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 :	Engineering English 5th Aug 2021 Shift 1
Subject Name :	Engineering (English)
Creation Date :	2021-08-05 13:51:22
Duration :	180
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Ruler Required? :	No
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Show Watermark on Console? :	Yes
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Auto Save on Console? :	Yes

Engineering (English)

Group Number :	1
Group Id :	3426043
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

Mathematics

Section Id :	3426047
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
Sub-Section Number :	1
Sub-Section Id :	3426047
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 342604321 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A and B are subsets of $\mathbb{R}$. Every element x of A is mapped to an element of B by the rule

$$y(x)=\begin{cases}\dfrac{5x}{(x-3)(x+3)} & \text{if } x\neq -1\\ -1 & \text{if } x=-1\end{cases}$$, then A =

Options :

1. ✖ $\mathbb{R}/\{-3,+3,-0\}$

2. ✔ $\mathbb{R}/\{-3,+3\}$

3. ✖ $\mathbb{R}/\{-3,\ 3,\ 0,\ -1\}$

4. ✖ $\mathbb{R}$

Question Number : 2 Question Id : 342604322 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The domain and range of $y(x)=\cos x-3$ are respectively

Options :

1. ✖ $\mathbb{R}$ and $[-1,\ 1]$

2. ✔

$\mathbb{R}$ and $[-4,-2]$

3. ✖ $\mathbb{R}/\{0\}$ and $[0,1]$

4. ✖ $\mathbb{R}/\left\{(2n+1)\frac{\pi}{2}\right\}$ and $[-1,1]$

Question Number : 3 Question Id : 342604323 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $f(1)=0$ and $f(n+1)-f(n)=5n\ \forall n\in\mathbb{N}$ then $f(n)=$

Options :

1. ✖ $\frac{5}{2}(n^2+n)$

2. ✔ $\frac{5}{2}(n^2-n)$

3. ✖ $\frac{5}{3}(3n^2-n)$

4. ✖

$$\frac{5}{4}(4n^2-1)(n-1)$$

Question Number : 4 Question Id : 342604324 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $A=\begin{pmatrix}1 & 0 & 0\\ 0 & 2 & 0\\ 0 & 0 & 3\end{pmatrix}$, then adj(adjA) is equal to

Options :

1. ✖ A

2. ✖ $36A$

3. ✔ $6A$

4. ✖ $\frac{1}{6}A$

Question Number : 5 Question Id : 342604325 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\text{If } A=\begin{bmatrix}1 & -1 & 1\\ 2 & -1 & 0\\ 1 & 0 & 0\end{bmatrix} \text{ then } A^5 =$$

Options :

1. ✖ A

2. ✖ Identity Matrix

3. ✖ Null Matrix

4. ✔ A^{-1}

Question Number : 6 Question Id : 342604326 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let A and B be two 3×3 non singular matrices, such that $\det\left(A^TBA\right)=27$ and $\det\left(AB^{-1}\right)=8$. Then $\det\left(B^TA^{-1}B\right)=$

Options :

1. ✔ $\frac{3}{32}$

2. ✖ $\frac{1}{16}$

3. ✖ 1

4. ✖ 16

Question Number : 7 Question Id : 342604327 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $z_1 = 1-2i,\ z_2 = 1+i$ and $z_3 = 3+4i$, then $\left|\left(\frac{1}{z_1}+\frac{2}{z_2}\right)\frac{z_3}{z_2}\right| =$

Options :

1. ✖ $\frac{\sqrt{7}}{2}$

2. ✖ $\frac{\sqrt{5}}{2}$

3. ✔

$\sqrt{\frac{45}{2}}$

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

4. ✖

Question Number : 8 Question Id : 342604328 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $2+2\sqrt{3}\,i = k(\cos\theta + i\sin\theta),\ (k>0)$, then $\frac{1}{\sqrt{3}}[\cos 6\theta + i\sin 6\theta] =$

Options :

1

1. ✖

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

2. ✔

$\sqrt{3}$

3. ✖

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

4. ✖

Question Number : 9 Question Id : 342604329 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $x=\frac{4}{5}+\frac{3}{5}i,\ y=\frac{\sqrt{3}}{\sqrt{8}}-\frac{\sqrt{5}}{\sqrt{8}}i,$ then $\left(x^2+\frac{1}{x^2}\right)\left(y^2-\frac{1}{y^2}\right)=$

Options :

1. $\frac{-7\sqrt{3}}{5\sqrt{5}}i$ ✔

2. $\frac{7}{125}i$ ✖

3. $\frac{7\sqrt{3}}{5\sqrt{5}}i$ ✖

4. $\frac{\sqrt{15}}{\sqrt{8}}i$ ✖

Question Number : 10 Question Id : 342604330 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $x^2-5x-14>0 \Rightarrow x$ lie outside $[\alpha,\beta]$, then $\frac{\alpha}{\beta}=$

Options :

1. ✔ $\frac{-2}{7}$

2. ✖ $\frac{-7}{2}$

3. ✖ $\frac{2}{7}$

4. ✖ $\frac{7}{2}$

Question Number : 11 Question Id : 342604331 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

For $x \in \mathbb{R} \setminus \{-6\}$, the value of $\frac{(x+2)(x+5)}{(x+6)}$ does not lie in the interval

Options :

1. ✖ $[-9,-1]$

$[-5,-2]$

2. ✖

$(-5,-2)$

3. ✖

$(-9,-1)$

4. ✔

Question Number : 12 Question Id : 342604332 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $x=2+2^{2/3}+2^{1/3}$, then $x^3-6x^2+6x=$

Options :

3

1. ✖

2

2. ✔

1

3. ✖

0

4. ✖

Question Number : 13 Question Id : 342604333 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The roots of the cubic equation $3x^3+4x^2-5x-2=0$ are diminished by h, and a cubic equation with these diminished roots is formed. If the transformed equation does not contain x^2 term, then the roots of the transformed equation are

Options :

1. ✖ $\frac{-7}{3}, \frac{2}{3}, \frac{5}{3}$

2. ✖ $\frac{7}{3}, \frac{-2}{3}, \frac{-5}{3}$

3. ✔ $\frac{13}{9}, \frac{-14}{9}, \frac{1}{9}$

4. ✖ $\frac{-13}{9}, \frac{14}{9}, \frac{-1}{9}$

Question Number : 14 Question Id : 342604334 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $0 < r < s < n$ and $n_{p_r} = n_{p_s}$, then $r + s =$

Options :

1. $2n - 2$ ✖

2. $2n - 1$ ✔

3. 2 ✖

4. 1 ✖

Question Number : 15 Question Id : 342604335 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Three and four digit numbers are formed from the digits 1, 3, 5, 6, 8. If e_1 is number of three digit even numbers with no digit repeated and e_2 is number of four digit even numbers with no digit repeated. Also O_1 represent the number of three digit odd numbers in which no digit is repeated and O_2 represent the number of four digit odd numbers in which no digit is repeated. Then

Options :

1. $e_1 = O_1, e_2 = O_2$ ✖

$$e_1 + e_2 + O_1 + O_2 = 5p_3 + 5^3$$

2. ✖

$$\frac{e_1 + e_2}{2} = \frac{O_1 + O_2}{3} = 6^2$$

3. ✔

$$\frac{e_1 + e_2}{O_1 + O_2} = \frac{3}{2}$$

4. ✖

Question Number : 16 Question Id : 342604336 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $f(n)$ is the coefficient of x^n in the expansion of $(1+x)(1-x)^n$, then $f(2021) =$

Options :

-2019

1. ✖

2020

2. ✔

2021

3. ✖

4. ✖

-2022

Question Number : 17 Question Id : 342604337 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If p and q are respectively the coefficient of x^{-3} and x^{-5} in the expansion of $\left(x^{1/3}+\frac{1}{2x^{1/3}}\right)^{21}$, $x>0$, then $\frac{5p}{4q}=$

Options :

1. 102 ✖

2. 408 ✔

3. 182 ✖

4. 468 ✖

Question Number : 18 Question Id : 342604338 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

For $n, p \in \mathbb{N} - \{1\}$, the coefficient of x^3 in $\frac{(1-x)^{-1/p}}{(1-x)^n} =$

Options :

1. ✔ $\frac{(np+1)(np+p+1)(np+2p+1)}{p^3 \times 3!}$

2. ✖ $\frac{(np+1)(np+p)(np+2p)}{3!\ p^3}$

3. ✖ $\frac{(np+p)(np+2p)(np+3p)}{3!\ p^3}$

4. ✖ $\frac{(np+1)(np+2)(np+3)}{3!\ p^3}$

Question Number : 19 Question Id : 342604339 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $\frac{1}{(x-1)(x-2)(x-3)} = \frac{A}{x-1} + \frac{B}{x-2} + \frac{C}{x-3}$, and $\frac{x}{(x-1)(x-2)(x-3)} = \frac{P}{x-1} + \frac{Q}{x-2} + \frac{R}{x-3}$ then $A + 2B + 3C =$

Options :

$P+Q+R$

1. ✔

$P+2Q+3R$

2. ✖

$3P+2Q+R$

3. ✖

$AP+BQ+CR$

4. ✖

Question Number : 20 Question Id : 342604340 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$2(\sin^6\theta+\cos^6\theta)-3(\sin^4\theta+\cos^4\theta)=$$

Options :

-1

1. ✔

1

2. ✖

0

3. ✖

12

4. ✖

Question Number : 21 Question Id : 342604341 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$\left(\frac{\sin 35^\circ}{\cos 55^\circ}\right)^2+\left(\frac{\cos 55^\circ}{\sin 35^\circ}\right)^2-2\cos 30^\circ =$$

Options :

$2+\sqrt{3}$

1. ✖

$2-\sqrt{3}$

2. ✔

$2\sqrt{3}$

3. ✖

$3\sqrt{2}$

4. ✖

Question Number : 22 Question Id : 342604342 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\text{If } \cos\theta = \frac{-3}{5} \text{ and } \pi < \theta < 3\pi/2 \text{ , then } \tan\left(\frac{\theta}{2}\right) =$$

Options :

2

1. ✖

-2

2. ✔

1

3. ✖

-1

4. ✖

Question Number : 23 Question Id : 342604343 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\frac{1-\tan^2 15^\circ}{1+\tan^2 15^\circ} =$$

Options :

1

1. ✖

$\sqrt{3}$

2. ✖

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

3. ✔

2

4. ✖

Question Number : 24 Question Id : 342604344 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $6\cos 2\theta + 2\cos^2\left(\frac{\theta}{2}\right) + 2\sin^2\theta = 0,\ -\pi < \theta < \pi$, then $\theta =$

Options :

$\frac{\pi}{3}$

1. ✖

$\frac{\pi}{3}, \text{Cos}^{-1}\left(\frac{3}{5}\right)$

2. ✖

$\text{Cos}^{-1}\left(\frac{3}{5}\right)$

3. ✖

4. ✔ $\pm\frac{\pi}{3},\pm\left(\pi-\text{Cos}^{-1}\frac{3}{5}\right)$

Question Number : 25 Question Id : 342604345 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$\sin\left(\text{Tan}^{-1}\frac{4}{5}+\text{Tan}^{-1}\frac{4}{3}+\text{Tan}^{-1}\frac{1}{9}-\text{Tan}^{-1}\frac{1}{7}\right)=$$

Options :

1. ✖ $\frac{1}{2}$

2. ✖ $\frac{1}{\sqrt{2}}$

3. ✖ $\frac{\sqrt{3}}{2}$

4. ✔ 1

Question Number : 26 Question Id : 342604346 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let $k>0$ and $t=\text{Sech}^{-1}\left(\frac{1}{2}\right)-\text{Cosech}^{-1}\left(\frac{3}{k}\right)$. If $3e^{t}=2+\sqrt{3}$, then $k=$

Options :

2

1. ✖

4

2. ✔

$3\sqrt{3}$

3. ✖

$3\sqrt{2}$

4. ✖

Question Number : 27 Question Id : 342604347 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a Δ ABC, if $4a=b+c$, then $\tan\frac{B}{2}\tan\frac{C}{2}=$

Options :

$\frac{1}{3}$

1. ✖

2. ✔ $\frac{3}{5}$

3. ✖ $\frac{2}{3}$

4. ✖ $\frac{1}{2}$

Question Number : 28 Question Id : 342604348 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If 4 times the area of a ΔABC is $c^2-(a-b)^2$, then sin C

Options :

1. ✖ $\frac{\sqrt{3}}{2}$

2. ✖ $\frac{1}{\sqrt{2}}$

3. ✖

$\frac{1}{2}$

1

4. ✔

Question Number : 29 Question Id : 342604349 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In a triangle ABC, if $\cot\frac{A}{2}\cot\frac{B}{2} = K$, then all the possible values of K lies in

Options :

$(0, 1]$

1. ✖

$[1, \infty)$

2. ✖

$(1, \infty)$

3. ✔

$(0, 1)$

4. ✖

Question Number : 30 Question Id : 342604350 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a triangle ABC, $b^2 \sin 2C + c^2 \sin 2B =$

Options :

1. ✖ 0

2. ✔ 4Δ

3. ✖ 2Δ

4. ✖ Δ

Question Number : 31 Question Id : 342604351 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The position vectors of the points P and Q are respectively $-2\bar{i}-3\bar{j}+\bar{k}$ and $3\bar{i}+3\bar{j}+2\bar{k}$. The ratio in which the point having position vector $\frac{-9}{2}\bar{i}-6\bar{j}+\frac{1}{2}\bar{k}$ divides the line segment joining P and Q is

Options :

$-3:2$

1. ✖

$1:2$

2. ✖

$2:1$

3. ✖

$-1:3$

4. ✔

Question Number : 32 Question Id : 342604352 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Consider the vectors $\bar{a}=3\bar{i}+5\bar{j}+2\bar{k}, \bar{b}=2\bar{i}-3\bar{j}-5\bar{k}$ and $\bar{c}=-5\bar{i}-2\bar{j}+3\bar{k}$. If l, m and n are length of projections of $\bar{a}$ on $\bar{b}$, $\bar{b}$ on $\bar{c}$ and $\bar{c}$ on $\bar{a}$ respectively, then

Options :

$l+m-n=0$

1. ✖

$l=m=n$

2. ✔

$l-m+n=0$

3. ✖

$m+n-l=0$

4. ✖

Question Number : 33 Question Id : 342604353 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Let $(x,y)\in(\mathbb{R}\times\mathbb{R})$ and $\bar{a}=x\bar{i}+2\bar{j}-\bar{k}$, $\bar{b}=6\bar{i}-y\bar{j}+2\bar{k}$ be two vectors. If $\left|\bar{a}\times\bar{b}\right|^2+\left|\bar{a}.\bar{b}\right|^2=f(x)g(y)$ then $f(x)+g(y)-46=0$ represents

Options :

a pair of lines

1. ✖

an ellipse

2. ✖

a hyperbola

3. ✖

a circle

4. ✔

Question Number : 34 Question Id : 342604354 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $\bar{a}=2\bar{i}+2\bar{j}+\bar{k}$, $|\bar{b}|=6$ and the angle between $\bar{a}$ and $\bar{b}$ is $\frac{\pi}{6}$, then the area of the triangle (in square units) with $\bar{a}$ and $\bar{b}$ as two of its sides is

Options :

1. ✖ $\frac{3\sqrt{3}}{2}$

2. ✖ $\frac{\sqrt{3}}{2}$

3. ✖ $\frac{5}{4}$

4. ✔ $\frac{9}{2}$

Question Number : 35 Question Id : 342604355 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $\bar{r}$ is a vector perpendicular to both the vectors $2\bar{i}+3\bar{j}-4\bar{k}$ and $3\bar{i}-\bar{j}+\bar{k}$ and satisfy $\bar{r}\cdot\left(3\bar{i}-3\bar{j}+4\bar{k}\right)=5$ then $|\bar{r}|=$

Options :

1. ✖

$\sqrt{366}$

2. ✖ $\sqrt{222}$

3. ✔ $\sqrt{318}$

4. ✖ $\sqrt{246}$

Question Number : 36 Question Id : 342604356 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The perpendicular distance from the origin to the plane containing the points having position vectors $\bar{i}+2\bar{j}+3\bar{k}$, $2\bar{i}+3\bar{j}-4\bar{k}$, $3\bar{i}-4\bar{j}+5\bar{k}$, is

Options :

1. ✖ $\frac{10}{\sqrt{60}}$

2. ✔ $\frac{12}{\sqrt{30}}$

3. ✖

$\frac{15}{\sqrt{127}}$

$\frac{25}{\sqrt{57}}$

4. ✖

Question Number : 37 Question Id : 342604357 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Let O be the mean deviation of the first five odd natural numbers about their mean and P be the mean deviation of the first five prime numbers about their mean. Then P – O =

Options :

0.3

1. ✖

0.32

2. ✔

0.23

3. ✖

0.2

4. ✖

Question Number : 38 Question Id : 342604358 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If a proper divisor of the integer 2520 is selected at random, then the probability that it is an odd number is

Options :

1. $\frac{11}{46}$ ✔

2. $\frac{12}{46}$ ✖

3. $\frac{11}{48}$ ✖

4. $\frac{1}{4}$ ✖

Question Number : 39 Question Id : 342604359 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Each of the two boxes P and Q contain 100 chits numbered from 1 to 100. If one chit is drawn at random from each box, then the probability that the number on the chit drawn from P is square of the number on the chit drawn from Q, is

Options :

1. $0.1\ \%$ ✔

2. 10% ✖

3. 1% ✖

4. 0.01% ✖

Question Number : 40 Question Id : 342604360 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A problem in Algebra is given to two students A and B whose chances of solving it are $\frac{2}{5}$ and $\frac{3}{4}$ respectively. The probability that the problem is solved, if both of them try independently, is

Options :

1. $\frac{17}{20}$ ✔

2. ✖

$\frac{1}{2}$

$\frac{3}{20}$

3. ✖

$\frac{13}{20}$

4. ✖

Question Number : 41 Question Id : 342604361 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The probability distribution of a random variable X is given below.

$X = x$	0	1	2	3	4	5	6	7
$P(x)$	0.01	0.10	0.26	0.33	0.18	0.06	K	0.04

Then $P(X \geq 3) - P(X < 6) =$

Options :

0.24

1. ✖

−0.27

2. ✖

0.57

3. ✖

-0.31

4. ✔

Question Number : 42 Question Id : 342604362 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $P(X=x)=5r^x$, $x=1,2,3...$ is the probability density function of a discrete random variable X, then $r=$

Options :

1. ✔ $\frac{1}{6}$

2. ✖ $\frac{1}{3}$

3. ✖ $\frac{2}{3}$

4. ✖ $\frac{1}{4}$

Question Number : 43 Question Id : 342604363 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If a point P(x, y) moves such that the sum of the squares of its coordinates is equal to their product, then the locus of P excluding origin is

Options :

1. ✖ $\frac{1}{x^2}+\frac{1}{y^2}=1$

2. ✖ $\frac{1}{x}+\frac{1}{y}=1$

3. ✔ $\frac{x}{y}+\frac{y}{x}=1$

4. ✖ $x^2+y^2-xy=1$

Question Number : 44 Question Id : 342604364 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

When the origin is shifted to $(-1,2)$ by the translation of axes, the transformed equation of $x^2+y^2+2x-4y+1=0$ is

Options :

1. $X^2 + Y^2 = 4$ ✔

2. $X^2 + Y^2 = 16$ ✖

3. $X^2 + 2X + Y^2 = 4$ ✖

4. $X^2 - 2X + Y^2 = 16$ ✖

Question Number : 45 Question Id : 342604365 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If the portion of a straight line intercepted between the coordinate axes is divided by the point (2, 3) in the ratio 2 : 3 then the product of the intercepts made by this line on the axes is

Options :

1. 25 ✔

2. $\frac{29}{6}$ ✖

3. 50 ✖

$\frac{31}{3}$

4. ✖

Question Number : 46 Question Id : 342604366 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The slope of a line L is 2. If m_1, m_2 are slopes of two lines which are inclined at an angle of $\frac{\pi}{6}$ with L, then $m_1 + m_2 =$

Options :

-11

1. ✖

16

2. ✖

11

3. ✖

-16

4. ✔

Question Number : 47 Question Id : 342604367 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a Δ ABC, $2x+3y+1=0, x+2y-12=0$ are the perpendicular bisectors of its sides AB and AC respectively and if A is (3, 2), then the slope of the side BC is

Options :

1. ✖ 1

2. ✖ $\frac{1}{3}$

3. ✔ $\frac{5}{3}$

4. ✖ $\frac{5}{2}$

Question Number : 48 Question Id : 342604368 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the equation of a line having a slope $m(m \in \mathbb{Z})$, passing through $(1,1)$ and making an angle of $\text{Tan}^{-1}\left(\frac{5}{7}\right)$ with the line $x+y-3=0$ is $ax+y+c=0$, then $ac=$

Options :

1. ✖

-7

-42

2. ✔

-21

3. ✖

12

4. ✖

Question Number : 49 Question Id : 342604369 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

From the point $(3, -4)$ perpendicular lines L_1 and L_2 are drawn on each of the lines $S \equiv 2x^2 + 3xy - 2y^2 - 7x + y + 3 = 0$. The area of the quadrilateral formed by the pair of lines $S = 0$, L_1 and L_2 is (in square units)

Options :

1. ✖ $\frac{64}{5}$

2. ✔ $\frac{72}{5}$

3. ✖

25

35

4. ✖

Question Number : 50 Question Id : 342604370 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The line $\frac{x}{3}+\frac{y}{2}=1$ and a pair of lines both passing through origin forms an isosceles triangle. If this pair of lines are perpendicular, then the equation of the pair of straight lines is

Options :

$5(x^2-y^2)+24xy=0$

1. ✖

$5(x^2-y^2)-24xy=0$

2. ✔

$5(x^2-y^2)+12xy=0$

3. ✖

$5(x^2-y^2)-12xy=0$

4. ✖

Question Number : 51 Question Id : 342604371 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $(2, \alpha)$ does not lie outside the circles $x^2+y^2=13$ and $x^2+y^2+x-2y=14$, then α lies in

Options :

1. $(-\infty,-3)\cup(4,\infty)$ ✖

2. $[-3,4]$ ✖

3. $(-\infty,-1)\cup(3,\infty)$ ✖

4. $[-2,3]$ ✔

Question Number : 52 Question Id : 342604372 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The locus of the centre of the circles passing through the origin and cutting off a chord of length 2 units on the line $x = 1$ is

Options :

1. a straight line ✖

a circle

2. ✖

a parabola

3. ✔

on ellipse

4. ✖

Question Number : 53 Question Id : 342604373 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The number of common tangents that can be drawn to the circles $x^2+y^2=1$ and $x^2+y^2-2x-6y+6=0$ is

Options :

4

1. ✔

0

2. ✖

2

3. ✖

4. ✖

1

Question Number : 54 Question Id : 342604374 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The equation of the circle passing through the points of intersection of two circles $x^2+y^2+2x+3y+1=0, x^2+y^2+4x+3y+2=0$ and the point $(-1, 1)$ is

Options :

1. $x^2+y^2+10x+3y+5=0$ ✔

2. $x^2+y^2+10x-3y+11=0$ ✖

3. $x^2+y^2+20x-3y+21=0$ ✖

4. $x^2+y^2+20x+3y+15=0$ ✖

Question Number : 55 Question Id : 342604375 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If the circle $x^2+y^2+2kx+4y-4=0$ has it's centre in 4^{th} quadrant and touches the circle $x^2+y^2+6x-2y+6=0$ then, $k=$

Options :

1. ✖ -5

2. ✖ $\frac{-15}{7}$

3. ✖ $\frac{-23}{5}$

4. ✔ -1

Question Number : 56 Question Id : 342604376 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If a parabola having horizontal axis and passes through the points $(-2,1),(1,2)$ and $(-1,3)$ then the y-coordinate of the focus of that parabola is

Options :

1. ✖ $\frac{37}{40}$

2. ✔ $\frac{21}{10}$

3. ✖ $\frac{41}{40}$

4. ✖ $\frac{-41}{40}$

Question Number : 57 Question Id : 342604377 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $ax^2+2hxy+by^2-82x+98y+144=0$ is the equation of a parabola with focus $(2,-3)$ and directrix $3x-2y+5=0$, then $ax^2+2hxy+by^2=0$ represents

Options :

1. ✖ two lines making an angle $\frac{\pi}{3}$ at origin

2. ✖ a conic with eccentricity $\frac{a}{b}$

3. ✖ two perpendicular lines

two coincident lines

4. ✔

Question Number : 58 Question Id : 342604378 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An ellipse has its major axis along y-axis and minor axis along x- axis. If its length of latus rectum is $\frac{2}{3}$ times of its minor axis, then the eccentricity of the ellipse is

Options :

1. $\frac{2}{3}$ ✖

2. $\frac{3}{5}$ ✖

3. $\frac{\sqrt{5}}{3}$ ✔

4. $\frac{\sqrt{2}}{5}$ ✖

Question Number : 59 Question Id : 342604379 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the length and breadth of a rectangle of maximum area that can be inscribed in an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ are $8\sqrt{2}$ and $4\sqrt{2}$ respectively, then the eccentricity of that ellipse is

Options :

1. ✖ $\frac{1}{2}$

2. ✔ $\frac{\sqrt{3}}{2}$

3. ✖ $\frac{1}{4}$

4. ✖ $\frac{1}{\sqrt{3}}$

Question Number : 60 Question Id : 342604380 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $\frac{x^2}{\alpha+3}+\frac{y^2}{2-\alpha}=1$ represents a hyperbola, then α lies in

Options :

$(-3, 2)$

1. ✖

$(-3, \infty)$

2. ✖

$(-\infty, -2)$

3. ✖

$(-\infty, -3) \cup (2, \infty)$

4. ✔

Question Number : 61 Question Id : 342604381 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The four points $A(2,-1,3)$, $B(4,-2,1)$, $C(4,5,-7)$ and $D(2,6,-5)$ forms a

Options :

Square

1. ✖

Parallelogram

2. ✔

Rectangle

3. ✖

4. ✖

Rhombus

Question Number : 62 Question Id : 342604382 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Suppose L_1 and L_2 are two lines having the direction ratios $1,-2,-2$ and $0, 2, 1$ respectively. If the direction cosines of a line perpendicular to both L_1 and L_2 are l,m,n then $|l|+|m|+|n|$ =

Options :

1. 3 ✖

2. $\frac{5}{3}$ ✔

3. $\sqrt{3}$ ✖

4. $\frac{7}{3}$ ✖

Question Number : 63 Question Id : 342604383 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The Cartesian equation of a plane parallel to the plane $\bar{r}\cdot(2i+3j-4k)=1$ and at a distance of 2 units from it is

Options :

1. $2x+3y-4z=3$ ✖

2. $2x+3y-4z=1\pm 2\sqrt{29}$ ✔

3. $2x+3y-4z=-1\pm 2\sqrt{29}$ ✖

4. $2x+3y-4z=-3$ ✖

Question Number : 64 Question Id : 342604384 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If $f(x)=\begin{cases}\dfrac{\sin[x]}{[x]}, & [x]\neq 0\\ 0, & [x]=0\end{cases}$, where $[x]$ denotes the greatest integer less than or equal to x, then $\lim\limits_{x\to 0^-} f(x)$

Options :

1. ✖

exist and equal to 1

exist and equal to sin 1

2. ✔

exist and equal to – sin 1

3. ✖

Does not exist

4. ✖

Question Number : 65 Question Id : 342604385 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$\lim_{x\to-\infty}\frac{3|x|^3-x^2+2|x|-5}{-5|x|^3+3x^2-2|x|+7}=$$

Options :

1. ✖ $\frac{3}{5}$

2. ✖ $\frac{-5}{7}$

3. ✖

$\frac{5}{7}$

$\frac{-3}{5}$

4. ✔

Question Number : 66 Question Id : 342604386 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$\text{Let } f(x)=\begin{cases}\dfrac{\tan(2p-7)x+\tan 3x}{x}, & x<0\\ p-q, & x=0\\ q\left(\dfrac{\sqrt{x^2+x}-\sqrt{x}}{x^{\frac{3}{2}}}\right), & x>0\end{cases}.$$

If $f(x)$ is continuous at $x=0$, then $\frac{q}{p}=$

Options :

$\frac{2}{3}$

1. ✔

$\frac{-2}{3}$

2. ✖

3. ✖ $\frac{3}{2}$

4. ✖ $\frac{-3}{2}$

Question Number : 67 Question Id : 342604387 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $xe^{xy} = y + \sin^2 x$, then $\frac{dy}{dx}$ at $x = 0$ is

Options :

1. ✖ 0

2. ✖ -1

3. ✖ -2

4. ✔ 1

Question Number : 68 Question Id : 342604388 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If $f(x)=x^2\sin\frac{1}{x}$, when $x\neq 0$ and $f(0)=0$, then $\underset{x\to 0}{Lt}\, f'(x)$

Options :

Does not exist

1. ✔

0

2. ✖

∞

3. ✖

1

4. ✖

Question Number : 69 Question Id : 342604389 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The derivate of $(\log x)^{\sin x}$ with respect to $\cos x$ at $x=\frac{\pi}{2}$ is

Options :

1. ✖

$\frac{-4}{\pi}$

2. ✖ $\frac{-\pi}{2}$

3. ✔ $\frac{-2}{\pi}$

4. ✖ $\frac{-\pi}{4}$

Question Number : 70 Question Id : 342604390 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Let $f(x)$ be differentiable function for all $x \in \mathbb{R}$ and $f(x+y) = f(x) + f(y) - 3xy$. If $\lim_{h \to 0} \frac{f(h)}{h} = 7$, then $f'(x) =$

Options :

1. ✔ $-3x + 7$

2. ✖ $3x - 7$

$3x+7$

3. ✖

$-7-3x$

4. ✖

Question Number : 71 Question Id : 342604391 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The equation of the tangent to the curve $xy^5+2x^2y-x^3+y+1=0$ at $x=0$ is

Options :

$3x+4y+4=0$

1. ✖

$y=x-1$

2. ✔

$5x+7y+7=0$

3. ✖

$x+y+1=0$

4. ✖

Question Number : 72 Question Id : 342604392 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A particle moves in a straight line such that its displacement S (in mts) at a time t (in sec) is given by $S(t)=t^3-4t^2+7t$. The instantaneous velocity v at $t=4$ is

Options :

21 m/sec

1. ✖

23 m/sec

2. ✔

20 m/sec

3. ✖

19 m /sec

4. ✖

Question Number : 73 Question Id : 342604393 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the two curves $x=y^2$ and $xy=K$ cut each other at right angles, then a possible value of K is

Options :

$\frac{1}{8}$

1. ✖

2. ✖ $\frac{1}{2}$

3. ✖ $\frac{1}{\sqrt{2}}$

4. ✔ $\frac{1}{2\sqrt{2}}$

Question Number : 74 Question Id : 342604394 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The Rolle's theorem is not applicable to $f(x)=\begin{cases} x, & 0\le x\le 1 \\ 2-x, & 1\le x\le 2 \end{cases}$ on $[0,2]$ because

Options :

1. ✖ $f(x)$ is not defined everywhere

2. ✖ $f(x)$ is not continuous

3. ✖ $f(0)\neq f(2)$

4. $f(x)$ is not differentiable ✔

Question Number : 75 Question Id : 342604395 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$\int \frac{xe^{\frac{x^2}{x^2-2}}}{x^4-4x^2+4}dx =$$

Options :

1. $\frac{-1}{4}e^{\frac{x^2}{x^2-2}}+C$ ✔

2. $\frac{1}{4}e^{\frac{x^2}{x^2-2}}+C$ ✖

3. $\frac{1}{x^2-2}e^{\frac{x^2}{x^2-2}}+C$ ✖

4. $\frac{-1}{(x^2-2)^4}e^{\frac{x^2}{x^2-2}}+C$ ✖

Question Number : 76 Question Id : 342604396 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$\text{If } \int \frac{2x^{12}+5x^{9}}{\left(x^{5}+x^{3}+1\right)^{3}}dx = \frac{1}{2}f(x)+C, \text{ then } f(1)-f(0)=$$

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. $\frac{1}{2}$

2. $\frac{1}{18}$

3. $\frac{1}{27}$

4. $\frac{1}{54}$

Question Number : 77 Question Id : 342604397 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\int \frac{\sqrt{\cot x}}{\sin 2x}\,dx =$$

Options :

$\sqrt{\cot x} + C$

1. ✖

$-\sqrt{\cot x} + C$

2. ✔

$\sqrt{\tan x} + C$

3. ✖

$-\sqrt{\tan x} + C$

4. ✖

Question Number : 78 Question Id : 342604398 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\lim_{n\to\infty} \frac{1}{n}\, log\left(\frac{(2n)!}{n^n \cdot n!}\right) = \int_1^2 f(x)\,dx\,, \text{ then } f(x) =$$

Options :

1. ✖

$log(1+x)$

$log\left(\frac{1}{x}\right)$

2. ✖

$log\, x$

3. ✔

$log\left(\frac{x+1}{x}\right)$

4. ✖

Question Number : 79 Question Id : 342604399 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$\int_{\frac{-\pi}{2}}^{\frac{\pi}{2}} \sin\left(x-[x]\right)dx =$$

Options :

$3(1-\cos 1)+\sin 2-\sin 1$

1. ✔

$\cos 2-\sin 2$

2. ✖

$3(1-\cos 1)+\cos 2-\sin 1$

3. ✖

0

4. ✖

Question Number : 80 Question Id : 342604400 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The solution of $\frac{dy}{dx}=\sqrt{1-y^2},\ y(0)=1,$ is

Options :

$\text{Sin}^{-1}\,y=x-\text{Sin}^{-1}(1)$

1. ✖

$\text{Sin}^{-1}\,y=x+\text{Sin}^{-1}(1)$

2. ✔

$\text{Cos}^{-1}\,y=x+\text{Cos}^{-1}(1)$

3. ✖

$\text{Sin}^{-1}\,y+x=\text{Sin}^{-1}(1)$

4. ✖

Physics

Section Id :	3426048
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
Sub-Section Number :	1
Sub-Section Id :	3426048
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 342604401 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The physics behind fusion test reactor is:

Options :

1. ✖ Newton's law of motion

2. ✖ Trapping and cooling of atoms by laser beams and magnetic fields

3. ✔ Magnetic confinement of plasma

4. ✖

Question Number : 82 Question Id : 342604402 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Consider an expression $QV=kPTL^{\alpha}$ where V, P, T, L are volume, pressure, time and length respectively. The quantity [Q] has dimension $ML^{-1}T^{-1}$. k is dimensionless constant. The value of integer α is:

Options :

1. ✖ 2

2. ✖ -2

3. ✔ 3

4. ✖ -1

Question Number : 83 Question Id : 342604403 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two cars A and B initially at rest are moving in same direction with accelerations a_1 and a_2 respectively. After a certain time, they achieve velocities v_1 and v_2 respectively and separated are by a distance of 50 m. If $(a_1 - a_2) = 4$ m/s^2, then the quantity $(v_1 - v_2)$ will be

Options :

1. 24 m/s ✖

2. 20 m/s ✔

3. 40 m/s ✖

4. 12 m/s ✖

Question Number : 84 Question Id : 342604404 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A rocket lifts off from ground and accelerate upwards at 1 m/s^2. 20 seconds after lift off a piece breaks off from the bottom of rocket. After breaking off, how much time it takes approximately to reach the ground?
(Take g = 10 m/s^2)

Options :

1. 6.3 s ✖

4.5 s

2. ✖

10.5 s

3. ✖

8.5 s

4. ✔

Question Number : 85 Question Id : 342604405 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two bodies were thrown simultaneously from the origin: one straight up and the other, at angle 60° to the vertical. The initial velocity of each body is equal to 10 m/s. Neglecting the air resistance, the distance between the two bodies after t = 2s is (Use g=10 m/s^2)

Options :

20 m

1. ✔

$20\sqrt{2}$ m

2. ✖

$5\sqrt{3}$ m

3. ✖

4. ✖

30 m

Question Number : 86 Question Id : 342604406 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A particle leaves the origin with initial velocity $\vec{v}=(3\hat{i})\,m/s$ and a constant acceleration $\vec{a}=(-1\hat{i}-0.5\hat{j})\,m/s^2$. The position vector of particle, when it reaches its maximum x-coordinate, is

Options :

1. ✖ $\frac{9}{2}(\hat{i}-\hat{j})\,m$

2. ✔ $\frac{9}{2}\left(\hat{i}-\frac{\hat{j}}{2}\right)m$

3. ✖ $\frac{9}{2}(-\hat{i}+\hat{j})\,m$

4. ✖ $\frac{9}{2}\left(\frac{\hat{i}}{2}-\hat{j}\right)m$

Question Number : 87 Question Id : 342604407 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A ball of mass 0.2 kg moving with a speed of 20 m/s is brought to rest in 0.1 s. The average force applied to the ball is

Options :

1. 20 N ✖

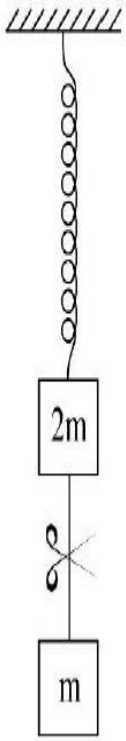
2. 30 N ✖

3. 40 N ✔

4. 60 N ✖

Question Number : 88 Question Id : 342604408 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A system as shown in figure is in equilibrium and is at rest. The spring and string are massless, now the string is cut. The acceleration of the masses '2m' and 'm' just after the string is cut, will be



Options :

1. $\frac{g}{2}$ upwards, g downwards ✔

2. g upwards, $\frac{g}{2}$ downwards ✖

3. g upwards, 2g downwards ✖

4. 2g upwards, g downwards ✖

Question Number : 89 Question Id : 342604409 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A constant force of 5 N accelerates a stationary particle of mass 500 gm through a displacement of 5 m. The average power delivered is

Options :

1. ✖ 6.25 w

2. ✔ 25 w

3. ✖ 62.5 w

4. ✖ 50 w

Question Number : 90 Question Id : 342604410 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which of the following is not a correct statement?

Options :

1. ✖ Work done by conservative force is equal to negative change in potential energy

Total energy of system is always conserved

2. ✖

Work done by non-conservative force in a closed path is equal to zero

3. ✔

In stable equilibrium, the potential energy is minimum

4. ✖

Question Number : 91 Question Id : 342604411 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A small block of mass 200 g is placed on a horizontal slab at a height of 2 m above the floor. The block is pressed against a horizontal spring fixed at one end to compress the spring through 10.0 cm. Upon releasing, the block moves horizontally till it leaves the spring. Calculate the horizontal distance covered by the block after leaving the slab and just before hitting the ground. The spring constant is 50 N/m.
(Assume $g = 10\ m/s^2$).

Options :

0.99 m

1. ✔

0.55 m

2. ✖

0.44 m

3. ✖

4. ✖ 0.33 m

Question Number : 92 Question Id : 342604412 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Three bodies a ring, a solid cylinder and a solid sphere roll down an inclined plane without slipping. They start from rest. Which of the bodies reaches bottom of plane with minimum velocity?

Options :

1. ✔ ring

2. ✖ solid cylinder

3. ✖ solid sphere

4. ✖ both ring & solid sphere

Question Number : 93 Question Id : 342604413 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The displacement of a particle in simple harmonic motion (SHM) is given by $y=\sqrt{3\pi}\sin\left(\frac{100}{\pi}t+\frac{\pi}{4}\right)$. What will be the displacement of the particle from the mean position when its kinetic energy is eight times that of its potential energy?

Options :

1. $\sqrt{\frac{\pi}{3}}$ ✔

2. $\sqrt{\frac{3\pi}{2}}$ ✖

3. $\sqrt{\pi}$ ✖

4. $\sqrt{3\pi}$ ✖

Question Number : 94 Question Id : 342604414 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two stars of equal masses M are orbiting in a circle of radius R. Their orbital time period is proportional to

Options :

1. ✔ $R^{\frac{3}{2}}$

2. ✖ R

3. ✖ R^{2}

4. ✖ $R^{\frac{1}{2}}$

Question Number : 95 Question Id : 342604415 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two springs of force constants K_1 and K_2 are loaded with weights W_1 and W_2 respectively. Assume that length of each string is increased by same amount. If $K_1 = 2\,K_2$, then the ratio $\frac{W_2}{W_1}$ is

Options :

1. ✖ 1

2. ✔ 0.5

0.25

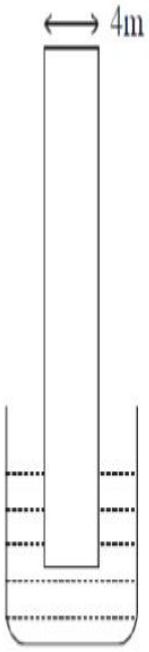
3. ✖

4

4. ✖

Question Number : 96 Question Id : 342604416 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A metal sheet 4 cm on a side and of negligible thickness is attached to a balance and inserted into container fluid. The balance to which metal sheet is attached read 0.50 N and the contact angle is found to be zero. A small amount of oil is then spread over the metal sheet. The contact angle now becomes 180° and the balance now reads 0.49 N. The surface tension of the fluid is



Options :

1. ✔ 6.25×10^{-2} N/m

1.25×10^{-1} N/m

2. ✖

4.25×10^{-2} N/m

3. ✖

0.1 N/m

4. ✖

Question Number : 97 Question Id : 342604417 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Match the columns I and II

Column I		Column II	
A)	Stoke's law	I)	Pressure and energy
B)	Turbulence	II)	Hydraulic lift
C)	Bernoulli's Principle	III)	Viscous drag
D)	Pascal's law	IV)	Reynold's number

The correct match is

Options :

A	B	C	D
III	IV	I	II

1. ✔

A	B	C	D
I	II	III	IV

2. ✖

A	B	C	D
II	I	IV	III

3. ✖

A	B	C	D
III	IV	II	I

4. ✖

Question Number : 98 Question Id : 342604418 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

An ideal gas undergoes an adiabatic process. If the pressure of the gas is reduced by 0.1 % then the volume is changed by $\left(\text{Given } r = \frac{C_p}{C_v} = 5/3 \right)$

Options :

0.1 %

1. ✖

2. ✖

0.05 %

0.06 %

3. ✔

–0.05 %

4. ✖

Question Number : 99 Question Id : 342604419 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A body cools from 70 °C to 40 °C in 5 min. Calculate the time it takes to cool from 60 °C to 40 °C. The temperature of the surrounding is 20 °C.

Options :

3.77 min

1. ✖

3.56 min

2. ✖

3.68 min

3. ✖

3.89 min

4. ✔

Question Number : 100 Question Id : 342604420 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The carnot heat engine have an efficiency of 50 %. The temperature of sink is maintained at 500 K. To increase the efficiency upto 80 %, the increment in the source temperature is

Options :

1. 1500 K ✔

2. 2500 K ✖

3. 500 K ✖

4. 2000 K ✖

Question Number : 101 Question Id : 342604421 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Consider an ideal gas in a closed container at 300 K. The container is then heated so that the average velocity of a particles of the gas increases by a factor of 4. What would be the final temperature?

Options :

1. 4500 $^{\circ}$C ✖

2. ✔ $4527\ ^{\circ}C$

3. ✖ $4617\ ^{\circ}C$

4. ✖ $4600\ ^{\circ}C$

Question Number : 102 Question Id : 342604422 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The mean free path for a gas at temperature 300 K and pressure 600 torr is 10^{-7} m. The mean free path of the gas at a temperature 400 K and pressure 200 torr will be

Options :

1. ✖ 2.5×10^{-8} m

2. ✖ 4.4×10^{-8} m

3. ✖ 3.3×10^{-8} m

4. ✔ 4×10^{-7} m

Question Number : 103 Question Id : 342604423 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A second wave of frequency 200 Hz is travelling in air. The speed of sound in the air is 340 m/s. What is the phase difference at a given instant between two points separated by a distance of 85 cm along the direction of propagation?

Options :

1. ✔ π

2. ✖ 2π

3. ✖ $\frac{\pi}{2}$

4. ✖ $\frac{\pi}{4}$

Question Number : 104 Question Id : 342604424 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An object is placed in front of a spherical concave mirror between the focal point and the radius of curvature. Its image is

Options :

Inverted, real, farther than radius of curvature from mirror

1. ✔

Inverted, virtual, closer than focal point to mirror

2. ✖

Upright, real, farther than radius of curvature from mirror

3. ✖

Inverted, Real, closer than radius of curvature to mirror

4. ✖

Question Number : 105 Question Id : 342604425 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The amplitude of the wave resulting from the superposition of three waves given by $x_1 = A\cos\omega t$, $x_2 = 2A\sin\omega t$ and $x_3 = \sqrt{2}A\cos\left(\omega t + \frac{\pi}{4}\right)$ is

Options :

$\sqrt{7}A$

1. ✖

$\sqrt{5}A$

2. ✔

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

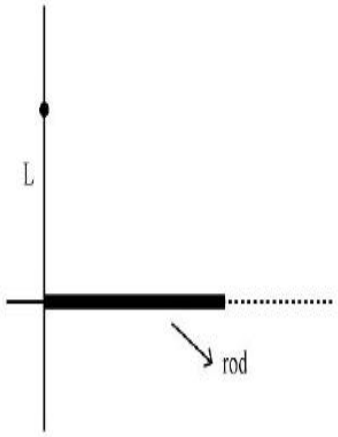
3. ✖

$\sqrt{2}A$

4. ✖

Question Number : 106 Question Id : 342604426 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A semi-infinite non conducting rod lies along +x-axis with its left end at the origin. The rod has uniform linear charge density λ. The magnitude of electric field $|\vec{E}|$ at a point on the y-axis at the distance L from the origin, will be



Options :

$\frac{\lambda}{4\pi \in_0 L}$

1. ✖

$\frac{\lambda}{2\pi \in_0 L}$

2. ✖

3. ✔

$$\frac{\lambda}{2\sqrt{2}\pi \in_0 L}$$

$$\frac{\sqrt{2}\lambda}{\pi \in_0 L}$$

4. ✖

Question Number : 107 Question Id : 342604427 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two capacitors, $C_1 = 2$ mF and $C_2 = 8$ mF are connected in series across a 300 V source. Then

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. The charge on each capacitor is 4.8×10^{-4} C

2. The potential difference across C_1 is 60 V

The potential difference across C_2 is 240 V

3.

The energy stored in the system is 5.2×10^{-2} J

4.

Question Number : 108 Question Id : 342604428 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A cylindrical metallic wire is stretched to increase its length. If the resistance of the wire is increased by 4 % then the percentage increase in its length is

Options :

1. 4 % ✖

2. 8 % ✖

3. 1 % ✖

4. 2 % ✔

Question Number : 109 Question Id : 342604429 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Two long parallel wires are separated by a distance of 2.50 cm. The force per unit length that each wire exerts on the other is 4×10^{-5} N/m, and the wires repel each other. The current in one wire is 0.5A. What is the current in the second wire?
(Take $\mu_0 = 4\pi\times10^{-7}$ SI Unit)

Options :

1. ✖ 12 A

2. ✖ 8 A

3. ✖ 6 A

4. ✔ 10 A

Question Number : 110 Question Id : 342604430 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the magnetic moment of orbiting electron in simple hydrogen atom?
Assume e = charge of electron, m_e = Mass of electron and $\vec{L}$ = orbital angular momentum of electron

Options :

1. ✖ $\vec{\mu} = \left(\frac{e}{m_e}\right)\vec{L}$

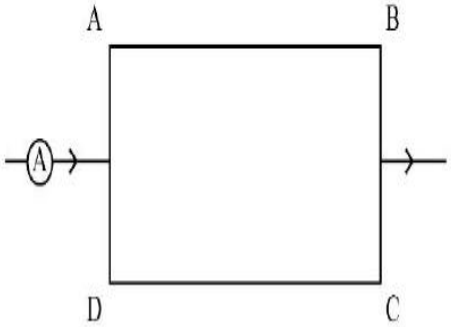
2. ✔ $\vec{\mu} = \left(\frac{e}{2m_e}\right)\vec{L}$

3. ✖ $\vec{\mu} = \left(\frac{2e}{m_e}\right)\vec{L}$

4. ✖ $\vec{\mu} = \left(\frac{e}{4m_e}\right)\vec{L}$

Question Number : 111 Question Id : 342604431 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

ABCD is a rectangular loop made of uniform wire. If AD = BC = 2 cm, what is the magnetic force per unit length acting on wire DC due to wire AB if ammeter reads 20 A. (The length of AB and DC are large in comparison with other two sides)



Options :

1. ✖ $10^{-1}\ \mathrm{Nm}^{-1}$

2. ✖ $10^{-2}\ \mathrm{Nm}^{-1}$

3. ✔ $10^{-3}\ \mathrm{Nm}^{-1}$

4. ✖ $10^{-4}\ \mathrm{Nm}^{-1}$

Question Number : 112 Question Id : 342604432 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A coil of resistance 50Ω is connected across a 5.0 V battery. If the current in the coil is found to be 50 mA after time t = 0.1s battery is connected, then the inductance of the coil is

Options :

1. ✔ $\frac{5}{\ln(2)}$

2. ✖ $10\ln(2)$

3. ✖

$5e^4$

$\frac{10}{e^4}$

4. ✖

Question Number : 113 Question Id : 342604433 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

How much current is drawn by the primary coil of a transformer, which steps down 220 V to 55 V to operate a device with an impedance of 275 Ω?

Options :

1. ✔ 0.05 A

2. ✖ 0.02 A

3. ✖ 0.2 A

4. ✖ 0.15 A

Question Number : 114 Question Id : 342604434 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Blue light travelling in vacuum has a wavelength of 450 nm. It enters a medium whose refractive index is 1.5. What is its frequency in the medium?
(Speed of light in vacuum = 3×10^8 m/s)

Options :

1. ✔ 6.67×10^{14} Hz

2. ✖ 10^{15} Hz

3. ✖ 4.45×10^{14} Hz

4. ✖ 10^{14} Hz

Question Number : 115 Question Id : 342604435 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The de-Broglie wavelength of an electron having kinetic energy 100 eV is
[Use h = 4.14×10^{-15} eVs, mass of electron = $\frac{0.5\times10^6}{c^2}$ eV , 1 pm = 10^{-12} m]

Options :

1. ✖ 150.1 pm

2. ✔ 124.2 pm

3. ✖ 115.5 pm

4. ✖ 120.8 pm

Question Number : 116 Question Id : 342604436 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If the light from Balmer series of hydrogen is used to eject photoelectrons from a metal, then the maximum work function of the metal can be

Options :

1. ✖ 1.89 eV

2. ✔ 3.4 eV

3. ✖ 3.8 eV

4. ✖ 5.1 eV

Question Number : 117 Question Id : 342604437 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The mass number and the volume of a nucleus is M and V respectively. If the mass number is increased to 2 M then the volume is changed to

Options :

1. ✖ $4V$

2. ✖ $\frac{V}{2}$

3. ✔ $2V$

4. ✖ $8V$

Question Number : 118 Question Id : 342604438 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The length of germanium rod is 0.928 cm and its area of cross section is 1 mm^2. If for germanium $n_i = 2.5\times10^{19}\,m^{-3}$, $\mu_n = 0.15\,m^2V^{-1}s^{-1}$, $\mu_e = 0.35\,m^2V^{-1}s^{-1}$ then resistivity is

Options :

1. ✔ $50\ \Omega\ cm$

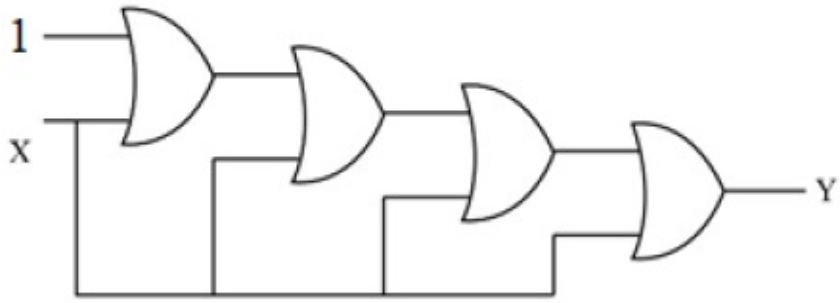
2. ✖ $25\ \Omega\ cm$

3. ✖ $50\ \Omega\ mm$

4. ✖ $100\ \Omega\ m$

Question Number : 119 Question Id : 342604439 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is output of the logic circuit shown below?



Options :

1. ✖ $Y = 0$

2. ✔ $Y = 1$

3. ✖ $Y = X$

4. ✖ $Y = \overline{X}$

Question Number : 120 Question Id : 342604440 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The height of transmitting antenna if TV programs have to cover the population in area of radius 64 km is
[Use Radius of earth=6.4×10^6 m]

Options :

1. 160 m ✖

2. 200 m ✖

3. 240 m ✖

4. 320 m ✔

Chemistry

Section Id :	3426049
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
Sub-Section Number :	1
Sub-Section Id :	3426049
Question Shuffling Allowed :	Yes

Question Number : 121 Question Id : 342604441 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A microscope using appropriate photons is engaged to track an electron in an atom within distance of 0.001 nm. What will be the uncertainty involved in measuring its velocity?

Options :

1. 5.79×10^7 m/s ✔

2. 5.79×10^6 m/s ✖

3. 4.79×10^7 m/s ✖

4. 3.7×10^6 m/s ✖

Question Number : 122 Question Id : 342604442 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An orbital with one angular node shows three maxima in its radial probability distribution curve, the orbital is?

Options :

3s

1. ✖

4p

2. ✔

5d

3. ✖

3p

4. ✖

Question Number : 123 Question Id : 342604443 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Starting from the 1st, the successive ionization potentials of an element are respectively 5.98, 18.8, 28.4, 120.1, 154 eV. The element is

Options :

B

1. ✖

Al

2. ✔

P

3. ✖

Mg

4. ✖

Question Number : 124 Question Id : 342604444 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The orbital with 4 radial and 1 angular nodes is

Options :

$5P_y$

1. ✖

$6P_z$

2. ✔

$4d_{xy}$

3. ✖

$5d_{yz}$

4. ✖

Question Number : 125 Question Id : 342604445 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The number of H_2O molecules participating in hydrogen bonding in $CuSO_4 \cdot 5H_2O$ is/are

Options :

1. 4 ✖

2. 2 ✖

3. 1 ✔

4. 0 ✖

Question Number : 126 Question Id : 342604446 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

One Debye is equal to how many coulomb meter?

Options :

1. 3.33×10^{-30} ✔

2. ✖

2.22×10^{-20}

3. 1.11×10^{-10} ✖

4. 4.44×10^{-24} ✖

Question Number : 127 Question Id : 342604447 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The dipole-dipole interaction energy between stationary polar molecules and rotating polar molecules, respectively is proportional to
[r is the distance between the polar molecules]

Options :

1. $r^3; \frac{1}{r^2}$ ✖

2. $\frac{1}{r^3}; \frac{1}{r^6}$ ✔

3. $\frac{1}{r^2}; r^2$ ✖

4. ✖

$$\frac{1}{r^2}; \frac{1}{r^4}$$

Question Number : 128 Question Id : 342604448 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which gas has a density of 1.24 g/L at 0 °C and 1 atm pressure?

Options :

1. O_2 ✖

2. CH_4 ✖

3. CO ✔

4. CO_2 ✖

Question Number : 129 Question Id : 342604449 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

From the given reactions identify the disproportionation reaction

i) $Cl_2(g)+2KI(aq)\longrightarrow 2KCl(aq)+I_2(s)$

ii) $Cl_2(g)+2OH^-(aq)\longrightarrow ClO^-(aq)+Cl^-(aq)+H_2O(l)$

iii) $Mg(s)+2HCl(aq)\longrightarrow MgCl_2(aq)+H_2(g)$

iv) $2H_2O_2(aq)\longrightarrow 2H_2O(l)+O_2(g)$

Options :

1. ✖ (i) and (iv)

2. ✔ (ii) and (iv)

3. ✖ (ii) and (iii)

4. ✖ (i) and (ii)

Question Number : 130 Question Id : 342604450 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$KMnO_4$ oxidises oxalic acid in acidic medium. The number of CO_2 molecules produced per mole of $KMnO_4$ is

Options :

1. ✔

5

4

2. ✖

3

3. ✖

1.5

4. ✖

Question Number : 131 Question Id : 342604451 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which of the following is not an intensive property?

Options :

Entropy

1. ✔

Melting point

2. ✖

Specific gravity

3. ✖

Refractive index

4. ✖

Question Number : 132 Question Id : 342604452 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The equilibrium constant (K_p) for the formation of ammonia from its constituent elements at 27 °C is 1.2×10^{-4} and at 127 °C is 0.60×10^{-4}. Calculate the mean heat of formation of ammonia per mole in this temperature range.

Options :

−82.64 Cal

1. ✖

−826.4 Cal

2. ✔

−1652.8 Cal

3. ✖

−165.2 Cal

4. ✖

Question Number : 133 Question Id : 342604453 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

For a reaction $2A \rightleftharpoons B+C$, K_c is 2×10^{-3}. At a given time, the reaction mixture has $[A]=[B]=[C]= 3\times10^{-4}$ M. Which of the following options is correct?

Options :

1. ✖ The system is at equilibrium

2. ✔ The reaction proceeds to the left

3. ✖ The reaction proceeds to the right

4. ✖ The reaction is complete

Question Number : 134 Question Id : 342604454 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Match the following.

Column-1 Reaction		Column-2 Main product
A) SO_3	$\xrightarrow{\text{heavy water}}$	I) C_2D_2
B) CaC_2	$\xrightarrow{\text{heavy water (excess)}}$	II) CD_4
C) Al_4C_3	$\xrightarrow{\text{heavy water (large excess)}}$	III) D_2SO_3
		IV) C_2D_4
		V) D_2SO_4

The correct match is

Options :

1. ✖

A	B	C
III	I	IV

2. ✖

A	B	C
III	IV	II

3. ✔

A	B	C
V	I	II

4. ✖

A	B	C
V	I	IV

Question Number : 135 Question Id : 342604455 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Powdered Berilium burns in air to give

Options :

1. ✖ BeO ; Be_2N_2

2. ✖ Be_2O_3 ; Be_3N_2

3. ✔ BeO ; Be_3N_2

4. ✖ BeO ; Be_2N

Question Number : 136 Question Id : 342604456 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Match the following.

	Column-1 Reaction		Column-2 Main product
A)	$B_2H_6 + 2CO \longrightarrow$	I)	B_2O_3
B)	$B_2H_6 + 3O_2 \longrightarrow$	II)	$2BH_3{\cdot}CO$
C)	$B_2H_6 + 6H_2O \longrightarrow$	III)	$2H_3BO_3$
		IV)	$2BH_2(CO)$
		V)	$2HBO_2$

The correct match is

Options :

A	B	C
IV	I	III

1. ✖

A	B	C
II	III	V

2. ✖

A	B	C
IV	III	I

3. ✖

A	B	C
II	I	III

4. ✔

Question Number : 137 Question Id : 342604457 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

During the process of fermentation, the number of moles of CO_2 liberated from one mole to glucose is

Options :

1. ✔ 2

2. ✖ 3

3. ✖ 4

4. ✖ 1

Question Number : 138 Question Id : 342604458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the given statements are correct, when carboxyheamoglobin reaches to 3-4% in blood?

I) Leads to headache
II) Results in cardiovascular problem
III) Increases the body temperature
IV) Leads to diarrhoea

Options :

1. ✔ (I) and (II)

(I) and (III)

2. ✖

(III) and (IV)

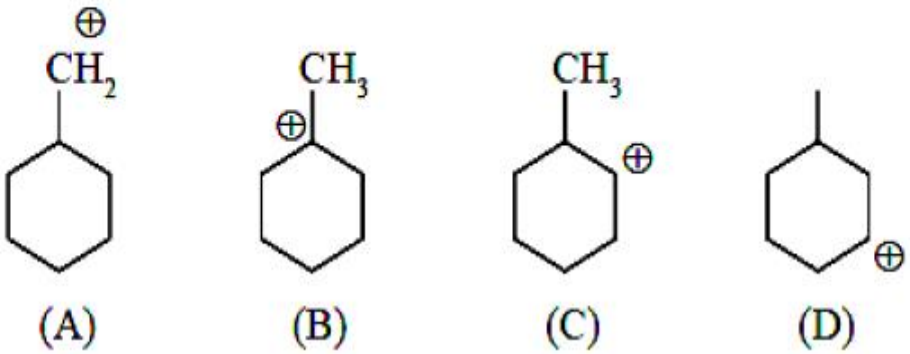
3. ✖

(II) and (III)

4. ✖

Question Number : 139 Question Id : 342604459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The decreasing order of stability of the given carbocations is



(A) (B) (C) (D)

Options :

(D) > (C) > (A) > (B)

1. ✖

(D) > (A) > (C) > (B)

2. ✖

(B) > (D) > (C) > (A)

3. ✔

(B) > (C) > (D) > (A)

4. ✖

Question Number : 140 Question Id : 342604460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The reaction $CH_2 = CH_2 + H_2 \xrightarrow[300\,°C]{Ni} CH_3 - CH_3$

Options :

Wurtz reaction

1. ✖

Kolbe reaction

2. ✖

Sabatier – Senderen's reaction

3. ✔

Dow's reaction

4. ✖

Question Number : 141 Question Id : 342604461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Benzene reacts with n-propyl chloride in the presence of anhydrous $AlCl_3$ to give predominantly

Options :

1. ✖ n-Propyl benzene

2. ✔ Isopropyl benzene

3. ✖ 3-Propyl-1-chloro benzene

4. ✖ 1-Chloro-3-n-propyl benzene

Question Number : 142 Question Id : 342604462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The fraction of the total volume occupied by the atoms in a simple cube is

Options :

1. ✖ $\frac{\pi}{2}$

2. ✖ $\frac{\pi}{4}$

3. ✔

$\frac{\pi}{6}$

$\frac{\pi}{8}$

4. ✖

Question Number : 143 Question Id : 342604463 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Match the following.

A)	Ebullioscopic constant	I)	Depression of freezing point
B)	Cryoscopic constant	II)	Total pressure is the sum of partial pressures of the components
C)	Henry's law	III)	Elevation of boiling point
D)	Dalton's law	IV)	Solubility of a gas in liquid

The correct match is

Options :

A	B	C	D
III	I	II	IV

1. ✖

A	B	C	D
I	III	II	IV

2. ✖

3. ✔

A	B	C	D
III	I	IV	II

A	B	C	D
I	III	IV	II

4. ✖

Question Number : 144 Question Id : 342604464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

On mixing urea, the boiling point of H_2O changed to 100.5 °C. Calculate the freezing point of the solution, if K_f of water is 1.87 K.kg.mol^{-1} and K_b of water is 0.52 K.kg.mol^{-1}

Options :

−1 °C

1. ✖

−0.5 °C

2. ✖

−1.8 °C

3. ✔

0 °C

4. ✖

Question Number : 145 Question Id : 342604465 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When the same quantity of electricity is passed through the aqueous solutions of the given electrolytes for the same amount of time, which metal will be deposited in maximum amount on the cathode?

Options :

1. ✖ $ZnSO_4$

2. ✖ $FeCl_3$

3. ✔ $AgNO_3$

4. ✖ $NiCl_2$

Question Number : 146 Question Id : 342604466 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Calculate the activation energy of a reaction, whose rate constant doubles on raising the temperature from 300 K to 600 K.

Options :

1. ✔ 3.45 kJ/mol

6.90 kJ/mol

2. ✖

9.68 kJ/mol

3. ✖

19.6 kJ/mol

4. ✖

Question Number : 147 Question Id : 342604467 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The most effective coagulating agent among the options for Sb_2S_3 sol is

Options :

Na_2SO_4

1. ✖

$Al_2(SO_4)_3$

2. ✔

$CaCl_2$

3. ✖

NH_4Cl

4. ✖

Question Number : 148 Question Id : 342604468 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The correct order of reducing ability of the following hydrides is

Options :

1. $BiH_3 > SbH_3 > PH_3 > NH_3$ ✔

2. $NH_3 > PH_3 > SbH_3 > BiH_3$ ✖

3. $SbH_3 > BiH_3 > PH_3 > NH_3$ ✖

4. $PH_3 > BiH_3 > SbH_3 > NH_3$ ✖

Question Number : 149 Question Id : 342604469 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Sulphur dioxide reacts with chlorine in the presence of charcoal to give

Options :

1. H_2SO_3 ✖

2. $SOCl_2$ ✖

SO_2Cl_2

3. ✔

H_2SO_4

4. ✖

Question Number : 150 Question Id : 342604470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Assertion (A) : The bond dissociation energy increases from F_2 to Cl_2 and then decreases to I_2

Reason (R) : The low bond energy of fluorine is due to the repulsion between the lone pairs of electrons in two fluorine atoms.

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 : 151 Question Id : 342604471 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The magnetic moment of the high spin complex is 5.92 BM. What is the electronic configuration?

Options :

$t_2g^3\ eg^1$

1. ✖

$t_2g^4\ eg^2$

2. ✖

$t_2g^3\ eg^2$

3. ✔

$t_2g^5\ eg^0$

4. ✖

Question Number : 152 Question Id : 342604472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

According to Valence Bond Theory, the number of unpaired electrons present in $[MnCl_6]^{3-}$, $[Fe(CN)_6]^{3-}$ and $[Co(C_2O_4)_3]^{3-}$, respectively, are

Options :

0 ; 5 ; 0

1. ✖

4 ; 3 ; 2

2. ✖

4 ; 1 ; 0

3. ✔

5 ; 4 ; 3

4. ✖

Question Number : 153 Question Id : 342604473 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Assertion (A) : In aqueous solution, α – amino acids exists as internal salt called as zwitter ion.

Reason (R) : Proline is a natural amino acid having a secondary amino group.

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

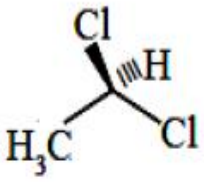
3. ✖

(A) is false but (R) is true

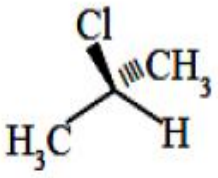
4. ✖

Question Number : 154 Question Id : 342604474 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

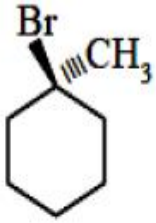
The chiral compounds among the following are



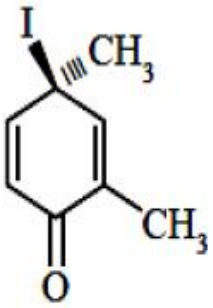
(I)



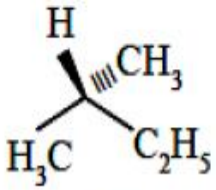
(II)



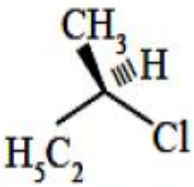
(III)



(IV)



(V)



(VI)

Options :

(I) and (III)

1. ✖

2. ✖

(II) and (IV)

(IV) and (V)

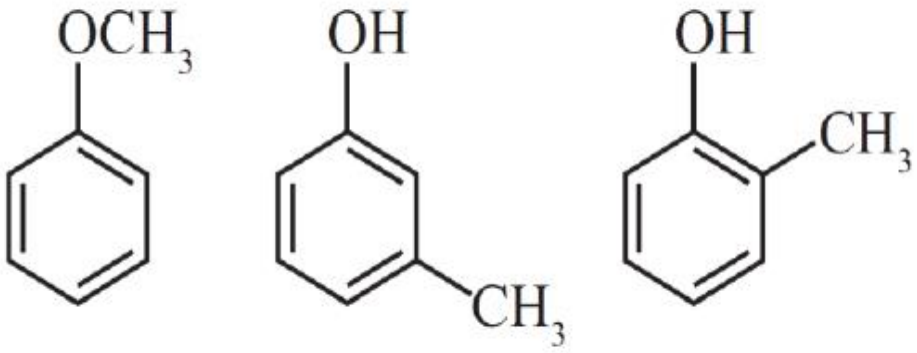
3. ✖

(IV) and (VI)

4. ✔

Question Number : 155 Question Id : 342604475 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The correct order of boiling points of below compounds is



(I) (II) (III)

Options :

(I) > (II) > (III)

1. ✖

(II) > (I) > (III)

2. ✖

(III) > (II) > (I)

3. ✖

(II) > (III) > (I)

4. ✔

Question Number : 156 Question Id : 342604476 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Match the following

	Column-1 Compound/ reagent		Column-2 Other name / Chemical / Name of the process
A)	Methanol	I)	Lucas reagent
B)	$ZnCl_2$ / Conc. HCl	II)	Baeyer's reagent
C)	Rectified spirit	III)	Wood spirit
D)	Dil. $KMnO_4$	IV)	95 % C_2H_5OH
		V)	75 % C_2H_5OH
		VI)	90 % C_3H_7OH

The correct match is

Options :

A	B	C	D
IV	I	III	II

1. ✖

A	B	C	D
III	I	VI	II

2. ✖

A	B	C	D
III	I	IV	II

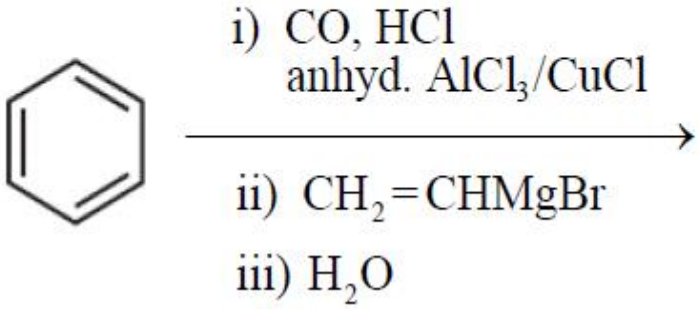
3. ✔

A	B	C	D
III	II	V	I

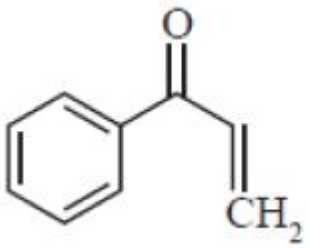
4. ✖

Question Number : 157 Question Id : 342604477 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

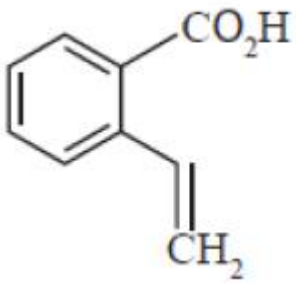
The major product of the following reaction sequence is



Options :

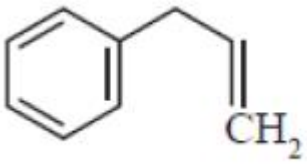


1. ✖

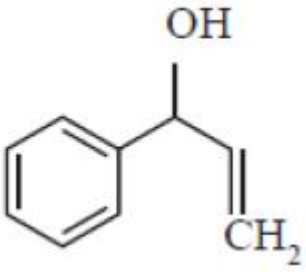


2. ✖

3. ✖

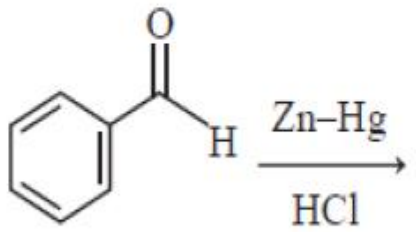
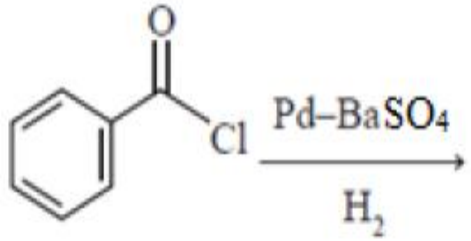
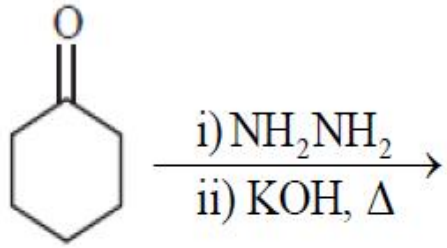


4. ✔



Question Number : 158 Question Id : 342604478 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Match the following

Column-1 Reaction		Column-2 Product
A)		I) Cyclohexanol
B)		II) Benzyl alcohol
C)		III) Toluene
		IV) Benzaldehyde
		V) Cyclohexane

The correct match is

Options :

1. ✔

A	B	C
III	IV	V

2. ✖

A	B	C
III	II	V

3. ✖

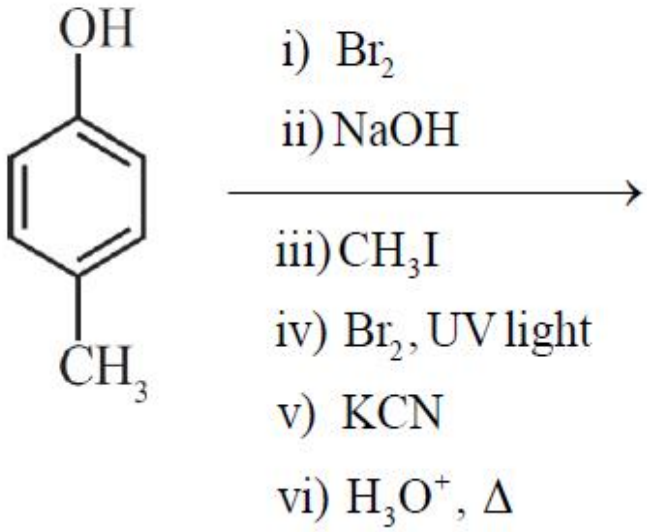
A	B	C
III	IV	I

A	B	C
II	IV	I

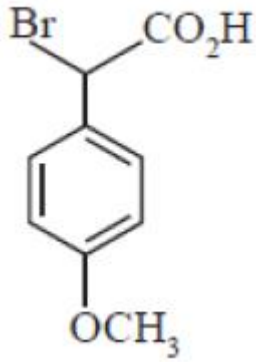
4. ✖

Question Number : 159 Question Id : 342604479 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

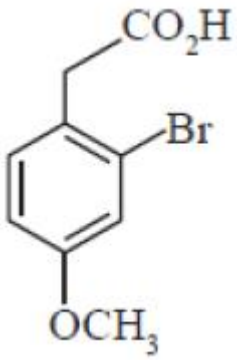
The major product of the following reaction sequence is

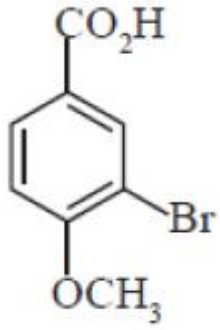


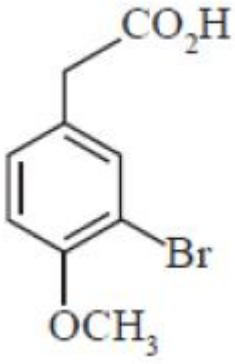
Options :



1. ✖

2. ✖ 

3. ✖ 

4. ✔ 

Question Number : 160 Question Id : 342604480 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The test that distinguishes primary amines from other amines is

Options :

1. ✖ Iodoform test

Victor Meyer test

2. ✖

Lucas test

3. ✖

Carbylamine test

4. ✔