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 20th Jul 2022 Shift 2
Subject Name :	Engineering (English)
Creation Date :	2022-07-21 14:44:06
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 :	1056158
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 :	10561522
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 :	10561522
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 1056151121 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✔ ϕ

2. ✖ $\mathbb{R}$

3. ✖ $\mathbb{Z}$

4. ✖ $\mathbb{R}-\mathbb{Z}$

Question Number : 2 Question Id : 1056151122 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $\leq x$, then the range of the real valued function $f(x)=\frac{1}{\sqrt{x-[x]}}$ is

Options :

1. ✖ $[0,1)$

$(0,1)$

2. ✖

$(1,\infty)$

3. ✔

$[1,\infty)$

4. ✖

Question Number : 3 Question Id : 1056151123 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 2×2 matrix such that $\det A = -21$ and trace of A^3 is 2024, then the trace of A is

Options :

6

1. ✖

11

2. ✔

12

3. ✖

13

4. ✖

Question Number : 4 Question Id : 1056151124 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $\begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$ is a skew symmetric matrix and b, c, f are non-zero real numbers then $\frac{b}{c} =$

Options :

1. $\frac{dh}{fg}$ ✖

2. $\frac{df}{gh}$ ✖

3. $\frac{-df}{gh}$ ✖

4. $\frac{-dh}{fg}$ ✔

Question Number : 5 Question Id : 1056151125 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 the matrix $\begin{bmatrix} -1 & x & 3 \\ -4 & -5 & -6 \\ -7 & y & 9 \end{bmatrix}$, if the cofactors of –6 and –7 are respectively 22 and 27, then $5x + y =$

Options :

1. 0 ✖

2. –1 ✖

-2

3. ✔

-4

4. ✖

Question Number : 6 Question Id : 1056151126 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 the simultaneous linear equations $\beta x+\alpha y-z=-1,\ 3x-\beta y+\alpha z=0$ $\alpha x+\beta y+z=1$. In the usual notation used in Crammer's rule, given that $\frac{\Delta_1}{\Delta}=-1,\ \frac{\Delta_2}{\Delta}=1,\ \frac{\Delta_3}{\Delta}=2$, then $(\alpha,\beta)=$

Options :

$(1,2)$

1. ✖

$(2,1)$

2. ✔

$(-1,\ 2)$

3. ✖

$(1,\ -2)$

4. ✖

Question Number : 7 Question Id : 1056151127 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $\begin{vmatrix} 2+3i & i \\ 1-2i & -i \end{vmatrix} = x+iy$, then $x+y=$

Options :

1. ✔ -2

2. ✖ -4

3. ✖ -8

4. ✖ 4

Question Number : 8 Question Id : 1056151128 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 are the roots of the equation $x^2-2x+2=0$ then $\alpha^{2020}+\beta^{2020}=$

Options :

1. ✖ 2^{1011}

2. ✔ -2^{1011}

3. ✖ 2^{2021}

4. ✖ 2^{-2021}

Question Number : 9 Question Id : 1056151129 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $z=\frac{-1-i\sqrt{3}}{2}$, then $\sum_{k=1}^{2022}\left(z^k+\frac{1}{z^k}\right)^2=$

Options :

1. 0 ✖

2. 2022 ✖

3. 4044 ✔

4. 1011 ✖

Question Number : 10 Question Id : 1056151130 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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) : The set of solutions of $|x|^2-4|x|+3<0$ is the interval $(-3,3)$.

Statement (II) : If $x<3$ or $x>5$ then $x^2-8x+15>0$.

Which of the above statements is(are) true?

Options :

1. Statement I is true, but Statement II is false ✖

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 : 11 Question Id : 1056151131 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $6x - x^2 + 12$ attains its extreme value β at $x = \alpha$ then β =

Options :

7α

1. ✔

5α

2. ✖

3α

3. ✖

α

4. ✖

Question Number : 12 Question Id : 1056151132 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let α be a common root of the equations $x^3 - 2x - 25\lambda = 0$, $3x^3 - 8x - \frac{175}{3}\lambda = 0$ and $\lambda > 0$. Then λ =

Options :

1. $\frac{3}{\sqrt{5}}$ ✖

2. $\frac{\sqrt{3}}{5\sqrt{5}}$ ✖

3. $\frac{3}{5\sqrt{5}}$ ✔

4. $\frac{3\sqrt{5}}{5}$ ✖

Question Number : 13 Question Id : 1056151133 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 sum of two roots of the equation $x^3 - 7px^2 + 5qx - 6r = 0$ is zero, then

Options :

1. $5p = \frac{6q}{7r}$ ✖

2. $5q = \frac{6r}{7p}$ ✔

3. $5r = \frac{6p}{7q}$ ✖

4. $pqr = 35$ ✖

Question Number : 14 Question Id : 1056151134 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 are the irrational roots of the equation $3p^2x^3 + px^2 + qx + 3 = 0$ when $p = 1$ and $q = -7$ then $|\alpha - \beta| =$

Options :

1. $\frac{3\sqrt{13}}{2}$ ✖

2. $\frac{\sqrt{3}}{2}$ ✖

3. $\frac{2\sqrt{13}}{3}$ ✔

4. 4 ✖

Question Number : 15 Question Id : 1056151135 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 roots of a cubic equation $f(x) = 0$ are diminished by $\frac{-3}{2}$ so as to remove the term containing x^2 and the transformed equation is $8x^3 - 54x - 78 = 0$. Then the equation $f(x) = 0$ is

Options :

1. $2x^3 - 9x^2 - 6 = 0$ ✔

2. $2x^3 - 9x^2 - 27x - 6 = 0$ ✖

$8x^3+3x^2-6=0$

3. ✖

$8x^3-9x^2+12x-15=0$

4. ✖

Question Number : 16 Question Id : 1056151136 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $m_{P_r}-(m-1)_{P_r}=a\cdot(m-1)_{P_s}$, then $a-s=$

Options :

1

1. ✔

0

2. ✖

$m-1$

3. ✖

$m-r$

4. ✖

Question Number : 17 Question Id : 1056151137 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 ways of selecting 4 letters from all the letters of the word TSEAMCET is

Options :

12

1. ✖

13

2. ✖

26

3. ✖

36

4. ✔

Question Number : 18 Question Id : 1056151138 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Numerically greatest term in the expansion of $(2x-3y)^{11}$ when $x=\frac{1}{3}$ and $y=\frac{1}{2}$ is

Options :

$^{11}C_8\left(\frac{2}{3}\right)^5$

1. ✖

$^{11}C_3\left(\frac{3}{2}\right)^5$

2. ✔

$^{11}C_2\left(\frac{3}{2}\right)^7$

3. ✖

$^{11}C_2\left(\frac{2}{3}\right)^7$

4. ✖

Question Number : 19 Question Id : 1056151139 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $\frac{x-2}{x^2(2x-3)} = \frac{A}{x} + \frac{B}{x^2} + \frac{C}{2x-3}$ then $2(A - C) =$

Options :

1. ✖ 3B

2. ✖ 2B

3. ✖ 0

4. ✔ B

Question Number : 20 Question Id : 1056151140 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $\frac{x^2-x+1}{(x^2+1)(x^2+x+1)} = \frac{Ax+B}{x^2+1} + \frac{Cx+D}{x^2+x+1}$ then $A + 2B + C + 2D =$

Options :

1. ✖ 0

2. ✖ 1

3. ✖ −1

4. ✔ 2

Question Number : 21 Question Id : 1056151141 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

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 $\text{Sin } A = \frac{-7}{25}$, $\cos B = \frac{8}{17}$, A does not lie in the 3rd quadrant and B does not lie in the 1st quadrant, then $8 \tan A - 5 \cot B =$

Options :

1. ✖ 0

2. ✔ $\frac{1}{3}$

3. ✖ $\frac{1}{2}$

4. ✖ 1

Question Number : 22 Question Id : 1056151142 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $\sin\theta - \cos\theta = \frac{1}{\sqrt{3}}$, then $\sin(2\theta) + \cos(4\theta) + \sin(6\theta) =$

Options :

1. ✖ $\frac{37}{27}$

2. ✖ $\frac{-37}{27}$

3. ✖ $\frac{-43}{27}$

$\frac{43}{27}$

4. ✔

Question Number : 23 Question Id : 1056151143 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $a\tan\alpha + b\tan\beta = (a+b)\tan\left(\frac{\alpha+\beta}{2}\right)$ and $\alpha - \beta \neq 2n\pi$ then $\frac{\cos\beta}{\cos\alpha} =$

Options :

$\frac{a}{b}$

1. ✖

$\frac{a+b}{a-b}$

2. ✖

$\frac{a^2-b^2}{a^2+b^2}$

3. ✖

$\frac{b}{a}$

4. ✔

Question Number : 24 Question Id : 1056151144 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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) : $\cot hx = \frac{1-k}{1+k}\ (0 < k < 2)$.

Reason(R) : The graph of $y = \tan h\, x$ always lies between the lines $y = -1$ and $y = 1$.

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 : 25 Question Id : 1056151145 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $\frac{5\sinh 2x}{7+6\cosh 2x}=\frac{3}{2}$, then $3\tanh^2 x+20\ \tanh x=$

Options :

1. ✖ 13

2. ✖ 26

3. ✔ 39

4. ✖ $\frac{13}{2}$

Question Number : 26 Question Id : 1056151146 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $a = 7,\ b = 8,\ \tan C = \frac{3\sqrt{5}}{2}$ and C is an acute angle, then $c =$

Options :

1. ✖ $\sqrt{145}$

2. ✖ 5

3. ✖ 11

4. ✔ 9

Question Number : 27 Question Id : 1056151147 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

In a triangle ABC, if $\frac{a}{\tan A} = \frac{b}{\tan B} = \frac{c}{\tan C}$ then $\cos^2 A + \cos^2 B + \cos^2 C =$

Options :

1. ✖ $\sqrt{2}$

2. ✔ $\frac{3}{4}$

3. ✖ $\frac{\sqrt{3}+1}{2}$

$\frac{2\sqrt{3}-1}{2}$

4. ✖

Question Number : 28 Question Id : 1056151148 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $a=7, b=10, c=11$, then $\frac{R}{r}=$

Options :

1. ✖ 14

2. ✖ 77

3. ✖ $\frac{24}{11}$

4. ✔ $\frac{55}{24}$

Question Number : 29 Question Id : 1056151149 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 ABC be a triangle and $\bar{a}, \bar{b}, \bar{c}$ be the position vectors of A, B, C respectively. Let D divide BC in the ratio 3:1 internally and E divide AD in the ratio 4:1 internally. Let BE meet AC in F. If E divides BF in the ratio 3 : 2 internally then the position vector of F is

Options :

1. ✖ $\frac{\bar{a}+\bar{b}+\bar{c}}{3}$

2. ✖ $\frac{\bar{a}-2\bar{b}+3\bar{c}}{2}$

3. ✖ $\frac{\bar{a}+2\bar{b}+3\bar{c}}{2}$

4. ✔ $\frac{\bar{a}-\bar{b}+3\bar{c}}{3}$

Question Number : 30 Question Id : 1056151150 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 real numbers such that $\left(\frac{7}{3}+\beta\right)\bar{i}-\bar{j}+(\alpha+\gamma)\bar{k}=\frac{5}{3}\left(\alpha\bar{i}+\bar{j}-\bar{k}\right)$ $+\beta\left(2\bar{j}+\bar{k}\right)+\left(\bar{i}+\gamma\bar{j}+3\bar{k}\right)$, then $5\alpha-9\beta+13\gamma=$

Options :

1. ✖ 4

2. ✔ 12

3. ✖ 0

4. ✖ 15

Question Number : 31 Question Id : 1056151151 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $\bar{r}=(2-\lambda+\mu)\bar{i}+(1-\mu)\bar{j}+(2-3\lambda+2\mu)\bar{k}$ is the vector equation of a plane, then the equivalent cartesian equation of the plane is

Options :

1. ✔ $3x+y-z=5$

2. ✖ $3x-y+z=5$

3. ✖ $-3x+y+z=5$

4. ✖ $3x-y-z=5$

Question Number : 32 Question Id : 1056151152 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $\bar{a}=2\bar{i}+\bar{j}-\bar{k},\ \bar{b}=\bar{i}-\bar{j}+3\bar{k},\ \bar{x}=\left(\frac{\bar{a}\cdot\bar{b}}{|\bar{b}|^2}\right)\bar{b},\ \bar{y}=\left(\frac{\bar{a}\cdot\bar{b}}{|\bar{a}|^2}\right)\bar{a}$ and θ is angle between $\bar{a}$ and $\bar{b}$, then $x^2+y^2=$

Options :

1. ✔ $17\cos^2\theta$

2. ✖ $\left(\sqrt{6}+\sqrt{11}\right)\cos^2\theta$

3. ✖ $17\cos 2\theta$

$17 \sin^2 \theta$

4. ✖

Question Number : 33 Question Id : 1056151153 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 a plane passing through the point $\bar{i}+\bar{j}+\bar{k}$ and perpendicular to the vector $-\bar{j}+2\bar{k}$. Let the line L passing through the points $3\bar{i}-2\bar{j}+\bar{k}$ and $-\bar{i}+3\bar{j}+\bar{k}$ be a normal to the plane π_2. If the angle between the planes π_1 and π_2 is θ then $\cos\theta =$

Options :

$\sqrt{\frac{5}{41}}$

1. ✔

$\frac{-14}{\sqrt{205}}$

2. ✖

$\frac{\pi}{4}$

3. ✖

$\frac{\pi}{2}$

4. ✖

Question Number : 34 Question Id : 1056151154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Three non-coplanar vectors $\bar{a}, \bar{b}, \bar{c}$ are the coterminous edges of a parallelepiped. If $\bar{a}$ and $\bar{b}$ determine the base of the parallelepiped then its height is

Options :

$$\frac{\left|\left[\bar{a}\,\bar{b}\,\bar{c}\right]\right|}{\left|\bar{b}\times\bar{c}\right|}$$

1. ✖

$$\frac{\left|\left[\bar{a}\,\bar{b}\,\bar{c}\right]\right|}{\left|\bar{a}\times\bar{b}\right|}$$

2. ✔

$$\frac{\left|\left[\bar{a}\,\bar{b}\,\bar{c}\right]\right|}{\left|\bar{a}\times\bar{c}\right|}$$

3. ✖

$$\frac{\left|\left[\bar{a}\,\bar{b}\,\bar{c}\right]\right|}{\left|\bar{b}+\bar{c}\right|}$$

4. ✖

Question Number : 35 Question Id : 1056151155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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) : The range of the ungrouped data does not change even if certain intermediate observations are removed.

Statement (II) : The value of the mean deviation of an ungrouped data about the median is always less than or equal to the value of the mean deviation computed about any other measure of central tendency.

Statement (III): For a grouped data, range is approximated as the difference between the lower limit of the largest class and the upper limit of the smallest class.

Options :

Statements I and II are true but statement III is false

1. ✔

Statements II and III are true but statement I is false

2. ✖

Statement III and I are true but statement II is false

3. ✖

Statements I, II and III are true

4. ✖

Question Number : 36 Question Id : 1056151156 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 probability of getting a king and a spade card when two cards are drawn simultaneously from a pack of 52 playing cards is

Options :

$\frac{1}{26}$

1. ✔

$\frac{8}{221}$

2. ✖

$\frac{2}{51}$

3. ✖

$\frac{1}{52}$

4. ✖

Question Number : 37 Question Id : 1056151157 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 cards are drawn from a pack of 52 playing cards one after the other. If p_1 is the probability of getting a queen in the first draw and a diamond card in the second draw when the first card drawn is replaced and p_2 is the probability of the same event when the first card drawn is not replaced. Then $\frac{p_1}{p_2} =$

Options :

1. ✔ 1

2. ✖ 2

3. ✖ 3

4. ✖ 4

Question Number : 38 Question Id : 1056151158 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Bag A contains 4 white and 2 black balls, bag B contains 3 white and 3 black balls and bag C contains 2 white and 4 black balls. If a bag is chosen at random and a ball is chosen at random from it, then the probability that the ball drawn is black is

Options :

1. ✖ $\frac{1}{3}$

2. ✖ $\frac{3}{4}$

3. ✔ $\frac{1}{2}$

$\frac{2}{3}$

4. ✖

Question Number : 39 Question Id : 1056151159 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 random variable X has the following probability distribution

$X = x_i$:	1	2	3	4	5	6	7	8	9
$P(X = x_i)$:	10k	9k	8k	8k	6k	5k	4k	3k	k

where k is a real number.

If A = $\{x_i \mid x_i$ is a prime number$\}$ and

B = $\{x_i \mid x_i > 5\}$ are two events, then $P(A \cup B) =$

Options :

$\frac{2}{3}$

1. ✔

$\frac{4}{9}$

2. ✖

$\frac{1}{27}$

3. ✖

$\frac{5}{6}$

4. ✖

Question Number : 40 Question Id : 1056151160 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 is a Poisson variate such that $\frac{5}{3}k = P(X = 2) = P(X = 3)$, then $P(X = 5) =$

Options :

k

1. ✖

$\frac{1}{4}k$

2. ✖

$\frac{1}{2}k$

3. ✖

$\frac{3}{4}k$

4. ✔

Question Number : 41 Question Id : 1056151161 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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(–4, 0) and B(4, 0) are two fixed points. C and D are two points on Y-axis such that CD = 4 and C is a point below D. Then the locus of the point of intersection of the lines AC and BD is

Options :

$x^2 - y^2 - xy = 0$

1. ✖

$x^2 + 2xy - 16 = 0$

2. ✔

$(x+y)^2 - 16 = 0$

3. ✖

$2xy = 16 + y^2 + x^2$

4. ✖

Question Number : 42 Question Id : 1056151162 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

By rotating the axes through an angle of 30° in the anti-clockwise direction about the origin, the equation $4x^2+12xy+9y^2+6x+9y+2=0$ becomes $ax^2+2hxy+by^2+2gx+2fy+c=0$ then

Options :

1. $a=21-6\sqrt{3}$ ✖

2. $g/f=\frac{3+2\sqrt{3}}{3\sqrt{3}-2}$ ✔

3. $b=31+6\sqrt{3}$ ✖

4. $c=6$ ✖

Question Number : 43 Question Id : 1056151163 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 an isosceles triangle the ends of its base are $(2a, 0)$, $(0, a)$ and one of its two other sides is a horizontal line other than X-axis. If the third vertex is (x_1, y_1) then $x_1+y_1=$

Options :

1. $\frac{9a}{2}$ ✖

2. $3a$ ✖

3. $\frac{9a}{4}$ ✔

$5a$

4. ✖

Question Number : 44 Question Id : 1056151164 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $L_1 \equiv x-2y+3=0$, $L_2 \equiv 2x+y+1=0$ and $L_3 \equiv 3x+y+c=0$ are concurrent and θ is the acute angle between the lines $L_1=0$ and $L_3=0$, then $\tan\theta =$

Options :

$c+2$

1. ✖

$c-5$

2. ✖

$c+5$

3. ✔

$c-2$

4. ✖

Question Number : 45 Question Id : 1056151165 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 lengths of the perpendiculars drawn from a point (a,b) to the lines $2x+3y+4=0$ and $3x-2y+4=0$ are same, then the point (a,b) lies on the line

Options :

$x-5y+8=0$ or $5x+y=0$

1. ✖

$x+5y+8=0$ or $5x-y+8=0$

2. ✖

3. ✔ $x-5y=0$ or $5x+y+8=0$

4. ✖ $x+5y=0$ or $5x-y+8=0$

Question Number : 46 Question Id : 1056151166 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $3x+6y+2=0,\ x+y+1=0,\ 2x-y+3=0$ are three given lines then the point $\left(\frac{-4}{3},\frac{1}{3}\right)$ is

Options :

1. ✖ the orthocentre of the triangle formed by the lines

2. ✔ the point of concurrence of the lines

3. ✖ the circumcentre of the triangle formed by the lines

4. ✖ the incentre of the triangle formed by the lines

Question Number : 47 Question Id : 1056151167 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If θ is the acute angle between the pair of lines $12x^2+2hxy+7y^2=0$ and $\tan\theta=\frac{8}{19}$, then $h=$

Options :

± 6

1. ✖

± 7

2. ✖

± 8

3. ✖

± 10

4. ✔

Question Number : 48 Question Id : 1056151168 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The number of real values of α for which the pair of lines represented by $\left(\alpha^2+12|\alpha|\right)x^2+6xy+\left(18-21|\alpha|\right)y^2=0$ are at right angles to each other, is

Options :

0

1. ✖

1

2. ✖

2

3. ✖

4

4. ✔

Question Number : 49 Question Id : 1056151169 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 line $x+2y-c=0$ meets the curve $x^2+y^2-3x-6y+3=0$ at two points P and Q and $\angle POQ=\frac{\pi}{2}$, where O is the origin. Then, $2c^2-15c=$

Options :

1. ✖ 15

2. ✔ -15

3. ✖ 2

4. ✖ -2

Question Number : 50 Question Id : 1056151170 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 line $4x+3y-4=0$ divides the circumference of a circle in the ratio 1 : 2. If C(5, 3) is the centre of that circle, then equation of the circle is

Options :

1. ✔ $(x-5)^2+(y-3)^2=10^2$

2. ✖ $(x-5)^2+(y-3)^2=12^2$

3. ✖ $(x-5)^2+(y-3)^2=7^2$

$(x-5)^2+(y-3)^2=8^2$

4. ✖

Question Number : 51 Question Id : 1056151171 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 sides of a square are along the lines $x=-5$ and $y=4$. The point of intersection of the diagonals is $(3,-4)$. The point of intersection of the tangents drawn to the circumcircle of the square at the two consecutive vertices lying on $x=-5$ is

Options :

$(-4,-4)$

1. ✖

$(-13,-4)$

2. ✔

$(-4,-13)$

3. ✖

$(-4,-10)$

4. ✖

Question Number : 52 Question Id : 1056151172 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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_1, L_2 and L_3 are the chords of contact of the three points (2, 0), (1, −2) and (4, 4) respectively with respect to the circle $x^2+y^2=3$, then L_1, L_2, L_3 are

Options :

concurrent lines

1. ✔

sides of a right-angled triangle

2. ✖

sides of an equilateral triangle

3. ✖

parallel lines

4. ✖

Question Number : 53 Question Id : 1056151173 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 combined equation of the direct common tangents of the circles $x^2+y^2+2x=0$ and $x^2+y^2-2y-3=0$ is

Options :

$xy+x+2y+2=0$

1. ✔

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

2. ✖

$2x^2+5xy+2y^2+13x+14y+20=0$

3. ✖

$2x^2-9xy+9y^2+3x-6y+1=0$

4. ✖

Question Number : 54 Question Id : 1056151174 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 (h,k) is the centre of the circle which passes through the origin and cuts the circles $x^2+y^2+4x+6y+12=0$ and $x^2+y^2+4x-6y+9=0$ orthogonally, then $k-2h=$

Options :

0

1. ✖

1

2. ✖

−1

3. ✖

5

4. ✔

Question Number : 55 Question Id : 1056151175 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $(-1, -1)$ is the radical centre of the circles $x^2 + y^2 + 2gx - 4y + 4 = 0$, $x^2 + y^2 + 6x + 2fy + 12 = 0$ and $x^2 + y^2 + 10y + 20 = 0$ then $g - f =$

Options :

0

1. ✖

−1

2. ✖

1

3. ✔

2

4. ✖

Question Number : 56 Question Id : 1056151176 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 given curve is $x^2-4x+4y-8=0$.
Match the following.

List - I		List - II	
A)	Focus	I)	$(4,2)$
B)	Vertex	II)	$(3,2)$
C)	One end of the latus rectum	III)	$(2,3)$
D)	Point of intersection of the axis and directrix	IV)	$(2,4)$
		V)	$(2,2)$

The correct match is

Options :

1. ✖

A	B	C	D
II	III	I	IV

2. ✖

A	B	C	D
IV	III	I	V

3. ✖

A	B	C	D
V	III	IV	I

4. ✔

A	B	C	D
V	III	I	IV

Question Number : 57 Question Id : 1056151177 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 one end of a focal chord of the parabola $y^2=\frac{8}{a}x(a>0)$ is at $(1,4)$, then the length of this focal chord is

Options :

$\frac{25}{8}$

1. ✖

$\frac{25}{2}$

2. ✖

$\frac{25}{4}$

3. ✖

25

4. ✔

Question Number : 58 Question Id : 1056151178 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 is the length of the latus rectum and n is the length of the major axis of the ellipse $25x^2+16y^2-150x-64y-111=0$, then the ordered pair $(m,n)=$

Options :

$\left(\frac{16}{5},10\right)$

1. ✖

$\left(\frac{32}{5},10\right)$

2. ✔

$\left(\frac{25}{2},8\right)$

3. ✖

$\left(\frac{25}{4},8\right)$

4. ✖

Question Number : 59 Question Id : 1056151179 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $P(\theta)$ and $Q\left(\frac{\pi}{2}+\theta\right)$ are two points on the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and the locus of midpoint of PQ is $\frac{x^2}{\alpha^2}+\frac{y^2}{\beta^2}=1$ then $\frac{a+b}{\alpha+\beta}=$

Options :

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

1. ✖

$\sqrt{3}$

2. ✖

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

3. ✖

$\sqrt{2}$

4. ✔

Question Number : 60 Question Id : 1056151180 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $x^2-2y^2=1$ lying on the positive X-axis. Let $P(-1,1)$ be a given point. Then the area of the triangle formed by the line PS with the coordinate axes is (in sq. units)

Options :

$$\frac{\sqrt{2}}{2\left(\sqrt{2}+3\right)}$$

1. ✖

$$\frac{\sqrt{6}}{2\left(2+\sqrt{6}\right)}$$

2. ✖

$$\frac{3}{2\left(2+\sqrt{6}\right)}$$

3. ✔

$$\frac{\sqrt{3}}{2\left(\sqrt{2}+\sqrt{3}\right)}$$

4. ✖

Question Number : 61 Question Id : 1056151181 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $P\left(\frac{\pi}{6}\right)$ is a point on the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$, S, S^1 are its foci and $SP+S'P=2\left|SP-S'P\right|$, then $e=$

Options :

$\sqrt{2}$

1. ✖

2

2. ✖

$\sqrt{3}$

3. ✔

3

4. ✖

Question Number : 62 Question Id : 1056151182 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Let $A=(1, 2, 0)$, $B=(2, 0, -1)$, $C=(0, -2, 3)$ and $D=(-1, 2, -3)$ be four points in the space. Let G_1 be the centroid of triangle ABC and G_2 be the centroid of tetrahedron ABCD. If P divides $G_1 G_2$ in the ratio 4 : 3 internally then P =

Options :

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

1. ✔

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

2. ✖

$\left(\frac{4}{7}, \frac{-2}{7}, \frac{1}{7}\right)$

3. ✖

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

4. ✖

Question Number : 63 Question Id : 1056151183 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 d.r.'s of two lines are connected by the relations $a - b + c = 0$, $a^2 - b^2 + 2c^2 = 0$ and θ is the angle between these lines then $\cos\theta =$

Options :

1. ✔ $\frac{2}{\sqrt{7}}$

2. ✖ $\frac{3}{2\sqrt{7}}$

3. ✖ $\frac{3}{4\sqrt{2}}$

4. ✖ $\frac{1}{3\sqrt{2}}$

Question Number : 64 Question Id : 1056151184 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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, m, n are the d.c.'s of a normal to the plane passing through the points (0, 1, 2), (3, 0, 2), (4, 5, 0) then $|l|+|m|+|n| =$

Options :

1. ✖ $\frac{13}{\sqrt{91}}$

2. ✖ $\frac{11}{\sqrt{57}}$

3. ✖ $\frac{13}{\sqrt{77}}$

$$\frac{12}{\sqrt{74}}$$

4. ✔

Question Number : 65 Question Id : 1056151185 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

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

Options :

$$0$$

1. ✖

$$\infty$$

2. ✖

$$\frac{5}{7}$$

3. ✖

$$\frac{7}{9}$$

4. ✔

Question Number : 66 Question Id : 1056151186 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$$\lim_{x\to 0}\frac{4\left[\sin(2022x)-\sin(2020x)\right]}{x\left[\cos(2022x)+2\cos(2021x)+\cos(2020x)\right]}=$$

Options :

$$1$$

1. ✖

$$2$$

2. ✔

2020

3. ✖

2021

4. ✖

Question Number : 67 Question Id : 1056151187 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $f(x)=\sum_{p=1}^{7} p^2 \operatorname{Sin}^{-1}\left(\frac{4}{5}\sin(px)-\frac{3}{5}\cos(px)\right)$ then the value of $\frac{df}{dx}$ at $x=1$ is

(Given that $\operatorname{Sin}^{-1}(\sin x)=x$)

Options :

0

1. ✖

628

2. ✖

1140

3. ✖

784

4. ✔

Question Number : 68 Question Id : 1056151188 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If $y=\frac{ax+b}{cx+d}$, then $\frac{dx}{dy}=$

Options :

$$\frac{ad-bc}{(ax+b)^2}$$

1. ✖

$$\frac{ad-bc}{(a-cy)^2}$$

2. ✔

$$\frac{ad+bc}{(cx+d)^2}$$

3. ✖

$$\frac{ad+bc}{(a+cy)^2}$$

4. ✖

Question Number : 69 Question Id : 1056151189 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $x^2+y^2=t-\frac{1}{t}$, $x^4+y^4=t^2+\frac{1}{t^2}$ then $\frac{dy}{dx}=$

Options :

$$\frac{x}{y}$$

1. ✖

$$\frac{-x}{y}$$

2. ✖

$$\frac{y}{x}$$

3. ✖

$\frac{-y}{x}$

4. ✔

Question Number : 70 Question Id : 1056151190 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 tangent to the curve $x^2 + y - 7 = 4x$ at the point (1, 10) is

Options :

$y = 2x + 8$

1. ✔

$y = x + 8$

2. ✖

$y = -2x - 14$

3. ✖

$y = x - 4$

4. ✖

Question Number : 71 Question Id : 1056151191 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $x^2 - y^2 = 4$ and $y^2 = 3x$ then $\tan\theta =$

Options :

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

1. ✖

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

2. ✔

$\frac{5}{18}$

3. ✖

$\frac{5}{6}$

4. ✖

Question Number : 72 Question Id : 1056151192 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 absolute maximum value of the function $f(x) = 2x^3 - 3x^2 - 36x + 9$ defined on $[-3, 3]$ is

Options :

36

1. ✖

53

2. ✔

63

3. ✖

72

4. ✖

Question Number : 73 Question Id : 1056151193 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $f(x) = \int \frac{2 - 3\sin^2 x}{1 + \cos 2x} dx$ and $f\left(\frac{\pi}{4}\right) = 1$ then $f(0) =$

Options :

1. $\frac{3}{8}(4-\pi)$ ✔

2. $3-\frac{\pi}{4}$ ✖

3. 0 ✖

4. 1 ✖

Question Number : 74 Question Id : 1056151194 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $x \neq (2n+1)\frac{\pi}{2}, n \in \mathbb{Z}$ and $\cos x \neq \frac{-1}{2}$ then $\int\left(\frac{\sin x+\sin 2x}{1+\cos x+\cos 2x}\right)^2 dx =$

Options :

1. $\frac{\tan^3 x}{3}-x+c$ ✖

2. $\frac{\sec^3 x}{3}-x+c$ ✖

3. $\cot x-x+c$ ✖

4. $\tan x-x+c$ ✔

Question Number : 75 Question Id : 1056151195 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Given that $\int \frac{1}{x^2+a^2}dx = \frac{1}{a}\text{Tan}^{-1}\left(\frac{x}{a}\right)+c.$

If $\int \frac{1}{x^4+3x^2+1}dx = a.\text{Tan}^{-1}\left(\frac{b\left(x^2-1\right)}{x}\right)+c\ \text{Tan}^{-1}\left(\frac{d\left(x^2+1\right)}{x}\right)+k$

where k is a constant of integration, then $5\left(c+d+ab\right)=$

Options :

1. ✔ 3

2. ✖ 5

3. ✖ 8

4. ✖ 10

Question Number : 76 Question Id : 1056151196 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

$\int_0^4 \left||x-2|-x\right| dx =$

Options :

1. ✖ 2

2. ✖ 3

3. ✔ 6

12

4. ✖

Question Number : 77 Question Id : 1056151197 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $\int_{-a}^{a} f(x)dx = \int_{0}^{a} f(x)dx + \int_{0}^{a} g(x)dx$ then $g(x) =$

Options :

$-f(x)$

1. ✖

$f(x)$

2. ✖

$f(-x)$

3. ✔

$f(x)+f(-x)$

4. ✖

Question Number : 78 Question Id : 1056151198 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

$f(x, y, c_1, c_2) = 0$ is an equation containing two arbitrary constants c_1 and c_2. If the differential equation having $f(x, y, c_1, c_2) = 0$ as its general solution is of k^{th} order, then the differential equation corresponding to $x^k + y^k = c^2$
(c is an arbitrary constant) is

Options :

$\frac{dy}{dx} + \frac{x}{y} = 0$

1. ✔

$$\frac{dy}{dx}+\frac{y}{x}=0$$

2. ✖

$$\frac{dy}{dx}-\frac{x}{y}=0$$

3. ✖

$$\frac{dy}{dx}-\frac{y}{x}=0$$

4. ✖

Question Number : 79 Question Id : 1056151199 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

If l and m are respectively the order and the degree of the differential equation $f(x)y''+g(x)y'=\frac{4y}{x}$ whose general solution is $y=ax^2+b\log x$, then $f(m)+g(m)=$

Options :

$2l$

1. ✖

l

2. ✔

$3m$

3. ✖

$l+m$

4. ✖

Question Number : 80 Question Id : 1056151200 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 $dx = (2x + 3y - 4)dy$ is

Options :

1. $2x + 6y - 3\log|4x + 6y - 5| = c$ ✖

2. $6y - 3\log|4x + 6y - 5| = c$ ✔

3. $2x + 6y - 8 - 3\log|4x + 6y - 5| = c$ ✖

4. $6x + 6y - 3\log|4x + 6y - 5| = c$ ✖

Physics

Section Id :	10561523
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 :	10561523
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 1056151201 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 fundamental forces, which one of the following is the strongest force

Options :

1. Electromagnetic force ✖

Strong Nuclear force

2. ✔

Gravitational force

3. ✖

Weak nuclear force

4. ✖

Question Number : 82 Question Id : 1056151202 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 the unit of mobility of a electron in a conductor?

Options :

$kg^{-1}s^2A^{-1}$

1. ✖

$kg^{-1}s^2A$

2. ✔

$kg^{-1}ms^2A^{-1}$

3. ✖

$kg\,ms^{-1}A^{-1}$

4. ✖

Question Number : 83 Question Id : 1056151203 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 car starts at time $t = 0$ from an initial speed of 10 m/s and accelerates uniformly with 2 m/s^2 on a straight road for time $0 \le t \le 10s$. Let S_1 and S_2 be the distance covered by the car in time $3 \le t \le 4s$ and $4 \le t \le 5s$ respectively. The ratio $\frac{S_2}{S_1}$ is

Options :

1

1. ✖

2. ✔ $\frac{19}{7}$

3. ✖ $\frac{9}{7}$

4. ✖ $\frac{5}{3}$

Question Number : 84 Question Id : 1056151204 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Particle A (which was located at the origin at time t = 0) is moving along the x – axis with a constant speed of 1 m/s. Location of particle B which is moving along the y – axis is given by $y = ct^2$, where $c = 1\ m/s^2$. Find the speed of particle A relative to particle B at t = 1 sec.

Options :

1. ✔ $\sqrt{5}$ m/s

2. ✖ 2 m/s

3. ✖ 1 m/s

4. ✖ 0 m/s

Question Number : 85 Question Id : 1056151205 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 is moving in xy – plane as $\vec{x}=\left(4t+t^2\right)\hat{i}$, $\vec{y}=\left(2t+\frac{t^2}{2}\right)\hat{j}$ where $\vec{x}$ & $\vec{y}$ are displacements measured along x and y axes respectively in meters and t in seconds. What is the velocity of the particle?

Options :

1. ✖ $\vec{v}=(4+t)\hat{i}+(2+t)\hat{j}$

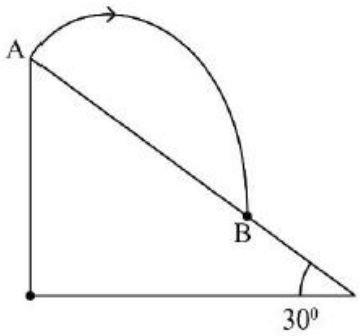
2. ✔ $\vec{v}=(4+2t)\hat{i}+(2+t)\hat{j}$

3. ✖ $\vec{v}=(4+2t)\hat{i}+\left(2+\frac{t}{2}\right)\hat{j}$

4. ✖ $\vec{v}=(4+t)\hat{i}+\left(2+\frac{t}{2}\right)\hat{j}$

Question Number : 86 Question Id : 1056151206 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 surface of a hill inclined at an angle 30° to the horizontal. A stone is thrown from the summit of the hill (point A) at an initial speed 10 m/s at angle 60° to the vertical. If the stone strikes the hill at point B as shown in the figure, the distance between A and B is
(Take g = 10 m/s^2)



Options :

1. ✖ 10 m

15 m

2. ✖

20 m

3. ✔

30 m

4. ✖

Question Number : 87 Question Id : 1056151207 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 spherical bob of mass 250g is attached to the end of a string having length 50 cm. The bob is rotated on a horizontal circular path about a vertical axis. The maximum tension that the string can bear is 72 N. The maximum possible value of angular velocity of bob (in rad/s) is

Options :

18

1. ✖

24

2. ✔

28

3. ✖

32

4. ✖

Question Number : 88 Question Id : 1056151208 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 boat of mass 1000 kg goes from rest to speed 20.0 m/s in 5.0 s. The water exerts a constant drag force and the acceleration of the boat is constant. If the average power required by the boat is 45000 W, then the magnitude of the drag force is

Options :

500 N

1. ✔

750 N

2. ✖

250 N

3. ✖

1000 N

4. ✖

Question Number : 89 Question Id : 1056151209 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 pump on the ground floor of a building can pump up water to fill a tank of volume 36 m^3 in 30 min. If the tank is 50 m above the ground, and the electric power consumed by the pump is 40 kW, the efficiency of the pump is
(Use g = 10m/s^2 and density of water = 1000 Kg /m^3)

Options :

30 %

1. ✖

25 %

2. ✔

33%

3. ✖

40 %

4. ✖

Question Number : 90 Question Id : 1056151210 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 cyclist is riding with a speed of 36 km/h. As he approaches a circular turn on the road of radius 50 m, he applies brakes and reduces his speed at the constant rate of 0.5 m/s every second. The magnitude and direction of the net acceleration of the cyclist on the circular turn respectively are

Options :

1. ✖ $\frac{\sqrt{3}}{2}$ m/s^2, $\text{Tan}^{-1}(4)$

2. ✖ $\frac{\sqrt{3}}{2}$ m/s^2, $\text{Tan}^{-1}\left(\frac{1}{4}\right)$

3. ✖ $\sqrt{17}$ m/s^2, $\text{Tan}^{-1}\left(\frac{1}{4}\right)$

4. ✔ $\frac{\sqrt{17}}{2}$ m/s^2, $\text{Tan}^{-1}(4)$

Question Number : 91 Question Id : 1056151211 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 in simple harmonic motion (S.H.M) on the end of the spring with position given by $x=(5)\cos\left(\omega t+\frac{\pi}{4}\right)$ cm. If the total mechanical energy used is 100 J to achieve maximum displacement, then the potential energy at time $t=0$ is

Options :

1. ✖ 20 J

2. ✖ 80 J

$75\ J$

3. ✖

$50\ J$

4. ✔

Question Number : 92 Question Id : 1056151212 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 : The force of attraction due to a hollow spherical shell of uniform density on a point mass situated inside it is always positive.

Statement II : The force of attraction between a hollow spherical shell of uniform density and a point mass situated outside is same just as if the entire mass of the shell is at the center of the shell.

Which of the following is correct?

Options :

Both statement I and statement II are True

1. ✖

Statement I is true, but statement II is false

2. ✖

Statement II is true, but statement I is false

3. ✔

Both statements, I and II are false

4. ✖

Question Number : 93 Question Id : 1056151213 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 work done in stretching a uniform metal wire of length from 2 m to 2.004 m with an area of cross section 10^{-6} m^2 ?
[Young's modulus of the wire = 2×10^{11} N/m^2]

Options :

1.6 J

1. ✖

0.8 J

2. ✔

8 J

3. ✖

16 J

4. ✖

Question Number : 94 Question Id : 1056151214 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 wide cylindrical vessel 50 cm in height is filled with water and rests on a table. Assuming the viscosity to be negligible, find at what height from the bottom of the vessel a small hole should be made for the water jet coming out of it to hit the surface of the table at the maximum horizontal distance from the vessel.

Options :

15 cm

1. ✖

35 cm

2. ✖

25 cm

3. ✔

10 cm

4. ✖

Question Number : 95 Question Id : 1056151215 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 spherical drop of radium r is divided in to 8 equal droplets. If the surface tension is S, then the work done in the process will be

Options :

1. $2\pi r^2 S$ ✖

2. $3\pi r^2 S$ ✖

3. $4\pi r^2 S$ ✔

4. $4\pi r^2 S^2$ ✖

Question Number : 96 Question Id : 1056151216 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 circular copper ring at 30 °C has a hole with an area of 9.98 cm^2. It is made to slip onto a steel rod of cross-sectional area of 10 cm^2, by raising the temperature of both ring and rod simultaneously by an amount ΔT. If the coefficient of linear expansion of copper and steel are 17×10^{-6}/°C and 11×10^{-6} /°C, then minimum value of ΔT should be

Options :

1. 167. 6 °C ✔

2. 133. 3 °C ✖

3. 83. 3 °C ✖

4. 249. 9 °C ✖

Question Number : 97 Question Id : 1056151217 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 : A device in which heat measurement can be made is called calorimeter.

Statement II : Skating is possible on snow due to the formation of water below the skates. Water is formed due to the increase of temperature and ice melts.

Statement III: Two bodies at different temperature are mixed in a calorimeter. Total internal energy of the two bodies remains conserved.

Which of the following is correct?

Options :

1. ✖ Statements I, II and III are true

2. ✖ Statements I is true, but statements II and III are false

3. ✖ Both statements I and II are true, but statement III is false

4. ✔ Both statements I, III are true, but statement II is false

Question Number : 98 Question Id : 1056151218 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Which of the following statements is NOT true ?

Options :

1. ✖ Specific heat capacity is dependent on nature of substance but independent of its quantity

2. ✖ Specific heat capacity depends on temperature

Specific heat capacity of water doesn't vary with temperature

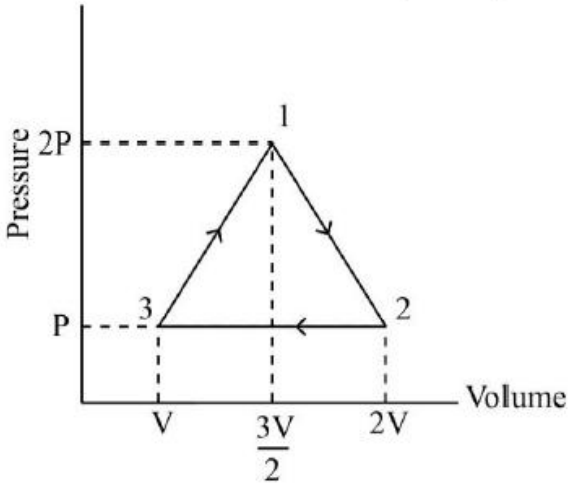
3. ✔

The SI unit of specific heat capacity is $JK^{-1}kg^{-1}$

4. ✖

Question Number : 99 Question Id : 1056151219 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 gas system is taken through the thermodynamic cyclic process $1 \rightarrow 2 \rightarrow 3 \rightarrow 1$ as shown below. The amount of heat released by the system is



Options :

$-P\frac{V}{2}$

1. ✔

PV

2. ✖

$\frac{PV}{2}$

3. ✖

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

4. ✖

Question Number : 100 Question Id : 1056151220 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 ideal gas at pressure P is enclosed in a container that is placed in a reservoir at temperature T. If the volume of the gas is increased to two times its original value, then the new pressure P^1 = ____ P

Options :

1. $\frac{1}{2}$ ✔

2. 2 ✖

3. 1 ✖

4. Cannot be determined ✖

Question Number : 101 Question Id : 1056151221 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 tube open at both ends has a fundamental frequency 'f' in air. The tube is dipped vertically in water so that half of it is in water. The new fundamental frequency is

Options :

1. f ✔

2. $\frac{f}{2}$ ✖

3. 2f ✖

4f

4. ✖

Question Number : 102 Question Id : 1056151222 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 of focal length 25 cm and made of glass with refractive index 1.5 is immersed in water. The absolute change in focal length of the glass is

[Use refractive index of water = $\frac{4}{3}$]

Options :

100 cm

1. ✖

37.5 cm

2. ✖

75 cm

3. ✔

12.5 cm

4. ✖

Question Number : 103 Question Id : 1056151223 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 Young's double slit experiment, if the distance between two slits is reduced by a factor of 2 and the wavelength of light is increased 4 times then the distance between two maxima will become _____ times the original value.

Options :

2

1. ✖

4

2. ✖

8

3. ✔

16

4. ✖

Question Number : 104 Question Id : 1056151224 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 block of mass 5 g and charge 5 μC is placed on insulated, frictionless, inclined plane of angle 60°. An electric field is applied parallel to the inclined plane. If the block remains at rest then the magnitude of electric field is
(Take g = 10 m/s^2)

Options :

$\frac{10^5}{\sqrt{3}}$ N/C

1. ✖

$\frac{5}{\sqrt{3}} \times 10^4$ N/C

2. ✖

$\sqrt{3} \times 10^4$ N/C

3. ✔

2×10^4 N/C

4. ✖

Question Number : 105 Question Id : 1056151225 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 metal spheres have their radii in the ratio of 4 : 7. They are put in contact and a charge 8.8 $\times 10^{-7}$C is given to the system. Then they are separated so that each can exert no influence on the other. The potential due to the smaller sphere at 60 m from it in Volt is

Options :

85

1. ✖

76

2. ✖

48

3. ✔

66

4. ✖

Question Number : 106 Question Id : 1056151226 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 time required to raise the temperature of 3 litre of water from 0 ˚C to 80 ˚C by a heater operated under 200 V having resistance of 50 Ω is
[specific heat capacity of water is 4200 J kg^{-1} K^{-1}] [density of water = 1000 kg/m^3]

Options :

12 min

1. ✖

18 min

2. ✖

21 min

3. ✔

24 min

4. ✖

Question Number : 107 Question Id : 1056151227 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 current density in a circular wire is given by $J(r) = (1\times10^5\ A/m^3)r$, where r is the radial distance and the wire's radius is 2 mm. If the potential applied across the wire is 70 V, then the energy consumed by the wire in 1000 seconds is

Options :

1. ✖ 25 kJ

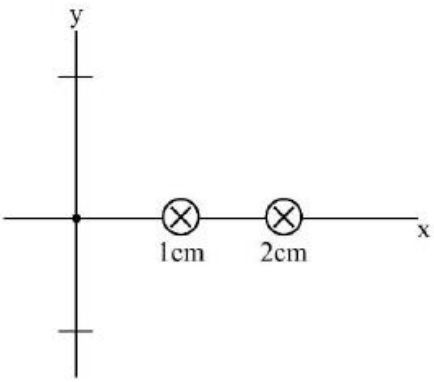
2. ✖ 30 π kJ

3. ✖ 18π kJ

4. ✔ 88 kJ

Question Number : 108 Question Id : 1056151228 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 infinitely long thin wires are placed at (1 cm, 0 cm) and (2 cm,0 cm) as shown in the figure.



The same current i flows in both the wires in the same direction, say, into the page. Let the magnetic field at the origin due to these wires is $\vec{B}$. If B_0 is the magnitude of the magnetic field if only the wire at (1cm, 0 cm) was present, then the value of B/B_0 is

Options :

3/2

1. ✔

2/3

2. ✖

1/2

3. ✖

2

4. ✖

Question Number : 109 Question Id : 1056151229 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

A toroid core has inner radius of 0.24 m and outer radius of 0.26 m. A current of 10 A flows through the wire having 2500 turns around it. Find the magnetic field inside the core of the toroid.

Options :

$\pi \times 10^{-2}\,\mathrm{T}$

1. ✖

$2\pi \times 10^{-2}\,\mathrm{T}$

2. ✖

$2 \times 10^{-2}\,\mathrm{T}$

3. ✔

$20 \times 10^{-2}\,\mathrm{T}$

4. ✖

Question Number : 110 Question Id : 1056151230 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 the magnetic meridian of a certain place, the horizontal component of the earth's magnetic field is 86.6 G (Gauss) and the magnetic field of earth is 100 G (Gauss). Then the dip angle is

Options :

1. ✖ 45°

2. ✖ 60°

3. ✔ 30°

4. ✖ 75°

Question Number : 111 Question Id : 1056151231 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 wheel of 20 metallic spokes each 40 cm long is rotated with a speed of 180 rev/min in a plane normal to the horizontal component of earth's magnetic field H_e at a place. If $H_e = 0.4$ G (Gauss) at that place, the induced emf between the axle and the rim of the wheel is

Options :

1. ✔ $192\pi \times 10^{-7}$ V

2. ✖ $256\pi \times 10^{-7}$ V

3. ✖ $148\pi \times 10^{-7}$ V

4. ✖ $110\pi \times 10^{-7}$ V

Question Number : 112 Question Id : 1056151232 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 generator produces a current of 100 A at 4000V. The voltage is stepped up to 2×10^5 V by a transformer before being sent on a high voltage transmission line of resistance 50 Ω. The percentage of power loss in the transmission line is

Options :

1. 0.25 % ✖

2. 0.05 % ✔

3. 1.25 % ✖

4. 0.02 % ✖

Question Number : 113 Question Id : 1056151233 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 plane EM wave the electric field oscillates sinusoidally at a frequency of 30 MHz and amplitude 150 V/m. Identify the correct expression of $\vec{B}$ assuming the wave is propagating along x-axis and is oscillating along y-axis.

Options :

1. $5\times10^{-7}\sin\left[\frac{x}{3}-6\times10^{+7}t\right]\hat{z}$ T ✖

2. $5\times10^{-7}\sin\left[\pi\left(\frac{x}{5}-6\times10^{+7}t\right)\right]\hat{z}$ T ✔

$$5\times10^{-7}\sin\left[\pi\left(\frac{x}{10}-3\times10^{+7}t\right)\right]\hat{z}\quad \text{T}$$

3. ✖

$$5\times10^{-7}\sin\left[\pi\left(\frac{2x}{5}-6\times10^{+8}t\right)\right]\hat{z}\quad \text{T}$$

4. ✖

Question Number : 114 Question Id : 1056151234 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 monochromatic light falls on a photo-sensitive metal, an electron is emitted with maximum velocity 1.6×10^6 m/s. Find the stopping potential.
[charge of electron = 1.6×10^{-19} C, mass of electron = 9×10^{-31}kg]

Options :

7.2 V

1. ✔

14.4 V

2. ✖

21.6 V

3. ✖

28.8 V

4. ✖

Question Number : 115 Question Id : 1056151235 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 lamp of power 942 W radiates energy uniformly in all direction. The wavelength of radiation is 660 nm. The photon flux on a small screen 5.0 m from the lamp in units of $\frac{\text{photon}}{m^2.s}$ is

(Take Planck's constant $h = 6.6\times10^{-34}$ SI unit)

Options :

1. ✖ 5×10^{20}

2. ✖ $2\pi\times10^{19}$

3. ✖ $\frac{6}{\pi}\times10^{18}$

4. ✔ 1×10^{19}

Question Number : 116 Question Id : 1056151236 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 shortest wavelength in Balmer series of hydrogen atom spectrum is approximately equal to
(use $R_H = 1.097\times10^7\ m^{-1}$)

Options :

1. ✔ 3646 $\mathring{A}$

2. ✖ 912 $\mathring{A}$

3. ✖ 364.6 $\mathring{A}$

4. ✖ 91.2 $\mathring{A}$

Question Number : 117 Question Id : 1056151237 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 will be the energy released in joule, in the process of fission by 1 mg of $^{240}_{92}U$.
Assume energy release per fission is 200 MeV.
[use Avogadro's number as 6×10^{23} and $1eV = 1.6 \times 10^{-19}$ J]

Options :

1. ✖ 6.2×10^7 J

2. ✖ 7.0×10^7 J

3. ✔ 8.0×10^7 J

4. ✖ 8.2×10^7 J

Question Number : 118 Question Id : 1056151238 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 band gap in a semi-conductor is 0.6 eV. The maximum wavelength of electromagnetic radiation which can create a hole-electron pair in this semiconductor is equal to
[Use $hc = 1242$ eV- nm]

Options :

1. ✖ 2450 nm

2. ✖ 1150 nm

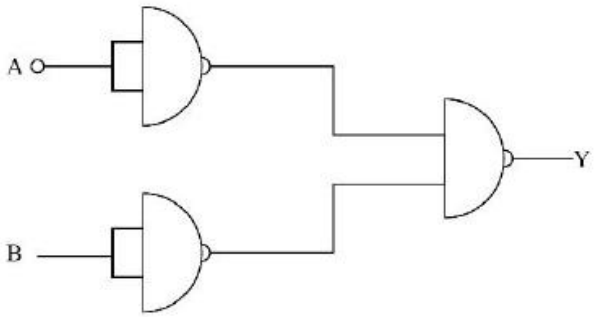
3. ✔ 2070 nm

1050 nm

4. ✖

Question Number : 119 Question Id : 1056151239 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 logic gate from the following with the same truth table characteristics of the logic circuit below.



Options :

NAND

1. ✖

NOR

2. ✖

AND

3. ✖

OR

4. ✔

Question Number : 120 Question Id : 1056151240 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 an amplitude modulated wave, the modulation index is found to be 0.5. If the maximum amplitude is found to be 10.0 V, then the minimum amplitude is

Options :

5.0 V

1. ✖

3.33 V

2. ✔

2.5 V

3. ✖

6.66 V

4. ✖

Chemistry

Section Id :	10561524
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 :	10561524
Question Shuffling Allowed :	Yes

Question Number : 121 Question Id : 1056151241 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Choose the correct statements in reference to the photoelectric effect.

a) There is no time lag between the striking of light and ejection of electrons from the metal surface.
b) The number of electrons ejected is independent of the intensity of light.
c) The elements K, Rb and Cs can show photoelectric effect when exposed to the beam of light.

Options :

a and b only

1. ✖

a and c only

2. ✔

a, b, c

3. ✖

b and c only

4. ✖

Question Number : 122 Question Id : 1056151242 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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) : Mo has the ground state electronic configuration $4d^5\ 5s^1$.

Reason (R) : Mo has the highest exchange energy among the second row transition elements.

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 : 123 Question Id : 1056151243 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 sequence is correct for decreasing order of ionic radius?

Options :

$I^- > Se^{2-} > Br^- > O^{2-} > F^-$

1. ✔

$Se^{2-} > I^- > Br^- > F^- > O^{2-}$

2. ✖

3. ✖ $I^- > Se^{2-} > O^{2-} > Br^- > F^-$

4. ✖ $Se^{2-} > I^- > Br^- > O^{2-} > F^-$

Question Number : 124 Question Id : 1056151244 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 successive ionisation energies (starting from the 1st) of an element are 801, 2430, 3660, 25,000 and 32,800 kJ mol^{-1}, respectively. The element is

Options :

1. ✔ B

2. ✖ C

3. ✖ O

4. ✖ N

Question Number : 125 Question Id : 1056151245 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 compounds with sp^2 hybridized central atom among the following are

A) H_2CO_3 B) SiF_4

C) BF_3 D) $HClO_2$

Options :

1. ✔ A and C only

2. ✖ A and B only

C and D only

3. ✖

A, B, C and D

4. ✖

Question Number : 126 Question Id : 1056151246 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 hybridisation and shape of I_3^- ion, respectively, are

Options :

sp^3d^2; distorted octahedral

1. ✖

sp^3d; linear

2. ✔

sp^3d; Trigonal bipyramid

3. ✖

dsp^3; Square pyramidal

4. ✖

Question Number : 127 Question Id : 1056151247 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

1 mole of a real gas is kept at high pressure of 100 bar at 300 K. If van der Waals constant b is 0.005 L / mol, what are the values of compressibility factor Z of the gas and % deviation of volume from ideality?

Options :

Z	% Deviation
1.10	10

1. ✖

Z	% Deviation
1.2	20

2. ✖

Z	% Deviation
1. 02	2

3. ✔

Z	% Deviation
1.2	15

4. ✖

Question Number : 128 Question Id : 1056151248 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

1 L closed flask contains a mixture of 4 g of methane and 4.4 g of carbon dioxide. The pressure inside the flask at $27\,^{\circ}C$ is [Assume ideal behaviour of gases]

Options :

8.6 atm

1. ✔

2.2 atm

2. ✖

4.2 atm

3. ✖

6.1 atm

4. ✖

Question Number : 129 Question Id : 1056151249 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Round the number 234555359 to 3 significant figures.

Options :

234000000

1. ✖

234000

2. ✖

235000000

3. ✔

234500000

4. ✖

Question Number : 130 Question Id : 1056151250 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Which of the following are disproportionation reactions?

A) $Cl_2 + 2\ NaOH \rightarrow NaCl + NaOCl + H_2O$

B) $H_2O_2 \rightarrow 2H_2O + O_2$

C) $2\ KMnO_4 \rightarrow K_2MnO_4 + MnO_2 + O_2$

D) $3MnO_4^{2-} + 4H^+ \rightarrow 2MnO_4^- + MnO_2 + 2H_2O$

Options :

A, B, C only

1. ✖

A, B, D only

2. ✔

A, C only

3. ✖

A, B, C, D

4. ✖

Question Number : 131 Question Id : 1056151251 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 bond enthalpies of heavy hydrogen, O–O and D–O are +400, +498 and +490 kJ mol^{-1}, respectively. The $\Delta_r H^\circ$ of the reaction to produce D_2O is

Options :

– 300 kJ mol^{-1}

1. ✖

– 331 kJ mol^{-1}

2. ✔

29.1 kJ mol^{-1}

3. ✖

4. ✖ $2.91\ kJ\ mol^{-1}$

Question Number : 132 Question Id : 1056151252 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 value of the equilibrium constant (K_P) for the reaction of oxygen gas oxidising ammonia gas to nitric oxide and water vapour. The pressure of each gas at equilibrium is 0.5 atm.

Options :

1. ✖ 1.5 atm

2. ✔ 0.5 atm

3. ✖ 1 atm

4. ✖ 2.5 atm

Question Number : 133 Question Id : 1056151253 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Ammonia is a Lewis base because it is

Options :

1. ✔ Electron pair donor

2. ✖ Electron pair acceptor

3. ✖ Proton donor

4. ✖ Proton acceptor

Question Number : 134 Question Id : 1056151254 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

$CaC_2 + 2\ D_2O \longrightarrow$ " P " + $Ca(OD)_2$

In the above reaction product " P " is

Options :

1. ✖ C_2H_2

2. ✖ C_2H_4

3. ✖ CD_4

4. ✔ C_2D_2

Question Number : 135 Question Id : 1056151255 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 ionic radii of the alkaline earth metals are smaller than those of alkali metals in the same period.

Reason (R) : Alkali metals have higher nuclear charge than that of the alkaline earth metals.

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 : 136 Question Id : 1056151256 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 black coloured element with ns^2np^1 outer electronic configuration cannot react with air in its crystalline form. However, in amorphous form, it gives an oxide in air which is acidic in nature. Identify the element.

Options :

1. ✔ Boron

2. ✖ Aluminium

3. ✖ Gallium

4. ✖ Indium

Question Number : 137 Question Id : 1056151257 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

The element that does not show catenation is

Options :

1. ✖ C

2. ✖ Ge

3. ✖ Sn

4. ✔ Pb

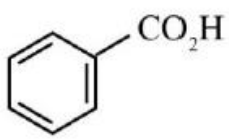
Question Number : 138 Question Id : 1056151258 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

From the following compounds, the ones which contain both sp and sp^2 hybridized carbons are

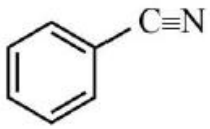
$N \equiv C - CH_2CO_2H$ (I)

$CH \equiv C - C \equiv H$ (II)

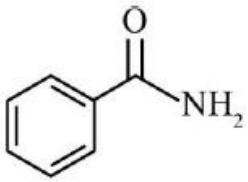
$H_2C = C = CH_2$ (III)



(IV)



(V)



(VI)

Options :

I, II and III

1. ✖

II, III and IV

2. ✖

I, III and VI

3. ✖

I, III and V

4. ✔

Question Number : 139 Question Id : 1056151259 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

1 – Chloro – 3 – methylbutane on reaction with zinc and dilute hydrochloric acid gives _____as the major product.

Options :

2– Methylbutane

1. ✔

2 – Methylbutene

2. ✖

n – pentane

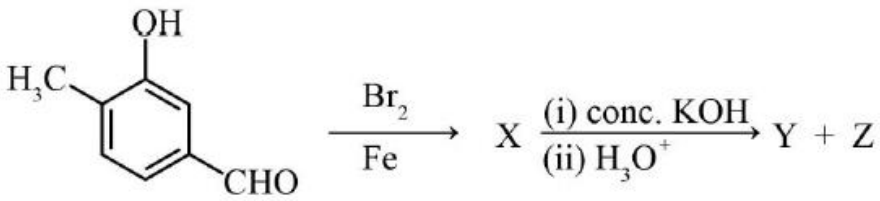
3. ✖

n – pentene

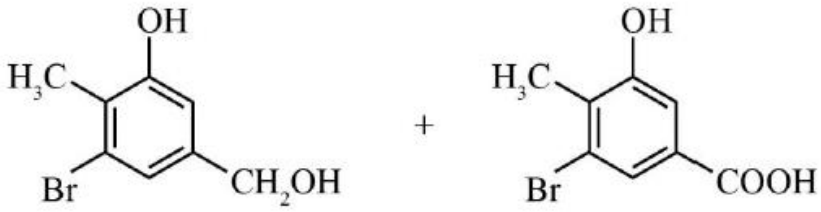
4. ✖

Question Number : 140 Question Id : 1056151260 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

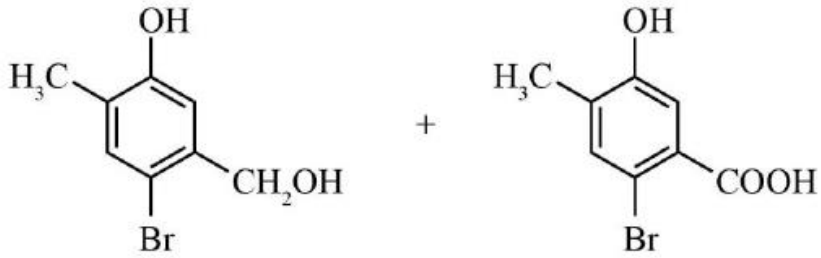
The major products Y and Z in the following reactions are



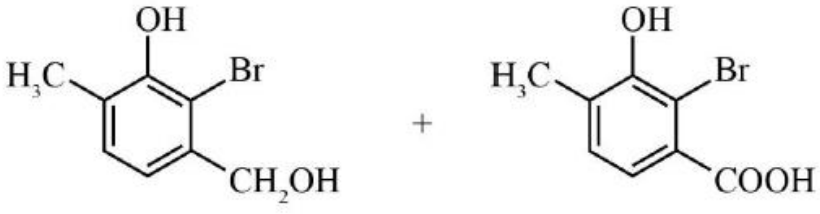
Options :



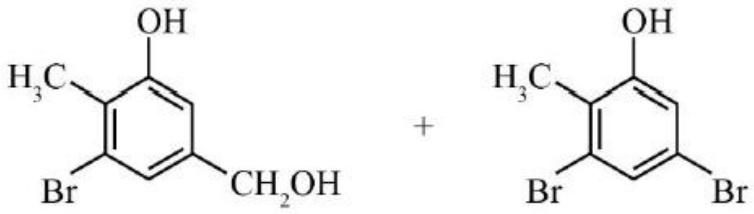
1. ✖



2. ✔



3. ✖



4. ✖

Question Number : 141 Question Id : 1056151261 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 has a structure in which 'W' atoms are located at the corners of a cubic lattice, oxygen atoms at the edge centre and Na atom at the body centre. The formula of the compound is

Options :

$NaWO_2$

1. ✖

Na_2WO_3

2. ✖

$NaWO_3$

3. ✔

$NaWO_4$

4. ✖

Question Number : 142 Question Id : 1056151262 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 2 g of NaOH is dissolved to make 200 ml solution at 25 °C, the molarity (M) at 90 °C is

Options :

$M < 0.25$

1. ✔

$0.5 > M > 0.25$

2. ✖

M = 0.25

3. ✖

0.5 < M < 1.0

4. ✖

Question Number : 143 Question Id : 1056151263 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 solvent freezes at 17 °C and it has latent heat of fusion 180 J g^{-1}. The molal depression constant of the solvent is [units of K_f = K kg mol^{-1}]

Options :

3.88

1. ✔

3.55

2. ✖

3.70

3. ✖

4.77

4. ✖

Question Number : 144 Question Id : 1056151264 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 E° of Ce^{4+} / Ce^{3+} = 1.6 V
Fe^{3+} / Fe^{2+} = 0.76 V
the E° of Fe^{3+} oxidising Ce^{3+} is

Options :

+ 0.84 V

1. ✖

– 0.84 V

2. ✔

– 2.32 V

3. ✖

+ 1.5 V

4. ✖

Question Number : 145 Question Id : 1056151265 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

For a reaction, the threshold energy is 75 kJ/mole. If the internal energy of the reactants is 20 kJ/mole, the activation energy (in kJ/mole) is

Options :

55

1. ✔

20

2. ✖

75

3. ✖

95

4. ✖

Question Number : 146 Question Id : 1056151266 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 process in which colloids, when subjected to DC electric field move towards an electrode is

Options :

Brownian movement

1. ✖

Tyndall effect

2. ✖

Peptization

3. ✖

Electrophoresis

4. ✔

Question Number : 147 Question Id : 1056151267 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Match the following

	Column – I (Reaction)		Column – II (colour of the product or nature)
A)	$FeCl_3(aq) + NH_3(aq) \longrightarrow$	I)	Green ppt
B)	$AgCl(aq) + NH_3(aq) \longrightarrow$	II)	Deep blue
C)	$Cu^{2+}(aq) + NH_3(aq) \longrightarrow$	III)	Brown ppt
		IV)	Colourless

The correct match

Options :

A	B	C
I	II	III

1. ✖

A	B	C
I	III	IV

2. ✖

A	B	C
III	IV	II

3. ✔

A	B	C
III	I	IV

4. ✖

Question Number : 148 Question Id : 1056151268 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 the following, the oxoacid with a peroxy bond is

Options :

$H_2S_2O_5$

1. ✖

$H_2S_2O_6$

2. ✖

$H_2S_2O_7$

3. ✖

$H_2S_2O_8$

4. ✔

Question Number : 149 Question Id : 1056151269 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Chlorine is allowed to react with excess of ammonia. In this, 1 mole of chlorine can oxidise 'Z' moles of NH_3. 'Z' is

Options :

$\frac{3}{8}$

1. ✖

$\frac{8}{3}$

2. ✔

$\frac{2}{3}$

3. ✖

$\frac{3}{2}$

4. ✖

Question Number : 150 Question Id : 1056151270 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 enthalpy of vaporisation of noble gases is

Options :

Xe > Kr > Ar > Ne > He

1. ✔

He > Ne > Kr > Ar > Xe

2. ✖

$Xe > Ar > He > Ne > Kr$

3. ✖

$Ne > Xe > Kr > He > Ar$

4. ✖

Question Number : 151 Question Id : 1056151271 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Choose the correct statement.
Fe^{3+} ion is more stable than Fe^{2+} ion because

Options :

More the charge on the atom, more is its stability

1. ✖

Configuration of Fe^{2+} is $3d^6$ while Fe^{3+} is $3d^5$

2. ✔

Fe^{2+} has a larger size than that of Fe^{3+}

3. ✖

Fe^{3+} ions are coloured

4. ✖

Question Number : 152 Question Id : 1056151272 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

Secondary valences of the following complexes based on their reactions with excess $AgNO_3$ are

	Formula of the complexes	Moles of AgCl precipitated per mole of complex
I)	$CoCl_3.6H_2O$	3
II)	$NiCl_3.6H_2O$	2
III)	$Co(SO_4)Br.5NH_3$	1

Options :

I	II	III
4	6	6

1. ✖

I	II	III
6	4	4

2. ✖

I	II	III
6	4	6

3. ✖

I	II	III
6	6	6

4. ✔

Question Number : 153 Question Id : 1056151273 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 aqueous solution, amino acids exist in dipolar ion form.

Reason (R) : Most of the naturally occurring amino acids have L-configuration.

The correct option among the following is

Options :

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

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

3. ✖ (A) is true but (R) is false

4. ✖ (A) is false but (R) is true

Question Number : 154 Question Id : 1056151274 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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

A)	$CH_3CH_2CH_2I \xrightarrow{aq.KOH}$	I)	SN^1
B)	$(CH_3)_3CI \xrightarrow{H_2O}$	II)	E_2
C)	$CH_3CH_2CH_2I \xrightarrow{alc.KOH}$	III)	E_1
D)	$(CH_3)_3COH \xrightarrow{H^{\oplus}}$	IV)	SN^2

The correct match is

Options :

1. ✖

A	B	C	D
I	II	III	IV

2. ✖

A	B	C	D
IV	II	III	I

3. ✔

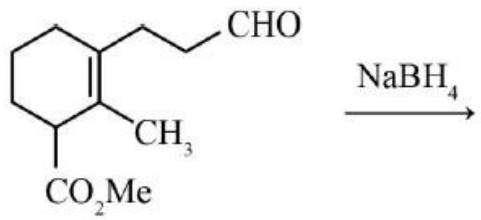
A	B	C	D
IV	I	II	III

4. ✖

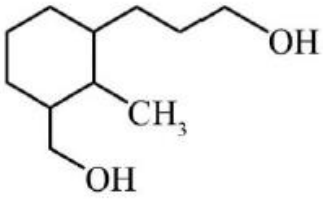
A	B	C	D
IV	II	I	III

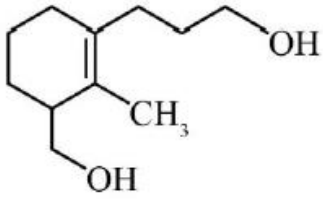
Question Number : 155 Question Id : 1056151275 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

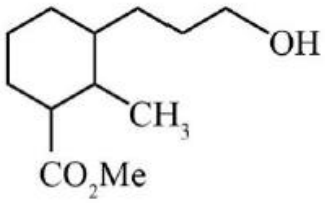
The major product in the following transformation is

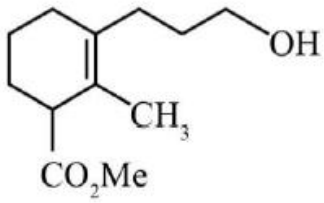


Options :

1. ✖ 

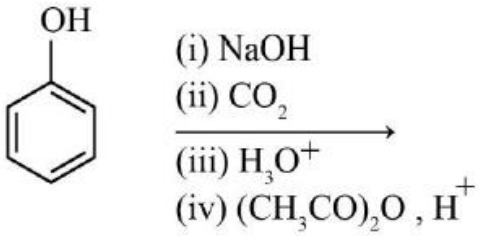
2. ✖ 

3. ✖ 

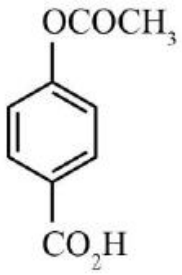
4. ✔ 

Question Number : 156 Question Id : 1056151276 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

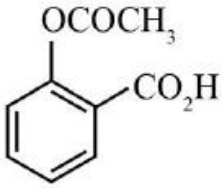
The major product of the following reaction is



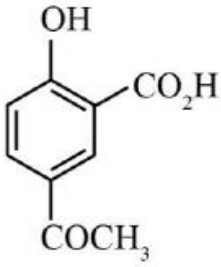
Options :



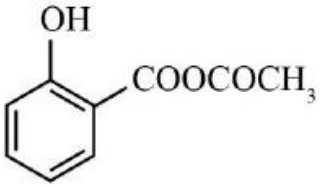
1. ✖



2. ✔



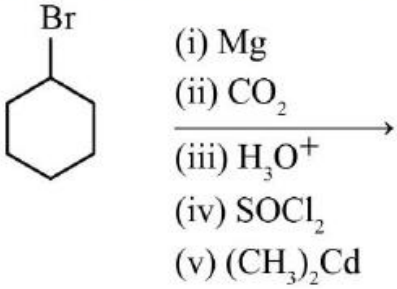
3. ✖



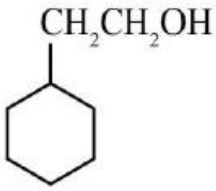
4. ✖

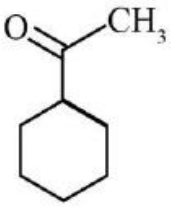
Question Number : 157 Question Id : 1056151277 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

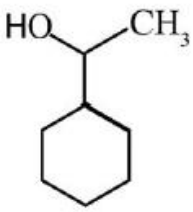
The major product of the following reactions is

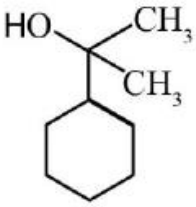


Options :

1. ✖ 

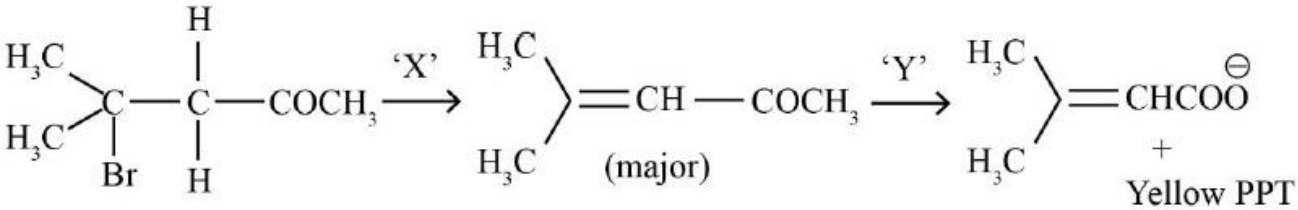
2. ✔ 

3. ✖ 

4. ✖ 

Question Number : 158 Question Id : 1056151278 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Correct Marks : 1 Wrong Marks : 0

Suitable reagents X and Y, respectively, in the following reactions are



Options :

1. ✖ aq. KOH, CrO_3

2. ✖ alc. KOH, Cu/Δ

aq. $NaHCO_3$, $KMnO_4$

3. ✖

alc. KOH, NaOI

4. ✔

Question Number : 159 Question Id : 1056151279 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 compounds

(i) $H-C\equiv C-COOH$ (ii) $CH_2=CH-COOH$

(iii) CH_3-CH_2COOH and (iv) CH_3-CH_2-OH

The correct order of acid strength is

Options :

(i) > (ii) > (iii) > (iv)

1. ✔

(iv) > (iii) > (ii) > (i)

2. ✖

(ii) > (i) > (iv) > (iii)

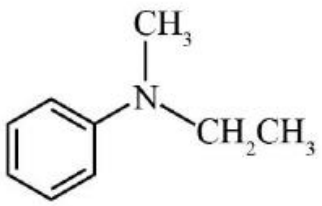
3. ✖

(iii) > (ii) > (i) > (iv)

4. ✖

Question Number : 160 Question Id : 1056151280 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes 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 IUPAC name of the below given compound?



Options :

N – Methyl – N – ethylbenzenamine

1. ✖

N – Methyl – N – phenylethanamine

2. ✖

N – Ethyl – N – Methylbenzenamine

3. ✔

N – Ethyl – N – phenylmethanamine

4. ✖