Andhra Pradesh State Council of 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.

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Eraser Required?: No
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Show Watermark on Console?: Yes
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Auto Save on Console?: Yes
Is this Group for Examiner?: No
Mathematics

Question Number : 1 Question Id : 813561801 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If \[
\begin{bmatrix}
1 & -1 & x \\
1 & x & 1 \\
x & -1 & 1 \\
\end{bmatrix}
\]
has no inverse, then the real value of \(x\) is

Options :
1. 2
2. 3
3. 0
Question Number : 2 Question Id : 813561802 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The locus of \( z \) satisfying \( \left| \frac{z-i}{z-2i} \right| = 2 \) is a

\[ \left| \frac{z-i}{z-2i} \right| = 2 \]  is a  ఒక్కనుగుండి  సదృశ శతాబ్ది

Options :

1. Hyperbola
   1. వంశం వంశం

2. Circle
   2. పటుస్సు

3. Straight line
   3. రైతవు

4. Ellipse
   4. పరిమితి లేదా పతమిష్టము

Question Number : 3 Question Id : 813561803 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
For how many natural numbers ‘n’ such that $1 \leq n \leq 2021$ is \(\left(\frac{1+i}{1-i}\right)^n = 1\) ?

$1 \leq n \leq 2021, \left(\frac{1+i}{1-i}\right)^n = 1$ అయితే ‘n’ మాత్రమే ఎంతా ఉంటుంది?

Options:

1. ✗ 504

2. ✓ 505

3. ✗ 506

4. ✗ 503

Find the value of ‘p’ and ‘q’ if the function $f(t) = t^3 - 6t^2 + pt + q$ defined on $[1, 3]$ satisfies the Rolle’s theorem for $c = \frac{2\sqrt{3}+1}{\sqrt{3}}$.

$[1,3]$ లో ఫంక్షన్ $f(t) = t^3 - 6t^2 + pt + q$ అంధకారముగా $c = \frac{2\sqrt{3}+1}{\sqrt{3}}$ ఎంతా ఉంటే ‘p’ మరియు ‘q’ ఎంతా ఉంండాలి?

Options:

1. ✗ $p \in R, q = 11$

2. ✓ $p = 11, q \in R$

3. ✗
\[ p \in R, \ q \in R \]

4. \[ p = 11, \ q = 11 \]

**Question Number : 5**  
**Question Id : 813561805**  
**Question Type : MCQ**  
**Display Question Number : Yes**  
**Is Question Mandatory : No**  
**Single Line Question Option : No**  
**Option Orientation : Vertical**

The domain of \( \sqrt{|x| - x} \) is

\[ \sqrt{|x| - x} \text{ ನಂತರ ಎಸೆಯವು} \]

**Options :**

1. \( (-\infty, 0) \)

2. \( (0, \infty) \)

3. \( (-\infty, \infty) \)

4. \( R - \{0\} \)

**Question Number : 6**  
**Question Id : 813561806**  
**Question Type : MCQ**  
**Display Question Number : Yes**  
**Is Question Mandatory : No**  
**Single Line Question Option : No**  
**Option Orientation : Vertical**

Let \( f(x) = \cos(ax) + \sin(x) \) be periodic. Then \( a \) must be

\[ f(x) = \cos(ax) + \sin(x) \text{ ಎತ್ತರ ಸಮಾಧಾನ ಇದ್ದು ಎತ್ತರ ಹೊಂದಬೇಕು.} \ a \text{ ಎಲ್ಲಾರು} \]

**Options :**
Irrational

Rational

Positive real number

Negative real number

Question Number : 7 Question Id : 813561807 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let $ABCDEF$ be a regular hexagon with the vertices $A, B, C, D, E, F$ counterclock-wise. Then the vector $\overrightarrow{AB} + \overrightarrow{AF} + \overrightarrow{CD} + \overrightarrow{EF}$ is equal to

$$\overrightarrow{ABCDEF}$$

Options :

1. $\overrightarrow{DE} + \overrightarrow{FA}$

2. $\overrightarrow{CB} + \overrightarrow{ED}$

3. $\overrightarrow{BC} + \overrightarrow{FA}$

4. $\overrightarrow{BC} + \overrightarrow{DE}$
Question Number : 8 Question Id : 813561808 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If the tangent to the curve \( x^{2/3} + y^{2/3} = a^{2/3} \) meets the x-axis at \( A \) and y-axis at \( B \), then \( AB = \)

\[ x^{2/3} + y^{2/3} = a^{2/3} \]  
\[ \text{is the equation of the tangent at } A \text{ and } B. \]

**Options :**

1. \( 2a \)
2. \( 3a \)
3. \( a \)
4. \( 4a \)

Question Number : 9 Question Id : 813561809 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If the number of rectangles formed on a chess board is 1296, then the total number of squares formed on the chess board is

\[ \text{Number of rectangles } = 1296 \]

**Options :**

1. \( 202 \)
Question Number : 10 Question Id : 813561810 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If \( \int \frac{1 + \cos(4x)}{\cot(x) - \tan(x)} \, dx = k \cos(4x) + c \), then

\[ \int \frac{1 + \cos(4x)}{\cot(x) - \tan(x)} \, dx = k \cos(4x) + c. \]

Options:

1. \( k = \frac{1}{8} \)

2. \( k = \frac{1}{4} \)

3. \( k = \frac{-1}{8} \)

4. \( k = \frac{-1}{4} \)
The equation of the circle circumscribing the triangle formed by the straight lines $x + y = 6$, $2x + y = 4$ and $x + 2y = 5$ is given by

$$x + y = 6, 2x + y = 4 \text{ and } x + 2y = 5 \text{ are the sides of the triangle.}$$

Options:
1. $x^2 + y^2 + 17x + 19y + 50 = 0$

2. $x^2 + y^2 - 17x - 19y + 50 = 0$

3. $x^2 + y^2 + 17x - 19y - 50 = 0$

4. $x^2 + y^2 - 17x + 19y - 50 = 0$

Question Number : 12 Question Id : 813561812 Question Type : MCQ Display Question
Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

$$\int x(\tan^2 x) \, dx =$$

Options:
1. $x \tan(x) - \log(\sec x) - \frac{x^2}{2} + c$

2. $x \tan(x) + \log(\sec x) - \frac{x^2}{2} + c$
3. \( x \tan(x) - \log(\sec x) + \frac{x^2}{2} + c \)

4. \( x \tan(x) + \log(\sec x) + \frac{x^2}{2} + c \)

Question Number : 13 Question Id : 813561813 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

In quadrilateral \( ABCD \), \( \overline{AB} = \overline{a} \), \( \overline{BC} = \overline{b} \), \( \overline{AD} = \overline{b} - \overline{a} \) if \( M \) is the midpoint of \( BC \) and \( N \) is a point on \( DM \) such that \( DN = \left( \frac{4}{5} \right) DM \), then \( 5 \overline{AN} = \)

Options:

1. \( \overline{AC} \)

2. \( 2 \overline{AC} \)

3. \( 3 \overline{AC} \)

4. \( 4 \overline{AC} \)

Question Number : 14 Question Id : 813561814 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
The image of the point with position vector \((\hat{i} + 3\hat{j} + 4\hat{k})\), in the plane \(\vec{r} \cdot (2\hat{i} - \hat{j} + \hat{k}) + 3 = 0\) is

\[\vec{r} \cdot (2\hat{i} - \hat{j} + \hat{k}) + 3 = 0 \quad \text{and} \quad (\hat{i} + 3\hat{j} + 4\hat{k}) \text{\ is the normal to the plane.}\]

Options:

1. \((3, 5, 2)\)

2. \((3, 5, -2)\)

3. \((-3, -5, 2)\)

4. \((-3, 5, 2)\)

---

Let \(f(x) = x^5 - 9x^4 + 29x^3 + 54x - 54\) suppose \(f(x) = (x - a)^n \cdot Q(x)\) where \(Q(x)\) is a polynomial not divisible by \((x - a)\). Then

\[f(x) = x^5 - 9x^4 + 29x^3 + 54x - 54 \quad \text{and} \quad f(x) = (x - a)^n \cdot Q(x)\] is divisible by \((x - a)\).

Option:

1. \(a = 1, \ n = 2\)

2. \(a = 3, \ n = 1\)
3. ✔ $a = 3$, $n = 3$

4. ✗ $a = -1$, $n = 2$

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**Question Number : 16**
**Question Id : 813561816**
**Question Type : MCQ**
**Display Question Number : Yes**
**Is Question Mandatory : No**
**Single Line Question Option : No**
**Orientation : Vertical**

If the pairs of straight lines $x^2 - 2pxy - y^2 = 0$ and $x^2 - 2qxy - y^2 = 0$ bisect the angles between each other, then which of the following is correct?

$x^2 - 2pxy - y^2 = 0$ మరియు $x^2 - 2qxy - y^2 = 0$ ఛత్రింపడం మార్ల ప్రతి మిగిలి

Options:

1. ✗ $1 - pq = 0$

2. ✗ $pq - 1 = 0$

3. ✔ $pq + 1 = 0$

4. ✗ $pq = 0$

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**Question Number : 17**
**Question Id : 813561817**
**Question Type : MCQ**
**Display Question Number : Yes**
**Is Question Mandatory : No**
**Single Line Question Option : No**
**Orientation : Vertical**
The line $x = m^2$ meets an ellipse $9x^2 + y^2 = 9$ in the real and distinct points if and only if

$$x = m^2 \text{ and } 9x^2 + y^2 = 9$$

Options:

1. $|m| > 1$

2. $|m| < 1$

3. $|m| > 2$

4. $|m| < 2$

Question Number : 18 Question Id : 813561818 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The sum of the cubes of three consecutive natural numbers is divisible by

మంచి మాంచి మాంచి పదార్థాల మాదిరి సమత్వం _______ ను వశిస్తుంది

Options:

1. 26

2. 25

3. 9

4. 7
Question Number : 19 Question Id : 813561819 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

\[ \int_{0}^{\pi/2} |\sin t - \cos t| \, dt = \]

Options :
1. \( 2(\sqrt{2} + 1) \)
2. \( 2(\sqrt{2} - 1) \)
3. \( \sqrt{2} + 1 \)
4. \( \sqrt{2} - 1 \)

Question Number : 20 Question Id : 813561820 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The derivative of \( y = \tan^{-1} \left( \frac{\sqrt{1+x^2} - 1}{x} \right) \) is equal to

\[ y = \tan^{-1} \left( \frac{\sqrt{1+x^2} - 1}{x} \right) \text{ is equal to} \]

Options :
1. \( \frac{2}{1+x^2} \)
2. \( \frac{1}{2(1+x^2)} \)

3. \( (1 + x^2) \)

4. \( 2(1 + x^2) \)

Question Number : 21 Question Id : 813561821 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If one of the lines \( 2x^2 - xy + by^2 = 0 \) passes through the point \((-4, -2)\), then \( b^2 = \) \( 2x^2 - xy + by^2 = 0 \) లేదా రేఖ స్థానం అంచె \((-4, -2)\) నుండి విచిత్రించారో \( b^2 = \)

Options :
1. \( -6 \)
2. \( 36 \)
3. \( 4 \)
4. \( 16 \)

Question Number : 22 Question Id : 813561822 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
On solving $\frac{dy}{dx} = \frac{x-y+3}{2x-2y+5}$, the solution obtained is $x = 2(x - y) + \log(t) + c$, find $t$

$\frac{dy}{dx} = \frac{x-y+3}{2x-2y+5}$ तब $x = 2(x - y) + \log(t) + c$ तथा $t = \,$

Options:
1. $x - y + 2$
2. $x + y - 2$
3. $x + y + 2$
4. $x - y - 2$

Question Number : 23
Question Id : 813561823
Question Type : MCQ
Display Question Number : Yes
Is Question Mandatory : No
Single Line Question Option : No
Orientation : Vertical

\[
\int x^{2020} (\tan^{-1} x + \cot^{-1} x) \, dx =
\]

Options:
1. $\frac{x^{2021}}{2020} (\tan^{-1} x + \cot^{-1} x) + c$
2. $\frac{x^{2021}}{2021} (\tan^{-1} x + \cot^{-1} x) + c$
3. $\frac{\pi x^{2021}}{2021} + \frac{\pi}{2} + c$
4. $\frac{x^{52}}{52} + \frac{\pi}{2} + c$

Question Number : 24 Question Id : 813561824 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

What is the coefficient of $\frac{y^3}{x^8}$ in $(x + y)^{-5}$, when $\left| \frac{y}{x} \right| < 1$?

$\left| \frac{y}{x} \right| < 1 \Rightarrow (x + y)^{-5}$ లో $\frac{y^3}{x^8}$ పరమాణు కలుగా

Options :
1. $-35$
2. $-30$
3. $-25$
4. $10$

Question Number : 25 Question Id : 813561825 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If $f(x) = x^4 - x^3 + 7x^2 + 14$, then what is the value of $f''(5)$?

$f(x) = x^4 - x^3 + 7x^2 + 14$ తో, $f''(5)$ విలువ ఎంతవంది?

Options :
1. $842$
Question Number : 26 Question Id : 813561826 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

\[ \lim_{x \to 1} \left( (1 - x) \tan \left( \frac{\pi x}{2} \right) \right) = \]

Options :

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

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

3. \( \frac{4}{\pi} \)

4. \( \frac{2}{\pi} \)

Question Number : 27 Question Id : 813561827 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
If \( y = \frac{1+\tan x}{\sqrt{1-\tan x}} \), then \( \frac{dy}{dx} = \)

\( y = \frac{1+\tan x}{\sqrt{1-\tan x}} \)\( \frac{dy}{dx} = \)

Options:

1. \( \frac{1}{2} \left( \frac{1-\tan x}{1+\tan x} \right) \sec^2 \left( \frac{\pi}{4} + x \right) \)

2. \( \frac{1}{2} \left( \frac{1-\tan x}{1+\tan x} \right) \sec \left( \frac{\pi}{4} + x \right) \)

3. \( \left( \frac{1-\tan x}{1+\tan x} \right) \sec^2 \left( \frac{\pi}{4} + x \right) \)

4. \( \frac{1}{2} \left( \frac{1+\tan x}{1-\tan x} \right) \sec^2 \left( \frac{\pi}{4} + x \right) \)

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Question Number : 28 Question Id : 813561828 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The equation of the line through the point \((2,3)\) such that its x-intercept is twice its y-intercept is ________

మంచగి మంచానికి, y-అక్షానికి అంతరింది లక్షణం \((2,3)\) మంచానికి చేయడానికి, అంతరింది అక్షాని ఎ మంచాని యొక్క బిందు

Options:
1. ✓ $x + 2y - 8 = 0$

2. ✗ $4x + y + 2 = 0$

3. ✗ $2x + 33y - 46 = 0$

4. ✗ $4x + 3y - 11 = 0$

Question Number : 29 Question Id : 813561829 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If 'n' is a positive integer, then $\sum_{r=1}^{n} r^2 \cdot C_r = (\quad)2^{n-2}$

'न के स्क्वायरेड तबा' $\sum_{r=1}^{n} r^2 \cdot C_r = (\quad)2^{n-2}$

Options :

1. ✗ $n(n - 1)$

2. ✗ $n$

3. ✓ $n(n + 1)$

4. ✗ $n + 1$

Question Number : 30 Question Id : 813561830 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Find the value of \( \lim_{x \to 0} \frac{\sin(x^m)}{(\sin x)^n} \), given that \( n < m \).

\[ n < m \implies \lim_{x \to 0} \frac{\sin(x^m)}{(\sin x)^n} = \]

Options:
1. \* 2
2. \* 1
3. ✔ 0
4. ✗ \( \infty \)

If the point \((1,4)\) lies inside the circle \(x^2 + y^2 - 6x - 10y + p = 0\) and the circle does not touch or intersect the coordinates axes, then

\[ x^2 + y^2 - 6x - 10y + p = 0 \] (1,4) మధ్యంగా కొన్ని అదేదిక పిండి కలుగు, అడుగు మించడం ఉండదని నిపుణమైన చేస్తుంది. అంతే

Options:
1. \* \( 0 < p < 34 \)
2. ✔ \( 25 < p < 29 \)
3. \[ 9 < p < 25 \]

4. \[ 7 < p < 29 \]

Question Number : 32 Question Id : 813561832 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The point of intersection of the pair of lines \( x^2 + xy + 2y^2 - 3x + 2y + 4 = 0 \) is

\[ x^2 + xy + 2y^2 - 3x + 2y + 4 = 0 \]

Options :
1. \( (1, 2) \)
2. \( (-1, 2) \)
3. \( (-2, 1) \)
4. \( (2, -1) \)

Question Number : 33 Question Id : 813561833 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The distance between the lines \( 3x + 4y = 9 \) and \( 6x + 8y = 15 \) is equal to _______ units

\[ 3x + 4y = 9 \] and \( 6x + 8y = 15 \)

Options :
The average marks of boys in a class is 40 and that of girls is 45. The average marks of both boys and girls combined is 42. Then the percentage of boys in the class is

Options:

1. 60 %
2. 30 %
3. 40 %
4. 50 %
Question Number : 35 Question Id : 813561835 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Find the condition for the line \( ax + by + c = 0 \) to be a normal to an ellipse \( \frac{x^2}{4} + \frac{y^2}{36} = 1 \)

\[
\frac{x^2}{4} + \frac{y^2}{36} = 1 \text{ என்றும் } ax + by + c = 0 \text{ என்றும் எத்தனைகள் சங்கிலியில் இருந்தும் } \]

Options :

1. \[ \frac{1}{a^2} + \frac{1}{b^2} = \frac{144}{c^2} \]

2. \[ \frac{1}{a^2} + \frac{1}{b^2} = \frac{128}{c^2} \]

3. \[ \frac{1}{a^2} + \frac{9}{b^2} = \frac{256}{c^2} \]

4. \[ \frac{1}{a^2} + \frac{9}{b^2} = \frac{32}{c^2} \]

Question Number : 36 Question Id : 813561836 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The radical axis of the co-axial system of circles with limiting points \((1, 2)\) and \((-2, 1)\) is

\((1, 2)\) முதல் \((-2, 1)\) வரை விளக்கும் கூட்டு கூட்டு வரைத்தை என்று\]

Options :

1. \[ x + 3y = 0 \]
2. \[2x + 3y = 0\]

3. \[3x + 2y = 0\]

4. \[3x + y = 0\]

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**Question Number : 37** Question Id : 813561837 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The equation of the plane whose intercepts on \(x, y, z\) axes are 1, 2, 4 respectively is \(x, y, z\) యొక్క సాంప్రదాయ ప్లేన్ యొక్క భూమిపు సాంప్రదాయం యొక్క మూలపు సాంప్రదాయం

**Options :**

1. \[4x + 2y + z = 4\]

2. \[4x + 2y + z = 2\]

3. \[4x + 2y + z = 1\]

4. \[x + 2y + 4z = 0\]

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**Question Number : 38** Question Id : 813561838 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Solve $\tan(x) + \sec(x) = \sqrt{3}, \ x \in [0, 2\pi]$ 

$\tan(x) + \sec(x) = \sqrt{3}, \ x \in [0, 2\pi]$ 

Options:

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

2. $\frac{\pi}{6}$

3. $\frac{13\pi}{6}$

4. $\frac{6\pi}{13}$

Intersection of two perpendicular tangents to the hyperbola $\frac{x^2}{4} - \frac{y^2}{2} = 1$ lies on the circle $x^2 + y^2 = ____$

$\frac{x^2}{4} - \frac{y^2}{2} = 1$ ఎంచుకోవడం పక్షప్పతి సంప్రదాయానికి సంబంధించిన వృత్తాన్ని కలిగించి ఆధారంగా కానందు వి ప్రతిపాదిత అంశాన్ని మిగిలిస్తుంది $x^2 + y^2 = ____$

వృత్తాన్ని ప్రశ్న ఉంటుంది.
3. $\sqrt{2}$

4. $2\sqrt{3}$

Question Number : 40

If $\cos(x) + \cos^2(x) = 1$, then $\sin^2(x) + \sin^4(x)$ is equal to

$\cos(x) + \cos^2(x) = 1$ असा, $\sin^2(x) + \sin^4(x)$ का मान किती?

Options :

1. $0$

2. $1$

3. $-1$

4. $2$

Question Number : 41

The general solution of the differential equation $\log \left( \frac{dy}{dx} \right) = ax + by$ is

$\log \left( \frac{dy}{dx} \right) = ax + by$ हे दिसून, ग्रांजीतेन्या गाणितिक रूपात समाधान केला हे.
Question Number : 42 Question Id : 813561842 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

In a \( \triangle ABC \), \( a = 1 \), \( b = \sqrt{3} \) and \( \angle C = \pi/6 \). Then the measure of the third side \( c = \)

\[ ABC \] \( a = 1 \), \( b = \sqrt{3} \) \( \angle C = \pi/6 \) \( c = \)

Options :

1. ☑ \( a e^{-by} + be^{ax} = c \)

2. ✗ \( ae^{ax} + be^{-by} = c \)

3. ✗ \( ae^{-by} - be^{ax} = c \)

4. ✗ \( ae^{by} + be^{-ax} = c \)

Question Number : 43 Question Id : 813561843 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

Options :

1. ☑ \( 1 \)

2. ✗ \( 3 \)

3. ☑ \( 4 \)

4. ✗ \( 2 \)
Let \( \mathbf{u} = -2\hat{i} + 2\hat{j} + \hat{k} \) and \( \mathbf{v} = \hat{i} - 2\hat{j} + 2\hat{k} \). Then the component of \( \mathbf{v} \) on \( \mathbf{u} \) is

\[ \mathbf{u} = -2\hat{i} + 2\hat{j} + \hat{k}, \quad \mathbf{v} = \hat{i} - 2\hat{j} + 2\hat{k} \]

Options:

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

The population of a city grows at the annual rate of 3%. What percentage increase is expected in 5 years?

Question Number : 44 Question Id : 813561844 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

Options:

1. \( 12.9 \% \)
2. \( 13.9 \% \)
3. ✗ 14.9 %

4. ✓ 15.9 %

Question Number : 45 Question Id : 813561845 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Determinant of skew-symmetric matrix of order “three” is always

3. 3 మినుగా నేను ఉంచానే వచ్చానే ఆవృత్తి

Options :
1. ✓ 0

2. ✗ 1

3. ✗ Depends on elements

4. ✗ –1

Question Number : 46 Question Id : 813561846 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The mean deviation from the mean of the series \((a), (a + d), (a + 2d), \ldots, (a + 2nd)\) is

\((a), (a + d), (a + 2d), \ldots, (a + 2nd)\) ఉమ్మడి భాగం నిమ్మేపిన భాగం రెండు మినుగా నేను ఉంచానే ఆవృత్తి

Options :

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\[
\frac{n(n-1)d}{2n+1}
\]

1. ✗

\[
\frac{n(n+1)d}{2n+1}
\]

2. ✓

\[
(n(n + 1)d)
\]

3. ✗

\[
\frac{n(n+1)d}{2n}
\]

4. ✗

Question Number : 47 Question Id : 813561847 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The radical axis of any two circles is \(\text{__________}\) to the line joining their centres

ఇది రెంటే మరింతమ నియంత్రించాలంటే అంటే రెంటే \(\text{__________}\)

Options :

- Parallel

1. ✗ రెంటే మరింతమ

- Perpendicular

2. ✓ రెంటే మరింతమ

- Intersecting but not perpendicular

3. ✗ రెంటే మరింతమ, కనుపు రెంటే మరింతమ

- Can’t be determined

4. ✗ కనుపు రెంటే మరింతమ
Question Number : 48 Question Id : 813561848 Question Type : MCQ Display Question
Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

If the length of the intercept made on the line \( y = ax \) by the lines \( y = 2 \) and \( y = 6 \) is less than 5 then

\[ y = ax \quad \text{then} \quad y = 2 \quad \text{and} \quad y = 6 \quad \text{then} \quad a \text{ should be less than } 5 \]

Options :

1. \( a \in (-\infty, \infty) \)

2. \( a \in \left(-\frac{4}{3}, \frac{4}{3}\right) \)

3. \( a \in \left(-\frac{3}{4}, \frac{4}{3}\right) \)

4. \( a < -\frac{4}{3} \quad \text{or} \quad a > \frac{4}{3} \)

Question Number : 49 Question Id : 813561849 Question Type : MCQ Display Question
Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

Let \( S \) be a finite set. Then a non-identity function \( f: S \to S \) can be __________

\( S \) యొక్క అంకితమైన సంఖ్యలు ఉంటాయి. అంటే, \( f: S \to S \) అంకితం ________

Options :

1. ✗
Injective but not surjective

-surjective, తేది ఎందుగా ఉంటే

Surjective but not injective

-surjective, తేది ఎందుగా ఉంటే

Bijective but it does not have an inverse function

-సాధారణం, తేది ఎందుకంటే ఎంధు ఉంటే

Data insufficient

-ముగించబడింది

Question Number : 50 Question Id : 813561850 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Let \( \alpha \) and \( \beta \) be the roots of the equation \( px^2 + qx + r = 0 \), \( p \neq 0 \). If \( p, q, r \) are in A.P. and \( \frac{1}{\alpha} + \frac{1}{\beta} = 4 \) then the value of \( |\alpha - \beta| \) is

\[ px^2 + qx + r = 0 \] లో రాయబడిన \( \alpha, \beta \) (అనేక ప్రత్యేకంగా ప్రత్యేకంగా ప్రత్యేకంగా (A.P.) ఉంటుంది

\( \frac{1}{\alpha} + \frac{1}{\beta} = 4 \) అయితే, \( |\alpha - \beta| \) ఎంతా ఉంటుంది?

Options:

1. \[ \frac{\sqrt{61}}{9} \]

2. \[ \frac{2\sqrt{17}}{9} \]
Question Number : 51 Question Id : 813561851 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A number lock has 3 rings and each ring has 8 digits. Total number of different ways in which 3 rings can be rotated is


era අවම පරිමාණියේ 3 යොදාගත දුරකථන මතයෙන් පිළිතුරු 8 අරයක් නොමැත. 3 යොදාගත

සියළු දෙකක් පහසු ලබන්නේ තදිනිකම්?

Options :

1.  \(3^8\)

2.  \(8^3\)

3.  \(3 \times 8\)

4.  \(P_3\)
If slope of one line of $ax^2 + 4xy + y^2 = 0$ is 3 times the other, then the value of ‘$a$’ is

$$ax^2 + 4xy + y^2 = 0 \text{ త్రికోణాంక నిర్దేశకాలు} \text{ అక్కడ త్రికోణాంక నిర్దేశకాలు సమానం \text{ 3 సముద్ర కాలిమి, } a \text{ కోట్లు}$$

**Options**:

1. ✗ -3
2. ✗ -1
3. ✔ 3
4. ✗ 1

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Question Number : 53 Question Id : 813561853 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The equation of the tangent to the parabola $y^2 = 12x$ at $(3, -6)$ is

$$y^2 = 12x \text{ త్రికోణాంక నిర్దేశకాలు} (3, -6) \text{ అక్కడ త్రికోణాంక నిర్దేశకాలు సమానం}$$

**Options**:

1. ✗ $x - y + 9 = 0$
2. ✔ $x + y + 3 = 0$
3. ✗ $x + y - 3 = 0$
4. ✗ $x = 3$
Question Number : 54 Question Id : 813561854 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

For any two events $A, B$ if $P(A \cup B) = aP(A \cap B) + bP(A) + cP(B)$, then $3a + 2b + 5c = ?$

$A, B$ లేగు దిశలు మాత్రమే $P(A \cup B) = aP(A \cap B) + bP(A) + cP(B)$ లోనే, $3a + 2b + 5c =$

Options :

1. ✗ 2

2. ✔ 4

3. ✗ 3

4. ✗ 1

Question Number : 55 Question Id : 813561855 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The curve $y = ax^3 + bx^2 + cx + 5$ touches the $x$-axis at $P(-2, 0)$ and cuts $y$-axis at a point $Q$ where gradient is 3. Then the values of $a, b, c$ are

$y = ax^3 + bx^2 + cx + 5$ లేదు $x$-కోణి పరిధి $P(-2, 0)$ లో ఉంటుంది $y$-పరిధి $Q$ లో గ్రాడెన్టు 3 లోనే. అంటే $a, b, c$ ఎలా ఉంటాయి?

Options :

1. ✔ $a = \frac{-1}{2}$, $b = \frac{-3}{4}$, $c = 3$

2. ✗
\[ a = \frac{1}{2}, \quad b = \frac{3}{4}, \quad c = 3 \]

3. \[ a = 1, \quad b = 2, \quad c = 3 \]

4. \[ a = -1, \quad b = -2, \quad c = 3 \]

Question Number : 56 Question Id : 813561856 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If \( \theta \) lies in third quadrant and \( \cos \theta = \frac{-3}{5} \) find value of \( \tan \theta \).

\[ \theta \text{ ద్వారా-III కోణు మూలా సాధారణ} \quad \cos \theta = \frac{-3}{5} \quad \text{ఫించుండి}, \quad \tan \theta = \]

Options :

1. \[ \frac{2}{3} \]

2. \[ \frac{-2}{3} \]

3. \[ \frac{-4}{3} \]

4. \[ \frac{4}{3} \]

Question Number : 57 Question Id : 813561857 Question Type : MCQ Display Question
If \( A = \begin{bmatrix} 3 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 4 \end{bmatrix} \) and \( B = A^3 \), then \( B^{-1} = \)

\[
A = \begin{bmatrix} 3 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 4 \end{bmatrix}
\]

Options:

1. \[
\begin{bmatrix} -3 & 0 & 0 \\ 0 & -5 & 0 \\ 0 & 0 & -4 \end{bmatrix}
\]  

2. \[
\begin{bmatrix} -27 & 0 & 0 \\ 0 & -125 & 0 \\ 0 & 0 & -64 \end{bmatrix}
\]  

3. \[
\begin{bmatrix} \frac{1}{27} & 0 & 0 \\ 0 & \frac{1}{125} & 0 \\ 0 & 0 & \frac{1}{64} \end{bmatrix}
\]  

4. \[
\begin{bmatrix} \frac{-1}{27} & 0 & 0 \\ 0 & \frac{-1}{125} & 0 \\ 0 & 0 & \frac{-1}{64} \end{bmatrix}
\]
Solve \((8 - t)^2 < (t^2 - 3t - 10)\)

\[(8 - t)^2 < (t^2 - 3t - 10)\]

Options:
1. \(^*\) \((\frac{74}{13}, 8]\)
2. \(\checkmark\) \((\frac{74}{13}, \infty)\)
3. \(^*\) \((8, \infty)\)
4. \[^*\] \([8, \infty)\)

Questions:

1. Solve \((8 - t)^2 < (t^2 - 3t - 10)\)

2. The equation of the locus of a point \(P(x, y, z)\) such that its distance from the \(x\)-axis is equal to its distance from the plane \(x + z = 1\) is

\[P(x, y, z)\]

3. Options:
   1. \(x^2 - 2y^2 - z^2 + 2xz - 2x - 2z + 1 = 0\)
   2. \(^*\) \(x^2 - 2y^2 - z^2 + 2xz - 2x - 2z - 1 = 0\)
3. \[ x^2 + 2y^2 + z^2 + 2xz - 2x - 2z + 1 = 0 \]

4. \[ x^2 - 2y^2 - z^2 + 2xz - 2x + 2z + 1 = 0 \]

Question Number : 60 Question Id : 813561860 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

In how many ways a committee of 6 members can be formed out of 10 members but always consisting of a specified member?

అన్ను యాత్రా విభాగాలను రూపాలను సంఖ్య బహుమిశ్రమం అంచు వాటికి, 10 మంది నిర్మించడానికి,

ప్రతివిధి విభాగాలను సంఖ్య

Options :

1. \( \frac{1}{2} \cdot \binom{9}{5} \)

2. \( \binom{9}{5} \)

3. \( \binom{9}{5} \)

4. \( \frac{1}{2} \cdot \binom{9}{5} \)

Question Number : 61 Question Id : 813561861 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
In \( \Delta ABC \), the circle that touches the sides BC internally and other two sides AB and AC externally, is called _______

\[ ABC \text{ ఆయన పరిధి వ్యాసాంశానికి సమాంతరంగా, } AB, AC \text{ మరియు మూడవ పరిధి వ్యాసాంశానికి సమాంతరం } \]

Options:

1. Ex circle opposite to angle A
2. In circle opposite to angle A
3. Circumcircle of the triangle
4. No such circle exists

\[ f(x) = |\log_e |x|| \] is differentiable at

\[ f(x) = |\log_e |x|| \] ______ అంతే జిల్లాలు

Options:

1. \( x = 0 \) only
2. \( x = 0 \) మరియు
2. x = 1 only
   x = 1 తేడా

3. x = -1 only
   x = -1 తేడా

4. \( R - \{0, \pm 1\} \)

Question Number : 63 Question Id : 813561863 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If \( x + iy = \frac{3}{2 + \cos(\theta) + i \sin(\theta)} \), then \( x^2 + y^2 = \cdots \)

\( x + iy = \frac{3}{2 + \cos(\theta) + i \sin(\theta)} \) తేడా, \( x^2 + y^2 = \cdots \)

Options :
1. 4x - 3
2. 4x + 3
3. 0
4. 1

Question Number : 64 Question Id : 813561864 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

The direction cosines of a line are \( \left( \frac{-9}{11}, \frac{6}{11}, \frac{-2}{11} \right) \) respectively. Then its direction ratios are

మొత్తం విశేషమే వ్యాఖ్యాతం \( \left( \frac{-9}{11}, \frac{6}{11}, \frac{-2}{11} \right) \) సమానం, ఆ విశేషమే వ్యాఖ్యాతం

Options :
1. \( (9, 6, -2) \)
2. \( (-9, -6, 2) \)
3. \( (-9, 6, -2) \)  ✔
4. \( (9, -6, -2) \)

Question Number : 65 Question Id : 813561865 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The equation of the tangent to the parabola \( y^2 = 8x \) inclined at 30° to the x-axis is

\[ x - \sqrt{3} y + 30^\circ రేఖాయం నుండి, y^2 = 8x మీద వైపు అంచు ఆధారాల అంచు మిశ్రమం \]

Options :
1. \( 3x - \sqrt{3} y + 14 = 0 \)
2. \( 2x - 3y + 14 = 0 \)
3. \( 2x - \sqrt{3} y + 7 = 0 \)
4. $x - \sqrt{3}y + 6 = 0$

Question Number : 66 Question Id : 813561866 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The line segment joining the points $A(2, 3, 4)$ and $B(-3, 5, -4)$ intersects $yz$-plane at the point $A(2, 3, 4)$ మిద్దను $B(-3, 5, -4)$ మిద్దను యేస్ ప్లేన్ ఆయుషు మిద్దను 

Options :

1. $(0, \frac{19}{5}, \frac{4}{5})$

2. $(0, 4, 5)$

3. $(9, \frac{14}{5}, 4)$

4. $(0, 0, 0)$

Question Number : 67 Question Id : 813561867 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

In 3 trials of a binomial distribution, the probability of 2 successes is 9 times the probability of 3 successes. Then the probability of success in each trial is

నాకు మిద్దను యేస్ప్లేన్ మిద్దను 3 ప్రసారం 2 ప్రసారం మిద్దను, 3 ప్రసారం మిద్దను షాంతి ఆయుషు 9 ప్రసారం మిద్దను, అందుకే మిద్దను యేస్ప్లేన్ మిద్దను షాంతి ఆయుషు మిద్దను?
If two lines are parallel to each other, then which of the following is true? (if \((l_1, m_1, n_1)\) and \((l_2, m_2, n_2)\) are direction cosines of the two lines)

\((l_1, m_1, n_1)\) = direction cosines of the first line
\((l_2, m_2, n_2)\) = direction cosines of the second line

Options:

1. \(l_1l_2 + m_1m_2 + n_1n_2 = 0\)
2. \(\Sigma(l_1l_2 - m_2m_1)^2 = 0\)
3. \(\frac{l_1}{l_2} = \frac{m_1}{m_2} = \frac{n_1}{n_2}\)

Question Number: 68
Question Id: 813561868
Question Type: MCQ
Display Question Number: Yes
Is Question Mandatory: No
Single Line Question Option: No
Orientation: Vertical
4. \[ l_1 l_2 + m_1 m_2 + n_1 n_2 = 1 \]

**Question Number : 69 Question Id : 813561869 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Suppose that \( f \) and \( g \) are integrable on \([a, b]\), then \( f + g \) is integrable on __________

\([a, b] \subset f, g \text{ are integrable on } [a, b], \text{ then } f + g \text{ is integrable on } [a, b] \)?

**Options :**

1. \( (a, b) \)

   Cannot comment

2. \( \text{nadhura namma cheyyelastha} \)

3. \( [a, b] \)

   Range of \( f + g \)

   \( f + g \text{ is continuous on } [a, b] \)

4. \( \text{nadhura namma cheyyelastha} \)

**Question Number : 70 Question Id : 813561870 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**
Integral \( \int \left( \frac{2x^3 - 3x + 5}{2x^2} \right) \, dx \) is valid for

\[ \int \left( \frac{2x^3 - 3x + 5}{2x^2} \right) \, dx \quad \text{if} \quad x \neq 0 \]

Options:
1. \( x \in R \setminus \{0\} \)
2. \( x > 0 \)
3. \( x < 0 \)
4. \( x \in R \)

A triangle can be uniquely determined by its __________

Options:
1. Three angles
2. Three sides
3. One of the angles and one of the sides
Question Number : 72 Question Id : 813561872 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Find \( \frac{dy}{dx} \) if \( 2x^2 - 3xy + y^2 + x + 2y - 8 = 0 \)

\( 2x^2 - 3xy + y^2 + x + 2y - 8 = 0 \) లో, \( \frac{dy}{dx} = \)

Options :

1. \( \frac{3y-4x-1}{2y-3x+2} \)

2. \( \frac{3y+4x-1}{2y-3x+2} \)

3. \( \frac{3y-4x-1}{2y+3x+2} \)

4. \( \frac{3y-4x-1}{2y-3x-2} \)
For any $a, b, c \in \mathbb{R}$, the determinant $
abla \begin{vmatrix} bc & b + c & 1 \\ ca & c + a & 1 \\ ab & a + b & 1 \end{vmatrix}$ is equal to

$$\begin{vmatrix} bc & b + c & 1 \\ ca & c + a & 1 \\ ab & a + b & 1 \end{vmatrix} =$$

Options:

1. $a(b^2 - c^2) + b(c^2 - a^2) + c(a^2 - b^2)$

2. $a(b - c) + b(c - a) + c(a - b)$

3. $(a - b)(b - c)(c - a)$

4. $abc$

Question Number : 74 Question Id : 813561874 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

If $\overrightarrow{P} = 3\hat{i} + 5\hat{j} - \hat{k}$ and $\overrightarrow{Q} = \hat{i} + 2\hat{j} + 3\hat{k}$ are two sides of a triangle, then its area is equal to ______ sq. units

$$\overrightarrow{P} = 3\hat{i} + 5\hat{j} - \hat{k} \quad \text{and} \quad \overrightarrow{Q} = \hat{i} + 2\hat{j} + 3\hat{k}$$

Options:

1. $\sqrt{390}$

2. $\frac{\sqrt{390}}{4}$
\[ \sqrt{390} \]

\[ \frac{\sqrt{390}}{2} \]  
3. ✓

\[ \frac{\sqrt{390}}{8} \]  
4. ✗

**Question Number : 75 Question Id : 813561875 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Find the value of \( \csc 750^\circ - 2(\cot 765^\circ) \)

\[ \csc 750^\circ - 2(\cot 765^\circ) \] \( \equiv \) \[\_\_\_\_\_\_\_\]  

**Options :**

1. ✓ 0

2. ✗ 1

3. ✗ 2

4. ✗ -1

**Question Number : 76 Question Id : 813561876 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**
If \( 3a + 5b + 6c = 0 \) then the family of lines \( ax + by + c = 0 \) pass through the fixed point.

\[ 3a + 5b + 6c = 0 \quad \text{选项} \quad ax + by + c = 0 \quad \text{通过固定点} \]

Options:

1. \( \left( \frac{5}{6}, \frac{1}{2} \right) \)
2. \( \left( \frac{1}{2}, \frac{1}{3} \right) \)
3. \( \left( \frac{1}{3}, \frac{1}{2} \right) \)
4. \( \left( \frac{1}{2}, \frac{5}{6} \right) \)

If \( (f(x))^2 = f(x^2) + f(1) \) holds good, then find \( f(x) \).

\[ (f(x))^2 = f(x^2) + f(1) \quad \text{选项} \quad f(x) = \]

Options:

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

Question Number : 78 Question Id : 813561878 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Solve the differential equation \( \frac{dy}{dx} = \frac{1 + y^2}{(\tan^{-1} y) - x} \)

\[ \frac{dy}{dx} = \frac{1 + y^2}{(\tan^{-1} y) - x} \text{ } \text{ (सरलता की है या नहीं?)} \]

Options :

1. \[ xe^{\tan^{-1} y} = e^{-\tan^{-1} y} \left((\tan^{-1} y) - 1 \right) + c \]

2. \[ xe^{\tan^{-1} y} = e^{\tan^{-1} y} \left((\tan^{-1} y) - 1 \right) + c \]

3. \[ xe^{\tan^{-1} y} = e^{\tan^{-1} y} \left((\tan^{-1} y) + 1 \right) + c \]

4. \[ xe^{\tan^{-1} y} = e^{-\tan^{-1} y} \left((\tan^{-1} y) + 1 \right) + c \]

Question Number : 79 Question Id : 813561879 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Given \( \triangle ABC \) such that \( A = 2\hat{i} - \hat{j} + \hat{k}, B = \hat{i} - 3\hat{j} - 5\hat{k} \) and \( C = 3\hat{i} - 4\hat{j} - 4\hat{k} \) then \( \triangle ABC \) is

\( \triangle ABC \) అనేది వైస్పై వైస్పై యుగ్మం, అనేక వైస్పి యుగ్మం

Options:

- An equilateral triangle

1. ✗ మైనంత వైస్పై యుగ్మం

- A right-angled triangle

2. ✔ మైనంత వైస్పై యుగ్మం

- An isosceles triangle

3. ✗ మైనంత వైస్పై యుగ్మం

- A scalene triangle

4. ✗ మైనంత వైస్పై యుగ్మం

Question Number : 80 Question Id : 813561880 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A random variable \( X \) has the probability distribution as given below. Let \( E = \{ X \mid X \text{ is prime number} \} \) and \( F = \{ X \mid X < 4 \} \), then \( P(E \cup F) = \)

\( X \) కంప్రెమెట ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న ప్రశ్న

\( E = \{ X \mid X \text{ is prime number} \} \) అని, \( P(E \cup F) = \)

<table>
<thead>
<tr>
<th>( X )</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P(X) )</td>
<td>( K )</td>
<td>( 2K )</td>
<td>( K^2 )</td>
<td>( 2K^2 )</td>
<td>( 5K^2 )</td>
<td>( K )</td>
<td>( K )</td>
<td>( 2K )</td>
</tr>
</tbody>
</table>

Options:
Physics

Section Id : 81356117
Section Number : 2
Mandatory or Optional : Mandatory
Number of Questions : 40
Number of Questions to be attempted : 40
Section Marks : 40
Display Number Panel : Yes
Group All Questions : Yes
Mark As Answered Required? : Yes

Question Number : 81 Question Id : 813561881 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
A body executes simple harmonic motion with an amplitude $A$. At what displacement, from the mean position, is the potential energy of the body one fourth of its total energy?

Options:

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

2. $\frac{A}{2}$

3. $\frac{3A}{4}$

4. $3A$

The distance between the centers of moon and earth is $D$ and mass of earth is 81 times the mass of moon. At what distance from the centre of the earth, the gravitational force will be zero?

Options:

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

3. \( \frac{4D}{3} \)

4. \( \frac{9D}{10} \)

Question Number : 83 Question Id : 813561883 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A bomb of mass 9 kg explodes into two pieces of mass 3 kg and 6 kg. The velocity of mass 3 kg is 16 m/s. The kinetic energy of mass 6 kg in joule is:

9 kg ద్రిశ్యంగా 3 kg మాత్రము 6 kg ద్రిశ్యంగా 3 kg మాత్రము ఉంటుంది. 3 kg ఉపగొండలో 16 m/s వేగం, 6 kg ఉపగొండలో వేగం నిమ్మించే గడీ ఉంటుంది

Options :

1. \( 96 \) 

2. \( 384 \) 

3. \( 192 \) 

4. \( 768 \)
Orientation : Vertical

What should be the diameter of a copper wire \((Y = 12 \times 10^{10} \text{ N} \cdot \text{m}^{-2})\) of length 5 m to produce the same elongation produced by a 5 m long aluminum wire \((Y = 7 \times 10^{10} \text{ N} \cdot \text{m}^{-2})\) of diameter 3 mm with the same 40 kg mass?

\[
\text{Given: } 5 \text{ m copper wire 3 mm diameter 40 kg mass, } Y = 12 \times 10^{10} \text{ N} \cdot \text{m}^{-2}, \text{ and 5 m aluminum wire 5 mm diameter 40 kg mass, } Y = 7 \times 10^{10} \text{ N} \cdot \text{m}^{-2}.
\]

Options :

1. \(\times 1.5 \text{ mm}\)
2. \(\times 5 \text{ mm}\)
3. \(\checkmark 2.3 \text{ mm}\)
4. \(\times 10 \text{ mm}\)

---

Question Number : 85 Question Id : 813561885 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A ball is dropped from a spacecraft revolving around the earth at a height of 120 km. What will happen to the ball?

\[\text{Given: } 120 \text{ km height. What happens to the ball at this height?} \]

Options :

- It will continue to move with same speed along the original orbit of spacecraft
- \(\checkmark \) It will continue to move with same speed along the original orbit of spacecraft
It will move with the same speed tangentially to the original orbit.

It will fall down to the earth gradually.

It will go very far in space.

Question Number : 86 Question Id : 813561886 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

When a moving body collides with a stationary body, of \( n \) times its mass, then the amount of kinetic energy transferred to the stationary body is ________

Options:

1. \( \frac{4n}{(1+n)^2} \)

2. \( \frac{n}{(1+n)^2} \)

3. \( \frac{n^2}{(1+n)^2} \)

4.
\[ \frac{4n^2}{(1+n)^2} \]

**Question Number : 87**  
**Question Id : 813561887**  
**Question Type : MCQ**  
**Display Question Number : Yes**  
**Is Question Mandatory : No**  
**Single Line Question Option : No**  
**Orientation : Vertical**

When a helium nucleus covers a circle of radius 0.8 m in 2 seconds, find the value of magnetic field \( B \) at the centre of the circle.

**Options :**

1. \( \frac{10^{-19}}{\mu_0} \)
2. \( \mu_0 \times 10^{-19} \)
3. \( 2 \mu_0 \times 10^{-10} \)
4. \( \frac{2 \times 10^{-19}}{\mu_0} \)

**Question Number : 88**  
**Question Id : 813561888**  
**Question Type : MCQ**  
**Display Question Number : Yes**  
**Is Question Mandatory : No**  
**Single Line Question Option : No**  
**Orientation : Vertical**
A uniform circular disc has radius \( r \). A square portion of diagonal \( r \) is cut from it. The centre of mass of the remaining disc from the centre of disc is

\[
\frac{r}{2-4\pi}
\]

Options:

1. \( \frac{r}{2-4\pi} \)  
2. \( \frac{r}{3-3\pi} \)  
3. \( \frac{r}{2-5\pi} \)  
4. \( \frac{2r}{1-2\pi} \)

Water flows through a hose pipe whose internal diameter is \( 4 \text{ cm} \) at a speed of \( 1 \text{ m/s} \). If water has to emerge at a speed of \( 4 \text{ m/s} \), the diameter of the nozzle should be

\( 4 \text{ cm} \) లో మార్పు చేసే ద్వారం అనే ద్వారం ద్వారం 1 \text{ m/s} \) లో మార్పు చేసే 4 \text{ m/s} \) లో మార్పు చేసే ద్వారం ద్వారం

Options:

1. \( 1 \text{ cm} \)
2. ✓ 2 cm

3. × 4 cm

4. × 0.5 cm

Question Number : 90 Question Id : 813561890 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Pick out the longest wavelength from the following types of radiations

వీధి వద్ద విద్యుత్ యొక్క శిరుదగానం గా దాని విస్తృతము

Options :

1. × visible blue light

2. × Ultraviolet light

3. × X- rays

4. ✓ visible red light

Question Number : 91 Question Id : 813561891 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option
Orientation : Vertical

The ratio of the adiabatic to isothermal elasticities of a triatomic (non-linear) gas is _____

వేసారిసరిసిలా (అతిసరిసలిసిలా) తెలాడిన శాస్త్రము, నాసివి నాసివి, కేమిస్ట్రీ కేమిస్ట్రీ
వేసరిసరిసిలా = ______

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

---

Orientation : Vertical

The terminal velocity ‘v’ of a spherical ball of lead of radius ‘R’ falling through a viscous liquid varies with ‘R’ such that

‘v’ సారి సరి తే నిర్ధారిసిన ఉపరుస్తుంది ధర్మానం రాడు ఏందర్ిసి ఉండాలి రెండు ప్రాంతాలు వచ్చాయి వచ్చాయి
‘v’ నాసివి ‘R’ యొక్క నాసివిసరిసలిసిలా

Options:
1. \( \frac{V}{R} = \text{constant} \) \( \frac{V}{R} = \text{constant} \)
2. \( VR = \text{constant} \) \( VR = \text{constant} \)
3. \( \text{constant} \) \( \text{constant} \)
\[ V = \text{constant} \quad \Rightarrow \quad \frac{V}{R^2} = \text{constant} \]

4. \( \checkmark \)

**Question Number : 93** Question Id : 813561893 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The half-life of a radioactive sample is \( T \). The fraction of the initial mass of the sample that decays in an interval \( T/2 \) is

ఎడిగారు అంగం మాత్రమే మినిగా, కంచి మాత్రమే \( T \). \( T/2 \) రాయడంలో ఎందుకంటే ఎంతం మూడాలో వచ్చే ఉంది

Options :

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

2. \( \sqrt{2} \)

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

4. \( \frac{(\sqrt{2}+1)}{\sqrt{2}} \)

**Question Number : 94** Question Id : 813561894 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option

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Orientation : Vertical

Taking earth to be a metallic sphere, its capacity will approximately be

Options :
1. $6.4 \times 10^6 \ F$
2. $700 \ F$
3. $700 \ \mu F$
4. $700 \ \mu F$

Orientation : Vertical

A vessel contains mixture of hydrogen and oxygen gasses in the ratio of their masses equal to 1 : 5. The ratio of mean kinetic energies of the two gasses is:

Options :
1. $1 : 1$
2. $1 : 16$
3. $16 : 5$
4. 5:16

Question Number : 96 Question Id : 813561896 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Which of the following generates a plane wave front?

Options :
- Point source
- Extended source
- Monochromatic source
- All light sources

Question Number : 97 Question Id : 813561897 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
A magnetic needle lying parallel to a magnetic field requires $W$ units of work to turn it through 60°. The torque required to maintain the needle in this position will be

\[ \frac{1}{2} \times B \times I \times L \]

Options :

1. $\sqrt{3} W$
2. $W$
3. $\frac{\sqrt{3}}{2} W$
4. $2W$

---

The energy stored in a strained wire is given by ________

\[ \frac{1}{2} \times \text{load} \times \text{extension} \]

Options :

1. $\frac{1}{2} \times \text{load} \times \text{extension}$
2. $\frac{1}{2} \times \text{stress} \times \text{extension}$
\[ \frac{1}{2} \times \text{stress} \times \text{strain} \]

\[ \frac{1}{2} \times \text{strain} \times \text{load} \]

\[ \frac{1}{2} \times \text{stress} \times \text{load} \]

Question Number : 99  Question Id : 813561899  Question Type : MCQ  Display Question Number : Yes  Is Question Mandatory : No  Single Line Question Option : No Option  Orientation : Vertical

Four pendulums A, B, C and D are hanged from the same elastic support as shown in figure. A and C are of the same length while B is smaller than A, C while D is longer than A. If A is given displacement, then at steady state

\[ \text{A లో నిష్టా రశ్మి ఉంటుంది, ఒకరు వాహన ఉండటం కావచ్చు అయితే A, B, C మధ్య D అంతాంత తెలుసు. ఆ మధ్య C అంతాంత తెలుసు, B మధ్య A, C అంతాంత తెలుసు మధ్య D ఇంది ఆ రాధని. A లో దక్షిణ వాహన ఉంటుంది. వాహన రాధని} \]

Diagram:

Options:

1. \[ D \text{ will vibrate with max amplitude} \]

2. \[ D \text{ లో రాధకుండా ఉంటుంది} \]

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2. C will vibrate with max amplitude
   C గా మిగిలి విస్తరించండి కాను విభేదంపై

3. B will vibrate with max amplitude
   B గా మిగిలి అభిమితి కాను విభేదంపై

4. All four will osculate with equal amplitude
   పన్నా ముందు సారి విస్తరించి కాను విభేదంపై

Question Number : 100 Question Id : 813561900 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

How many revolutions does a wheel with angular speed 88 rad. s\(^{-1}\) make in one second?

88 rad. s\(^{-1}\) కి పోస్టరంగా ఎక్కడ ఒకటి సారి విస్తరించి కాను విభేదంపై?

Options :
1. 7
2. ✔ 14
3. ✗ 28
4. ✗ 44

Question Number : 101 Question Id : 813561901 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

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Electric lines of force in the field of a positive point charge are ________

Which of the following remains constant for a projectile fired from the earth?

Options:

1. radially outward

2. radially inward

3. parallel

4. converged

Options:

1. Momentum

2. Vertical component of velocity

3.
Kinetic energy

Horizontal component of velocity

The maximum velocity of an electron emitted by light of wavelength \( \lambda \) incident on the surface of a metal of work function \( \phi \) is \[ \sqrt{\frac{2(hc+\lambda \phi)}{m\lambda}} \] \[ \sqrt{\frac{2(hc-\lambda \phi)}{m\lambda}} \] Option 3.

Options:

1. \[ \sqrt{\frac{2(hc+\lambda \phi)}{m\lambda}} \]

2. \[ \frac{2(hc-\lambda \phi)}{m} \]

3. \[ \sqrt{\frac{2(hc-\lambda \phi)}{m\lambda}} \] ☑

4. \[ \frac{2(h\lambda-\phi)}{m} \] ☑
Question Number : 104 Question Id : 813561904 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A man pushes a wall and fails to displace it. He does __________

అడుగును మీరు నాణు నిపుణంగా సమాధానం చేస్తే వర్గం వాటి.

Options : 

1. Negative work
2. Positive but not maximum work
3. No work at all
4. Maximum work

Question Number : 105 Question Id : 813561905 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Four identical spheres each of radius 10 cm and equal mass 1 kg each are placed on horizontal surface touching each other so that their centre are located at the vertices of a square of side 20 cm. What is the distance of their centre of mass from the centre of either sphere?

10 cm రహదారిలో, 1 kg తెగిన ఎక్కడ రేఖాయి ఏమీ జరిగిన గాయాల నుంచి మాత్రమే సహజంగా దర్శనంకు లింగంతో రెగిస్తాను. ఈ రెగిస్తాను చేరుకునే రెగిస్తాను వచ్చాం. కానీ, ఏమీ రెగిస్తాను బుద్ధి బసిను ఈ రెగిస్తాను చేరానందం?

Options:
1. ✗ $20\sqrt{2}$
2. ✗ $30\sqrt{2}$
3. ✓ $10\sqrt{2}$
4. ✗ $40\sqrt{2}$
The center of a wheel rolling on a plane surface moves with a speed $V_o$. A particle on the rim of the wheel at the same level as the center will be moving at a speed _______

అలంకరణ సంభారం గల ఏంటే విశాలమైనంటే విశాఖ పాయింది విశాఖ పాయింది విశాఖ పాయింది విశాఖ పాయింది విశాఖ పాయింది విశాఖ పాయింది 

Options:
1. $0$
2. $V_o$
3. $\sqrt{2} V_o$
4. $2 V_o$

Question Number : 107 Question Id : 813561907 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The efficiency of a Carnot’s engine is 100% only when

చారాట యొక్క దూర్పాట కలిగే 100% తినదివి国立

Options:
1. Ideal gas is used as a working substance
   వాయుసాధారణ పద్ధతి పునర్మారుసారం

2. Temperature of the sink is equal to absolute zero
   చేపిడి గురించి పంచ వంటి పునర్మారుసారం

3. ✗
Source temperature is equal to the temperature of the sink

Source temperature is equal to absolute zero

Question Number : 108 Question Id : 813561908 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The coils of a step-down transformer have 500 and 5000 turns. In the primary coil an A.C current of 4 A at 2200 V is sent. The value of the current and potential difference in the secondary coil is

Options :
1. ✗ 20 A, 220 V
2. ✗ 0.4 A, 22000 V
3. ✔ 40 A, 220 V
4. ✗ 40 A, 22000 V

Question Number : 109 Question Id : 813561909 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Electric potential at a point distant 0.5 m from a spherical conductor of radius 0.2 m charged to +1 nC is:

\[ +1 \text{ nC के विपरीत धारित किया गया 0.2 m वृत्तीय लम्ब के केंद्र से 0.5 m } \]

स्थानांतरण के साथ विवेजित विद्युत विषय

Options:
1. ✗ + 9 V
2. ✗ − 9 V
3. ✔ + 18 V
4. ✗ − 18 V

The condition \( dQ = dW \) holds good in which of the following?

\[ dQ = dW \text{ वैद्युत ऊर्जा प्रणाली के विवेजित विषय?} \]

Options:
1. ✗ अध्यायक मृत्ति
2. ✔ भित्तीक मृत्ति
Iscchoric process

3. \[ \text{\textit{Iscchoric process}} \]

Isobaric process

4. \[ \text{\textit{Isobaric process}} \]

Question Number : 111 Question Id : 813561911 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

306 J of heat is required to raise the temperature of 2 moles of an ideal gas at constant pressure from 25 °C to 35 °C. The amount of heat required to raise the temperature of the same gas through the same range at constant volume is

\[ \text{\textit{306 J of heat is required to raise the temperature of 2 moles of an ideal gas at constant pressure from 25 °C to 35 °C. The amount of heat required to raise the temperature of the same gas through the same range at constant volume is}} \]

Options :

1. \[ \text{\textit{306 J}} \]

2. \[ \text{\textit{153 J}} \]

3. \[ \text{\textit{140 J}} \]

4. \[ \text{\textit{80 J}} \]

Question Number : 112 Question Id : 813561912 Question Type : MCQ Display Question
A body at 3000 K emits maximum energy at a wavelength of 9660 Å. If the sun emits maximum energy at a wavelength of 4950 Å, what would be the temperature of the sun?

Options:
1. ✓ 5855 K
2. ✗ 7000 K
3. ✗ 4250 K
4. ✗ 8000 K

The primary of a transformer has 100 turns, and operates at 100 V-200 W. The number of turns in the secondary, if the output voltage is 2000 V is

Options:
1. ✓ 2000
2. ✗ 200
3.  **100**

4.  **500**

**Question Number : 114**  
**Question Id : 813561914**  
**Question Type : MCQ**  
**Display Question Number : Yes**  
**Is Question Mandatory : No**  
**Single Line Question Option : No**  
**Orientation : Vertical**

A rocket is fired vertically from the ground with a resultant vertical acceleration of a 10 m. s\(^{-2}\). Fuel is finished in 1 min and it continues to move up. What the maximum height reached?

**Options :**

1.  **36.4 km**

2.  **42.3 km**

3.  **48.4 km**

4.  **25.6 km**

**Question Number : 115**  
**Question Id : 813561915**  
**Question Type : MCQ**  
**Display Question Number : Yes**  
**Is Question Mandatory : No**  
**Single Line Question Option : No**  
**Orientation : Vertical**
A proton enters a magnetic field of flux density $1.5 \, \text{Wb.m}^{-2}$ with a velocity of $2 \times 10^7 \, \text{m.s}^{-1}$ at an angle of $30^\circ$ with the field. The force on the proton will be

$\text{ప్రోటాన్ తీసుకు ముందు 1.5 \, \text{Wb.m}^{-2} \, \text{కేంద్ర వైపు యొక్క వైపు నుంచి 2 \times 10^7 \, \text{m.s}^{-1} \, \text{వ్యాపారం ముందు} 30^\circ \, \text{ఎంతో చచ్చింది. ప్రోటాన్ ను విస్తృతం చేయడానికి}}$

**Options:**

1. $2.4 \times 10^{-12} \, \text{N}$

2. $24 \times 10^{-12} \, \text{N}$

3. $0.24 \times 10^{-12} \, \text{N}$

4. $0.024 \times 10^{-12} \, \text{N}$

A tuned circuit of a transistor oscillator unit has an inductance of $5 \, \text{mH}$ and a capacitance of $5 \, \text{pF}$. The natural frequency of the oscillator is __________

$\text{అంతోయిస్టర్ యొక్క టెండు యొక్క ఎంటుకునే నియమాలు యొక్క నియమాలు 5 \, \text{mH} \, \text{తెగమ్మ సంఖ్య సాధారణం యొక్క నియమాలు 5 \, \text{pF} \, \text{తెగమ్మ సంఖ్య సాధారణం __________}}$

**Options:**

1. $100 \, \text{kHz}$

2. __________
A current \( I = 10 \, A \) is passed through the part of a circuit shown in the figure. What will be the potential difference between \( A \) and \( B \) when \( I \) is decreased at constant rate of \( 10^2 \, A. \, s^{-1} \) at the beginning?

---

**Options:**

1. \( -7.5 \, V \) **✓**
2. \( 3.5 \, V \) ✗
3. \( -3.5 \, V \) ✗
4. \( 4 \, V \) ✗
Question Number : 118 Question Id : 813561918 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A block of mass $m$ is placed on a smooth wedge of inclination $\theta$. The whole system is accelerated horizontally so that the block does not slip on the wedge. The force exerted by the wedge on the block (g is acceleration due to gravity) will be

$$\theta \text{ మేధా కొన్ని మెయిడ్ మధ్యమం చెందుతుంది. మధ్యమం మధ్యమం మధ్యమం మధ్యమం మధ్యమం మధ్యమం మధ్యమం వాడుతుంది. రెండు సౌశయం సౌశయం సౌశయం సౌశయం సౌశయం సౌశయం సౌశయం సౌశయం}$$

(g మధ్యమం మధ్యమం మధ్యమం మధ్యమం మధ్యమం మధ్యమం మధ్యమం)

Options :

1. $mg \cos \theta$
2. $mg \sin \theta$
3. $mg$
4. $mg \sec \theta$

Question Number : 119 Question Id : 813561919 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
A rectangular metal plate 8 cm × 4 cm at 127°C emits E J s⁻¹. If both length and breadth are halved and the temperature is raised to 327°C, the rate of emission is

\[ E \left( \frac{9}{4} \right) \text{ J s}^{-1} \]

Options:

1. **\( E \left( \frac{31}{64} \right) \text{ J s}^{-1} \)**
2. **\( E \left( \frac{27}{8} \right) \text{ J s}^{-1} \)**
3. **\( E \left( \frac{10}{7} \right) \text{ J s}^{-1} \)**

**Question Number : 120 Question Id : 813561920 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Acceleration due to gravity at a height ‘h’ is equal to that at a depth ‘d’ below the surface of the earth, if

\[ d = h \]

Options:

1. **\( d = h \)**
2. **\( d = h \)**
2d = h

3. ✓  
\[ d = 2h \]

4. ✗  
\[ 3d = h \]

---

**Chemistry**

Section Id : 81356118  
Section Number : 3  
Mandatory or Optional : Mandatory  
Number of Questions : 40  
Number of Questions to be attempted : 40  
Section Marks : 40  
Display Number Panel : Yes  
Group All Questions : Yes  
Mark As Answered Required? : Yes  

Question Number : 121  
Question Id : 813561921  
Question Type : MCQ  
Display Question Number : Yes  
Is Question Mandatory : No  
Single Line Question Option : No  
Orientation : Vertical  

Which element of the 3d series has highest third ionisation enthalpy?

Which 3d element has the highest third ionisation enthalpy?

Options :  
1. ✗ \( Mn \)
2. ✓ Zn

3. ✗ Fe

4. ✗ Cu

Question Number : 122 Question Id : 813561922 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Which among the following represents the correct order of variation of bond angles in the given molecules?

ఒప్పందాలు నిల్వచేసే గాని సదృశి ముందు రెండు పరిపుణ్యం కి?

Options :

1. ✗ $NH_3 > NF_3 > PCl_3 > BF_3$

2. ✚ $BF_3 > PCl_3 > NH_3 > NF_3$

3. ✗ $BF_3 > NH_3 > PCl_3 > NF_3$

4. ✓ $BF_3 > NH_3 > NF_3 > PCl_3$

Question Number : 123 Question Id : 813561923 Question Type : MCQ Display Question
For a compound with empirical formula $C_7H_8O$, how many aromatic structures are possible?

$C_7H_8O$ అరోమాటికంగా ఎన్ని స్థాయిపత్రాలు సంభవించవచ్చు?

Options:
1. 9
2. 5
3. 7
4. 4

Which of the following can show geometrical isomerism?

మాయనే ఈ ద్విఖాతనానికి ఎందుకు సిద్ధితుంది?

Options:
1. $CHCl = CHCl$
2. $CH_2 = CCl_2$
3. $CCl_2 = CHCl$
4. \[ CH_2 = CH_2 \]

Question Number: 125  Question Id: 813561925  Question Type: MCQ  Display Question Number: Yes  Is Question Mandatory: No  Single Line Question Option: No  Option Orientation: Vertical

Options:

1. \[ 2 \times 10^2 \]

2. \[ 4 \times 10^2 \]  

3. \[ 4 \times 10^0 \]

4. \[ 4 \times 10^3 \]

Question Number: 126  Question Id: 813561926  Question Type: MCQ  Display Question Number: Yes  Is Question Mandatory: No  Single Line Question Option: No  Option Orientation: Vertical

Options:

How much current is required to produce \( H_2 \) gas at the rate of 1 cc/sec under STP?

\[ \text{STP పై 1 cc/sec వేయించే \( H_2 \) గాసు ప్రదానం కేవలం 1 సెకన్ కు ఎంత వాటాపోతుంది?} \]
A metallic solid undergoes Frenkel defect. Its original mass, volume and density are $M_0$, $V_0$, and $D_0$ respectively. After Frenkel defect the mass, volume, and density are $M$, $V$ and $D$ respectively. The variations of $M$, $V$ and $D$ after Frenkel defect are

Options:

1. $M = M_0$, $V = V_0$, $D = D_0$

2. $M < M_0$, $V < V_0$, $D < D_0$

3. $M > M_0$, $V = V_0$, $D > D_0$
4. \[ M = M_0, \quad V < V_0, \quad D > D_0 \]

**Question Number : 128**  
**Question Id : 813561928**  
**Question Type : MCQ**  
**Display Question Number : Yes**  
**Is Question Mandatory : No**  
**Single Line Question Option : No**  
**Orientation : Vertical**

Calculate energy of half mole of photons of a radiation with frequency \(3 \times 10^{12}\) Hz.

\[ 3 \times 10^{12}\text{ Hz లో మినము నెలకొలు మూలము అంటే ఎత్తు ప్రతి పండితి ఎంత?} \]

**Options :**

1. \[598.2\text{ kJ mol}^{-1}\]

2. \[0.598\text{ kJ mol}^{-1}\]

3. \[1.196\text{ kJ mol}^{-1}\]

4. \[119.6\text{ kJ mol}^{-1}\]

**Question Number : 129**  
**Question Id : 813561929**  
**Question Type : MCQ**  
**Display Question Number : Yes**  
**Is Question Mandatory : No**  
**Single Line Question Option : No**  
**Orientation : Vertical**
Which of the following statement about aniline is false?

A. Aniline is a strong base than ammonia
B. Aniline is a less basic than methylamine
C. $pK_b$ of aniline is more than that of ammonia
D. Aniline reacts with bromine water to form a white precipitate

Options:

1. ✔️
2. ❌
3. ❌
4. ❌
A charcoal cube having side length 10 cm is chopped lengthwise into 5 equal pieces. Then, the effective adsorption power ____________

10 cm విస్తరణ గల చార్కోల్ కోని తొమ్మిది సంఖ్య ఛాపి చిరించి స్తంభావం చెబుతుంది, అతడు పతించి ప్రతి ప్రతి ప్రాంగణం ____________

Options:

1. Increases by 2.33 times
   
   2.33 ఎక్కువు ప్రదర్శన

   ✔️

2. decreases by 2.33 times
   
   2.33 కు కుదుకు ప్రదర్శన

   ✗

3. Increases by 2.14 times
   
   2.14 ఎక్కువు ప్రదర్శన

   ✗

4. decreases by 2.14 times
   
   2.14 కు కుదుకు ప్రదర్శన

   ✗

Question Number : 131 Question Id : 813561931 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

For the reaction \( 2NH_3(g) + CO_2(g) \rightleftharpoons NH_2CONH_2(aq) + H_2O(l) \); find the value of equilibrium constant at 295 K. Given, standard Gibbs energy change at the given temperature is 13.9 kJ/mol^{-1}

\[ 295 \text{ K లో } 2NH_3(\text{g}) + CO_2(\text{g}) \rightleftharpoons NH_2CONH_2(\text{aq}) + H_2O(\text{l}) \] కంప్యూటర్ నందించడం పొట్టుదని స్టాండార్డ్ గిబ్బస్ ఎంపాట్ మార్కాస్ తరువాత పనిచేయితే 13.9 kJ/mol^{-1}

Options:

1. ✔️ \( 2.88 \times 10^2 \)
Which among the following materials is extensively used as a piezoelectric material?

Options:
1. Quartz
2. Mica
3. Amorphous silica
4. Tridymite
The common name of isopropyl benzene is

Options:

1. Styrene

2. Quinol

3. Cumene

4. Cresol
DNA consists of two polynucleotide chains. Each chain forms a right-handed spiral with how many bases in one turn of spiral?

DNA ఎలాంటి కర్ణమయ్యం కృతిడి వలన నిషిద్ధ కొందరు. అంతము నిర్మాణం అనే పదానికి విస్తృతం నిర్భువు ఉంటుంది. వాయి సాగడం ప్రకారం ఎంత కొండల ద్రవం ఉంటారు?

Options :

1. ✗ 4
2. ✗ 6
3. ✗ 8
4. ✔ 10

The supply of oxygen to tissues by blood, can be explained by

సందర్భం అంగస్థల సాగడం ప్రకారం ________ గురించి విశ్లేషించండి.

Options :

1. ✔ Le-Chatlier’s principle
2. ✗ Boyle’s law

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3. **Charle’s law**

4. **Dalton’s law**

---

**Question Number : 136 Question Id : 813561936 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Which of the following statements is correct about \( CO_3^{2-} \)?

A. The hybridization of central atom is \( sp^3 \)

B. Its resonance structure has one \( C - O \) single bond and two \( C = O \) double bonds

C. The average formal charge on each Carbon atom is 0.67 units

D. All \( C - O \) bond lengths are equal

\( CO_3^{2-} \) ల హిబ్రిడేషన్ ఆంధ్రిక అంశం \( sp^3 \) అనేది?

A. మాత్రం మాంచేది మందు మాంచేది \( sp^3 \)

B. పంచ విస్ఫెంచు విస్ఫెంచు మరియు \( C - O \) సంప్రదాయ మరియు \( C = O \) జాయిడ్ విస్ఫెంచు

C. చిత్తు చిత్తు కొలువు చిత్తు 0.67 అమేర్మాను

D. పంచ చిత్తు \( C - O \) సంప్రదాయ కలపము

**Options :**

1. **A**

2. **B**

3. **C**
Question Number : 137 Question Id : 813561937 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

A 40% by mass sucrose solution is heated till it becomes 50% by mass. Calculate the mass of water lost from 100 g of the solution is

40% సుక్రవు పండితలు ఖాతాకాల సౌందర వద్ద తేలు చేసుకునే తరువాత తప్ప 50% సుక్రవు పండితలు మరింతం.

100 g లో ఎంత పండితలు బహిరంగం కంటే నేసి ఉండాలా వారి ఊరి లేదా?

Options :

1. 10 g

2. 15 g

3. 20 g

4. 25 g

Question Number : 138 Question Id : 813561938 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Find the correct order of the given elements with respect to their size

అమ్మిని ఉండాలా వారి సంమానం కంటే గమనం కేవాలం?
Options:

1. $\text{Zn} > \text{Fe} > \text{Fe}^{2+} > \text{Fe}^{3+}$

2. $\text{Fe}^{3+} > \text{Fe}^{2+} > \text{Zn} > \text{Fe}$

3. $\text{Fe} > \text{Fe}^{2+} > \text{Fe}^{3+} > \text{Zn}$

4. $\text{Zn} > \text{Fe}^{3+} > \text{Fe}^{2+} > \text{Fe}$

The correct order of decreasing acid strength of following acids is:

1) Trichloro acetic acid
2) Trifluoro acetic acid
3) Acetic acid
4) Formic acid

Options:

1. $1 > 2 > 3 > 4$
Question Number : 140 Question Id : 813561940 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

The electronic configuration of Cs is

\[ [Kr] 5s^1 \]

Options:

1. \[ [Kr] 5s^1 \]

2. \[ [Xe] 6s^1 \]

3. \[ [Rn] 7s^1 \]

4. \[ [Ar] 4s^1 \]
Calculate the ratio of the effusion of CO and N₂, when temperature and pressure gradients are held constant?

Options:

1. 1 : 2

2. ✓ 1 : 1

3. ✗ 2 : 1

4. ✗ 1 : 4

Which of the following statements is correct for the cell \( Zn \mid Zn^{+2} \ || \ Cu^{+2} \mid Cu \)?

\[ Zn \mid Zn^{+2} \ || \ Cu^{+2} \mid Cu \]

Options:

1. ✗ \( Zn \) is reducing agent

2. ✗ \( Cu \) is anode

3. ✗ \( Cu \) is oxidizing agent
The cell reaction is $Zn + Cu^{+2} \rightarrow Zn^{+2} + Cu$

4. ✓

**Question Number : 143 Question Id : 813561943 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Among the following processes, for which process, the change in entropy ($\Delta S$) is negative?

1. Sublimation of Iodine

2. Freezing of water

3. Burning of rocket fuel

4. Dissolution of Sugar

**Question Number : 144 Question Id : 813561944 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**
The correct order of increasing acidic strength among the following is

Options :

- Phenol < Ethanol < Chloroacetic acid < Acetic acid
- Ethanol < Phenol < Chloroacetic acid < Acetic acid
- Ethanol < Phenol < Acetic acid < Chloroacetic acid
- Chloroacetic acid < Acetic acid < Phenol < Ethanol

Question Number : 145 Question Id : 813561945 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Calculate the number of protons, neutrons and electrons in $^{32}_{16}S^{2-}$

Options :

1. 14, 18, 16
2. 16, 16, 14
3. ✖️ 18, 16, 14

4. ✓ 16, 16, 18

Question Number : 146 Question Id : 813561946 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Calculate the molar ratio of a weak acid HA \( (K_a = 10^{-6}) \) and its salt with strong base so that the pH of buffer solution is 6.

\[
\text{pH} = 6 \quad \text{వక్షానికి} \quad \text{నుండి} \quad \text{రాయకు} \quad \text{అడిగే} \quad \text{హేండు} \quad \text{HA} \quad \text{లో} \quad \text{ప్రభావం}\quad \text{చేయింది}
\]

Options :
1. ✖️ 10

2. ✓ 1

3. ✖️ 6

4. ✖️ 0.1

Question Number : 147 Question Id : 813561947 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
A pungent smelling gas “A” gives dense white fumes with conc. HCl. When “A” reacts with alkaline solution of a colorless reagent “B”, a reddish-brown precipitate “C” is formed. The compounds A, B, C respectively are

1. \( NO_2, NaOH, [Fe(H_2O)_5NO]^2+ \)
2. \( NH_3, NaOH, K_2HgI_4 \)
3. \( NH_3, K_2HgI_4, NH_2.HgO.Hgl \)
4. \( Cl_2, Sodium\ nitroprusside, [Na_2Fe(CN)_5NOS] \)

The possible oxidation states of Group-13 elements is/are

1. +3
2. +1, +3
3. ✗ + 1

4. ✗ + 1, + 2, + 3

Question Number : 149 Question Id : 813561949 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Which of the following mineral acids can attack $SiO_2$?

ఎంటి మినరల్ ఎస్సైడ్స్ మాత్రమే $SiO_2$ జిలులు వాడలుకురుమలో?

Options :
- conc. $HNO_3$
- $HCl$
- $H_2SO_4$
- $HF$

Question Number : 150 Question Id : 813561950 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
What is the shape of $I_3^-$ ion?

$I_3^-$ జిలిం రుంటు వారికి?

Options :
When glucose reacts with bromine water, the main product is ________

Options:

1. Acetic acid
2. Saccharic acid
3. Glyceraldehyde
Gluonic acid

4. ✓ గ్లుమోనిక ఏసిడ్

**Question Number : 152** Question Id : 813561952 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Elements of which of the following group(s) of periodic-table do not form hydrides?

ఎంపిక్ విభాగాల్లో నిలువు కలిగినది ఎంపిక్ విభాగాల్లో నిలువు కలిగినది?

Options :

1. ✓ 7, 8, 9
2. 13
3. 15, 16, 17
4. 14

**Question Number : 153** Question Id : 813561953 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

AP EAMCET 2020
The volume of a given mass of a gas is directly proportional to its Kelvin temperature at constant pressure. The above statement is known as ________

Options:

Boyle-law
1. ✗ బొయ్లీ వాయానపు

Vant Hoff’s law
2. ✗ వంట్ హోఫ్ వాయానపు

Charles’s Law
3. ✔ చారీస్ వాయానపు

Daltons law of partial pressures
4. ✗ డాలటింస్ వాయానపు

Question Number : 154 Question Id : 813561954 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

For a reversible reaction, if the concentration of reactants is increased, the equilibrium constant of the reaction ______

అయికినప్పటి (రాకండాలని) సమీప పరిస్థితిలో గొప్పం యంత్రాలు, కొస్టంత తోంటం ______

Options:

Increases
1. ✔ ఇంచుగా వచ్చినది
Remains constant

2. ✗

Decreases

3. ✗

Depends on amount of reactant

4. ✗

Question Number : 155 Question Id : 813561955 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

What is the temperature of 4 moles of a gas occupying 5 L volume at 3.32 bar?

\((R = 0.083 \text{ bar. L. K}^{-1}. \text{mol}^{-1})\)

3.32 bar\(\text{(ప్రమాదం)}\) యొక్క నైట్రోం 4 మాయు సంభాగం 5 L స్త్రీమాతృత్వంలోసంభాగం ఉండాలా, తిన తేడా మాదించండి? \((R = 0.083 \text{ bar. L. K}^{-1}. \text{mol}^{-1})\)

Options :

1. ✗ 5 \(K\)

2. ✔ 50 \(K\)

3. ✗ 500 \(K\)

4. ✗ 0.5 \(K\)

Question Number : 156 Question Id : 813561956 Question Type : MCQ Display Question
Which of the following alkenes will yield 2-methyl propanal on reductive ozonolysis, (addition with ozone followed by the reaction with Zn/H₂O)

هملاهارا ఆ ప్రాంతం (మోగ్రథ వాయిద అంటే తెలుసు Zn/H₂O లో అంటుంది) యే 2-మైలోరి చివరలో రేగదంటి చివరలో మీద ఉండేది?

Options:

1. ✗

2. ✗

3. ✓

4. ✗
When 10 g of Copper and 10 g of Iodine are mixed, calculate the theoretical yield of \( \text{CuI} \) according to the equation \( 2\text{Cu} + \text{I}_2 \rightarrow 2\text{CuI} \).

10 g काप्ते से 10 g इडियन के संयोग से \( 2\text{Cu} + \text{I}_2 \rightarrow 2\text{CuI} \) के प्रकार कितना \( \text{CuI} \) उत्पन्न होगा?

**Options:**

1. \( \star \) 30 g
2. \( \star \) 10 g
3. \( \checkmark \) 15 g
4. \( \star \) 20 g

**Question Number : 158 Question Id : 813561958 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Find the product of the following reaction when \( \text{Xe} \) is taken in excess, \( \text{Xe}_2\text{(g)} + \text{F}_2\text{(g)} \rightarrow ? \)

\( \text{Xe}_2\text{(g)} + \text{F}_2\text{(g)} \rightarrow ? \) \( \text{Xe} \) \( \) \( \text{XeF}_4 \) \( \) \( \text{XeF}_2 \) \( \) ?

**Options :**

1. \( \star \) \( \text{XeF}_4 \)
2. \( \checkmark \) \( \text{XeF}_2 \)
Question Number : 159 Question Id : 813561959 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

In comparison to a 0.01 M solution of glucose, the depression in freezing point of a 0.01 M MgCl₂ solution is _____ (M.W. of MgCl₂ = 95, M.W. of glucose = 180)

0.01 M గ్లయ్స్యూ సామీతి విస్త్రణ జాగ్రత్తలో, 0.01 M MgCl₂ మిలియన్ ప్రాంపరిక సామీతి విస్త్రణ జాగ్రత్తలో ___________ (MgCl₂ మిలియన్ 95, గ్లయ్స్యూ మిలియన్ 180)

Options :

1. The same
2. About twice
3. About three times
4. About six times
At STP, if 5.6 litres of a gas weighs 7.5 gm, then identify the gas.

Options:
1. $CO$
2. $NO$
3. $NO_2$
4. $CO_2$