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 2
Subject Name :	Engineering (English)
Creation Date :	2022-07-19 13:06:33
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 :	1056152
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 :	1056154
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 :	1056154
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 105615161 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 $\mathbb{R}$ be the set of all real numbers.

Statement I : The function $f:\left(-\frac{\pi}{2},\frac{\pi}{2}\right)\to\mathbb{R}$ defined by $f(x)=\sec x+\tan x$ is a one - one function.

Statement II : The function $f:[0,\infty)\to\mathbb{R}$ defined by $f(x)=x^2$ is a one – one function.

Which of the above statements is(are) true?

Options :

Statement I is true, but Statement II is false

1. ✖

Statement II is true, but Statement I is false

2. ✖

Both Statement I and Statement II are true

3. ✔

Both Statement I and Statement II are false

4. ✖

Question Number : 2 Question Id : 105615162 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 $\mathbb{R}$ be the set of all real numbers. Let $f:\mathbb{R}\to\mathbb{R}$ be a function defined by

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

Match the following

	List – I		List – II
A)	$f(-5)+f(0)+f(-1)=$	I)	16
B)	$f\left(f(5)+10f(-3)\right)=$	II)	40
C)	$f\left(\lvert f(-4)\rvert\right)=$	III)	−32
D)	$f\left(f\left(f(1)\right)\right)=$	IV)	−12
		V)	19

The correct match is

Options :

1. ✖

A	B	C	D
III	II	V	I

2. ✖

A	B	C	D
V	IV	I	III

3. ✔

A	B	C	D
IV	V	II	I

4. ✖

A	B	C	D
IV	V	III	I

Question Number : 3 Question Id : 105615163 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 $A+B=\begin{bmatrix}2&1&2\\1&2&0\\0&2&2\end{bmatrix}$, $AB=\begin{bmatrix}1&2&2\\1&1&0\\1&2&1\end{bmatrix}$ then $A^2+B(A+B)=$

Options :

1. $\begin{bmatrix}4&6&6\\3&4&2\\1&6&3\end{bmatrix}$ ✔

2. $\begin{bmatrix}4&9&6\\3&3&2\\4&7&4\end{bmatrix}$ ✖

3. $\begin{bmatrix}6&10&8\\4&5&2\\4&9&6\end{bmatrix}$ ✖

4. $\begin{bmatrix}3&4&4\\2&3&2\\0&4&2\end{bmatrix}$ ✖

Question Number : 4 Question Id : 105615164 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, P, B are 3×3 matrices. If $|-B|=5$, $|BA^T|=15$, $|P^TAP|=-27$, then one of the values of $|P|$ is

Options :

3

1. ✔

−5

2. ✖

9

3. ✖

6

4. ✖

Question Number : 5 Question Id : 105615165 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 is a 3×3 matrix and $|A|=\frac{1}{2}$ then $\left|A^{-1}\left(\text{Adj}(\text{Adj}A)\right)\right|^{-1}=$

Options :

8

1. ✔

$\frac{1}{8}$

2. ✖

$\frac{1}{2}$

3. ✖

2

4. ✖

Question Number : 6 Question Id : 105615166 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 $x=\alpha,\ y=\beta,\ z=\gamma$ be the unique solution of the system of simultaneous linear equations $2x+3y-2z+4=0,\ 3x-4y+3z+5=0,\ kx-2y+z+3=0$. If $\alpha=-2$ then $k=$

Options :

$\begin{vmatrix}1 & 2\\ 3 & 5\end{vmatrix}$

1. ✖

$\begin{vmatrix}5 & 3\\ 1 & 2\end{vmatrix}$

2. ✖

$\begin{vmatrix}3 & 5\\ 1 & 2\end{vmatrix}$

3. ✔

$\begin{vmatrix}3 & 5\\ 2 & 1\end{vmatrix}$

4. ✖

Question Number : 7 Question Id : 105615167 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 point (x, y) satisfies the equation $\frac{x+i(x-2)}{3+i}-i=\frac{2y+i(1-3y)}{i-3}$, then $x+y=$

Options :

4

1. ✖

2

2. ✔

0

3. ✖

−2

4. ✖

Question Number : 8 Question Id : 105615168 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 $\cos\alpha+\cos\beta+\cos\gamma=0$ and $\sin\alpha+\sin\beta+\sin\gamma=0$ then $\cos 2\alpha+\cos 2\beta+\cos 2\gamma=$

Options :

$\frac{3}{2}$

1. ✖

$\cos^2\frac{\alpha}{2}+\cos^2\frac{\beta}{2}+\cos^2\frac{\gamma}{2}$

2. ✖

$3\sin(\alpha+\beta+\gamma)$

3. ✖

$\cos(\alpha+\beta)+\cos(\beta+\gamma)+\cos(\gamma+\alpha)$

4. ✔

Question Number : 9 Question Id : 105615169 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

One of the values of $(-32i)^{\frac{2}{5}}$ is

Options :

$4\,cis\frac{2\pi}{5}$

1. ✖

$4\,cis\frac{3\pi}{5}$

2. ✔

$4\,cis\frac{4\pi}{5}$

3. ✖

$4\,cis\frac{6\pi}{5}$

4. ✖

Question Number : 10 Question Id : 105615170 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 quadratic equations $x^2-7x+3c=0$ and $x^2+x-5c=0$ have a common root, then for non-zero real value of c the sign of the expression x^2-3x+c is

Options :

negative for all $x\in\mathbb{R}$

1. ✖

positive for all $x\in(1,3)$

2. ✖

negative for all $x \in (1,3)$

3. ✖

positive for all $x \in \mathbb{R}$

4. ✔

Question Number : 11 Question Id : 105615171 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 $f(x)=\frac{6x^2-18x+21}{6x^2-18x+17}$. If m is the maximum value of $f(x)$ and $f(x)>n \ \forall x \in \mathbb{R}$ Then $14m-7n=$

Options :

-1

1. ✖

23

2. ✔

35

3. ✖

42

4. ✖

Question Number : 12 Question Id : 105615172 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 $x^3+x^2+x+r=0$ and $\alpha^3+\beta^3+\gamma^3=5$, then $r=$

Options :

1. ✖ $\frac{-1}{2}$

2. ✖ 1

3. ✔ -1

4. ✖ $\frac{1}{2}$

Question Number : 13 Question Id : 105615173 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 $\frac{5}{2}$ is the sum of two roots of the equation $6x^6 - 25x^5 + 31x^4 - 31x^2 + 25x - 6 = 0$ then the sum of all non-real roots of the equation is

Options :

1. ✖ does not exist

2. ✖ 0

3. ✔ $\frac{5}{3}$

$\frac{2}{5}$

4. ✖

Question Number : 14 Question Id : 105615174 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 $1+\sqrt{2}$ and $2-i$ are the roots of the equation $x^4+bx^3+cx^2+dx+e=0$ where b, c, d, e are rational numbers, then the roots of the equation $bx^2+cx+d=0$ are

Options :

real and different

1. ✖

real and equal

2. ✔

purely imaginary

3. ✖

complex conjugate

4. ✖

Question Number : 15 Question Id : 105615175 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 transformed equation of $2x^4-8x^3+3x^2-1=0$ so that the term containing the cubic power of x is absent be $2x^4+bx^2+cx+d=0$. Then $b=$

Options :

-18

1. ✖

−15

2. ✖

−9

3. ✔

−16

4. ✖

Question Number : 16 Question Id : 105615176 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, b, c are three particular speakers among the 10 speakers of a meeting. The number of ways of arranging all the 10 speakers on the dias in a row so that all the three speakers a, b, c do not sit together is

Options :

714 (7!)

1. ✖

89 (8!)

2. ✖

719 (7!)

3. ✖

84 (8!)

4. ✔

Question Number : 17 Question Id : 105615177 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 exponent of 6 in 72! is

Options :

34

1. ✔

70

2. ✖

17

3. ✖

35

4. ✖

Question Number : 18 Question Id : 105615178 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 4^{th} term in the expansion of $\left(\frac{x}{2}-\frac{2y}{3}\right)^6$ is -20, then $xy =$

Options :

2

1. ✖

3

2. ✔

8

3. ✖

27

4. ✖

Question Number : 19 Question Id : 105615179 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 $\int \frac{x+3}{(x-1)^2(2x-1)}dx = \frac{A}{x-1} + B\log(2x-1) + C\log(x-1) + K$ then $A + B + C =$

Options :

3

1. ✖

11

2. ✖

-4

3. ✔

-11

4. ✖

Question Number : 20 Question Id : 105615180 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 $\frac{x^2+7}{(x^2+1)(x-2)} = \frac{A}{x-2} + \frac{Bx+C}{x^2+1}$, then the determinant of the matrix $\begin{pmatrix} A & B \\ C & \frac{2}{5} \end{pmatrix}$ is

Options :

5

1. ✖

-5

2. ✖

$\frac{94}{25}$

3. ✖

-2

4. ✔

Question Number : 21 Question Id : 105615181 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 $\tan 15°$ and $\tan 30°$ are the roots of the equation $x^2 + px + q = 0$, then $pq =$

Options :

$\frac{6\sqrt{3}+10}{\sqrt{3}}$

1. ✖

$\frac{10-6\sqrt{3}}{3}$

2. ✔

$\frac{10+6\sqrt{3}}{3}$

3. ✖

$\frac{10-6\sqrt{3}}{\sqrt{3}}$

4. ✖

Question Number : 22 Question Id : 105615182 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 $\cos x+\cos y=p, \sin x+\sin y=q$, then $\cos\left(\frac{x-y}{2}\right)=$

Options :

1. $\pm\frac{\sqrt{p^2+q^2}}{2}$ ✔

2. $\pm\frac{pq}{2}$ ✖

3. $\pm\left(\frac{p+q}{2}\right)$ ✖

4. $\pm\frac{\sqrt{p^2+q^2}}{4}$ ✖

Question Number : 23 Question Id : 105615183 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 $A+B+C=\frac{3\pi}{2}$ then $4\sin A\sin B\sin C+\cos 2A+\cos 2B+\cos 2C=$

Options :

1. $-\sin(A+B+C)$ ✔

2. $\cos(A+B+C)$ ✖

$\sin(A+B+C)$

3. ✖

$2-\cos(A+B+C)$

4. ✖

Question Number : 24 Question Id : 105615184 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

$$\frac{e^{4x}+e^{-4x}+14}{4\left(e^{x}-e^{-x}\right)^{2}}=$$

Options :

$\sin h^2 x+\cot h^2 x$

1. ✔

$\sin h^2 x+\sec h^2 x$

2. ✖

$\cos h^2 x+\sec h^2 x$

3. ✖

$\cos h^2 x+\tan h^2 x$

4. ✖

Question Number : 25 Question Id : 105615185 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

$$\text{If } \tan h\, x=\frac{1}{2} \text{ then } \sin h\, 2x-\sec h\, 2x=$$

Options :

$\frac{29}{15}$

1. ✖

$\frac{11}{15}$

2. ✔

3

3. ✖

$\frac{-13}{15}$

4. ✖

Question Number : 26 Question Id : 105615186 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 A is acute, C is obtuse, $\sin A = \frac{3\sqrt{3}}{14}$, $a = 3$ and $b = 5$, then $c =$

Options :

$\frac{16}{7}$

1. ✖

7

2. ✔

$\frac{14}{3}$

3. ✖

6

4. ✖

Question Number : 27 Question Id : 105615187 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 Δ denotes the area of triangle ABC, then $(b\sin C + c\sin B)(b\cos C + c\cos B) =$

Options :

1. $ab\cos C$ ✖

2. 2Δ ✖

3. $bc\cos A$ ✖

4. 4Δ ✔

Question Number : 28 Question Id : 105615188 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 be the area of in-circle and A_1, A_2, A_3 be the areas of ex-circles of a triangle. If $A_1 = 4, A_2 = 9, A_3 = 16$, then $A =$

Options :

1. 81 ✖

2. $\frac{61}{169}$ ✖

3. $\frac{144}{61}$ ✖

$\frac{144}{169}$

4. ✔

Question Number : 29 Question Id : 105615189 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 $3\bar{i}-5\bar{j}+2\bar{k}$, $7\bar{i}+2\bar{j}-4\bar{k}$, $\bar{i}-3\bar{j}+4\bar{k}$ and $-7\bar{i}-17\bar{j}+16\bar{k}$ are position vectors of the points A, B, C and D respectively, then the angle between $\overline{AB}$ and $\overline{CD}$ is

Options :

0°

1. ✖

$\frac{\pi}{4}$

2. ✖

$\frac{\pi}{2}$

3. ✖

π

4. ✔

Question Number : 30 Question Id : 105615190 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 $A(2\bar{i}+\bar{j}-\bar{k})$, $B(\lambda\bar{i}+5\bar{j}+4\bar{k})$, $C(-4\bar{i}+3\bar{j}+2\bar{k})$ and $D(-\bar{i}-2\bar{j}+3\bar{k})$ are four points in space such that $\overline{AB}=x\overline{AC}+y\overline{AD}$ for some real numbers $x\neq 0, y\neq 0$ then $17(\lambda+9)=$

Options :

5

1. ✖

3

2. ✖

7

3. ✔

9

4. ✖

Question Number : 31 Question Id : 105615191 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 plane P has the points $\bar{i}$, $\bar{j}$ and $\bar{i}+\bar{j}+\bar{k}$. Let L be the line through the point A and parallel to the vector $\bar{i}-\bar{j}+\bar{k}$. If the plane P and line L intersect at a point $B(0,3,2)$ and the distance from A to B is 3 units, then equations of the normal to the plane P through A are

Options :

1. ✔ $\frac{x-3}{1}=\frac{y}{1}=\frac{z-5}{-1}$

2. ✖ $\frac{x+3}{1}=\frac{y-6}{1}=\frac{z-1}{-1}$

3. ✖ $\frac{x+3}{1}=\frac{y}{1}=\frac{z-5}{-1}$

4. ✖ $\frac{x+3}{1}=\frac{y-6}{-1}=\frac{z+1}{1}$

Question Number : 32 Question Id : 105615192 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 $\bar{a}=\bar{i}+\bar{j}+\bar{k}$ and $\bar{b}$ be two vectors such that $\bar{a}\cdot\bar{b}=1$, $\cos\left(\bar{a},\bar{b}\right)=\frac{1}{3}$ and the components of $\bar{b}$ w.r.t $\left(\bar{i},\bar{j},\bar{k}\right)$ be integers. Then the number of possible vectors that represent $\bar{b}$ is

Options :

1. ✖ 1

2. ✖ 2

3. ✔ 3

4. ✖ 4

Question Number : 33 Question Id : 105615193 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 π_1 be the plane passing through the point $2\bar{i}-\bar{j}+\bar{k}$ and perpendicular to the vector $a\bar{i}+2\bar{j}-3\bar{k}$ and π_2 be the plane passing through the point $\bar{i}+2\bar{j}-\bar{k}$ and perpendicular to the vector $\bar{i}-2\bar{j}+\bar{k}$. If θ is the angle between the planes π_1 and π_2 and $\cos\theta=-\sqrt{\frac{3}{7}}$, then the integral value of a is

Options :

1. ✖ –2

-1

2. ✖

2

3. ✖

1

4. ✔

Question Number : 34 Question Id : 105615194 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 $\bar{a}$ and $\bar{b}$ are two vectors such that $\bar{a}=2\bar{i}+2\bar{j}+p\bar{k}$, $|\bar{b}|=7$, $\bar{a}\cdot\bar{b}=4$ and $|\bar{a}\times\bar{b}|=5\sqrt{17}$ then $p=$

Options :

± 5

1. ✖

± 6

2. ✖

± 1

3. ✔

± 3

4. ✖

Question Number : 35 Question Id : 105615195 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 mean deviation from the mean of the discrete data 1, 3, 4, 7, 11, 18, 29, 47, 78 is

Options :

22

1. ✖

24

2. ✖

$\frac{176}{9}$

3. ✔

$\frac{182}{9}$

4. ✖

Question Number : 36 Question Id : 105615196 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 two dice are thrown, the probability of getting a prime number on one die and a composite number on the other is

Options :

$\frac{1}{3}$

1. ✔

$\frac{1}{4}$

2. ✖

$\frac{1}{2}$

3. ✖

$\frac{1}{6}$

4. ✖

Question Number : 37 Question Id : 105615197 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, B, C be three pairwise independent events of a random experiment. If $P(\overline{B} \cup \overline{C}) = \frac{1}{2}, P(A) > 0, P(B) = b$ and $P(C) = c$, then $P((\overline{B} \cap \overline{C}) \mid A) =$

Options :

$1 + b - c$

1. ✖

$2 + b - c$

2. ✖

$\frac{3}{2} - b - c$

3. ✔

$2 - b - c$

4. ✖

Question Number : 38 Question Id : 105615198 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 dice are thrown and the sum of the numbers appearing on the dice is observed to be a multiple of 4. If p is the conditional probability that number 4 has appeared atleast once, then 3p + 2 =

Options :

$\frac{25}{12}$

1. ✖

2. ✖ $\frac{1}{6}$

3. ✔ $\frac{7}{3}$

4. ✖ $\frac{5}{2}$

Question Number : 39 Question Id : 105615199 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 random experiment of throwing 5 coins, the number of heads is defined as a random variable. The mean of the random variable is

Options :

1. ✖ $\frac{2}{3}$

2. ✖ $\frac{3}{2}$

3. ✖ $\frac{7}{9}$

4. ✔ $\frac{5}{2}$

Question Number : 40 Question Id : 105615200 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 variance of a Poisson variate X is 2. Then $P(X \geq 3) =$

Options :

1. ✖ $\frac{e^2 - 7}{e^2}$

2. ✖ $\frac{e^2 - 3}{e^2}$

3. ✔ $\frac{e^2 - 5}{e^2}$

4. ✖ $1 - \frac{4}{e^2}$

Question Number : 41 Question Id : 105615201 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 perimeter of a triangle is 20 and two of its vertices are (–5, 0) and (6, 0), then the locus of the third vertex is

Options :

1. ✔ $40x^2 - 81y^2 - 40x - 800 = 0$

2. ✖ $40x^2 + 9y^2 - 25x + 800 = 0$

$40x^2 - 9y^2 = 800$

3. ✖

$5x^2 - 3y^2 + 3x - 4y + 25 = 0$

4. ✖

Question Number : 42 Question Id : 105615202 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 transformed equation of $3x^2 + 4xy + y^2 - 8x - 4y - 4 = 0$ is $f(X,Y) = aX^2 + 2hXY + bY^2 + c = 0$ when the origin is shifted to a new point by the translation of axes. Then $f(1,1) =$

Options :

0

1. ✔

1

2. ✖

-1

3. ✖

-8

4. ✖

Question Number : 43 Question Id : 105615203 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 $2x - 3y + 4 = 0$ divides the line segment joining the points $A(-2, 3)$ and $B(3, -2)$ in the ratio $m:n$, then the point which divides AB in the ratio $-4m:3n$ is

Options :

$(-17,18)$

1. ✔

$\left(-\frac{59}{7},\frac{66}{7}\right)$

2. ✖

$(-5,6)$

3. ✖

$\left(-\frac{5}{7},\frac{12}{7}\right)$

4. ✖

Question Number : 44 Question Id : 105615204 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 lines $L_1 \equiv 2x+y+3=0$, $L_2 \equiv kx+2y-3=0$ and $L_3 \equiv 3x-2y+1=0$ are concurrent then the cosine of the acute angle between the lines $L_2 = 0$ and $2x-5y+7=0$ is

Options :

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

1. ✖

$\left(\frac{15}{2\sqrt{29}}\right)$

2. ✖

$\left(\frac{25}{29}\right)$

3. ✖

$\left(\frac{20}{29}\right)$

4. ✔

Question Number : 45 Question Id : 105615205 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 Q is the image of the point P(1,1) with respect to the straight line $x+y+1=0$, then the length of the perpendicular drawn from Q to the line $3x-4y+3=0$ is

Options :

$\frac{5}{2}$

1. ✖

2

2. ✖

1

3. ✔

$\frac{1}{2}$

4. ✖

Question Number : 46 Question Id : 105615206 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 centroid of the triangle formed by the lines $x-3y+3=0$, $x+3y+3=0$, $x+y-1=0$ is

Options :

$\left(0,\frac{-1}{3}\right)$

1. ✔

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

2. ✖

$\left(\frac{-1}{3},1\right)$

3. ✖

$\left(1,\frac{-1}{3}\right)$

4. ✖

Question Number : 47 Question Id : 105615207 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 slope of one of the lines represented by $5x^2+\frac{40}{3}xy+ky^2=0$ is 3, then the angle between the pair of lines is

Options :

0°

1. ✖

$\frac{\pi}{4}$

2. ✖

$\frac{\pi}{3}$

3. ✖

$\frac{\pi}{2}$

4. ✔

Question Number : 48 Question Id : 105615208 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 pairs of lines $6x^2 - xy - 12y^2 = 0$ and $15x^2 + 14xy - 8y^2 = 0$, then the combined equation the other two lines is

Options :

1. $10x^2 - 19xy + 6y^2 = 0$ ✔

2. $5x^2 - 4xy + 7y^2 = 0$ ✖

3. $x^2 - 9xy + y^2 = 0$ ✖

4. $3x^2 + 6xy + 11y^2 = 0$ ✖

Question Number : 49 Question Id : 105615209 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 is a line passing through the point $(-1,1)$ and parallel to the common line of the pairs of lines $6x^2 - xy - 12y^2 = 0$ and $15x^2 + 14xy - 8y^2 = 0$, then the equation of pair of lines joining the origin to the points of intersection of the curve $2x^2 - xy - y^2 + x - y = 0$ and the line L is

Options :

1. $x^2 - xy - y^2 = 0$ ✖

2. $x^2 + xy - y^2 = 0$ ✖

$x^2 - y^2 = 0$

3. ✔

$2x^2 + 3xy - 6y^2 = 0$

4. ✖

Question Number : 50 Question Id : 105615210 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

From a point A(0, 3) on the circle $(x+2)^2 + (y-3)^2 = 4$, a chord AB is drawn and it is extended to a point Q such that AQ = 2AB. Then the locus of Q is

Options :

$(x+4)^2 + (y-3)^2 = 16$

1. ✔

$(x+1)^2 + (y-3)^2 = 32$

2. ✖

$(x+1)^2 + (y-3)^2 = 4$

3. ✖

$(x+1)^2 + (y-3)^2 = 1$

4. ✖

Question Number : 51 Question Id : 105615211 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 m_1, m_2 are the slopes of the tangents drawn from a point $(1,-3)$ to the circle $x^2 + y^2 - 6x + 4y + 12 = 0$ then $9\left(m_1^2 + m_2^2\right) =$

Options :

1. ✔ 16

2. ✖ 25

3. ✖ 4

4. ✖ 1

Question Number : 52 Question Id : 105615212 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, B are the points of contact of the tangents drawn from the point $P(-2,-3)$ to the circle $x^2+y^2-8x-10y+5=0$ and the chord AB subtends an angle θ at P then $\tan\theta=$

Options :

1. ✖ $\frac{3}{4}$

2. ✔ $\frac{24}{7}$

3. ✖ $\frac{7}{24}$

4. ✖ $\frac{4}{3}$

Question Number : 53 Question Id : 105615213 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 of the transverse common tangent of the circles $x^2+y^2-6x-8y+9=0$ and $x^2+y^2+2x-2y+1=0$ is

Options :

1. $4x+3y-4=0$ ✔

2. $3x+y-1=0$ ✖

3. $2x-y+2=0$ ✖

4. $x+2y-3=0$ ✖

Question Number : 54 Question Id : 105615214 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 angle between the circles $x^2+y^2-2x-4y-4=0$ and $x^2+y^2-8x-12y+43=0$ then $|7\sec\theta-18\cos\theta|=$

Options :

1. 11 ✔

2. 9 ✖

0

3. ✖

1

4. ✖

Question Number : 55 Question Id : 105615215 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 $\left(0, \frac{3}{4}\right)$ is the radical centre of the circles $S \equiv x^2 + y^2 + \alpha x + 6y = 0$, $S' \equiv x^2 + y^2 + 2\alpha x + \alpha y + 6 = 0$ and $S'' \equiv x^2 + y^2 + 6\alpha x - \alpha y + 3 = 0$ then the distance between the radical centre and the centre of the circle $S' = 0$ is

Options :

8

1. ✖

15

2. ✖

$\frac{\sqrt{65}}{4}$

3. ✔

$\frac{\sqrt{5}}{4}$

4. ✖

Question Number : 56 Question Id : 105615216 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 vertex and the focus of the parabola $2x^2 + 5y - 6x + 1 = 0$ respectively, are

Options :

$\left(\frac{-3}{2},\frac{7}{10}\right),\left(\frac{-3}{2},\frac{53}{40}\right)$

1. ✖

$\left(\frac{-3}{2},\frac{7}{10}\right),\left(\frac{-3}{2},\frac{3}{40}\right)$

2. ✖

$\left(\frac{3}{2},\frac{7}{10}\right),\left(\frac{3}{2},\frac{53}{40}\right)$

3. ✖

$\left(\frac{3}{2},\frac{7}{10}\right),\left(\frac{3}{2},\frac{3}{40}\right)$

4. ✔

Question Number : 57 Question Id : 105615217 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 axis of a parabola is along the line $y = x$ and the distance of its vertex A from (0, 0) is $\sqrt{2}$ and that of its focus S from (0, 0) is $2\sqrt{2}$. If A and S lie in first quadrant, then the equation of the parabola in parametric form is

Options :

$x=(t+1)^2, y=(t-1)^2$

1. ✔

$x=t^2, y=2t$

2. ✖

$x=\left(t-\sqrt{2}\right)^2, y=\left(t+\sqrt{2}\right)^2$

3. ✖

$x = t^2 + 5, y = t^2 - 5$

4. ✖

Question Number : 58 Question Id : 105615218 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 $S \equiv \frac{x^2}{a^2} + \frac{y^2}{b^2} - 1 = 0,\ S' \equiv \frac{x^2}{\alpha^2} + \frac{y^2}{\beta^2} - 1 = 0$ be two intersecting ellipses. If $p(a\cos\theta, b\sin\theta)$ and $Q\left(a\cos\left(\frac{\pi}{2}+\theta\right), b\sin\left(\frac{\pi}{2}+\theta\right)\right)$ are their points of intersection then $\frac{1}{2}\left(a^2\beta^2 + b^2\alpha^2\right) =$

Options :

$a^2 b^2$

1. ✖

$\alpha^2 + \beta^2$

2. ✖

$a^2 + b^2$

3. ✖

$\alpha^2 \beta^2$

4. ✔

Question Number : 59 Question Id : 105615219 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

$P(\theta_1)$ and $Q(\theta_2)$ are two points on the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ with eccentricity e. If PSQ is a focal chord and $\tan\left(\frac{\theta_1}{2}\right)\tan\left(\frac{\theta_2}{2}\right)=-(2\sqrt{2}+3)$, then e and S are

Options :

1. $\frac{1}{\sqrt{3}}, \left(\frac{a}{\sqrt{3}},0\right)$ ✖

2. $\frac{1}{\sqrt{3}}, \left(\frac{-a}{\sqrt{3}},0\right)$ ✖

3. $\frac{1}{\sqrt{2}}, \left(\frac{a}{\sqrt{2}},0\right)$ ✖

4. $\frac{1}{\sqrt{2}}, \left(\frac{-a}{\sqrt{2}},0\right)$ ✔

Question Number : 60 Question Id : 105615220 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 S be the focus of the hyperbola $\frac{x^2}{16}-\frac{y^2}{9}=1$ lying on the positive X− axis and $P(5, y_1)$ be point on the hyperbola. Then SP =

Options :

1. $\frac{1}{4}$ ✖

$\frac{3}{4}$

2. ✖

$\frac{9}{4}$

3. ✔

$\frac{5}{4}$

4. ✖

Question Number : 61 Question Id : 105615221 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 $P(\theta)=\left(x_1,\frac{3\sqrt{5}}{2}\right),\ 0<\theta<\frac{\pi}{2}$ is a point on the hyperbola $\frac{x^2}{25}-\frac{y^2}{9}=1$, where θ is the parameter in its parametric form, then $2x_1+9\sin^2\theta=$

Options :

8

1. ✖

10

2. ✖

20

3. ✔

34

4. ✖

Question Number : 62 Question Id : 105615222 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 A(1, 3, 5), B(2, 4, 6), C(4, 5, k) form a right angled triangle then the number of possible values of k is

Options :

1. ✔ 2

2. ✖ 3

3. ✖ 0

4. ✖ 1

Question Number : 63 Question Id : 105615223 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 $A=(3,4,0)$, $B=(4,4,4)$, $C=(-6,2,3)$ and $D=(1,1,2)$. If θ is the acute angle between the lines AB and CD then $\cos\theta =$

Options :

1. ✖ $\frac{4}{17\sqrt{3}}$

2. ✔ $\frac{3}{17\sqrt{3}}$

3. ✖ $\frac{12}{17\sqrt{3}}$

$$\frac{11}{17\sqrt{3}}$$

4. ✖

Question Number : 64 Question Id : 105615224 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 plane containing two lines whose direction ratios are $(-1,2,1)$ and $(1,3,2)$ passes through the point $(2,1,k)$. If this plane also passes through the point $(3,-1,4)$, then $k =$

Options :

5

1. ✔

3

2. ✖

6

3. ✖

-3

4. ✖

Question Number : 65 Question Id : 105615225 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$=(a_{ij})$ be an $n\times n$ matrix defined by $a_{ij}=\begin{cases}k^i, & \forall i=j\\ 0, & \text{otherwise}\end{cases}$. If $m=$ trace of A and $\lim\limits_{k\to 1}\dfrac{n-m}{1-k}=171$ then the value of n is

Options :

18

1. ✔

23

2. ✖

35

3. ✖

42

4. ✖

Question Number : 66 Question Id : 105615226 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

$$\lim_{x\to\infty} x^3\left[\sqrt{x^2+\sqrt{x^4+1}}-\sqrt{2}x\right]=$$

Options :

0

1. ✖

1

2. ✖

$\frac{1}{4\sqrt{2}}$

3. ✔

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

4. ✖

Question Number : 67 Question Id : 105615227 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 $f(x)=\begin{cases}3-x & \text{if} \quad x<-3 \\ 6 & \text{if} \quad -3\le x\le 3 \\ 3+x & \text{if} \quad x>3\end{cases}$. Let α be the number of points of discontinuity of f and β be the number of points where f is not differentiable. Then $\alpha+\beta=$

Options :

6

1. ✖

3

2. ✖

2

3. ✔

0

4. ✖

Question Number : 68 Question Id : 105615228 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 $a\,f(x)+b\,f\left(\frac{1}{x}\right)=x+1$, and $\frac{d}{dx}(x^2 f(x))=2x^2+2x+\frac{1}{3}$, then $a-b=$

Options :

2

1. ✖

3

2. ✔

0

3. ✖

1

4. ✖

Question Number : 69 Question Id : 105615229 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 $f(x)=\sin\left(\cos h\left(\frac{x^2+1}{x^2+2}\right)\right)$ then $f'(1)=$

Options :

$\frac{2}{9}\sin h\left(\frac{2}{3}\right)\cos\left(\cos h\left(\frac{2}{3}\right)\right)$

1. ✔

$\sin h\left(\frac{2}{3}\right)\cos\left(\cos h\left(\frac{2}{3}\right)\right)$

2. ✖

$\frac{2}{9}\cos\left(\cos h\left(\frac{2}{3}\right)\right)$

3. ✖

$\frac{2}{9}\cos h\left(\frac{2}{3}\right)\cos\left(\sin h\left(\frac{2}{3}\right)\right)$

4. ✖

Question Number : 70 Question Id : 105615230 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 an error of 0.02 sq.cm is found in the surface area of a sphere when its radius is measured as 10 cm, then the approximate error that occurs in the volume of the sphere, in cubic centimetres, is

Options :

0.2

1. ✖

0.01

2. ✖

0.3

3. ✖

0.1

4. ✔

Question Number : 71 Question Id : 105615231 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 angle between the curves $y^2 = 4x$ and $x^2 + y^2 = 5$ then $|\tan\theta| =$

Options :

5

1. ✖

4

2. ✖

3

3. ✔

2

4. ✖

Question Number : 72 Question Id : 105615232 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 local maximum value of the function $f(x)=-(x-2)^3(x+2)^2$ is

Options :

0

1. ✖

$\frac{12^3 \cdot 8^2}{5^5}$

2. ✔

125

3. ✖

$\frac{2^9 \cdot 3^2}{5^6}$

4. ✖

Question Number : 73 Question Id : 105615233 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 $\int \frac{1+\cos 8x}{\tan 2x-\cot 2x}dx = f(x).\cos(g(x))+c$, then $f\left(\frac{1}{4}\right)+g\left(\frac{1}{4}\right)=$

Options :

2

1. ✖

$\frac{17}{8}$

2. ✖

$\frac{15}{8}$

3. ✖

$\frac{33}{16}$

4. ✔

Question Number : 74 Question Id : 105615234 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 $x \neq \frac{-3}{5}, \frac{2}{5}$, if $f\left(\frac{2x+1}{5x+3}\right) = x+2$, then $\int f(x)\,dx =$

Options :

$\frac{7}{5}x - \frac{1}{5}\log|5x+3| + c$

1. ✖

$\frac{7}{5}x - \frac{1}{25}\log|5x+3| + c$

2. ✖

$\frac{7}{5}x - \frac{1}{25}\log|5x-2| + c$

3. ✔

$\frac{7}{5}x - \frac{1}{5}\log|5x-2| + c$

4. ✖

Question Number : 75 Question Id : 105615235 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 $\int e^x \cos x\,dx = \frac{e^x}{2}(\cos x + \sin x)$ and $\int \frac{\cos\left(\log\left(\frac{2x+3}{3-2x}\right)\right)}{(3-2x)^2}dx = \frac{f(x)}{24}\left[\cos(g(x)) + \sin(g(x))\right] + c$ then $g(1) =$

Options :

1. 5 ✖

2. $\log f(2)$ ✖

3. $\log f(1)$ ✔

4. 0 ✖

Question Number : 76 Question Id : 105615236 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

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

Options :

1. $\sqrt{3}$ ✔

2

2. ✖

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

3. ✖

$\frac{1}{2}$

4. ✖

Question Number : 77 Question Id : 105615237 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 $[x]$ denotes the greatest integer function of x and $\int_{-3/2}^{3/2} [2x-3]\,dx = k$, then $\left|k+\frac{1}{2}\right| =$

Options :

7

1. ✖

8

2. ✖

10

3. ✔

12

4. ✖

Question Number : 78 Question Id : 105615238 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 corresponding to the family of curves given by $ax^2 + by^2 = 1$ where a and b are arbitrary constants is

Options :

$$x\frac{d^2y}{dx^2} = \frac{dy}{dx}$$

1. ✖

$$xy\frac{d^2y}{dx^2} + x\left(\frac{dy}{dx}\right)^2 - y\frac{dy}{dx} = 0$$

2. ✔

$$xy\frac{d^2y}{dx^2} + y\left(\frac{dy}{dx}\right)^2 - x\frac{dy}{dx} = 0$$

3. ✖

$$xy\frac{d^2y}{dx^2} - x\left(\frac{dy}{dx}\right)^2 + y\frac{dy}{dx} = 0$$

4. ✖

Question Number : 79 Question Id : 105615239 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 the differential equation $\sqrt{\frac{d^2y}{dx^2}} = \sqrt[3]{\left[y\frac{dy}{dx} + x\sin\left(\frac{dy}{dx}\right)\right]^2}$

Options :

Order is 2 and degree is 3

1. ✖

Order is 3 and degree is 3

2. ✖

Order is 3 and degree is 2

3. ✖

Order is 2 and degree is not defined

4. ✔

Question Number : 80 Question Id : 105615240 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 general solution of the differential equation $\frac{dy}{dx}=\frac{xy+x-2y-2}{xy-2x+y-2}$ is

Options :

$x+y+3\log\left|\frac{x+1}{y+1}\right|=c$

1. ✖

$x+y+3\log\left|\frac{y+1}{x+1}\right|=c$

2. ✖

$x-y+3\log\left|\frac{x+1}{y+1}\right|=c$

3. ✖

$x-y+3\log\left|\frac{y+1}{x+1}\right|=c$

4. ✔

Physics

Section Id :	1056155
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 :	1056155
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 105615241 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 interaction is responsible for beta decay?

Options :

1. ✖ Gravitational

2. ✔ Weak

3. ✖ Electromagnetic

4. ✖ Strong

Question Number : 82 Question Id : 105615242 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 RC circuit, where R is resistance and C is capacitance which of the following has the dimension of time.

Options :

1. ✖ R/C

C/R

2. ✖

$\sqrt{RC}$

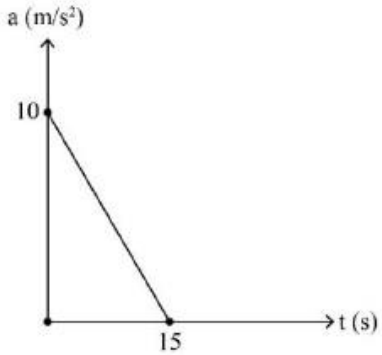
3. ✖

RC

4. ✔

Question Number : 83 Question Id : 105615243 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 particle starts from rest. Its acceleration (a) versus time (t) is as shown in the figure. The maximum speed of the particle will be



Options :

150 m/s

1. ✖

75 m/s

2. ✔

37.5 m/s

3. ✖

45 m/s

4. ✖

Question Number : 84 Question Id : 105615244 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 zero velocity of a particle at any instant always implies zero acceleration at that instant

Reason(R) : A body is momentarily at rest when reverses its direction of motion.

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 : 85 Question Id : 105615245 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 river has a steady speed of 'v'. A man swims upstream at a distance of 'd' and swims back to the starting point in total time 't'. The man can swim at a speed of '2v' in still water. If the time taken by the man in still water is 't_0' to complete the same length of swim, then $\frac{t}{t_0}$ is

Options :

1. ✖ $\frac{1}{2}$

2. ✖ $\frac{3}{2}$

$\frac{3}{4}$

3. ✖

$\frac{4}{3}$

4. ✔

Question Number : 86 Question Id : 105615246 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 given an initial velocity of $(3i+4j)m/s$ where, $\hat{i}$ is along the ground and $\hat{j}$ is along the vertical. Assuming g = 10 m/s ^{2}, if the equation of its trajectory can be written as $\frac{1}{9}\left[\beta x+\gamma x^2\right]$, then the value of γ is

Options :

-8

1. ✖

-5

2. ✔

-6

3. ✖

-12

4. ✖

Question Number : 87 Question Id : 105615247 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 block is placed on a parabolic shape ramp given by equation $y=\frac{x^2}{20}$. If the coefficient of static friction (μ_s) is 0.5, then what is the maximum height above the ground at which the block can be placed without slipping?

Options :

2.5 m

1. ✖

1.25 m

2. ✔

0.5 m

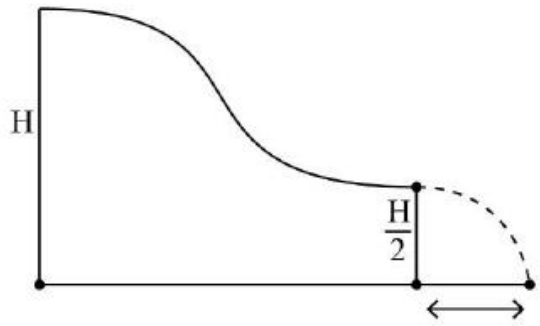
3. ✖

0.25 m

4. ✖

Question Number : 88 Question Id : 105615248 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 small object slides down with initial velocity equal to zero from the top of a smooth hill of height H. The other end of the hill is horizontal and is at height $\frac{H}{2}$ as shown in the figure. The horizontal distance covered by the object from the end of the hill to the ground is



Options :

1. ✖ $2H$

2. ✔ H

3. ✖ $\frac{H}{2}$

4. ✖ $\frac{3H}{2}$

Question Number : 89 Question Id : 105615249 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 moving particle collides with a stationary particle of mass $\frac{1}{n}$ times the mass of moving particle, the fraction of its kinetic energy transferred to the stationary particle is

Options :

1. ✖ $\frac{4n^2}{(1+n)^2}$

2. ✔ $\frac{4n}{(1+n)^2}$

3. ✖ $\frac{4n}{1+n^2}$

4. ✖ $4n^2$

Question Number : 90 Question Id : 105615250 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 solid cylinder of mass m and radius R rolls down an inclined plane of height 30 m without slipping. The speed of its centre of mass when the cylinder reaches the bottom is
[use $g = 10\ m/s^2$]

Options :

1. 10 m/s ✖

2. 20 m/s ✔

3. 30 m/s ✖

4. 40 m/s ✖

Question Number : 91 Question Id : 105615251 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 simple pendulum consists of a small sphere of mass 'm' suspended by a thread of length 'l'. The sphere carries a positive charge q. The pendulum is allowed to do small oscillations in a uniform electric field E with direction vertically upwards. The time period of oscillation is

Options :

1. $2\pi\sqrt{\frac{l}{g}}$ ✖

2. $2\pi\sqrt{\frac{ml}{qE}}$ ✖

3. ✔ $2\pi\sqrt{\frac{l}{g-\frac{q}{m}\mathrm{E}}}$

4. ✖ $2\pi\sqrt{\frac{l}{g+\frac{q}{m}\mathrm{E}}}$

Question Number : 92 Question Id : 105615252 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 rocket fired vertically with a speed of 4 km/s from the earth's surface. How far from the earth does the rocket go before returning to the earth?
(Take radius of earth = 6.4×10^6 m and g = 10 m/s^2)

Options :

1. ✖ 500.24 km

2. ✔ 914.28 km

3. ✖ 1230.24 km

4. ✖ 1750.28 km

Question Number : 93 Question Id : 105615253 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 swimming pool has a depth of 22 m and area 700 m^2. Calculate fractional change $\frac{\Delta \mathrm{v}}{\mathrm{v}}$ of water at the bottom of the swimming pool. Given that the bulk modulus of water is 2.2×10^9 Nm^{-2}, g = 10 m/s^2, and density of water 1000 kg/m^3.

Options :

2.2×10^{-4}

1. ✖

0.7×10^{-4}

2. ✖

0.31×10^{-4}

3. ✖

10^{-4}

4. ✔

Question Number : 94 Question Id : 105615254 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 hollow spherical body of outer and inner radii of 4 cm and 2 cm respectively floats half submerged in a liquid of density 2.0 g/cm^3. The density of the material of the sphere is

Options :

1.02 g/cm^3

1. ✖

1.14 g/cm^3

2. ✔

1.18 g/cm^3

3. ✖

1.24 g/cm^3

4. ✖

Question Number : 95 Question Id : 105615255 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

What is the terminal velocity of a rain drop of radius 0.02 mm ?
[Note that the coefficient of viscosity of air is 1.8×10^{-5} N/m^2, density of water is 1000 Kg/m^3. Use g = 10m/s^2 and density of air can be neglected in comparison with density of water]

Options :

1. ✔ 4.9 cm/s

2. ✖ 9.8 cm/s

3. ✖ 0.49 cm/s

4. ✖ 49 cm/s

Question Number : 96 Question Id : 105615256 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 hole of diameter 5 cm is drilled in a metal sheet at $30\,^{\circ}C$. The linear expansion of metal is $2\times10^{-5}\,K^{-1}$. The diameter of the hole when the temperature is raised to $230\,^{\circ}C$, is equal to

Options :

1. ✖ 5.01 cm

2. ✔ 5.02 cm

3. ✖ 5.03 cm

4. ✖ 5.04 cm

Question Number : 97 Question Id : 105615257 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 cube absorbs 2100.0 J of heat when its temperature is raised by 2 °C. If the specific heat of the metal is 900 J kg^{-1} K^{-1}, then the mass of the cube is

Options :

1. 1.116 kg ✔

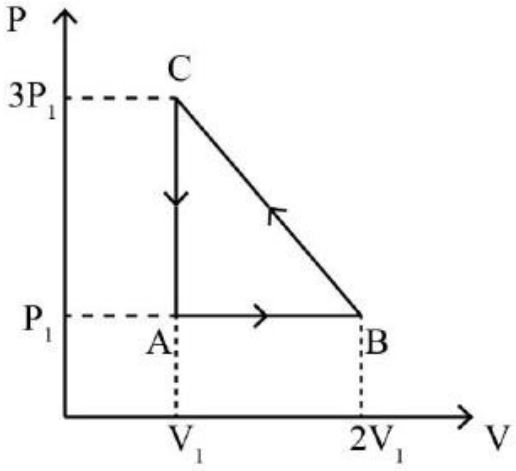
2. 2.33 kg ✖

3. 1.66 kg ✖

4. 1.33 kg ✖

Question Number : 98 Question Id : 105615258 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 net work done by an ideal gas going through the cycle as shown in the P – V diagram below is



Options :

1. 0 ✖

P_1V_1

2. ✔

$\frac{3}{2}P_1V_1$

3. ✖

$\frac{1}{2}P_1V_1$

4. ✖

Question Number : 99 Question Id : 105615259 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 diatomic gas $\left(C_P = \frac{7}{2}R\right)$ does 200 J of work when it is expanded isobarically. The heat given to the gas in the process is

Options :

600 J

1. ✖

800 J

2. ✖

900 J

3. ✖

700 J

4. ✔

Question Number : 100 Question Id : 105615260 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

Statement (I) : Gas thermometers are less sensitive than liquid thermometers.

Statement (II) : The ratio of universal gas constant and avagadro's number is called Boltzman's constant.

Statement (III) : The density of a given mass of a gas at constant pressure is inversely proportional to its absolute temperature.

The correct option among the following is

Options :

Statements I, II, III are true.

1. ✖

Statements I, II are true, but statement III is false.

2. ✖

Statements II, III are true, but statement I is false.

3. ✔

Statements I, II, III are false.

4. ✖

Question Number : 101 Question Id : 105615261 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 distance between two successive minima of a transverse wave is 2.7 m. Five crests of the wave pass a given point along the direction of travel every 15.0 s. The speed of the wave is

Options :

0.9 m/s

1. ✔

1.2 m/s

2. ✖

0.5 m/s

3. ✖

2.4 m/s

4. ✖

Question Number : 102 Question Id : 105615262 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 convex lens focusses an object 20 cm from it on a screen placed 5 cm away from it. A glass plate (refractive index = $\frac{7}{5}$) of thickness 1.4 cm is inserted between the lens and the screen. What is the distance of the object from the lens, so that its image is again focused on the screen?

Options :

22.5 cm

1. ✖

30.7 cm

2. ✔

25.0 cm

3. ✖

28.4 cm

4. ✖

Question Number : 103 Question Id : 105615263 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 angular width of a fringe in a double slit experiment is found to be 0.2° on a screen 1 m away. The wavelength of light used is 600 nm. The change in angular width of the fridge if the entire measurement system is immersed in water is
[Use refractive index of water as 4/3]

Options :

0.05°

1. ✔

0.10°

2. ✖

0.15°

3. ✖

0.20°

4. ✖

Question Number : 104 Question Id : 105615264 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 metal plate has a surface charge density of $8.85\times10^{-6}\ \mathrm{C/m^2}$. An electron having initial kinetic energy of $8\times10^{-17}J$ is moving towards the center of the plate. If the electron stops just before reaching the plate then the initial distance between the electron and the plate is

$\left[\text{Take } \varepsilon_0 = 8.85\times10^{-12}\ \mathrm{C^2/Nm^2}\right]$

Options :

0.5 mm

1. ✔

0.1 mm

2. ✖

0.2 cm

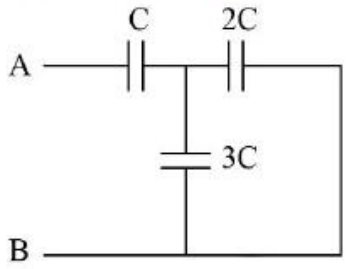
3. ✖

0.02 cm

4. ✖

Question Number : 105 Question Id : 105615265 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 equivalent capacitance between points A and B is



Options :

5/6 C

1. ✔

11/5 C

2. ✖

6 C

3. ✖

5/11 C

4. ✖

Question Number : 106 Question Id : 105615266 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 cylindrical metallic wire is stretched to increase its length in such a way that the metallic wire changes its resistance by 6%. The percentage increase in its length is

Options :

2 %

1. ✖

4 %

2. ✖

3 %

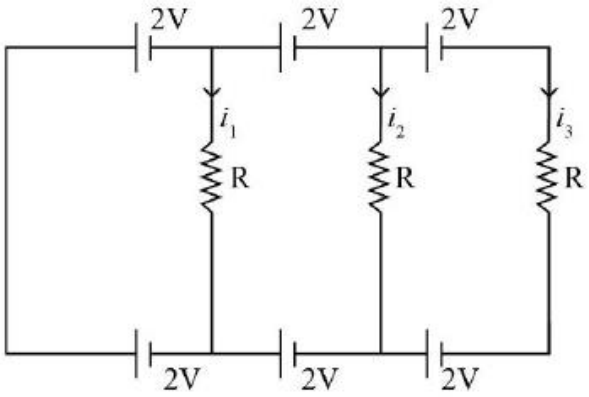
3. ✔

12 %

4. ✖

Question Number : 107 Question Id : 105615267 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 current in the three resistors as shown in the following figure?



Options :

$$i_1 = 0,\ i_2 = \frac{4V}{R},\ i_3 = \frac{2V}{R}$$

1. ✖

$$i_1 = 0,\ i_2 = 0,\ i_3 = 0$$

2. ✔

$$i_1 = 0,\ i_2 = \frac{2V}{R},\ i_3 = \frac{4V}{R}$$

3. ✖

$$i_1 = 0,\ i_2 = \frac{2V}{R},\ i_3 = \frac{2V}{R}$$

4. ✖

Question Number : 108 Question Id : 105615268 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 horizontal wire carries 160 A current below which another wire of linear density 10 g /m carrying a current is kept at 4 cm distance. If the wire is kept below hangs in air, what is the current in this wire when the direction of current in both the wires is same? ($g = 10\ m/s^2$ and $\mu_0 = 4\pi \times 10^{-7}$)

Options :

125 A

1. ✔

140 A

2. ✖

110 A

3. ✖

100 A

4. ✖

Question Number : 109 Question Id : 105615269 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 70 turns/cm and carries current I. An electron moves within the solenoid in a circle of radius 2.5 cm perpendicular to the solenoid axis. If the speed of the electron is 4.4×10^6 m/s then the current I in the solenoid is (Take $\mu_0 = 4\pi \times 10^{-7}$ SI unit, mass of electron = 9×10^{-31} kg, charge of electron = 1.6×10^{-19} C)

Options :

98.5 mA

1. ✖

112.5 mA

2. ✔

125 mA

3. ✖

175.0 mA

4. ✖

Question Number : 110 Question Id : 105615270 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 magnetic field lines are continuous and form closed loops.

Reason (R) : Magnetic monopole does not exist.

The correct option among the following is

Options :

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

1. ✔

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

2. ✖

(A) is true but (R) is false

3. ✖

(A) is false but (R) is true

4. ✖

Question Number : 111 Question Id : 105615271 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 flat circular coil has 100 turns of wire of radius 10 cm. A uniform magnetic field exists in a direction perpendicular to the plane of the coil and it grows at a rate of 0.1 T/sec. the induced emf in the coil is:

Options :

π V

1. ✖

10π V

2. ✖

$\frac{\pi}{10}$ V

3. ✔

2π V

4. ✖

Question Number : 112 Question Id : 105615272 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 2μF capacitor is charged to 50 V by a battery. The battery is removed after capacitor is fully charged. At time $t = 0$, a 10 mH coil is connected in series with the capacitor. The maximum rate at which the current changes in the circuit is

Options :

2000 A/s

1. ✖

5000 A/s

2. ✔

2500 A/s

3. ✖

10000 A/s

4. ✖

Question Number : 113 Question Id : 105615273 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 has its electric and magnetic fields given by

$\vec{E}(t) = \vec{E}_m \sin(kx - \omega t)$

$\vec{B}(t) = \vec{B}_m \sin(kx - \omega t)$

If the direction of $\vec{E}_m$ & $\vec{B}_m$ are in the direction of $\hat{i} + \hat{j}$ and $\hat{i} - \hat{j}$ respectively, the unit vector that gives the direction of propagation of the wave is

Options :

1. ✔ $-\hat{k}$

2. ✖ $\hat{k}$

3. ✖ $\hat{i}$

4. ✖ $-\hat{i}$

Question Number : 114 Question Id : 105615274 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 value of Plank's constant, if the slope of the graph of stopping potential vs frequency of incident light is 4×10^{-15} Vs is
(given charge of an electron = 1.6×10^{-19}C)

Options :

1. ✖ 6.0×10^{-34} Js

2. ✖ 6.2×10^{-34} Js

3. ✔ 6.4×10^{-34} Js

6.6×10^{-34} Js

4. ✖

Question Number : 115 Question Id : 105615275 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 beam of white light is incident normally on a plane surface absorbing 70 % of the light and reflecting the rest. If the incident beam carries 10 W of power, the force exerted by it on the surface is

Options :

3.3×10^{-8} N

1. ✖

4.33×10^{-8} N

2. ✔

2.3×10^{-8} N

3. ✖

3.53×10^{-8} N

4. ✖

Question Number : 116 Question Id : 105615276 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 series limit frequency of Balmer series is v_B, then the series limit frequency of the Brackett series is

Options :

$\frac{4v_B}{25}$

1. ✖

$\frac{v_B}{9}$

2. ✖

3. ✔ $\frac{v_B}{4}$

4. ✖ $\frac{9v_B}{4}$

Question Number : 117 Question Id : 105615277 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 a nucleus ${}^{60}_{30}\times$. It's approximate density is
(Take 1 amu=1.6 $\times 10^{-27}$ kg, $R_o = 1.2 \times 10^{-15}$ m.)

Options :

1. ✖ 1.2×10^{18} kg/m^3

2. ✖ 8.5×10^{19} kg/m^3

3. ✖ 3.3×10^{16} kg/m^3

4. ✔ 2.2×10^{17} kg/m^3

Question Number : 118 Question Id : 105615278 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 resistivity of a material is found to be $10^8\,\Omega - m$. Then the material would be

Options :

1. ✔ Only insulator

Only metal

2. ✖

Only semiconductor

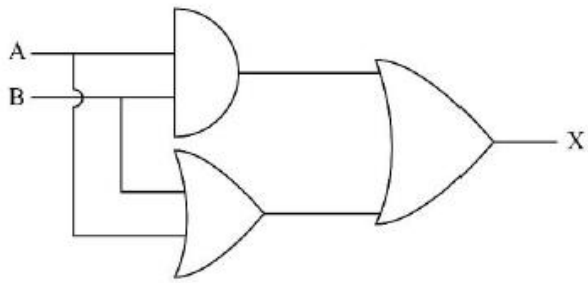
3. ✖

Only Superconductor

4. ✖

Question Number : 119 Question Id : 105615279 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 behaviour of the circuit is like _____gate



Options :

OR

1. ✔

NOR

2. ✖

NAND

3. ✖

AND

4. ✖

Question Number : 120 Question Id : 105615280 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 message signal of frequency 15 kHz is used to modulate a carrier of frequency υ_c. If the side bands produced are 1515 kHz and 1485 kHz, then υ_c is

Options :

2.0 MHz

1. ✖

1.5 MHz

2. ✔

2.5 MHz

3. ✖

3.0 MHz

4. ✖

Chemistry

Section Id :	1056156
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 :	1056156
Question Shuffling Allowed :	Yes

Question Number : 121 Question Id : 105615281 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 total number of spectral lines observed when electron returns from the 6^{th} shell until the 2^{nd} shell in hydrogen atom is

Options :

15

1. ✔

2. ✖ 10

3. ✖ 8

4. ✖ 2

Question Number : 122 Question Id : 105615282 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 orbital angular momentum of an electron in d orbital is equal to

Options :

1. ✖ 0

2. ✖ $2\sqrt{3}\ \hbar$

3. ✖ $6\ \hbar$

4. ✔ $\sqrt{6}\ \hbar$

Question Number : 123 Question Id : 105615283 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 acidic nature of oxides

Options :

1. ✖ $Li_2O > BeO > CO_2 > B_2O_3 > N_2O_3$

2. ✖ $CO_2 > N_2O_3 > B_2O_3 > Li_2O > BeO$

$CO_2 > BeO > Li_2O > B_2O_3 > N_2O_3$

3. ✖

$N_2O_3 > CO_2 > B_2O_3 > BeO > Li_2O$

4. ✔

Question Number : 124 Question Id : 105615284 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 change in enthalpy $[\Delta H]$ in kJ mol^{-1} for the reaction is

$Mg + 2F \rightarrow Mg\ F_2$

Given: EA of F = 328 kJ mol^{-1}, IE_1 of Mg = 737 kJ mol^{-1}, IE_2 of Mg = 1451 kJ mol^{-1}

Options :

3064

1. ✖

876

2. ✖

1860

3. ✖

1532

4. ✔

Question Number : 125 Question Id : 105615285 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

Dipole – induced dipole interactions are present between which of the following pairs?

Options :

H_2O and C_2H_5OH

1. ✖

Cl_2 and CCl_4

2. ✖

NH_3 and H_2

3. ✔

SiF_4 and BF_3

4. ✖

Question Number : 126 Question Id : 105615286 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 the Lewis formula of O_3, the correct option is

Options :

σ bonds	π bonds	lone pairs of electrons
2	1	3

1. ✖

σ bonds	π bonds	lone pairs of electrons
2	1	4

2. ✖

σ bonds	π bonds	lone pairs of electrons
1	2	4

3. ✖

σ bonds	π bonds	lone pairs of electrons
2	1	6

4. ✔

Question Number : 127 Question Id : 105615287 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 gaseous mixture of 2 moles of A, 3 moles of B, 5 moles of C and 10 moles of D contained in a vessel. Assuming that gases are ideal and partial pressure of C is 1.5 atm, the total pressure is

Options :

15 atm

1. ✖

10 atm

2. ✖

3 atm

3. ✖

6 atm

4. ✔

Question Number : 128 Question Id : 105615288 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 rate constant of a reaction is increased 4 times after addition of catalyst to the reaction mixture at the same temperature of 27 °C. The change in the activation energy of this reaction is

(Take $\ln\left(\frac{1}{4}\right) = -1.386$, R = 8.314)

Options :

−15 kJ/mol

1. ✖

−1.5 kJ/mol

2. ✖

−3.45 kJ/mol

3. ✔

−34.5 kJ/mol

4. ✖

Question Number : 129 Question Id : 105615289 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 of edge length 1 cm is divided into smaller cubes of uniform size of length 1 nm. Assuming that no voids are present, the ratio of total surface area of all the cubes of 1 nm edge length to the surface area of the initial cube is

Options :

10^9

1. ✖

10^7

2. ✔

10^6

3. ✖

10^5

4. ✖

Question Number : 130 Question Id : 105615290 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

Calculate the number of moles of NaOH required to completely neutralise 100 g of 118% oleum

Options :

2.4

1. ✔

1.2

2. ✖

4.8

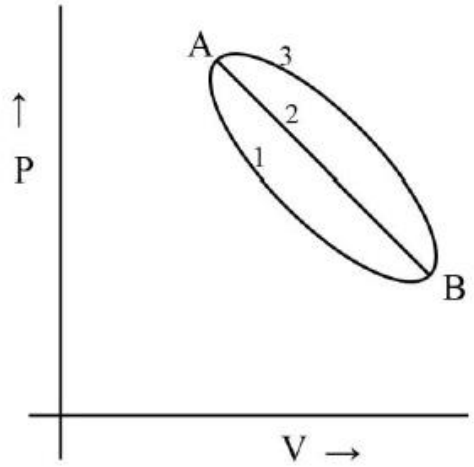
3. ✖

8.4

4. ✖

Question Number : 131 Question Id : 105615291 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 certain mass of a gas was brought from state A to B by following three different paths, namely 1, 2 and 3, respectively. Which of the following relations is correct for the work done?



Options :

1. $W_1 = W_2 = W_3$ ✖

2. $W_1 < W_2 < W_3$ ✔

3. $W_1 > W_2 > W_3$ ✖

4. $W_1 = W_3 < W_2$ ✖

Question Number : 132 Question Id : 105615292 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 the formation of ammonia gas from its constituent elements, the K_P / K_C is

Options :

1. RT ✖

2. $\frac{1}{(RT)^2}$ ✔

3. ✖ $\frac{1}{\sqrt{RT}}$

4. ✖ 1

Question Number : 133 Question Id : 105615293 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

List - I	List - II
A) Aq. solution of $AlCl_3$	I) Basic
B) Aq. solution of CH_3COONa	II) Acidic
C) Aq. solution of KCl	III) Highly conductive
D) Al_2O_3	IV) Strongly basic
	V) Amphoteric

The correct match is

Options :

1. ✔

A	B	C	D
II	I	III	V

2. ✖

A	B	C	D
I	III	IV	V

3. ✖

A	B	C	D
III	II	I	V

4. ✖

A	B	C	D
IV	V	II	I

Question Number : 134 Question Id : 105615294 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 most effective water softening method is

Options :

1. ✖ Lime – soda process

2. ✖ Permutit process

3. ✔ Ion – exchange process

4. ✖ Boiling followed by filtration

Question Number : 135 Question Id : 105615295 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

Potassium superoxide on hydrolysis gives

Options :

1. ✖ $K^+ + \bar{O}H + O_2$

2. ✖ $K^+ + K_2O + O_2 + \bar{O}H$

3. ✔ $K^+ + H_2O_2 + O_2 + \bar{O}H$

4. ✖ $K^+ + H_2O_2 + \bar{O}H$

Question Number : 136 Question Id : 105615296 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 aluminium chloride is dissolved in water, it gives

Options :

1. ✖ $[Al(OH)_6]^{3-} + 3\ HCl$

2. ✖ $Al_2O_3 + 6\ HCl$

3. ✔ $[Al(H_2O)_6]^{3+} + 3\ Cl^-$

4. ✖ $Al^{3+} + 3\ Cl^-$

Question Number : 137 Question Id : 105615297 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

Among the following given substances, the one with zero $\Delta_f H^\circ$ is

Options :

1. ✖ Diamond

2. ✔ Graphite

3. ✖ Fullerene

4. ✖ Bituminous coal

Question Number : 138 Question Id : 105615298 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 chiral molecule among the following.

Options :

Isopropyl alcohol

1. ✖

2–Pentanol

2. ✔

1–Bromo–3–butene

3. ✖

Isobutyl alcohol

4. ✖

Question Number : 139 Question Id : 105615299 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 most suitable solvent for Wurtz reaction is

Options :

Dry acetonitrile

1. ✖

Dry dichloromethane

2. ✖

Dry ethanol

3. ✖

Dry ether

4. ✔

Question Number : 140 Question Id : 105615300 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

Propyne was subjected to a reaction with $HgSO_4$ / dil. H_2SO_4, which resulted in a product P. The product P was heated with $Ba(OH)_2$ to give the product Q. The molecular formula of the product Q is

Options :

C_3H_6O

1. ✖

2. ✖ C_3H_8OH

3. ✖ $C_6H_{12}O_2$

4. ✔ $C_6H_{10}O$

Question Number : 141 Question Id : 105615301 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 option for axial distances and axial angles for hexagonal crystal system is

Options :

1. ✖ $a \neq b \neq c, \alpha \neq \beta \neq \gamma = 90^\circ$

2. ✖ $a = b \neq c, \alpha = \beta = \gamma = 90^\circ$

3. ✔ $a = b \neq c, \alpha = \beta = 90^\circ, \gamma = 120^\circ$

4. ✖ $a \neq b \neq c, \alpha = \beta = \gamma = 90^\circ$

Question Number : 142 Question Id : 105615302 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/are "not correct" for $CH_3OH + CH_3COOH$ mixture solution?

a) $\Delta H_{mix} < 0$
b) Does not obey Raoult's law
c) $\Delta H_{mix} > 0$
d) An example of ideal solution

Options :

d only

1. ✖

a, c only

2. ✖

a, b, c only

3. ✔

c, d only

4. ✖

Question Number : 143 Question Id : 105615303 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

Henry's law is valid for

A) Ammonia gas dissolution in water
B) O_2 gas dissolution in unsaturated blood
C) O_2 dissolution in water
D) CO_2 dissolution in water

Options :

A and B

1. ✖

B and C

2. ✖

C and D

3. ✔

B and D

4. ✖

Question Number : 144 Question Id : 105615304 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 a current of 1.2 A through a solution of salt of copper for 40 min, 0.96 g of copper was deposited. The equivalent weight of copper in g is

Options :

1. ✖ 21.2

2. ✔ 31.75

3. ✖ 63.5

4. ✖ 15.9

Question Number : 145 Question Id : 105615305 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

Half life periods for a reaction at initial concentrations of 0.1 M and 0.01 M are 5 and 50 minutes, respectively. The order of reaction is

Options :

1. ✖ 3

2. ✔ 2

3. ✖ 1

4. ✖ 0

Question Number : 146 Question Id : 105615306 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

Catalysts in the following reactions are

I) $CH_3COOCH_3(l)+H_2O(l)\rightarrow CH_3COOH(aq)+CH_3OH(l)$

II) $2SO_2(g)\rightarrow 2SO_3(g)$

III) $2SO_2(g)+O_2(g)\rightarrow 2SO_3(g)$

IV) $N_2(g)+3H_2(g)\rightarrow 2NH_3(g)$

Options :

1. ✔ HCl (*l*), Pt (s), NO (g) and Fe (s)

2. ✖ HCl (*l*), NO (g), Pt (s) and Fe (s)

3. ✖ HCl (*l*), Ni (s), NO (g) and Fe (s)

4. ✖ HCl (*l*), Pt (s), N_2O (g) and Fe (s)

Question Number : 147 Question Id : 105615307 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 total number of paramagnetic gaseous products formed in all the following reactions [A + B + C]

(A) $NH_4NO_3 \xrightarrow{\Delta}$ Products

(B) $3NaNO_2 + 3H_2SO_4 \longrightarrow$ Products

(C) $Pb(NO_3)_2 \xrightarrow{673\,K}$ Products

Options :

1. ✖ 0

2. ✖ 1

3. ✖ 2

3

4. ✔

Question Number : 148 Question Id : 105615308 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 main products P and Q of the following unbalanced disproportionation reaction are $SeCl_2 \rightarrow P + Q$

Options :

P	Q
$SeCl_2$	$SeCl_3$

1. ✖

P	Q
$SeCl_4$	$SeCl_2$

2. ✖

P	Q
$SeCl_4$	Se

3. ✔

P	Q
$SeCl_4$	Se_2

4. ✖

Question Number : 149 Question Id : 105615309 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 acidity of HClO, HBrO and HIO is

Options :

$HIO > HBrO > HClO$

1. ✖

$HBrO > HIO > HClO$

2. ✖

3. ✔ $HClO > HBrO > HIO$

4. ✖ $HIO > HClO > HBrO$

Question Number : 150 Question Id : 105615310 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 linear molecule among the following is

Options :

1. ✖ $SnCl_2$

2. ✖ $PbCl_2$

3. ✖ SO_2

4. ✔ XeF_2

Question Number : 151 Question Id : 105615311 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) : In general, transition metals have high melting points.

Reason (R) : More number of electrons from '(n-1)d' and 'ns' are involved in interatomic metallic bonding.

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 : 152 Question Id : 105615312 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

Among the given complexes that possess "CO" ligand bridges are

$[Co_2(CO)_8]$ I $\quad [Fe_3(CO)_{12}]$ II $\quad [Mn_2(CO)_{10}]$ III $\quad [Fe_2(CO)_9]$ IV

Options :

1. ✖ I, II and III

2. ✖ II, III and IV

3. ✔ I, II and IV

4. ✖ I, III and IV

Question Number : 153 Question Id : 105615313 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 sucrose needed to produce 1 mole of glucose using acid hydrolysis is

Options :

1. ✖ 360 g

2. ✖ 180 g

342 g

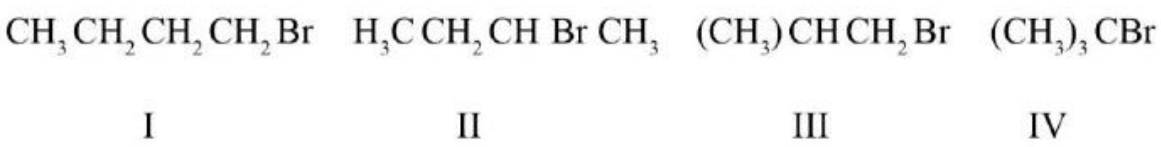
3. ✔

171 g

4. ✖

Question Number : 154 Question Id : 105615314 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 dilute aqueous KOH in S_N1 reaction is



I II III IV

Options :

$I < IV < III < II$

1. ✖

$IV < II < III < I$

2. ✖

$III < II < I < IV$

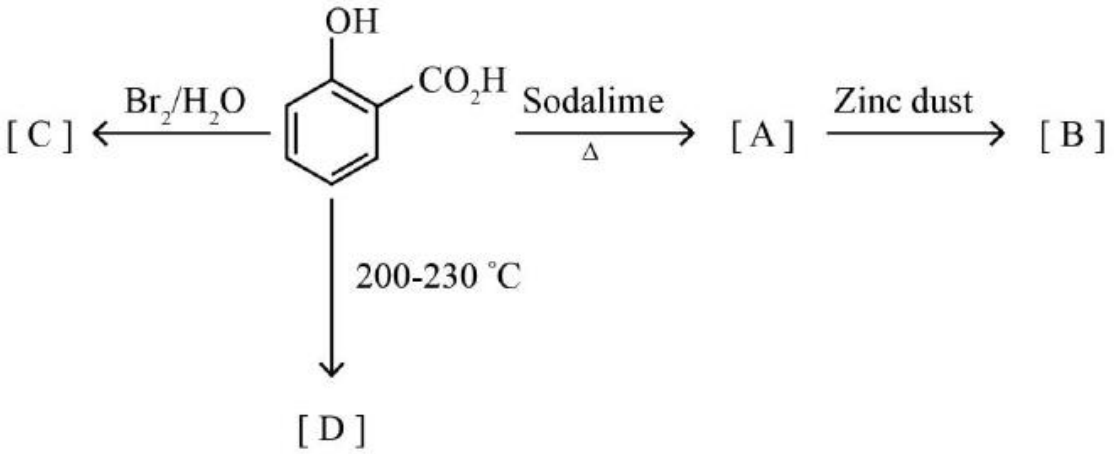
3. ✖

$I < III < II < IV$

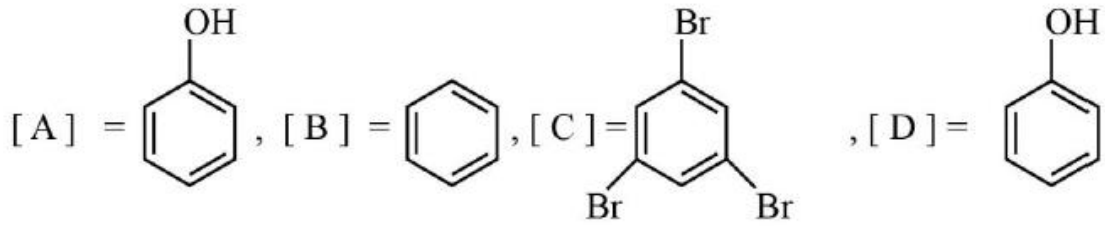
4. ✔

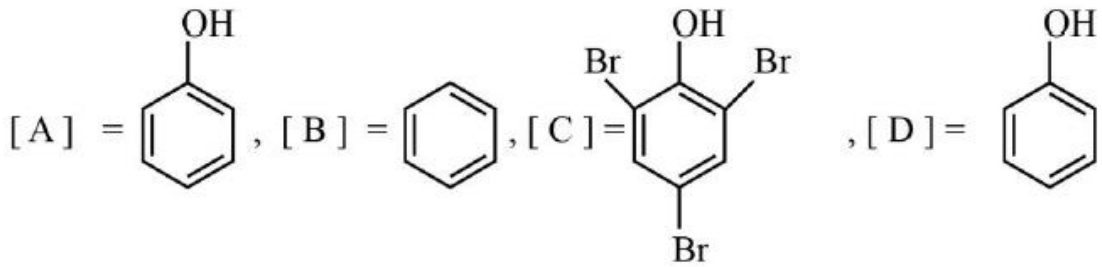
Question Number : 155 Question Id : 105615315 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

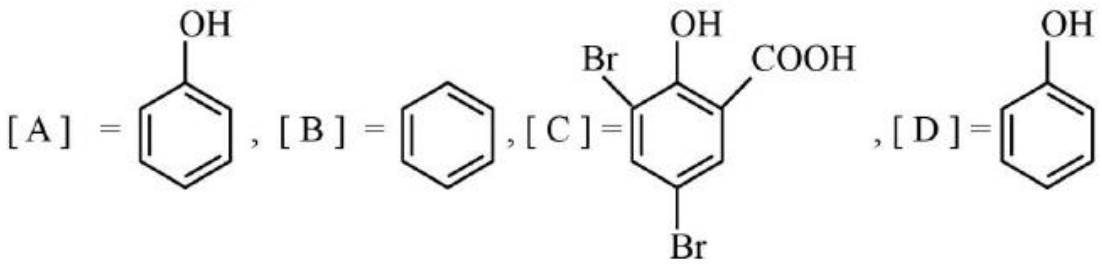
A, B, C, D in the following reactions are

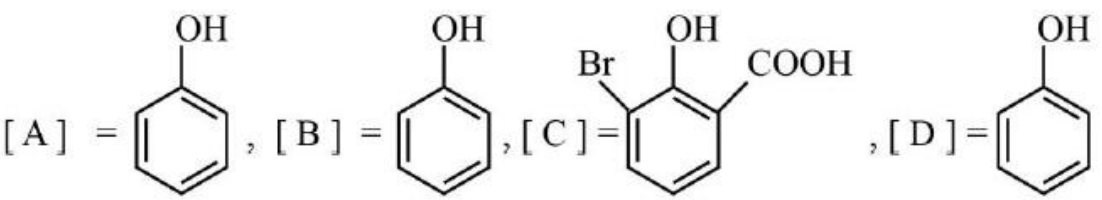


Options :

1. ✖ 

2. ✔ 

3. ✖ 

4. ✖ 

Question Number : 156 Question Id : 105615316 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 are correct for phenol?

(A) In general, phenol is more acidic than alcohol.
(B) Phenol is used in the production of melamine plastic.
(C) Phenol gives violet colour with neutral ferric chloride solution.
(D) Phenol when heated with acetyl chloride gives phenetole.

Options :

1. ✖ C and D

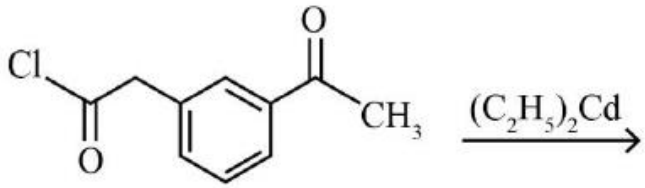
2. ✖ A and D

3. ✖ B and C

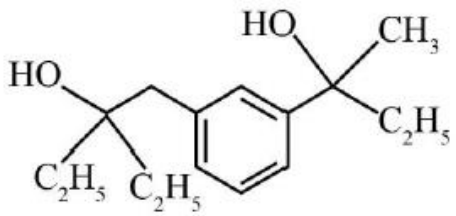
4. ✔ A and C

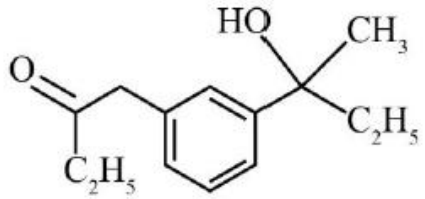
Question Number : 157 Question Id : 105615317 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The major product in the following reactions is

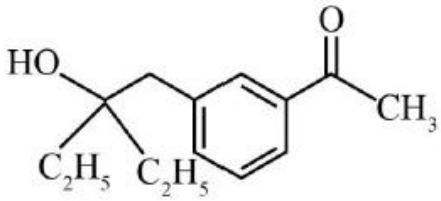


Options :

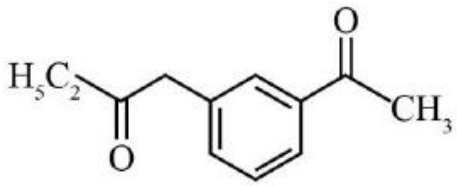
1. ✖ 



2. ✖



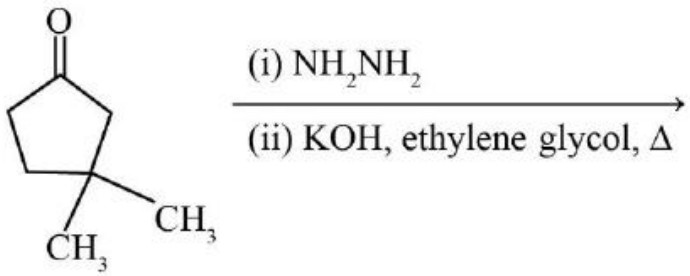
3. ✖



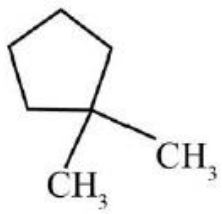
4. ✔

Question Number : 158 Question Id : 105615318 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

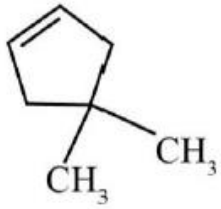
The major product of the following reaction is

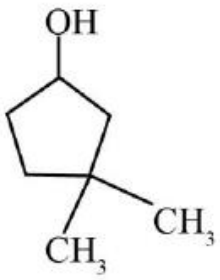


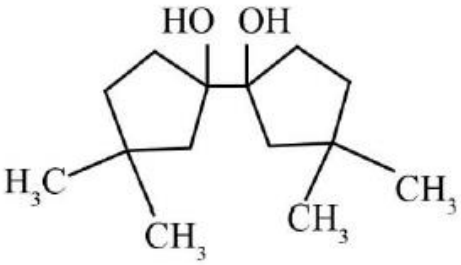
Options :



1. ✔

2. ✖ 

3. ✖ 

4. ✖ 

Question Number : 159 Question Id : 105615319 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

n–Propanol on treatment with concentrated HBr gives P. The product P on reaction with KCN gave the product Q. The product Q on heating with aqueous acidic solution, furnished the product R. The product 'R' is

Options :

1. ✖ Propanoic acid

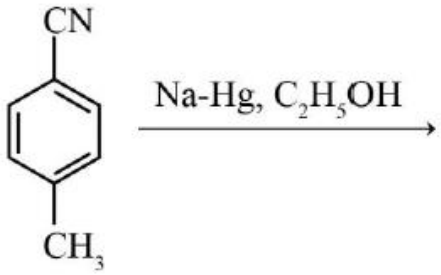
2. ✖ Propanamide

3. ✔ Butanoic acid

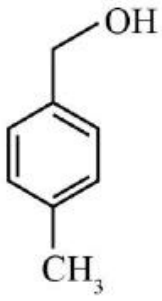
4. ✖ Butanamide

Question Number : 160 Question Id : 105615320 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 of the following synthetic sequence is

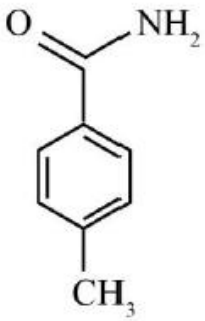


Options :

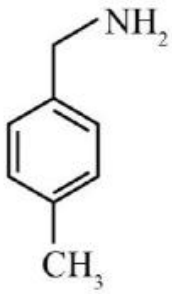


1. ✖

2. ✖



3. ✖



4. ✔