If \( f : \mathbb{R} \to \mathbb{R} \) is defined by
\[
 f(x) = \begin{cases} 
 [x-5] & \text{for } x < 5 \\
 \lceil x-5 \rceil & \text{for } x \geq 5 
\end{cases}
\]

then \((f \circ f)\left(\frac{-7}{2}\right) = \)

(Here \([x]\) is the greatest integer not exceeding \(x\))

\[
 f : \mathbb{R} \to \mathbb{R} \ni \\
 f(x) = \begin{cases} 
 [x-5] & \text{for } x < 5 \\
 \lceil x-5 \rceil & \text{for } x \geq 5 
\end{cases}
\]

\( \text{Option: } (\circ f)f\left(\frac{-7}{2}\right) = \)

(Select \([x]\) to be \(x\) as given in the question)
If \( f : A \to B \) is an onto function such that \( f(x) = \sqrt{|x| - x} + \frac{1}{\sqrt{|x| - x}} \), then A and B are respectively

\[ f : A \to B \quad \text{where} \quad f(x) = \sqrt{|x| - x} + \frac{1}{\sqrt{|x| - x}} \]

A के स्रोत B के दृष्टिकोण

Options:

1. \((-\infty, \infty), (0, \infty)\)
2. \((-\infty, 0], [2, \infty)\)
3. \((0, \infty), (2, \infty)\)
4. \((-\infty, 0], (0, \infty)\)

\[ \frac{1}{2.5} + \frac{1}{5.8} + \frac{1}{8.11} + \ldots 16 \text{ terms} = \]

\[ \frac{1}{2.5} + \frac{1}{5.8} + \frac{1}{8.11} + \ldots 16 \text{ शब्दोंी =} \]
The maximum value of the determinant of the matrix

\[
\begin{vmatrix}
1 + \sin^2 x & \cos^2 x & 4 \sin 2x \\
\sin^2 x & 1 + \cos^2 x & 4 \sin 2x \\
\sin^2 x & \cos^2 x & 1 + 4 \sin 2x
\end{vmatrix}
\]

is

\[
\begin{vmatrix}
1 + \sin^2 x & \cos^2 x & 4 \sin 2x \\
\sin^2 x & 1 + \cos^2 x & 4 \sin 2x \\
\sin^2 x & \cos^2 x & 1 + 4 \sin 2x
\end{vmatrix}
\]

Options :

1. 0
2. 2
3. 4
4. 6
If \( A = \begin{bmatrix} 1 & 0 & -2 \\ -2 & -1 & 2 \\ 3 & 4 & 1 \end{bmatrix} \) then \( A^{-1} = \)

\[
A = \begin{bmatrix} 1 & 0 & -2 \\ -2 & -1 & 2 \\ 3 & 4 & 1 \end{bmatrix} \text{ and } A^{-1} =
\]

Options:
1. \( A^2 - 2A - 4I \)
2. \( A^2 - A - 3I \)
3. \( \frac{1}{2} [A^2 + A + 2I] \)
4. \( A^2 + A - 2I \)

If the system of simultaneous linear equations \( x + y + z = a, x - y + bz = 2, 2x + 3y - z = 1 \) has infinitely many solutions, then \( b - 5a = \)

\[
\text{सीमाही व्यक्ति सीमाहीते मुद्रांने } x + y + z = a, x - y + bz = 2, 2x + 3y - z = 1 \text{ हे सिमुलेटीवन } \\
\text{सीमाहीते सिमुलेटीवन तरतूदी } b - 5a =
\]

Options:
1. 4
2. 5
3. 3
4. 7
5. -3
If \( z = x + iy, \ x, y \in \mathbb{R} \) and if the point \( P \) in the Argand plane represents \( z \), then the locus of \( P \) satisfying the condition \( \text{Arg} \left( \frac{z-1}{z-3i} \right) = \frac{\pi}{2} \) is

\[ z = x + iy, \ x, y \in \mathbb{R} \text{ and } Arg \left( \frac{z-1}{z-3i} \right) = \frac{\pi}{2} \]

Options:

1. \( \left\{ \frac{z \in \mathbb{C}}{\left| \frac{(1+3i)}{2} \right| = \frac{\sqrt{10}}{2}} \right\} \)

2. \( \left\{ \frac{z \in \mathbb{C}}{(3-i)z + (3+i)\bar{z} = 6} \right\} \)

3. \( \left\{ \frac{z \in \mathbb{C}}{(3-i)z + (3+i)\bar{z} > 6, \left| \frac{1+3i}{2} \right| = \frac{\sqrt{10}}{2}} \right\} \)

4. \( \left\{ \frac{z \in \mathbb{C}}{(3-i)z + (3+i)\bar{z} < 6, \left| \frac{1+3i}{2} \right| = \frac{\sqrt{10}}{2}} \right\} \)

---

If \( P, Q \) and \( R \) are points respectively representing the complex numbers \( z, ze^{\frac{i\pi}{3}} \) and \( z \left( 1 + e^{\frac{i\pi}{3}} \right) \) in Argand plane, then the area of the triangle \( PQR \) is
\[ \sqrt{3} |z|^2 \]

\[ \frac{\sqrt{3}}{2} |z|^2 \]

\[ \frac{\sqrt{3}}{4} |z|^2 \]

\[ 2\sqrt{3} |z|^2 \]

Question Number : 9  Question Id : 1874634329  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

A(z₁) and B(z₂) are two points in the Argand plane. Then the locus of the complex number z satisfying \( \text{Arg} \left( \frac{z - z₁}{z - z₂} \right) = 0 \) or \( \pi \), is

A(z₁) మరియు B(z₂) అండులు అరగండ్ ప్లేన్ లో రెండు సమస్థములు. \( \text{Arg} \left( \frac{z - z₁}{z - z₂} \right) = 0 \) అయితే \( \pi \) ఉండి జాతీయత ప్రదేశం ఛ లేదా స్థిరం ఉండాలి

Options:

1. The circle with \( \overline{AB} \) as a diameter
   \( \overline{AB} \) ని పైకి వండి మధ్యబిందు విభజించడం

2. The ellipse with A, B as extremities of the major axis.
   A, B మరియు మధ్యబిందు విభజించడం

3. The perpendicular bisector of \( \overline{AB} \)
   \( \overline{AB} \) ప్రతిమితర బీస్టర్ విభజించడం
4. The straight line passing through the points A and B

4. Question Number : 10 Question Id : 1874634330 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If \( a \) is a cube root of unity other than 1, then,

\[
\bigg( x + \frac{1}{x} \bigg)^2 + \bigg( x^2 + \frac{1}{x^2} \bigg)^2 + ... + \bigg( x^{12} + \frac{1}{x^{12}} \bigg)^2 =
\]

\[
\bigg( x + \frac{1}{x} \bigg)^2 + \bigg( x^2 + \frac{1}{x^2} \bigg)^2 + ... + \bigg( x^{12} + \frac{1}{x^{12}} \bigg)^2 =
\]

Options :
1. 12
2. 64
3. 24
4. 0

4. Question Number : 11 Question Id : 1874634331 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If \( 3x^2 - 7x + 2 = 0 \) and \( 15x^2 - 11x + a = 0 \) have a common root and \( a \) is a positive real number, then the sum of the roots of the equation \( 15x^2 - ax + 7 = 0 \) is

\[
3x^2 - 7x + 2 = 0 \quad \text{and} \quad 15x^2 - 11x + a = 0 \quad \text{have a common root and} \quad a \quad \text{is a positive real number, then the sum of the roots of the equation} \quad 15x^2 - ax + 7 = 0 \quad \text{is}
\]

Options :
1. \( \frac{76}{15} \)
2. \( \frac{38}{15} \)
Let $\alpha, \beta$ be the roots of the equation $x^2 - |a|x - |b| = 0$ such that $|\alpha| < |\beta|$. If $|a| < \beta - 1$, then the positive root of $\log_{|a|} \left( \frac{x^2}{\beta^2} \right) - 1 = 0$ is

$$|\alpha| < \beta$$

\text{Options :}

1. $< |\alpha|$
2. $< \alpha$
3. $< \beta$
4. $> \beta$

If $x \in \mathbb{R}$ and $1 \leq \frac{3x^2 - 7x + 8}{x^2 + 1} \leq 2$, then the minimum and maximum values of $x$ are respectively

$$x \in \mathbb{R} \text{ satisfies } 1 \leq \frac{3x^2 - 7x + 8}{x^2 + 1} \leq 2$$

\text{Options :}

1, 2
Let \( \phi(x) = \frac{x}{(x^2 + 1)(x + 1)} \). If \( a, b \) and \( c \) are the roots of the equation \( x^3 - 3x + \lambda = 0 \) \( (\lambda \neq 0) \)

then \( \phi(a) \phi(b) \phi(c) = \)

\[ \phi(x) = \frac{x}{(x^2 + 1)(x + 1)} \]

Options:

1. \( \lambda \)

2. \( \frac{-\lambda}{(\lambda + 2)(\lambda^2 + 16)} \)

3. \( \frac{\lambda}{(\lambda + 2)} \)

4. \( \frac{\lambda}{(\lambda + 2)(\lambda^2 + 16)} \)

Question Number : 15  Question Id : 1874634335  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical
In an examination hall there are \(mn\) chairs in \(m\) rows and \(n\) columns. The number of ways in which \(m\) students can be seated such that no row is vacant is

\[
\text{(a) } m^n n! \\
\text{(b) } n^m m! \\
\text{(c) } n^n m! \\
\text{(d) } m^n m!
\]

Consider the following statements:

I: The number of non-trivial even divisors of the number \(2^{\alpha_1}3^{\alpha_2}4^{\alpha_3}5^{\alpha_4}6^{\alpha_5}\) is \((\alpha_1+1)(\alpha_2+1)(\alpha_3+1)(\alpha_4+1)(\alpha_5+1)-2\)

II: The number of non-trivial odd divisors of the number \(2^{\alpha_1}3^{\alpha_2}4^{\alpha_3}5^{\alpha_4}6^{\alpha_5}\) is \(\alpha_2 + \alpha_4 + \alpha_5 + \alpha_2\alpha_4 + \alpha_4\alpha_5\).

Then

\(\text{Options:}\)

\(\text{I is false and II is false}\)

\(\text{I is false and II is true}\)
The coefficient of $x^5$ in the expansion of $(x^2 + 2x + 3)^5$ is

$$\binom{5}{3}(x^2)^2(2x)^3 = 10 \cdot x^5$$

Options:
1. 1052
2. 540
3. 480
4. 1020

If $x$ is so small, that $x^5$ and higher power of $x$ may be neglected, then the coefficient of $x^4$ in the expansion of $\sqrt{x^2 + 4} - \sqrt{x^2 + 9}$ is

$$x^5 \text{ మేరుగు దానికి ప్రవేశించే పిలుట్టండి, } \sqrt{x^2 + 4} - \sqrt{x^2 + 9} \text{ మేరుగు దానికి ప్రవేశించే } x^4 \text{ మేరుగు కంప్లెక్సు}$$

Options:
1. 19
2. 1728
If \( \frac{8}{(x+3)^2(x-2)} = \frac{Ax+B}{(x+3)^2} + \frac{C}{x-2} \) then \( 25(B+8C-A) = \)

\[
\frac{8}{(x+3)^2(x-2)} = \frac{Ax+B}{(x+3)^2} + \frac{C}{x-2}
\]

Options:

1. 25
2. 1
3. 8
4. -8

Let \( \alpha, \beta, \) and \( \gamma \) be such that \( 0 < \alpha < \beta < \gamma < 2\pi \). For any \( x \in \mathbb{R} \) if 
\[
\cos(x+\alpha) + \cos(x+\beta) + \cos(x+\gamma) = 0,
\]
then \( \tan(\gamma - \alpha) = \)

\[
0 < \alpha < \beta < \gamma < 2\pi \text{ so } \alpha, \beta, \gamma \text{ are not in } 2\pi \text{ mod.}
\]
\[
\cos(x+\alpha) + \cos(x+\beta) + \cos(x+\gamma) = 0 \text{ so }, \tan(\gamma - \alpha) =
\]

Options:

1. \(-\sqrt{3}\)
If ABC is not a right angled triangle and \( \sin \left( \frac{\pi}{4} - A \right) \sin \left( \frac{\pi}{4} - B \right) = -\frac{1}{2\sqrt{2}} \csc \left( \frac{\pi}{4} - C \right) \), then \( \tan A \tan B + \tan B \tan C + \tan C \tan A = \)

\[
ABC\text{ is not a right angled triangle, } \sin \left( \frac{\pi}{4} - A \right) \sin \left( \frac{\pi}{4} - B \right) = -\frac{1}{2\sqrt{2}} \csc \left( \frac{\pi}{4} - C \right) \text{ is satisfied,}
\]
\( \tan A \tan B + \tan B \tan C + \tan C \tan A = \)

Options:
1. \( \cot A + \cot B + \cot C \)
2. \( \tan A + \tan B + \tan C \)
3. \( \frac{1}{\tan A + \tan B + \tan C} \)
4. \( \frac{1}{\cot A + \cot B + \cot C} \)

If \( \tan \frac{\theta}{2} = \csc \theta - \sin \theta \), then \( \tan^2 \frac{\theta}{2} = \)

\[
\tan \frac{\theta}{2} = \csc \theta - \sin \theta \text{ is satisfied, } \tan^2 \frac{\theta}{2} =
\]

Options:
Question Number : 23  Question Id : 1874634343  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

The number of real values of \( x \in \left[ 0, 2\pi \right] \setminus \left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\} \) satisfying the equation

\[
|\cos x|^{2\sin^2 x - 3\sin x + 1} = 1
\]

is

\[ x \in \left[ 0, 2\pi \right] \setminus \left\{ \frac{\pi}{2}, \frac{3\pi}{2} \right\} \]

Options :
1. 3
2. 4
3. 5
4. 6

Question Number : 24  Question Id : 1874634344  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

The sum of the maximum and the minimum values of \( 2\left( \cos^{-1} x \right)^2 - \pi \cos^{-1} x + \frac{\pi^2}{4} \) is

\[
2\left( \cos^{-1} x \right)^2 - \pi \cos^{-1} x + \frac{\pi^2}{4}
\]

Options :
1. \( \frac{\pi^2}{8} \)

2. \( \frac{3\pi^2}{8} \)

3. \( \frac{3\pi^2}{2} \)

4. \( 4\pi^2 \)

**Question 25**

If \( y = \log_a \tan \left( \frac{\pi}{4} + \frac{x}{2} \right) \), then \( \tanh \left( \frac{y}{2} \right) = \)

\( y = \log_a \tan \left( \frac{\pi}{4} + \frac{x}{2} \right) \)  
\( \tanh \left( \frac{y}{2} \right) = \)

**Options:**

1. \( \cot \left( \frac{x}{2} \right) \)

2. \( \tan x \)

3. \( \coth x \)

4. \( \tan \left( \frac{x}{2} \right) \)

**Question 26**

In \( \triangle ABC \), if \( a, b, c \) are in arithmetic progression, then \( \cos A + 2\cos B + \cos C = \)

\( \triangle ABC \)  
\( a, b, c \)  
\( \cos A + 2\cos B + \cos C = \)

**Options:**
If the area of triangle ABC is \( b^2 - (c - a)^2 \), then \( \tan B = \) 

\[ \text{කාස්හා හාභා \( b^2 - (c - a)^2 \) දමුතත්, \( \tan B = \)} \]

Options:
1. \( \frac{1}{13} \)
2. \( \frac{1}{15} \)
3. \( \frac{1}{4} \)
4. \( \frac{8}{15} \)

In \( \Delta ABC \), \( \frac{1}{r_1^2} + \frac{1}{r_2^2} + \frac{1}{r_3^2} + \frac{1}{r^2} = \)

\[ \Delta ABC \Rightarrow \frac{1}{r_1^2} + \frac{1}{r_2^2} + \frac{1}{r_3^2} + \frac{1}{r^2} = \]

Options:
\[ \frac{d^2 + b^2 + c^2}{\Delta^2} \]
For a non-zero real number \( x \), if the points with position vectors

\[(x-u)\hat{i} + x\hat{j} + x\hat{k}, \quad (x-v)\hat{j} + x\hat{k}, \quad x\hat{i} + x\hat{j} + (x-w)\hat{k}\]

and

\[(x-1)\hat{i} + (x-1)\hat{j} + (x-1)\hat{k}\]

are coplanar, then

Options:

1. \( u + v + w = 1 \)

2. \( uvw = 1 \)

3. \( \frac{1}{u} + \frac{1}{v} + \frac{1}{w} = 1 \)

4. \( uv + vw + uw = 1 \)
If \( P \) is a point lying on the line passing through the point \( A(\vec{i} - \vec{j} + 3\vec{k}) \) and parallel to the vector \( 2\vec{i} + \vec{j} - 2\vec{k} \) such that \( |\vec{AP}| = 18 \), then a position vector of \( P \) is

\[ \vec{P} = \vec{A} + 18 \cdot 2\vec{i} + \vec{j} - 2\vec{k} \]

Options:

1. \(-13\vec{i} - 5\vec{j} + 9\vec{k}\)
2. \(11\vec{i} + 7\vec{j} - 15\vec{k}\)
3. \(13\vec{i} - 5\vec{j} + 9\vec{k}\)
4. \(13\vec{i} + 5\vec{j} - 9\vec{k}\)

\[ \vec{a}, \vec{b}, \vec{c} \] are three vectors such that \( |\vec{a}| = 1, |\vec{b}| = 2, |\vec{c}| = 3 \) and \( \vec{b} \cdot \vec{c} = 0 \). If the projection of \( \vec{b} \) along \( \vec{a} \) is equal to the projection of \( \vec{c} \) along \( \vec{a} \), then

\[ |2\vec{a} + 3\vec{b} - 3\vec{c}| = \]

Options:

1. 3
2. \( \sqrt{22} \)
3. 9
4. 11
Let \( \vec{m} \) be a vector of magnitude \( \sqrt{3} \) and perpendicular to the vectors \( \vec{i} + \vec{j} \) and \( \vec{j} - \vec{k} \). Let \( \vec{n} \) be another vector of magnitude \( 2\sqrt{6} \) and perpendicular to the vectors \( 2\vec{i} - \vec{j} \) and \( \vec{j} + 2\vec{k} \). The area (in sq. units) of the triangle formed with \( \vec{m} \) and \( \vec{n} \) as sides is

\[
(\vec{i} + \vec{j}) \times (\vec{j} - \vec{k}) = \sqrt{3} \quad (\vec{j} + \vec{k}) \times (2\vec{i} - \vec{j}) = 2\sqrt{6} \quad (\vec{j} + 2\vec{k}) \times (\vec{j} + 2\vec{k}) = 4\sqrt{6}.
\]

**Options:**

1. \( \sqrt{2} \)
2. \( \sqrt{6} \)
3. \( 2\sqrt{3} \)
4. \( 3\sqrt{2} \)

---

\( \vec{a} = \vec{i} - \vec{j} + \vec{k} \), \( \vec{b} = \vec{i} - 2\vec{j} + \vec{k} \), \( \vec{c} = p\vec{i} + 2\vec{j} + q\vec{k} \) and \( \vec{d} = p\vec{i} + q\vec{j} + 2\vec{k} \) are given vectors. If the projection of \( \vec{c} \) on \( \vec{a} \) is \( 5\sqrt{3} \) units and if \( \vec{a}, \vec{b}, \vec{c} \) form a parallelepiped of volume 5 cubic units, then \( \tan^{-1}(\vec{b} \cdot \vec{d}) = \frac{\pi}{2} \).

---

\( \vec{a} = \vec{i} - \vec{j} + \vec{k} \), \( \vec{b} = \vec{i} - 2\vec{j} + \vec{k} \), \( \vec{c} = p\vec{i} + 2\vec{j} + q\vec{k} \), \( \vec{d} = p\vec{i} + q\vec{j} + 2\vec{k} \) are given vectors. If \( \vec{a}, \vec{b}, \vec{c} \) form a parallelepiped of volume 5 cubic units, then \( \tan^{-1}(\vec{b} \cdot \vec{d}) = \frac{\pi}{2} \).

**Options:**

1. \( \frac{\pi}{2} \)
Question Number : 34  Question Id : 1874634354  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical
Given  \( \vec{a} = 2\vec{i} + \vec{j} + \vec{k}, \vec{b} = \vec{i} + 2\vec{j} - \vec{k} \) and a unit vector \( \vec{c} \) are coplanar. If \( \vec{c} \) is perpendicular to \( \vec{a} \), then \( \vec{c} = \)

\[ \vec{a} = 2\vec{i} + \vec{j} + \vec{k}, \vec{b} = \vec{i} + 2\vec{j} - \vec{k} \]

Options :

1. \( \pm \frac{1}{\sqrt{3}}(\vec{i} - \vec{j} - \vec{k}) \)
2. \( \frac{1}{\sqrt{5}}(\vec{i} - 2\vec{j}) \)
3. \( \frac{-1}{\sqrt{3}}(\vec{i} + \vec{j} + \vec{k}) \)
4. \( \pm \frac{1}{\sqrt{2}}(\vec{j} + \vec{k}) \)

Question Number : 35  Question Id : 1874634355  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical
The coefficient of variation of 9, 3, 11, 5, 7 is

9, 3, 11, 5, 7 విభాగ పరిమాణము

Options :
The mean deviation about the mean for the following data

<table>
<thead>
<tr>
<th>Marks obtained</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Boys</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

\[
\frac{100 \sqrt{2}}{7}
\]

\[
\frac{200 \sqrt{2}}{3}
\]

\[
\frac{200 \sqrt{2}}{7}
\]

\[
\frac{100 \sqrt{2}}{3}
\]

Options:
1. 9.33
2. 5.6
3. 8.33
4. 9.6
The probability of occurrence of an event is \( \frac{2}{5} \) and the probability of non-occurrence of another event is \( \frac{3}{10} \). If these events are independent, then the probability that only one of the two events occur is

\[
\begin{align*}
\text{Options :} & \\
1. & \frac{27}{25} \\
2. & \frac{27}{50} \\
3. & \frac{7}{25} \\
4. & \frac{14}{25}
\end{align*}
\]

Let \( \alpha \) be a root of \( x^2 + x + 1 = 0 \) and suppose that a fair die is thrown 3 times. If \( a, b, c \) are the numbers shown on the die, then the probability that \( \alpha^a + \alpha^b + \alpha^c = 0 \) is

\[
\begin{align*}
\text{Options :} & \\
1. & \frac{2}{36}
\end{align*}
\]
Suppose that a bag A contains \( n \) red and 2 black balls and another bag B contains 2 red and \( n \) black balls. One of the two bags is selected at random and two balls are drawn from it at a time. When it is known that the two balls drawn are red, if the probability that those two balls drawn are from bag A is \( \frac{6}{7} \), then \( n = \) 

Options:
1. 6
2. 4
3. 8
4. 7
A random variable $X$ has its range $\{-1, 0, 1\}$. If its mean is 0.2 and $P(X = 0) = 0.2$, then $P(X = 1) =$

అనే విశేషపొందిన విభాగం $X$ ఉపయోగించబడింది. అది సంఖ్య ప్రతిశతం 0.2 కాదు $P(X = 0) = 0.2$ మేము, $P(X = 1) =$

Options:
1. 0.1
2. 0.7
3. 0.4
4. 0.5

There are 800 families with four children in each family. Assuming equal chance for every child to be a boy or a girl, the number of families expected to have children of both sexes is

800 ప్రతితిపతనాల ఉంటాయి. ఫలితానికి మాత్రమే యోధనుని ఉంటాయి, మాత్రమే మాత్రమే యోధనుని ఉంటాయి

Options:
1. 700
2. 100
3. 500
4. 300
A straight line meets the X and Y axes at the points A, B respectively. If AB = 6 units, then the locus of the point P which divides the line segment AB such that AP:PB = 2:1 is

Options:
1. $3x^2 + y^2 = 36$
2. $4x^2 + y^2 = 36$
3. $3x^2 + y^2 = 16$
4. $4x^2 + y^2 = 16$

If the area of the region bounded by the curves $y = x^2$ and $x = y^2$ is $k$, then the area of the region bounded by the curves

$$\frac{x + \sqrt{3}y}{2} = \left(\frac{\sqrt{3}x - y}{2}\right)^2 \text{ and } \frac{\sqrt{3}x - y}{2} = \left(\frac{x + \sqrt{3}y}{2}\right)^2$$

is

Options:
1. $\frac{\sqrt{3}}{2}k$
2. $\frac{1}{2}k$
3. $k$
4. \[ \left( \frac{\sqrt{3}+1}{2} \right)^k \]

**Question Number : 44  Question Id : 1874634364  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes Single Line Question Option : No  Option Orientation : Vertical**

The set of values that \( \beta \) can assume so that the point \( (0, \beta) \) should lie on or inside the triangle having sides \( 3x + y + 2 = 0, 2x - 3y + 5 = 0 \) and \( x + 4y - 14 = 0 \) is

\[ 3x + y + 2 = 0, 2x - 3y + 5 = 0 \] modulo \( x + 4y - 14 = 0 \) \( \Delta \) మీద సమీప్తి యుగ్మాలు (0, \( \beta \) ) పూర్వ లేఖ లక్షణాలు, \( \beta \) సహాగా ఎందుకు లక్షణాలు

**Options :**

1. \[ \begin{bmatrix} 5 \\ 7 \\ 3 \\ 2 \end{bmatrix} \]
2. \[ \begin{bmatrix} 2 \\ 5 \\ 3 \\ 2 \end{bmatrix} \]
3. \[ \begin{bmatrix} -1 \\ 2 \\ 3 \\ 3 \end{bmatrix} \]
4. \[ \begin{bmatrix} 1 \\ 5 \\ 2 \\ 2 \end{bmatrix} \]

**Question Number : 45  Question Id : 1874634365  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes Single Line Question Option : No  Option Orientation : Vertical**

If \( (\lambda^2, \lambda + 1) \), \( \lambda \in Z \) belongs to the region between the lines \( x + 2y - 5 = 0 \) and \( 3x - y + 1 = 0 \) which includes the origin, then the possible number of such points is:

\[ (\lambda^2, \lambda + 1) \in Z మీద x + 2y - 5 = 0, 3x - y + 1 = 0 సరిహేతు లేదా సరిశీత్యమైన సమీప లేఖ లక్షణాలు

**Options :**

1. 4
If the mid points of the sides BC, CA and AB of a triangle ABC, are respectively (2, 1), (–1, –2) and (3, 3), then the equation of the side BC is

\[ x - 2y = 0 \]

Options:
1. \[ x - 2y = 0 \]
2. \[ 5x - 4y = 6 \]
3. \[ 2x + 3y = 8 \]
4. \[ 3x - 2y = 6 \]

The distance between the pair of lines \( x^2 + 2\sqrt{2}xy + 2y^2 + 4x + 4\sqrt{2}y + 1 = 0 \) is

\[ x^2 + 2\sqrt{2}xy + 2y^2 + 4x + 4\sqrt{2}y + 1 = 0 \]  

Options:
1. \( 4\sqrt{2} \)
2. \( 2\sqrt{2} \)
3. 2
Question Number : 48  Question Id : 1874634368  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

A pair of lines $S = 0$ together with the lines given by the equation $8x^2 - 14xy + 3y^2 + 10x + 10y - 25 = 0$ form a parallelogram. If its diagonals intersect at the point $(3, 2)$, then the equation $S = 0$ is

$$S = 0$$

Options :

1. $6x^2 - 9xy + y^2 - 25x + 30y + 25 = 0$

2. $8x^2 - 14xy + 3y^2 - 25x + 30y + 50 = 0$

3. $8x^2 - 14xy + 3y^2 - 50x + 50y + 75 = 0$

4. $6x^2 + 14xy - 3y^2 - 30x + 40y - 75 = 0$

---

Question Number : 49  Question Id : 1874634369  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

If the equation of the circle having its centre in the second quadrant touches the coordinate axes and also the line $\frac{x}{5} + \frac{y}{12} = 1$ is $x^2 + y^2 + 2\lambda x - 2\lambda y + \lambda^2 = 0$, then $\lambda = \frac{x}{5} + \frac{y}{12} = 1$ and the circle touches the coordinate axes.

Options :

1. $\lambda = \frac{x}{5} + \frac{y}{12} = 1$
Question Number : 50  Question Id : 1874634370  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

The equation of a circle passing through the point (2, 8), touching the lines $4x - 3y - 24 = 0$ and $4x + 3y - 42 = 0$ and having the $x$ coordinate of its centre less than or equal to 8 is

$$(2, 8) \text{ నుండి కొన్ని స్థానంపు వరుసలు, } 4x - 3y - 24 = 0 \text{ కలిపే స్థానాంతరాలు } 4x + 3y - 42 = 0 \text{ కలిపే స్థానాంతరాలు కొన్ని వ్యాసాలు నుండి హదు స్థానంపు వరుసలు కొన్ని వ్యాసాలు నుండి హదు స్థానంపు వరుసలు, అయితే } x \text{ నుండి స్థానంపు విశాలం స్థానంపు విశాలం స్థానంపు విశాలం}

Options :

1. $x^2 + y^2 + 2x - 8y - 8 = 0$

2. $x^2 + y^2 - 4x - 6y - 12 = 0$

3. $x^2 + y^2 + 4x - 10y + 4 = 0$

4. $x^2 + y^2 - 6x - 4y - 24 = 0$

Question Number : 51  Question Id : 1874634371  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

The point of intersection of the common tangents drawn to the circles $x^2 + y^2 - 4x - 2y + 1 = 0$ and $x^2 + y^2 - 6x - 4y + 4 = 0$ is.

$x^2 + y^2 - 4x - 2y + 1 = 0 \text{ కలిపే స్థానాంతరాలు } x^2 + y^2 - 6x - 4y + 4 = 0 \text{ కలిపే స్థానాంతరాలు}

Options :

$\begin{pmatrix} 5 & 3 \\ 2 & 2 \end{pmatrix}$
The circle \( S = 0 \) cuts the circle \( x^2 + y^2 - 4x + 2y - 7 = 0 \) orthogonally. If \((2, 3)\) is the centre of the circle \( S = 0 \), then its radius is

\[
S = 0 \text{ కచ్చీ రుండు, } x^2 + y^2 - 4x + 2y - 7 = 0 \text{ పుటియానికి రుండు గుండాయేము. } S = 0 \text{ కచ్చీ రుండు (2, 3) రేఖెలు, తద్వి రుండించే రెంటు}
\]

Options:
1. 2
2. 1
3. 3
4. 4
The equation of the circle which cuts the circles
\[ S_1 = x^2 + y^2 - 4 = 0 \]
\[ S_2 = x^2 + y^2 - 6x - 8y + 10 = 0 \]
\[ S_3 = x^2 + y^2 + 2x - 4y - 2 = 0 \]
at the extremities of diameters of these circles is

Options:
1. \[ x^2 + y^2 - 4x - 6y - 4 = 0 \]
2. \[ x^2 + y^2 + 4x - 4 = 0 \]
3. \[ x^2 + y^2 = 25 \]
4. \[ x^2 + y^2 + x + y + 1 = 0 \]

The length of the latus rectum of the parabola
\[ 20(x^2 + y^2 - 6x - 2y + 10) = (4x - 2y - 5)^2 \]
is

Options:
1. \[ \sqrt{5} \]
2. \[ 2\sqrt{5} \]
3. $\sqrt{5}$

4. $4\sqrt{5}$

Question Number : 55  Question Id : 1874634375  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

$y = 3x - 2$ is a straight line touching the parabola $(y - 3)^2 = 12(x - 2)$. If a line drawn perpendicular to this line at P on it, touches the given parabola, then the point P is

$y = 3x - 2$ సూత్రం నందించేది పరాభవ యుగు నందించేది (y - 3)^2 = 12(x - 2) నందించేది. ఏ నందించేది మొదలుల వెనువి ప్రాంది పరాభవ యుగు నందించేది అవి కంటుంది ప

Options :
1. $(-1, -5)$
2. $(-1, 5)$
3. $(-2, -8)$
4. $(2, 4)$

Question Number : 56  Question Id : 1874634376  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

If $(l, m)$ is the circumcentre of an equilateral triangle inscribed in the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

having vertices at points with eccentric angles $\theta_1, \theta_2, \theta_3$, then

$$\frac{2}{3}\left[\cos(\theta_1 - \theta_2) + \cos(\theta_2 - \theta_3) + \cos(\theta_3 - \theta_1)\right] =$$

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$ నందించేది మొదలుల వెనువి పరాభవ యుగు నందించేది, వెనువి $\theta_1, \theta_2, \theta_3$

సమానం పరాభవ యుగు నందించేది. ఏ నందించేది వెనువి (l, m) లభించిన,

$$\frac{2}{3}\left[\cos(\theta_1 - \theta_2) + \cos(\theta_2 - \theta_3) + \cos(\theta_3 - \theta_1)\right] =$$

Options :
If \( l \) and \( b \) are respectively the length and breadth of the rectangle of greatest area that can be inscribed in the ellipse \( x^2 + 4y^2 = 64 \), then \((l, b) = \) 

\[ x^2 + 4y^2 = 64 \text{ యుట్టండి విశేషంగా గాను మంచిగా నిలిచే మిశ్రములు కార్యాలు చేసే విధం విశాఖి మిశ్రములు లేదా మిశ్రములు } \]

\[ l \times b \text{ పెంచిన ఒక విభాగం } (l, b) = \]

Options:

1. \((16\sqrt{2}, 4\sqrt{2})\)

2. \((8\sqrt{2}, 6\sqrt{2})\)

3. \((8\sqrt{2}, 4\sqrt{2})\)

4. \((6\sqrt{2}, 4\sqrt{2})\)

If \( 2x - ky + 3 = 0 \) and \( 3x - y + 1 = 0 \) are conjugate lines with respect to \( 5x^2 - 6y^2 = 15 \), then \( k = \) 

\[ 5x^2 - 6y^2 = 15 \text{ యుట్టండి } 2x - ky + 3 = 0, 3x - y + 1 = 0 అంటే చిత్రాల శీఘ్రగా ఉండాలి ల ఉంటే } k = \]

Options:
The points $A(2, -1, 4)$, $B(1, 0, -1)$, $C(1, 2, 3)$ and $D(2, 1, 8)$ form a

A$(2, -1, 4)$, B$(1, 0, -1)$, C$(1, 2, 3)$, D$(2, 1, 8)$ అవి సాధారణం నందితి నివృత్తి

Options:
1. Rectangle
2. Square
3. Rhombus
4. Parallelogram

If $l_1, m_1, n_1$ and $l_2, m_2, n_2$ are direction cosines of $\overrightarrow{OA}$ and $\overrightarrow{OB}$ such that $|\overrightarrow{AOB}| = \theta$, where $O$ is the origin, then the direction cosines of the internal angular bisector of $|\overrightarrow{AOB}|$ are

$l_1, m_1, n_1$ ప్రత్యేకి $l_2, m_2, n_2$ ప్రత్యేకి $\overrightarrow{OA}$, $\overrightarrow{OB}$ ను ప్రత్యేకి, $O$ అంతర్గతం ప్రత్యేకి $|\overrightarrow{AOB}| = \theta$ ప్రత్యేకి, $|\overrightarrow{AOB}|$ ప్రత్యేకి, అంతర్గతం ప్రత్యేకి సాధారణం నందితి నందితి

Options:
The distance of the plane $3x + 4y + 5z + 19 = 0$ from the point $(1, -1, 1)$ measured along a line parallel to the line with direction ratios $2, 3, 1$ is

\[ \frac{23}{5\sqrt{2}} \]

\[ \frac{\sqrt{71}}{5\sqrt{2}} \]

\[ \sqrt{14} \]

\[ \sqrt{23} \]
For \( A \neq 0, x < 0 \), \( \lim_{n \to \infty} \frac{\sin nx - e^{nx}}{1 + A e^{nx}} = \)

\( A \neq 0, x < 0 \), \( \lim_{n \to \infty} \frac{\sin nx - e^{nx}}{1 + A e^{nx}} = \)

Options:
1. \( \frac{1}{A} \)
2. \( \sin x \)
3. \( -\frac{1}{A} \)
4. \( -\sin x \)

Define \( f(x) = \begin{cases} \sqrt{1 + px} - \sqrt{1 - px} & \text{if } -1 \leq x < 0 \\ \frac{2x + 1}{x - 2} & \text{if } 0 \leq x \leq 1 \end{cases} \)

If \( \lim_{x \to 0} f(x) \) exists, then \( p = \)

\[ f(x) = \begin{cases} \sqrt{1 + px} - \sqrt{1 - px} & -1 \leq x < 0 \\ \frac{2x + 1}{x - 2} & 0 \leq x \leq 1 \end{cases} \]

\[ \Rightarrow \lim_{x \to 0} f(x) \] 

Options:
1. \(-1\)
Question Number : 64  Question Id : 1874634384  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

Given \( \sin x = \sum_{n=1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \). If the function \( f(x) \) given by

\[
f(x) = \frac{\cos (\sin x) - \cos x}{x^4} \quad (x \neq 0) \quad \text{and} \quad f(0) = k, \text{ is continuous at } x = 0, \text{ then } k =
\]

\[
\sin x = \sum_{n=1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \quad \text{and} \quad f(x) = \frac{\cos (\sin x) - \cos x}{x^4} \quad (x \neq 0)
\]

\( f(0) = k \) \quad \text{is continuous at} \quad f(x), x = 0 \quad \text{then} \quad f(x) \text{, at} \quad k =

Options :

1. \( \frac{1}{6} \)

2. \( \frac{1}{3} \)

3. \( \frac{1}{2} \)

4. 0

Question Number : 65  Question Id : 1874634385  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical
Match for each functions in List-I to its derivative given in List-II.

List - I

A) \( \sin^{-1}\left(\frac{2x}{1+x^2}\right) \)

B) \( \tan^{-1}\left(\frac{1-x}{1+x}\right) \)

C) \( e^{\log(\sin x+\cos x)} \)

D) \( \sqrt{1-\sin 2x} \left(0 < x < \frac{\pi}{4}\right) \)

List - II

I) \( \cos x - \sin x \)

II) \( \frac{-1}{1+x^2} \)

III) \( \frac{2}{1+x^2} \)

IV) \( \cos x + \sin x \)

V) \( -\sin x - \cos x \)

The correct match is:

Options:

1. III II I V
2. II III V IV
3. II III V I
4. III II I V
If \( f(t) = \frac{1 + \csc t}{1 - \csc t} \) for \( 0 < t < \frac{\pi}{2} \) and \( f'(t) = f(t)g(t) \), then \( g(t) = \)

\[ 0 < t < \frac{\pi}{2}, \quad f(t) = \frac{1 + \csc t}{1 - \csc t}, \quad f'(t) = f(t)g(t), \quad g(t) = \]

Options:
1. \(-4 \csc 2t\)
2. \(4 \csc 2t\)
3. \(2 \sin 2t\)
4. \(4 \csc t\)

Question Number : 67  Question Id : 1874634387  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

If \( x = 4 \cos^3 \theta \) and \( y = 3 \sin^2 \theta \), then \( \frac{d^2y}{dx^2} \) at \( \theta = \frac{\pi}{4} \) is

\[ x = 4 \cos^3 \theta, \quad y = 3 \sin^2 \theta, \quad \theta = \frac{\pi}{4}, \quad \frac{d^2y}{dx^2} = \]

Options:
1. \(\frac{1}{3}\)
2. \(\frac{1}{6}\)
3. \(-\frac{1}{6}\)
4. \(-\frac{1}{3}\)

Question Number : 68  Question Id : 1874634388  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical
Tangents are drawn to the curve \( y = \sin x \) from the origin. The locus of the points of contact is

\[ y = \sin x \text{ and } \tan y = \frac{\cos x}{\cos y} \]  

Options:
1. \( xy = x + y \)
2. \( x^2y^2 = x^2 - y^2 \)
3. \( xy = x - y \)
4. \( x^2 + y^2 = x^2 + y^2 \)

Question Number: 69 Question Id: 1874634389 Question Type: MCQ Option Shuffling: Yes Display Question Number: Yes Single Line Question Option: No Option Orientation: Vertical

A man of height 2 meters walks at a uniform speed of 7 meters per minute away from a lamp post of height 9 meters. The rate (in meters per minute) at which the length of his shadow increases is

Options:
1. \( \frac{2}{2} \)
2. \( \frac{5}{2} \)
3. \( \frac{3}{2} \)
4. \( \frac{7}{2} \)

Question Number: 70 Question Id: 1874634390 Question Type: MCQ Option Shuffling: Yes Display Question Number: Yes Single Line Question Option: No Option Orientation: Vertical
Let $a, b, c$ be real numbers such that $2a + 3b + 6c = 0$ and $g(x) = ax^2 + bx + c = 0$ has at least one root in the interval $(1, 2)$. If a function $f : [1, 2] \rightarrow \mathbb{R}$ for which Rolle's mean value theorem holds is such that $f(x)$ is a primitive of $g(x)$, then $f(x) =$

$$a, b, c \text{ are real numbers such that } 2a + 3b + 6c = 0 \text{ and } g(x) = ax^2 + bx + c = 0 \text{ has at least one root in the interval } (1, 2).$$

The maximum volume (in cubic units) of the cylinder which can be inscribed in a sphere of diameter 6 units is

$$6 \text{ units}$$

Options:

1. $12\sqrt{3}\pi$

2. $4\sqrt{3}\pi$

3. $3\sqrt{3}\pi$

4. $8\sqrt{3}\pi$
\[
\int \frac{x}{\sqrt{x+1} + \sqrt{x-1}} \, dx = A(x) \left( x + 1 \right)^{\frac{3}{2}} + B(x) \left( x - 1 \right)^{\frac{3}{2}} + C, \text{ then } A(x) + B(x) =
\]

Options:

1. \(\frac{4}{15}\)

2. \(-\frac{4}{15}\)

3. \(\frac{2x}{5}\)

4. \(-\frac{2x}{5}\)

\[
\int \frac{x \cdot \log x}{\left( \sqrt{x^2 - 1} \right)^3} \, dx =
\]

Options:

1. \(\sec^{-1} x + \frac{\log x}{\sqrt{x^2 - 1}} + c\)

2. \(\sec^{-1} x - \frac{\log x}{\sqrt{x^2 - 1}} + c\)

3. \(\frac{\log x}{\sqrt{x^2 - 1}} - \sec^{-1} x + c\)
4. \[ \frac{-\log x}{\sqrt{x^2 - 1}} - \sec^{-1} x + c \]

Question Number : 74  Question Id : 1874634394  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

\[ \int \frac{\cos 2x \cdot \sin 4x}{\cos^4 x \left( 1 + \cos^2 2x \right)} \, dx = \]

Options :
1. \[ \log \left( \frac{1 + \cos 2x}{1 + \cos^2 2x} \right) + \sec^2 x + c \]
2. \[ \log \left( \frac{(1 + \cos 2x)^2}{1 + \cos^2 x} \right) + \sec x + c \]
3. \[ \log \left( \frac{(1 + \cos 2x)^2}{(1 + \cos^2 2x)} \right) + \sec^2 x + c \]
4. \[ \log \left( \frac{1 + \cos^2 2x}{(1 + \cos 2x)^2} \right) + \sec x + c \]

Question Number : 75  Question Id : 1874634395  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

If \( A_n = \int_{\frac{\pi}{2}}^{\infty} e^{-x} \cdot \cos^n x \, dx \), then \( \frac{A_4 - A_6}{A_4} = \]

\[ A_n = \int_{\frac{\pi}{2}}^{\infty} e^{-x} \cdot \cos^n x \, dx \quad \therefore \quad \frac{A_4 - A_6}{A_4} = \]

Options :
1. \( \frac{3}{2} \)
Question Number : 76  Question Id : 1874634396  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

\[
\lim_{{n \to \infty}} \left\{ \frac{1}{n + m} + \frac{1}{n + 2m} + \frac{1}{n + 3m} + \ldots + \frac{1}{n + nm} \right\} =
\]

Options :

1. \( \log_e (m) \)

2. \( \frac{\log_e (1+m)}{1+m} \)

3. \( \frac{\log_e (1+m)}{m} \)

4. \( \frac{\log_e (1+m)}{1-m} \)

Question Number : 77  Question Id : 1874634397  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

\[
\tan^{-1} \left[ \frac{\pi}{2} \cdot \frac{\cos x}{1 + e^x} \right] =
\]

Options :

1. \( \pi/4 \)
The area (in sq. units) bounded by $x^2 = y$, $y = x + 2$ and the X-axis is

$$x^2 = y, \ y = x + 2 \text{ is and the } X\text{-axis is } \pi \text{ unit.}$$

Options:

1. $\frac{2}{3}$
2. $\frac{3}{5}$
3. $\frac{5}{6}$
4. $\frac{4}{5}$
Statement (I): The elimination of arbitrary constants from \( \alpha, \beta \) and \( \gamma \) from \( y = (\alpha + \beta + \gamma) x \) results in a differential equation of order three.

Statement (II): The elimination of arbitrary constants \( \alpha, \beta \) and \( \gamma \) from \( y = \alpha x + \beta \sin x + \gamma e^x \) results in a differential equation of order three.

Make the correct choice of the following.

Options:
1. I is true and II is false
2. I is false and II is false
3. I is true and II is true
4. I is false and II is true
1. \( \sec y = x - 1 - ce^x \)
2. \( \sec y = x + 1 + ce^x \)
3. \( \sec y = x + e^x + c \)
4. \( \sec y = x - e^x + c \)

**Physics**

Display Number Panel: Yes
Group All Questions: No

Question Number : 81  Question Id : 1874634401  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

If 1% and 2% are the errors in the measurement of mass and density of a cube respectively, then the error in the measurement of length is

1% లోనివంతం 2% లోనివంతం అంచగా యుగును చేసేది వాటా సమత్వం సంపాదింది కానపు జాతికి రెండవ అంశం ఉండేవాలా

Options :
1. 1%
2. 3%
3. 2%
4. 4%

Question Number : 82  Question Id : 1874634402  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical
A body travelling along a straight line path travels first half of the distance with a velocity 7 ms\(^{-1}\). During the travel time of the second half of the distance, first half time is travelled with a velocity 14 ms\(^{-1}\) and the second half time is travelled with a velocity 21 ms\(^{-1}\). Then the average velocity of the body during the journey is

Options:
1. 14 ms\(^{-1}\)
2. 10 ms\(^{-1}\)
3. 9 ms\(^{-1}\)
4. 12 ms\(^{-1}\)

Assertion (A): The range of a projectile is maximum when the angle of projection is 45°.
Reason (R): The range of a projectile depends only on the angle of projection.

Options:
Both (A) and (R) are true and (R) is the correct explanation of (A)
1. (A),(R) అనే విషయం యొక్క విషయం అనేక హోస్పిటల్ రోజులను ముద్రిస్తే (R), (A) లా విషయం విషయం

Both (A) and (R) are true but (R) is not the correct explanation of (A)
2. (A),(R) అనే విషయం యొక్క విషయం అనేక హోస్పిటల్ రోజులను ముద్రిస్తే (R), (A) లా విషయం విషయం రావాలస్తే

(A) is true but (R) is false
3. (A) విషయం యొక్క విషయం అనే హోస్పిటల్ రోజులను ముద్రిస్తే (R) నిషేధించబడింది
(A) is false but (R) is true

4. (A) అద్భుతం నం (R) అద్భుతం

Question Number : 84  Question Id : 1874634404  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

A car moving with a certain velocity, jumps from an inclined plane placed at one bank of a river and reaches the other bank by attaining a maximum height of 80 m. If the same car, moving with the same velocity jumps from another inclined plane having different angle of inclination and reaches the same point on the other bank by attaining maximum height of 45 m, then the width of the river is

సార్లు, సార్లు మంచు సార్లు కాబట్టి అద్భుతం నం అద్భుతం నం అద్భుతం నం అద్భుతం నం. 80 మీటర్ల విశేషాలు కాబట్టి, 45 మీటర్ల విశేషాలు కాబట్టి అద్భుతం నం అద్భుతం నం అద్భుతం నం అద్భుతం నం.

Options:
1. 80 m
2. 60 m
3. 125 m
4. 240 m

Question Number : 85  Question Id : 1874634405  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical
A system containing masses and pulleys connected on an inclined plane is shown in the figure. If the system is in equilibrium then the value of m is

In the arrangement shown in the figure, the coefficient of friction between two blocks is 0.5. The force of friction between the two blocks is (Assume that the 4 kg block is placed on a smooth horizontal surface)

(Acceleration due to gravity = 10 m/s²)

Options:
1. 1 kg
2. 0.5 kg
3. 0.75 kg
4. 0.25 kg
In the arrangement shown in the figure, work done by the string on the block of mass 0.36 kg during the first second after the blocks are released from state of rest is (Ignore friction and mass of the string)

\( \text{Acceleration due to gravity} = 10 \text{ m/s}^2 \)

Options:
1. 8 J
2. 4 J
3. 12 J
Question Number: 88  Question Id: 1874634408  Question Type: MCQ  Option Shuffling: Yes  Display Question Number: Yes  Single Line Question Option: No  Option Orientation: Vertical

A man who is running has half the kinetic energy of a boy of half his mass. The man speeds up by 1 ms\(^{-1}\) and then has the same kinetic energy as the boy. The initial speed of the boy is

\[ \frac{1}{2} m v_1^2 = \frac{1}{2} m (v_1 + 1)^2 \]

Options:

1. \[ \sqrt{2} + 1 \text{ ms}^{-1} \]
2. \[ 2(\sqrt{2} + 1) \text{ ms}^{-1} \]
3. \[ \sqrt{2} \text{ ms}^{-1} \]
4. \[ 2 \text{ ms}^{-1} \]

Question Number: 89  Question Id: 1874634409  Question Type: MCQ  Option Shuffling: Yes  Display Question Number: Yes  Single Line Question Option: No  Option Orientation: Vertical

A solid sphere rolls down without slipping on a smooth inclined plane of inclination Sin\(^{-1}\) (0.42). If the acceleration due to gravity is 10 ms\(^{-2}\), the acceleration of the rolling sphere is

\[ a = g \sin \theta (1 + \frac{1}{2} \frac{I}{M} \frac{1}{R^2}) \]

where \(I = \frac{2}{5} MR^2\)

Options:

1. \[ 1 \text{ ms}^{-2} \]
2. \[ 2 \text{ ms}^{-2} \]
3. \[ 3 \text{ ms}^{-2} \]
4. \[ 4 \text{ ms}^{-2} \]
A thin wire of length \( l \) having linear density \( \rho \) is bent into a circular loop with \( C \) as its centre as shown in the figure. The moment of inertia of the loop about the line \( AB \) is

\[ \frac{5\rho l^3}{16\pi^2} \]

\[ \frac{\rho l^2}{16\pi^2} \]

\[ \frac{\rho l^2}{8\pi^2} \]

\[ \frac{3\rho l^3}{8\pi^2} \]

A particle executing SHM along a straight line has zero velocity at points \( A \) and \( B \) whose distances from \( 'O' \) on the same line \( OAB \) are \( 'a' \) and \( 'b' \) respectively. If the velocity at the midpoint between \( A \) and \( B \) is \( 'v' \), then its time period is
A rocket is launched straight up from the surface of the earth. When its altitude is \( \frac{1}{3} \) of the radius of the earth, its fuel runs out and therefore it coasts. If the rocket has to escape from the gravitational pull of the earth, the minimum velocity with which it should coast is \( ( \text{Escape velocity on the surface of the earth is } 11.2 \text{ kms}^{-1} ) \)

Options:

1. 11.2 kms\(^{-1}\)
2. 10.7 kms\(^{-1}\)
3. 9.7 kms\(^{-1}\)
4. 8.7 kms\(^{-1}\)
Two wires of equal length and equal cross sectional areas are suspended as shown in the figure. Their Young’s moduli are $Y_1$ and $Y_2$ respectively. The equivalent Young’s modulus is

\[ Y = \frac{Y_1 Y_2}{Y_1 + Y_2} \]

Options:
1. $Y_1 + Y_2$
2. $\frac{Y_1 + Y_2}{2}$
3. $\frac{Y_1 Y_2}{Y_1 + Y_2}$
4. $\sqrt{Y_1 Y_2}$

A rain drop of radius $r$ is falling through air, starting from rest. The work done by all the forces on the drop, when it attains terminal velocity, is proportional to

\[ \frac{4}{3} \pi r^3 \rho g \]

Options:
1. $r^3$
Which of the following statements is correct regarding P–V graph?

a) Slope of P–V graph in an isothermal process is \( \frac{P}{V} \)

b) Slope of P–V graph in an adiabatic process is \( \frac{P}{V} \)

c) Slope of P–V graph in an isochoric process is \( -\frac{\gamma P}{V} \)

d) Slope of P–V graph in an isobaric process is zero

Options:

- a, c, d are correct
- a, c, d ఎండ్ తెలుగులో

b, c are correct
- b, c ఎండ్ తెలుగులో
Two metallic spheres P and Q made of same material have same smoothness but the weight of P is 8 times that of Q. If the two are heated to same temperature and left to cool, then the ratio of rate of cooling of Q to that of P is

Options:
1. 4
2. 8
3. 2
4. 1
Three moles of an ideal monatomic gas performs a cycle ABCDA as shown in the figure. The temperatures of the gas at the states A, B, C and D are 400 K, 800 K, 2400 K and 1200 K respectively. The work done by the gas during this cycle is

\[(R \text{ - universal gas constant})\]

Three moles of an ideal monatomic gas performs a cycle ABCDA as shown in the figure. The temperatures of the gas at the states A, B, C and D are 400 K, 800 K, 2400 K and 1200 K respectively. The work done by the gas during this cycle is

\[(R \text{ - universal gas constant})\]

Options:

1. 1200 R
2. 3600 R
3. 2400 R
4. 2000 R
An insulated system contains 4 moles of an ideal diatomic gas at temperature $T$. When a heat $Q$ is supplied to the gas, 2 moles of the gas is dissociated into atoms and the temperature remained constant. Then the relation between $Q$ and $T$ is 

$$Q = RT$$

1. $Q = RT$
2. $Q = 2RT$
3. $Q = 3RT$
4. $Q = 4RT$

Under standard conditions, the density of a gas is $\frac{1400}{1089} \text{ kg m}^{-3}$ and the speed of sound propagation in it is 330 ms$^{-1}$, then the number of degrees of freedom of the gas molecules is 

$$\text{Number of Degrees of Freedom} = \frac{1400}{1089} \text{ kg m}^{-3} \times 330 \text{ ms}^{-1}$$

1. 2
2. 3
3. 5
4. 3
When the air column of a resonance tube is vibrated together with a tuning fork, 3 beats are heard per second, either the temperature of the air column is 51 °C or 16 °C. The frequency of the tuning fork is

Options:
1. 128 Hz
2. 98 Hz
3. 105 Hz
4. 256 Hz

Two sources A and B are producing notes of frequency 680 Hz. A listener moves from A to B with a constant velocity ‘v’. If the speed of sound in air is 340 ms⁻¹, the value of ‘v’ so that he hears 10 beats per second is

Options:
1. 2.0 ms⁻¹
2. 2.5 ms⁻¹
3. 3.0 ms⁻¹
4. 3.5 ms⁻¹
A thin converging lens of focal length 25 cm forms a sharp image of an object on a screen placed at a distance of 75 cm from the lens. Later the screen is moved closer to the lens by a distance 25 cm. The distance through which the object is to be shifted so that its image on the screen is sharp again is

\[ 25 \text{ cm} \times \frac{25 \text{ cm}}{75 \text{ cm} + 25 \text{ cm}} = \frac{25 \text{ cm}}{3} \]

Options:
1. 50 cm towards the lens
2. 50 cm away from the lens
3. 12.5 cm towards the lens
4. 12.5 cm away from the lens

A ray of light is incident on the surface of a glass plate of refractive index \( \sqrt{3} \) at the polarising angle. The angle of refraction of the ray is

\[ \frac{1}{\sqrt{3}} \]

Options:
1. 30°
2. 45°
3. 60°
Six point charges each of magnitude ‘Q’ are placed at the vertices of a regular hexagon of side ‘a’ as shown in the figure. Electric field intensity on the line passing through the centre ‘O’ and perpendicular to the plane of the figure at a large distance x(>>a) from ‘O’ is

\[
\frac{1}{4\pi \varepsilon_0} = k
\]

Options:

1. \[k \times \frac{4Qa}{x^3}\]

2. \[k \times \frac{2Qa}{x^3}\]

3. \[k \times \frac{8Qa}{x^3}\]

4. 0
A ball of mass 1 g having a charge of 20 \( \mu \)C is tied to one end of a string of length 0.9 m can rotate in a vertical plane in a uniform electric field 100 NC\(^{-1}\) directed upwards. The minimum horizontal velocity that must be given to the ball at the lowest position so that it completes the vertical circle is \( (g = 10 \text{ ms}^{-2}) \)

\[
\text{(g = 10 ms}^{-2})
\]

Options:

1. 9 ms\(^{-1}\)
2. 18 ms\(^{-1}\)
3. 36 ms\(^{-1}\)
4. 6 ms\(^{-1}\)

---

A regular hexagon of side 5 cm has a charge 10 \( \mu \)C at each of its vertices. The potential at the centre of hexagon is

\[
\text{(5 cm రేఖ ముడు నిర్మించే యొక్క ఒక కోణా పై 10 \( \mu \)C ఎంచుకుంటుంది. ఆ రేఖల సరిశీలించ}
\]

Options:

1. 0 V
2. \(18 \times 10^5\) V
3. \(1.08 \times 10^7\) V
4. \(1.08 \times 10^5\) V
The potential in an electric field varies as \( V = (x^2 - y^2) \). The electric lines of the force in the \( X-Y \) plane are:

\[
\text{Options:}
\]

1. \[
\text{Y-axis} \quad \rightarrow \quad \text{X-axis}
\]

2. \[
\text{Y-axis} \quad \rightarrow \quad \text{X-axis}
\]

3. \[
\text{Y-axis} \quad \rightarrow \quad \text{X-axis}
\]

4. \[
\text{Y-axis} \quad \rightarrow \quad \text{X-axis}
\]
The length of a potentiometer wire is \( l \). A cell of emf \( E \) is balanced at a length \( \left( \frac{l}{3} \right) \) from positive end of the wire. If the length of the wire is increased by \( \left( \frac{l}{2} \right) \), the distance at which the same cell gives the balancing point is (cell in the primary is ideal and no series resistance is present in the primary circuit)

Options:

1. \( \frac{2l}{3} \)
2. \( \frac{l}{2} \)
3. \( \frac{l}{6} \)
4. \( \frac{4l}{3} \)
\(n\) identical resistances are taken in which \(\frac{n}{2}\) resistors are joined in series in the left gap and the remaining \(\frac{n}{2}\) resistances are joined in parallel in the right gap of a metre bridge. Balancing length in cm is

\[\text{Options:}
\begin{align*}
1. & \quad \frac{100n^2}{n^2 + 4} \\
2. & \quad \frac{100n^2}{n^2 + 1} \\
3. & \quad \frac{400}{n^2 + 4} \\
4. & \quad \frac{400}{n^2 + 1}
\end{align*}\]

The magnetic field normal to the plane of a coil of \(N\) turns and radius \(r\) which carries a current \(i\) is measured on the axis of the coil at a distance \(h\) from the centre of the coil. This is smaller than the field at the centre by the fraction

\[\text{Options:}\]
A small block of mass 20 g and charge 4 mC is released on a long smooth inclined plane of inclination 45°. A uniform horizontal magnetic field of 1 T is acting parallel to the surface, as shown in the figure. The time from the start when the block loses contact with the surface of the plane is

Options:
1. 2 s
2. 3 s
3. 5 s
Match the following List-I with List-II

List - I  
A) \( \oint E dA \) 
B) \( \oint B dA \) 
C) \( \int E dl \) 
D) \( \int B dl \)

List - II  
I) 0  
II) \(- \frac{d\Phi_B}{dt}\)  
III) \(\frac{Q}{\varepsilon_0}\)  
IV) \(\mu_0(i_c + i_d)\)

The correct answer is

Options:

1. III II I IV

2. IV I III II
Two concentric coplanar circular conducting loops have radii $R$ and $r$ ($R >> r$). Their mutual inductance is proportional to

*Telugu Text*

Options:

1. $\frac{r}{R}$
2. $\frac{R}{r}$
3. $\frac{r^2}{R}$
4. $\frac{R^2}{r}$
When an inductor $L$ and a resistor $R$ in series are connected across a 12 V, 50 Hz supply, a current of 0.5 A flows in the circuit. The current differs in the phase from applied voltage by $\frac{\pi}{3}$ radian. Then the value of $R$ is

\[\text{Options:}\]
1. 10 $\Omega$
2. 3 $\Omega$
3. 12 $\Omega$
4. 15 $\Omega$

A point source of electromagnetic radiation has an average power output of 960 W. The peak value of the electric field at a distance 400 cm from the source is

\[\text{Options:}\]
1. 60 V/m
2. 120 V/m
3. 30 V/m
4. 180 V/m
All electrons ejected from a metallic surface by incident light of wavelength 400 nm travelled 1 m in the direction of uniform electric field of 2 NC\(^{-1}\) and came to rest. The work function of the surface is

400 nm యంత్రప్రభాదం కే కలదు విచిత్రిత లక్షణం కావాలి నిష్టు ఇతరియ నిష్ట యంత్ర ప్రభాదం 2 NC\(^{-1}\) నుండి కలదు విచిత్రిత లక్షణం 1 m ద్రావం కలదు విచిత్రిత లక్షణం నిష్టు యంత్ర ప్రభాదం

Options :

1. 1.1 eV
2. 2.2 eV
3. 3.1 eV
4. 5.1 eV

Question Number : 117  Question Id : 1874634437  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

Speed of electron in its 1\(^{st}\) Bohr’s orbit is given by \(2.18 \times 10^6\) ms\(^{-1}\). If the time period of electron in n\(^{th}\) orbit is measured as 4.10 femto second, the value of n is

ప్రధాన చక్రాలు యంత్ర ప్రభాదం కే \(2.18 \times 10^6\) ms\(^{-1}\) అంతర్చాలు. ఉపాధ్యాయ ని తిప్పు అంతర్చాలు

4.10 femto second అంతర్చాలు కే \(n\) విలుము

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 118  Question Id : 1874634438  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical
A radioactive substance of half life 138.6 days is placed in a box. After $n$ days only 20% of the substance is present, then the value of ‘$n$’ is

\[(\ln (5) = 1.61)\]

Options:
1. 693
2. 138.6
3. 277.2
4. 322

---

Three amplifiers with voltage gains 10, 20 and 30 are connected in series. If the input signal has a peak value of 1 mV then the peak value of the output voltage is

Hello, 10, 20, 30, 1 mV

Options:
1. 6 V
2. 60 V
3. 0.6 V
4. 0.06 V
A TV tower has a height 160 m. Its coverage range is nearly (Earth's radius = 6400 km)

వ్యాపార విక్రమం వెలుగు 160 మీ. విడిది రాశి ఇంకా 6400 మీ (రాధామహాదీరి = 6400 కి.మీ.)

Options:
1. 45255 m
2. 55265 m
3. 452.55 km
4. 552.65 m

If the kinetic energy of an electron of mass $9.0 \times 10^{-31}$ kg is $2.0 \times 10^{-25}$ J, the wavelength of the electron in nm is approximately

$9.0 \times 10^{-31}$ kg ఒడ్డనించని వేగానికి $2.0 \times 10^{-25}$ J ఎంత ఇంటిని సాధించే ఒడ్డ ఒడ్డ 994.3

Options:
1. 1004.3
2. 1204.3
3. 1104.3
4. 994.3
If a suitable photon is employed to locate an electron (mass = 9.11 × 10^{-31} kg) in an atom within a distance of 10.98 nm, the uncertainty involved in the measurement of its velocity in m s^{-1} is

\[ \frac{1.6565 \times 10^6}{\pi} \]

1. \[ \frac{1.6565 \times 10^4}{\pi} \]

2. \[ \frac{1.6565 \times 10^{-8}}{\pi} \]

3. \[ \frac{1.6565 \times 10^8}{\pi} \]

Which one of the following is the correct order of ionic radii?

\[ \text{Pr}^{3+} > \text{Gd}^{3+} > \text{Tm}^{3+} \]

1. \[ \text{Pr}^{3+} < \text{Gd}^{3+} < \text{Tm}^{3+} \]

2. \[ \text{Pr}^{3+} > \text{Tm}^{3+} > \text{Gd}^{3+} \]

3. \[ \text{Pr}^{3+} < \text{Tm}^{3+} < \text{Gd}^{3+} \]
Observe the following molecules/ions

\[ \text{H}_2, \text{N}_2, \text{O}_2, \text{N}_2^-, \text{O}_2^-, \text{O}_2, \text{F}_2 \]

Identify correct statement

Options:
1. \( \text{H}_2, \text{N}_2, \text{O}_2, \text{F}_2 \) show diamagnetic property
2. \( \text{O}_2, \text{O}_2^-, \text{O}_2^-, \text{N}_2^+ \) show paramagnetic property
3. \( \text{N}_2, \text{F}_2, \text{O}_2^+, \text{O}_2^- \) show diamagnetic property
4. \( \text{H}_2, \text{N}_2^+, \text{O}_2^+, \text{O}_2^- \) show paramagnetic property
Match the following.

**List - I**

A) BrF₅  
B) SF₄  
C) XeF₄  
D) ClF₃

**List - II**

I) AB₄E₂, see-saw  
II) AB₄E₂, square planar  
III) AB₃E, square pyramid  
IV) AB₃E₂, T-shape  
V) AB₃E₂, square pyramid

The correct answer is

Options:

A  B  C  D
1. V  I  II  IV
2. III  I  II  V
3. III  I  II  IV
4. V  I  III  II
If the most probable speed of CO₂ at 27°C is 400 m s⁻¹, the root mean square velocity of CO₂ at the same temperature in m s⁻¹ is approximately

27°C లో CO₂ గ్లాస్ నుండి గెలుతున్న విత్తన దైర్ఘ్యము 400 m s⁻¹ అయితే ఎంత కొలువు ఉంటుంది? CO₂ గ్లాస్ లో విత్తన దైర్ఘ్యము ఎంత మేమిస్తుంది విత్తన దైర్ఘ్యము?

Options:
1. 600
2. 490
3. 267
4. 245

---

Question Number : 127  Question Id : 1874634447  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

20mL of Fe²⁺ solution of certain concentration has completely reacted with 20 mL of 0.01 M K₂Cr₂O₇ in acid medium. If 20 mL of same Fe²⁺ solution has reacted completely with 20 mL of KMnO₄ solution in acid medium, the molarity of KMnO₄ solution is

20 మీలియన్ ఫెంటియిన్ సల్యూషన్ ఒక ఉంచి ఎత్తు 20 మీలియన్ K₂Cr₂O₇ సల్యూషన్ ఎక్స్ న్యూట్ మారుతుంది. అయితే ఎత్తు 20 మీలియన్ ఫెంటియిన్ సల్యూషన్ 20 మీలియన్ KMnO₄ సల్యూషన్ ఎక్స్ న్యూట్ మారుతుంది.

Options:
1. 0.01M
2. 0.12M
3. 0.10M
4. 0.012M

---

Question Number : 128  Question Id : 1874634448  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical
If $K_p$ for the conversion of oxygen to ozone at 400 K is $1.0 \times 10^{-30}$, its standard Gibbs energy change in kJ mol$^{-1}$ is approximately

$400$ K యొక్క ఓస్మన్ ఇంద్రాగం లో $K_p$ రేఖ పెట్టి $1.0 \times 10^{-30}$ కుడి లావడా ప్యాడం సంచేత కుడి మొదటి కుడి ఇన్ సంచేత జాతి రేఖ పెట్టి $1$ KJ mol$^{-1}$ ఎంపి పాడం సంచేత జాతి రేఖ పెట్టి $1$ KJ mol$^{-1}$ ఎంపి పాడం సంచేత జాతి రేఖ పెట్టి $1$ KJ mol$^{-1}$ ఎంపి పాడం సంచేత జాతి రేఖ పెట్టి $1$ KJ mol$^{-1}$ ఎంపి పాడం సంచేత జాతి రేఖ పెట్టి $1$ KJ mol$^{-1}$ ఎంపి పాడం సంచేత జాతి రేఖ పెట్టి $1$ KJ mol$^{-1}$ ఎంపి పాడం సంచేత జాతి రేఖ పెట్టి $1$ KJ mol$^{-1}$ ఎంపి పాడం సంచేత జాతి రేఖ పెట్టి $1$ KJ mol$^{-1}$ ఎంపి పాడం సంచేత 

Options:
1. 229.8
2. 114.9
3. -229.8
4. -114.9

Question Number: 129  Question Id: 1874634449  Question Type: MCQ  Option Shuffling: Yes  Display Question Number: Yes  Single Line Question Option: No  Option Orientation: Vertical

At 1000 K, the partial pressures of CO$_2$(g) and CO(g) for the reaction CO$_2$(g) + C(s) $\rightleftharpoons$ 2CO(g) in a closed vessel at equilibrium are 0.15 and 0.60 bar respectively. The $K_c$ for this reaction at the same temperature is approximately

హేతు 1000 K లో CO$_2$(g) మరియు CO(g) నుండి ప్రతి విషాదాన్ని CO$_2$(g) + C(s) $\rightleftharpoons$ 2CO(g) హేతు 1000 K లో CO$_2$(g) మరియు CO(g) నుండి ప్రతి విషాదాన్ని CO$_2$(g) + C(s) $\rightleftharpoons$ 2CO(g) హేతు 1000 K లో CO$_2$(g) మరియు CO(g) నుండి ప్రతి విషాదాన్ని CO$_2$(g) + C(s) $\rightleftharpoons$ 2CO(g) హేతు 1000 K లో CO$_2$(g) మరియు CO(g) నుండి ప్రతి విషాదాన్ని CO$_2$(g) + C(s) $\rightleftharpoons$ 2CO(g) హేతు 1000 K లో CO$_2$(g) మరియు CO(g) నుండి ప్రతి 

Options:
1. $2.0 \times 10^{-4}$
2. $2.89 \times 10^{-2}$
3. $2.89 \times 10^{-3}$
4. $5.78 \times 10^{-3}$
At T(K), if the ionization constant of ammonia in solution is $2.5 \times 10^{-5}$, the pH of 0.01 M ammonia solution and the ionization constant of its conjugate acid respectively at that temperature are ($\log 2 = 0.30$)

\[
\text{T(K) నుండి అమ్మాన్య మొలక పాయాడితే ప్రదర్శించాలంటాం ప్రదర్శించాలంటాం 2.5 \times 10^{-5} కూడా అమ్మాన్య ప్రదర్శించాలంటాం ప్రదర్శించాలంటాం 0.01 M అమ్మాన్య స్ల౉సియన్ వర్గా పిఖ, రాయ దృప్పయే అమ్మాన్య ప్రదర్శించాలంటాం ప్రదర్శించాలంటాం అమ్మాన్య ప్రదర్శించాలంటాం (\log 2 = 0.30)$

Options:
1. $10.7, 4.0 \times 10^{-8}$
2. $10.7, 4.0 \times 10^{-10}$
3. $3.3, 4.0 \times 10^{-8}$
4. $3.3, 4.0 \times 10^{-10}$

**Question Number : 131  Question Id : 1874634451  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Which of the following correctly represents Copper sulphate pentahydrate?

చంద్రసంయోగ కు చంద్ర ప్రదాన సంయోగ పరిమితించే కానీ తోంద ఉంటారు?

Options:
1. $\left[\text{Cu}(\text{SO}_4)(\text{H}_2\text{O})_3\right]\text{2H}_2\text{O}$
2. $\left[\text{Cu}(\text{SO}_4)(\text{H}_2\text{O})_5\right]$ 
3. $\left[\text{Cu}(\text{H}_2\text{O})_4\right]\text{SO}_4\cdot\text{H}_2\text{O}$
4. $\left[\left(\text{H}_2\text{O}\right)_4\text{Cu}\langle\overset{\text{SO}_4}{\text{Cu}(\text{H}_2\text{O})_4}\rangle\right]\text{2H}_2\text{O}$

**Question Number : 132  Question Id : 1874634452  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**
A compound \((\text{MO}_2)\) of group I element (M) hydrolyses to form \(M^+\), \(\text{OH}^-\), \(X\) and \(Y\). When \(X\) reacts with \(I_2\) in basic medium, the products formed are \(I^-\), water and \(Y\). Then \(X\) and \(Y\) are respectively

\[ X = \text{I}_2 \text{O}_3 \]

Options :
1. \(\text{H}_2\text{O}_2, \text{O}_2\)
2. \(\text{H}_2\text{O}_2, \text{O}_3\)
3. \(\text{H}_2, \text{O}_2\)
4. \(\text{O}_2, \text{H}_2\)

**Question Number : 133  Question Id : 1874634453  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

What is \(X\) in the following reaction?

\[ \text{NaH} + \text{B}_2\text{H}_6 \xrightarrow{\text{diethyl ether}} X \]

Options :
1. \(\text{Na[BH}_4]\)
2. \(\text{NaBO}_2\)
3. \(\text{H}_3\text{BO}_3\)
4. \(\text{(C}_2\text{H}_5\text{OC}_2\text{H}_4)^+ (\text{BH}_4)^-\)

**Question Number : 134  Question Id : 1874634454  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**
Which one of the following is used as refrigerant for ice cream and frozen foods?

శిక్షించిన శాస్త్రీయ పదమానంలో ఎవరు దేశం కంప్యూటర్ ప్రాంటికిని (ఫార్స్‌ఫిస్ట్‌మెట్‌) వహించగలనం?

Options:
1. Dry CO
2. Liquid CH₄
3. Dry ice
4. Liquid H₂

Acid rain is caused by the presence of X and Y in air. X, Y are respectively

ప్రతిపాదం X, Y ను ఉపయోగించడంతో ఇంటి ప్రతిపాదం ను ఉపయోగించడంతో. X, Y ను ఉపయోగించడం

Options:
1. SO₂, NO₂
2. CFC, O₃
3. CO, CFC
4. SO₂, O₃
IUPAC name of \( \text{OCH}_3 \) \( \text{OCH}_3 \) is

\[ \text{OCH}_3 \text{ OCH}_3 \text{ IUPAC } \]

Options:

1. 5-methoxycyclohexene

2. methoxycyclohex-3-ene

3. methoxycyclohex-4-ene

4. 4-methoxycyclohexene

Wurtz reaction of bromoethane gives n-butane. Sodium salt of \( X \) on heating with sodalime also results in n-butane. Compound \( X \) is

\[ \text{CH}_3\text{CH}_2\text{CHCOOH} \]

1. \( \text{CH}_3\text{CH}_2\text{CH}_2\text{COOH} \)

2. \( \text{CH}_3(\text{CH}_2)_3\text{COOH} \)

3. \( \text{CH}_3(\text{CH}_2)_4\text{COOH} \)
4. \( \text{CH}_3\text{CH}_2\text{COOH} \)

**Question Number : 138  Question Id : 1874634458  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Identify ortho and para directing groups from the following:

\[
\begin{align*}
-I & \quad -\text{CHO} \\
-II & \quad -\text{NCOCH}_3 \\
-III & \quad -\text{OCH}_3 \\
-IV & \quad -\text{SO}_2\text{H}
\end{align*}
\]

**Options :**

1. III, IV
2. II, III
3. II, IV
4. I, IV

**Question Number : 139  Question Id : 1874634459  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If 0.5 mol of a metal forms hexagonal close packed structure, the total number of voids, and tetrahedral voids respectively in mol are

0.5 mol \( \text{mol} \) of a metal forms hexagonal close packed structure, the total number of voids, and tetrahedral voids respectively in mol are

**Options :**

1. 1.5, 1.0
2. 1.0, 0.5
3. 1.0, 1.5
4. 0.5, 1.0
At 300 K an ideal solution is formed by mixing 460 g of toluene with 390 g benzene. If the vapour pressure of pure toluene and benzene at 300 K are 32 and 40 mm respectively, the mole fraction of toluene in vapour phase is

300 K 460 g 390 g 32 40 mm

Options:
1. 0.196
2. 0.588
3. 0.294
4. 0.444

If aqueous solution contains 9% and 1% (W/W) of two non-volatile, non-electrolytes X (molecular weight 180) and Y (molecular weight 50) respectively, the boiling point of solution in °C approximately is (K = 0.52 K kg mol⁻¹)

X (molecular weight 180), Y (molecular weight 50) 9% 1% (W/W)

Options:
1. 101.4
2. 100.4
3. 102.4
4. 100.8
If the $E^{0}_{\text{cell}}$ of an equilibrium reaction

$$A(s) + 2B^+(aq) \rightleftharpoons A^{2+}(aq) + 2B(s)$$

at 298 K is 0.59 V, the equilibrium constant $K_c$ is

$$298 \text{ K} \quad A(s) + 2B^+(aq) \rightleftharpoons A^{2+}(aq) + 2B(s) \quad \text{has \ } E^{0} = 0.59 \text{ V} \quad \text{and} \quad K_c$$

Options:
1. $1.0 \times 10^{10}$
2. $1.0 \times 10^2$
3. $1.0 \times 10^{-20}$
4. $1.0 \times 10^{20}$

Which one of the following statements is correct?

Options:

In collision theory $e^{-E_a/RT}$ corresponds to the fraction of molecules that have energy equal or greater than $E_a$

1. The number of collisions of reacting molecules per second per unit volume of the reaction mixture is activated complex

2.
Molecularity is the number of molecules involved in a complex reaction

A catalyst catalyses the non-spontaneous reaction

Which one of the following enzymes converts proteins into amino acids?

Options:
1. Maltase
2. Pepsin
3. Trypsin
4. Zymase

X₂ is used in the refining of Ti metal by van-Arkel method. Y₂ does not liberate O₂ from water and does not form HY and HOY with water. X₂ and Y₂ are respectively

Options:
1. I₂, Cl₂
Which one of the following statements is not correct regarding phosphine?

Options:

1. It is a weak base
2. It reacts with CuSO₄ solution to form CuHPO₄
3. It is formed by the reaction of Ca₃P₂ with HCl
4. It is used in smoke screens.

Question Number : 147  Question Id : 1874634467  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

Aqueous sulphite reacts with dilute sulphuric acid to form X(g). The liberated X(g) is passed into acidified KMnO₄ solution. What is the oxidation state of Mn in the product formed?

Options:

1. +6
Phosphorous reacts with \( \text{SO}_2 \text{Cl}_2 \) to form \( \text{PCl}_3 \) and \( X \). At 723K, \( \text{HCl} \) gas reacts with \( \text{O}_2 \) in the presence of \( \text{CuCl}_2 \) to form water and \( Y \). \( Y \) reacts with \( X \) in water to form two acids \( A \) and \( B \). What are \( A \) and \( B \) respectively?

1. \( \text{H}_2\text{SO}_4, \text{HCl} \)
2. \( \text{H}_2\text{SO}_4, \text{HNO}_3 \)
3. \( \text{HCl, HNO}_3 \)
4. \( \text{H}_2\text{SO}_4, \text{H}_3\text{PO}_4 \)

Identify the correct statements from the following:

i. The ionic radius of \( \text{Pr}^{3+}, \text{Dy}^{3+} \) and \( \text{Sm}^{3+} \) follow the order, \( \text{Sm}^{3+} > \text{Pr}^{3+} > \text{Dy}^{3+} \)
ii. \( \text{Eu}^{2+} \) acts as a strong reducing reagent
iii. \( \text{Pu} \) exhibits +7 oxidation state

1. \( \text{Pr}^{3+}, \text{Dy}^{3+}, \text{Sm}^{3+} \) adheres to the order \( \text{Sm}^{3+} > \text{Pr}^{3+} > \text{Dy}^{3+} \)
2. \( \text{Eu}^{2+} \) behaves as a strong reducing reagent
3. \( \text{Pu}, \text{ +7 oxidation state} \)
If the crystal field splitting energy of a tetrahedral complex ($\Delta_t$) of the type $[ML_4]^{n+}$ is $x$ eV, what is the crystal field splitting energy with respect to an octahedral complex, $[ML_6]^{n+}$?

$[ML_4]^{n+}$ ఏ చరిత్రను పొందాయి లాంటి కంప్యూటరు దృశ్యం కాదు ఇది యొక్క మూల పరిమిత పరిమిత గాని ఉంది $[ML_6]^{n+}$ ఏ చరిత్రను పొందాయి లాంటి కంప్యూటరు దృశ్యం కాదు ఇది యొక్క మూల పరిమిత పరిమిత?

Options:

1. $\frac{9x}{4}$ eV
2. $\frac{9x}{8}$ eV
3. $\frac{4x}{9}$ eV
4. $\frac{4x}{5}$ eV

The monomers of nylon 6, 6 (X) and terylene (Y) are

నయడు 6, 6 (X), టెర్య్లెన్ (Y) లు నయం
The general structural formula of α-Amino acid is \( \text{H}_2\text{N} \ldots \text{H} \). The group R in tryptophan (X) and histidine (Y) are respectively

\[
\begin{align*}
\text{X} & : & \text{H}_2\text{N} - & \text{R} - & \text{COOH} \\
\text{Y} & : & \text{H}_2\text{N} - & \text{R} - & \text{COOH}
\end{align*}
\]

\( \alpha \)-అమోనియా అమిడ్ యూనిట్ లో ఖండాలు ఉగాదిలో ఉంటதే \( \text{H}_2\text{N} \) కంటే ప్రతి ఎక్కడ ఇది నంతి రంగం పర౗ణం ఉంటుంది 

\[
\begin{align*}
\text{X} & : & \text{H}_2\text{N} - & \text{R} - & \text{COOH} \\
\text{Y} & : & \text{H}_2\text{N} - & \text{R} - & \text{COOH}
\end{align*}
\]

Options :
1.

2.

3.

4.

Question Number : 153  Question Id : 1874634473  Question Type : MCQ  Option Shuffling : Yes  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical
Which of the following statements are correct?

i. Binding of inhibitor at allosteric site changes the shape of the active site
ii. Shape of the receptor does not change after attachment of chemical messenger to it
iii. A chemical messenger gives message to the cell by entering it
iv. Erythromycin is an example of bacteriostatic antibiotic

Which of the following statements are correct?

i. భార్య వాయిడ్ లు పొడవు సమయంలో ఎండు పెంచబడతాయి
ii. అమ్మ భార్య వాయిడ్ దూరే ఎండు పెంచబడతాయి
iii. భార్య వాయిడ్ దూరే ఎండు పెంచబడతాయి
iv. ఐరిస్మొరోసిన్ ఒక ఉదాహరణ బియటిస్టికి అయిను ఈయిస్టికి అయిను

Options:
1. i, ii
2. ii, iii
3. i, iv
4. iii, iv

Assertion (A): $S_N1$ hydrolysis of optically active 2-bromo-octane results in the formation of $(\pm)$-octan-2-ol
Reason (R): The reaction proceeds through a planar carbocation which can be attacked by the nucleophile from either side

నంద్యా (A): $S_N1$ హిడ్రోలిసిస్ ఒక ప్రతిక్రియ ఉత్పత్తి ఉంటుంది $(\pm)$-నుటాన్-2-ఓల్
నంద్యా (R): ప్రతిక్రియ పంపడివచ్చిన ప్లానర్ కార్బోకాసన్ కాబట్టి నపఽడు ప్రత్యేక నుటాన్సిన్ ఉంటుంది

The correct answer is

Options:
What are A, B and C in the following reactions?

$$\text{Cumene} + \text{O}_2 \rightarrow A + \text{H}_2\text{O} \rightarrow B + C$$

What are A, B, C in the following reactions?

$$\text{Cumene} + \text{O}_2 \rightarrow A + \text{H}_2\text{O} \rightarrow B + C$$

Options:

1. 
   - A
     - OH
     - $\text{C}_6\text{H}_5 - \text{C} - \text{CH}_3$
   - B
     - $\text{C}_6\text{H}_5 - \text{CHO}$
   - C
     - $\text{CH}_3\text{CHO}$

2. 
   - A
     - $\text{C}_6\text{H}_5 - \text{CH} - \text{O} - \text{OH}$
     - $\text{CH}_3$
   - B
     - $\text{C}_6\text{H}_5 - \text{CH} - \text{OH}$
     - $\text{CH}_3$
   - C
     - $\text{H}_2\text{O}$
What is X in the following reaction?

\[ \text{CO} + 2\text{H}_2 \xrightarrow{X} \text{CH}_3\text{OH} \]

Options:
1. 623K/300atm
2. KMnO₄/H⁺
3. Zn/Δ
4. ZnO-Cr₂O₃, 200-300 atm, 573-673 K

Alkenes (X) and carbonyl compounds (Y) participate in which of the following addition reactions?

\[ \text{X} + \text{Y} \rightarrow \text{Product} \]
Which one of the following is used for purification of aldehydes?

ఆల్డె南宁市 పంయం నిష్ణానం చేయవచ్చు?

Options:

1. NaOCl
2. NaHSO₃
3. C₆H₅SO₂Cl
4. Na₂SO₄
Mixed aldol products obtained from aldol condensation of ethanal and propanone are

Options:

1. 

2. 

3. 

4. 

What are X and Y in the following reactions?

(ఎప్పుడు X, Y ఎంటుందో ధర్మాన్ని సంచారం చేసి ఎంటుందో)

Options:
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<tbody>
<tr>
<td>1</td>
<td>CH$_3$CH$_2$OH</td>
<td>H$_3$PO$_2$, H$_2$O</td>
</tr>
<tr>
<td>2</td>
<td>CH$_3$MgX</td>
<td>H$_3$PO$_3$</td>
</tr>
<tr>
<td>3</td>
<td>CH$_3$CHO</td>
<td>H$_2$O</td>
</tr>
<tr>
<td>4</td>
<td>CH$_2$ = CH$_2$</td>
<td>NaNO$_2$/HCl</td>
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