite

4. ✔

Question Number : 150 Question Id : 105615150 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 element that even can diffuse through silica glass is

Options :

He

1. ✔

Ar

2. ✖

Kr

3. ✖

Xe

4. ✖

Question Number : 151 Question Id : 105615151 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 compound with more covalent character in the following is

Options :

FeF_3

1. ✖

VF_5

2. ✔

VF_2

3. ✖

TiF_2

4. ✖

Question Number : 152 Question Id : 105615152 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 correct order of decreasing field strength of the below given ligands is

NCS^-	S^{2-}	en	SCN^-
I	II	III	IV

Options :

1. ✖ I > II > IV > III

2. ✖ III > II > IV > I

3. ✔ III > I > IV > II

4. ✖ III > IV > I > II

Question Number : 153 Question Id : 105615153 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

Assertion (A) : The denaturation of proteins can destroy all 1°, 2° and 3° protein structures.

Reason (R) : Curdling of milk is due to denaturation of proteins.

The correct option among the following is

Options :

1. ✖ (A) is true, (R) is true and (R) is the correct explanation for (A)

2. ✖ (A) is true, (R) is true but (R) is not the correct explanation for (A)

3. ✖ (A) is true but (R) is false

4. ✔ (A) is false but (R) is true

Question Number : 154 Question Id : 105615154 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 major product formed in the following reaction sequence is

$$CH_3CH=CH_2 \xrightarrow[\text{iii) } CH_3CH_2CHO]{\text{i) HBr, peroxide}\ \text{ii) Mg}\ \text{iv) } CrO_3}$$

Options :

1. ✔ 3−Hexanone

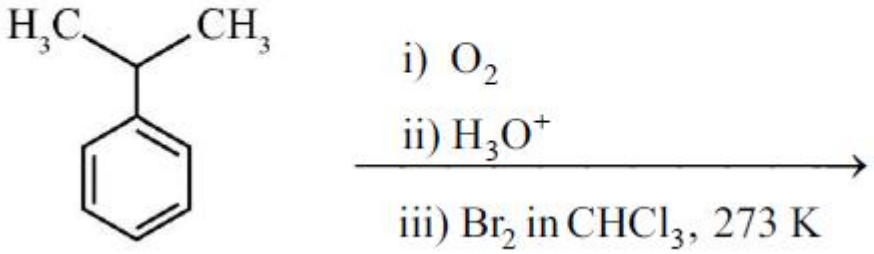
2. ✖ 2−Hexanone

3. ✖ 2−Methyl−3−pentanone

4. ✖ Hexanal

Question Number : 155 Question Id : 105615155 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 major aromatic product of the following reaction sequence is

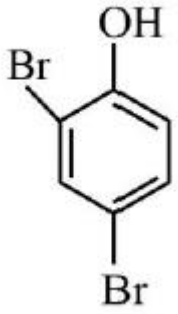


Options :

1. ✖



2. ✖



3. ✖



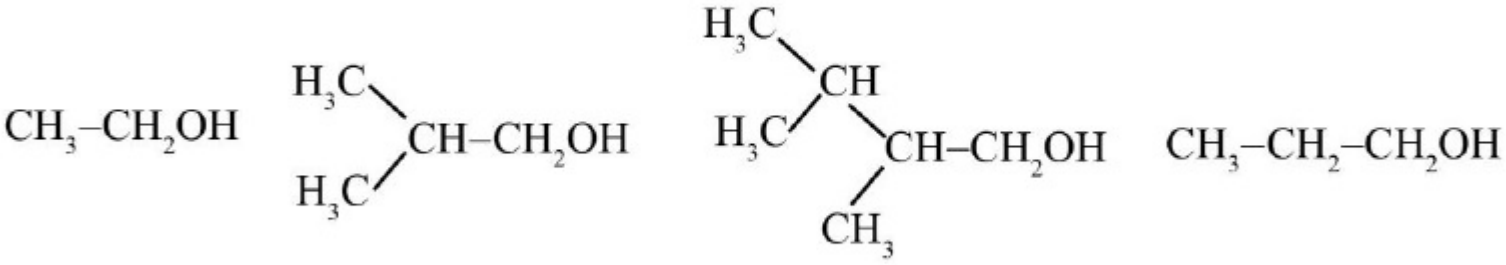
4. ✔



Question Number : 156 Question Id : 105615156 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 order of reactivity of the following compounds towards the esterification with acetic acid is



(I) (II) (III) (IV)

Options :

1. ✖ I > II > III > IV

2. ✖ IV > III > II > I

3. ✔ I > IV > II > III

4. ✖ I > IV > III > II

Question Number : 157 Question Id : 105615157 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 following reaction, where

(A) The change in the functional group and

(B) The corresponding change in the hybridization from starting to the final product A and B are

$$CH_3C \equiv N \xrightarrow[\text{(ii) } H_3O^+]{\text{(i) } SnCl_2,\ HCl} \xrightarrow[\text{(iii) HI + Red P}]{}$$

Options :

A	B
$-CN$ to $-CH_2-OH$	sp^2 to sp^3

1. ✖

A	B
$-CN$ to $-CONH_2$	sp to sp^2

2. ✖

A	B
$-CN$ to $-CH_2NH_2$	sp to sp^3

3. ✖

A	B
$-CN$ to $-CH_3$	sp to sp^3

4. ✔

Question Number : 158 Question Id : 105615158 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

Which of the following reactions will give benzophenone as major product?

(A) Benzoyl chloride + Benzene + $AlCl_3$ (anhyd.)
(B) Benzoyl chloride + Phenylmagnesium bromide (excess)
(C) Benzoyl chloride + Diphenyl cadmium

Options :

1. ✖ A and B only

2. ✖ B and C only

3. ✔ A and C only

4. ✖ A, B and C

Question Number : 159 Question Id : 105615159 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 reagent that can reduce the carboxylic acid group to the corresponding alcohol is

Options :

1. ✖ $NaBH_4/H_3O^+$

2. ✔ B_2H_6/H_3O^+

3. ✖ $Zn-Hg/conc.HCl$

4. ✖ H_2, Pd/C

Question Number : 160 Question Id : 105615160 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 starting material that produce pentanamine by Hoffmann bromamide reaction is

Options :

1. ✖ $CH_3CH_2CH_2CH_2CN$

2. ✖ $CH_3CH_2CH_2CH_2CONH_2$

3. ✖ $CH_3CH_2CH_2CH_2NCO$

4. ✔ $CH_3CH_2CH_2CH_2CH_2CONH_2$