Question Paper Name: B TECH ETE 18th March 2021 Shift 2
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B TECH ETE
Group Number: 1
Group Id: 86435170
Group Maximum Duration: 0
Group Minimum Duration: 180
Show Attended Group?: No
Edit Attended Group?: No
Break time: 0
Group Marks: 300
Is this Group for Examiner?: No

Physics Section A
Section Id: 864351415
Section Number: 1
Section type: Online
Mandatory or Optional: Mandatory
Number of Questions: 20
Number of Questions to be attempted: 20
Section Marks: 80
Mark As Answered Required?: Yes
Sub-Section Number: 1
Sub-Section Id: 864351415
Question Shuffling Allowed: Yes

Question Number: 1 Question Id: 8643516211 Question Type: MCQ Option Shuffling: Yes Is Question Mandatory: No Correct Marks: 4 Wrong Marks: 1
Consider a sample of oxygen behaving like an ideal gas. At 300 K, the ratio of root mean square (rms) velocity to the average velocity of gas molecule would be:

(Molecular weight of oxygen is 32 g/mol; R = 8.3 J K⁻¹ mol⁻¹)

Options:

\[ \frac{3\pi}{8} \]
86435118631.

\[ \frac{8\pi}{3} \]
86435118632.

\[ \frac{8}{3} \]
86435118633.

\[ \frac{3}{3} \]
86435118634.
The square root of \( \frac{3}{3} \) is 1.

Question Number : 2 Question Id : 8643516212 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

An object of mass \( m_1 \) collides with another object of mass \( m_2 \), which is at rest. After the collision the objects move with equal speeds in opposite direction. The ratio of the masses \( m_2 : m_1 \) is:

Options:
86435118635. 1 : 1
86435118636. 1 : 2
86435118637. 2 : 1
86435118638. 3 : 1

Question Number : 2 Question Id : 8643516212 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

\[ m_1 \text{ ప్రవహించిన అంశాలు లేదు కానీ ప్రవహించిన ప్రశ్నానికి} \quad m_2 \text{ ప్రవహించిన అంశాలు కానీ లేవు కానీ} \quad m_2 : m_1 \text{ ప్రశ్నానికి ఉపరిత్రితం. తదే అంశాలలో మూడు} \quad m_2 : m_1:

Options:
86435118635. 1 : 1
86435118636. 1 : 2
86435118637. 2 : 1
86435118638. 3 : 1
A particle of mass \( m \) moves in a circular orbit under the central potential field, \( U(r) = -\frac{C}{r} \), where \( C \) is a positive constant.

The correct radius – velocity graph of the particle’s motion is:

Options:

1. [Graph image]
2. [Graph image]
3. [Graph image]
4. [Graph image]
\[ m \frac{dv}{dr} = -\frac{C}{r} \]

\[ C \text{ is a constant.} \]

Options:

1. \[ r \]
2. \[ r \]
3. \[ r \]
4. \[ r \]
A solid cylinder of mass \( m \) is wrapped with an inextensible light string and, is placed on a rough inclined plane as shown in the figure. The frictional force acting between the cylinder and the inclined plane is :

\[
\text{[The coefficient of static friction, } \mu_s \text{ is 0.4]}
\]

Options :

86435118643. \( \frac{mg}{5} \)

86435118644. \( \frac{5mg}{2} \)

86435118645. \( \frac{7mg}{2} \)

86435118646. 0
If the angular velocity of earth’s spin is increased such that the bodies at the equator start floating, the duration of the day would be approximately:

\[ \text{[Take } g = 10 \text{ m/s}^2, \text{ the radius of earth, } R = 6400 \times 10^3 \text{ m, Take } \pi = 3.14] \]
Consider a uniform wire of mass $M$ and length $L$. It is bent into a semicircle. Its moment of inertia about a line perpendicular to the plane of the wire passing through the centre is:

\[ \frac{ML^2}{\pi^2} \]


\[ \frac{1}{2} \frac{ML^2}{\pi^2} \]

86435118652.

\[ \frac{1}{4} \frac{ML^2}{\pi^2} \]

86435118653.

\[ \frac{2}{5} \frac{ML^2}{\pi^2} \]

86435118654.

Question Number : 6  Question Id : 8643516216  Question Type : MCQ  Option Shuffling : Yes  Is Question Mandatory : No  Correct Marks : 4  Wrong Marks : 1

Options :

\[ \frac{ML^2}{\pi^2} \]

86435118651.

\[ \frac{1}{2} \frac{ML^2}{\pi^2} \]

86435118652.

\[ \frac{1}{4} \frac{ML^2}{\pi^2} \]

86435118653.

\[ \frac{2}{5} \frac{ML^2}{\pi^2} \]

86435118654.

Question Number : 7  Question Id : 8643516217  Question Type : MCQ  Option Shuffling : Yes  Is Question Mandatory : No  Correct Marks : 4  Wrong Marks : 1
The speed of electrons in a scanning electron microscope is $1 \times 10^7$ ms$^{-1}$. If the protons having the same speed are used instead of electrons, then the resolving power of scanning proton microscope will be changed by a factor of:

Options:

86435118655. $\frac{1}{1837}$

86435118656. $\frac{1}{\sqrt{1837}}$

86435118657. $\sqrt{1837}$

86435118658. $\sqrt{1837}$

Question Number : 7 Question Id : 8643516217 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Question Number : 8 Question Id : 8643516218 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
The velocity - displacement graph of a particle is shown in the figure.

The acceleration - displacement graph of the same particle is represented by:

Options:

86435118659.

86435118660.

86435118661.

86435118662.

Question Number: 8 Question Id: 8643516218 Question Type: MCQ Option Shuffling: Yes Is Question Mandatory: No
Correct Marks: 4 Wrong Marks: 1

Options:

86435118659.

86435118660.

86435118661.

86435118662.

Question Number: 9 Question Id: 8643516219 Question Type: MCQ Option Shuffling: Yes
Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

For an adiabatic expansion of an ideal gas, the fractional change in its pressure is equal to (where $\gamma$ is the ratio of specific heats):

Options :

$-\gamma \frac{dV}{V}$
86435118663.

$-\gamma \frac{V}{dV}$
86435118664.

$-\frac{1}{\gamma} \frac{dV}{V}$
86435118665.

$\frac{dV}{V}$
86435118666.

Question Number : 9 Question Id : 8643516219 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Options :

$-\gamma \frac{dV}{V}$
86435118663.

$-\gamma \frac{V}{dV}$
86435118664.

$-\frac{1}{\gamma} \frac{dV}{V}$
86435118665.
\[ \frac{dV}{V} \]
86435118666.

**Question Number : 10**  
**Question Id : 8643516220**  
**Question Type : MCQ**  
**Option Shuffling : Yes**  
**Is Question Mandatory : No**  
**Correct Marks : 4**  
**Wrong Marks : 1**

The angular momentum of a planet of mass \( M \) moving around the sun in an elliptical orbit is \( \vec{L} \). The magnitude of the areal velocity of the planet is:

**Options :**

\[ \frac{L}{M} \]
86435118667.

\[ \frac{L}{2M} \]
86435118668.

\[ \frac{2L}{M} \]
86435118669.

\[ \frac{4L}{M} \]
86435118670.

**Question Number : 10**  
**Question Id : 8643516220**  
**Question Type : MCQ**  
**Option Shuffling : Yes**  
**Is Question Mandatory : No**  
**Correct Marks : 4**  
**Wrong Marks : 1**

**Options :**

\[ \frac{L}{M} \]
86435118667.

\[ \frac{L}{2M} \]
86435118668.
Question Number : 11 Question Id : 8643516221 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

An ideal gas in a cylinder is separated by a piston in such a way that the entropy of one part is $S_1$ and that of the other part is $S_2$. Given that $S_1 > S_2$. If the piston is removed then the total entropy of the system will be:

Options :

86435118671. $S_1 \times S_2$

86435118672. $S_1 - S_2$

86435118673. $S_1 + S_2$

86435118674. $\frac{S_1}{S_2}$

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Question Number : 11 Question Id : 8643516221 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

అయిన ముఖ్యంగా రెండు భాగాలు రెండు భాగాలు రెండు భాగాలు రెండు భాగాలు. అయితే $S_1 > S_2$. ఉండాలి. $S_1 > S_2$ తో అన్యాధికారిత అయితే. అయితే అంతే కాగా వింతలు ఇమిల్లి మరొక అదితీ:

Options :

86435118671. $S_1 \times S_2$

86435118672. $S_1 - S_2$

86435118673. $S_1 + S_2$
The function of time representing a simple harmonic motion with a period of \( \frac{\pi}{\omega} \) is:

**Options:**

1. \( \sin(\omega t) + \cos(\omega t) \)
   86435118675.
2. \( \sin^2(\omega t) \)
   86435118676.
3. \( 3 \cos\left(\frac{\pi}{4} - 2\omega t\right) \)
   86435118677.
4. \( \cos(\omega t) + \cos(2\omega t) + \cos(3\omega t) \)
   86435118678.

**Question Number : 12 Question Id : 8643516222 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

\( S_1 \)

\( S_2 \)
Question Number : 13  Question Id : 8643516223  Question Type : MCQ  Option Shuffling : Yes  Is Question Mandatory : No  Correct Marks : 4 Wrong Marks : 1

In a series LCR circuit, the inductive reactance \( (X_L) \) is 10 \( \Omega \) and the capacitive reactance \( (X_C) \) is 4 \( \Omega \). The resistance \( (R) \) in the circuit is 6 \( \Omega \).

The power factor of the circuit is :

Options :

\[
\frac{1}{\sqrt{2}}
\]

86435118679.

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

86435118680.

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

86435118681.

\[
\frac{1}{2\sqrt{2}}
\]

86435118682.

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Question Number : 13  Question Id : 8643516223  Question Type : MCQ  Option Shuffling : Yes  Is Question Mandatory : No  Correct Marks : 4 Wrong Marks : 1

\( \text{అం} \) LCR సరిపు చిహ్నమైన విడిది వైపు నడిబురి (X_L) = 10 \( \Omega \) హోసి స్థిర నడిబురి (X_C) = 4 \( \Omega \). స్థిర నడిబురి (R) = 6 \( \Omega \) అంశం ఏ స్థిరమైన పనిచేయడానికి విభిన్నమైన చరిత్రస్థానం:

Options :

\[
\frac{1}{\sqrt{2}}
\]

86435118679.

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

86435118680.

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

86435118681.
\[
\frac{1}{2\sqrt{2}}
\]

Question Number : 14 Question Id : 8643516224 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Which of the following statements are correct?

(A) Electric monopoles do not exist whereas magnetic monopoles exist.

(B) Magnetic field lines due to a solenoid at its ends and outside cannot be completely straight and confined.

(C) Magnetic field lines are completely confined within a toroid.

(D) Magnetic field lines inside a bar magnet are not parallel.

(E) \( \chi = -1 \) is the condition for a perfect diamagnetic material, where \( \chi \) is its magnetic susceptibility.

Choose the correct answer from the options given below:

Options:

(B) and (D) only
86435118683.

(B) and (C) only
86435118684.

(A) and (B) only
86435118685.

(C) and (E) only
86435118686.
Question Number : 15 Question Id : 8643516225 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

The correct relation between $\alpha$ (ratio of collector current to emitter current) and $\beta$ (ratio of collector current to base current) of a transistor is:

Options :

$$\beta = \frac{\alpha}{1 + \alpha}$$

86435118687.
\[ \alpha = \frac{\beta}{1 - \alpha} \]

86435118688.

\[ \beta = \frac{1}{1 - \alpha} \]

86435118689.

\[ \alpha = \frac{\beta}{1 + \beta} \]

86435118690.

**Question Number : 15** Question Id : 8643516225 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

\[ \text{एक} \ (\text{सर्वप्रथम} \ शरीर) \ \alpha \ \text{सादी} \ \beta \ \text{सादी} \ \text{सहित} \ \text{स्थिरता} \ \alpha \ \text{(कहीं} \ \text{सादी} \ \text{भीतरी} \ \text{सहायता} \ \text{मात्रा)} \ \text{को} \ \beta \ (\text{सर्वप्रथम} \ \text{सादी} \ \text{की} \ \text{सहायता} \ \text{सहायता)} : \]

Options :

\[ \beta = \frac{\alpha}{1 + \alpha} \]

86435118687.

\[ \alpha = \frac{\beta}{1 - \alpha} \]

86435118688.

\[ \beta = \frac{1}{1 - \alpha} \]

86435118689.

\[ \alpha = \frac{\beta}{1 + \beta} \]

86435118690.

**Question Number : 16** Question Id : 8643516226 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

A proton and an \(\alpha\)-particle, having kinetic energies \(K_p\) and \(K_\alpha\) respectively, enter into a magnetic field at right angles.

The ratio of the radii of trajectory of proton to that of \(\alpha\)-particle is 2 : 1. The ratio of \(K_p : K_\alpha\) is :
Question Number : 16 Question Id : 8643516226 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

86435118691. 1 : 4
86435118692. 4 : 1
86435118693. 8 : 1
86435118694. 1 : 8

Question Number : 17 Question Id : 8643516227 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

86435118691. 1 : 4
86435118692. 4 : 1
86435118693. 8 : 1
86435118694. 1 : 8
Three rays of light, namely red (R), green (G) and blue (B) are incident on the face PQ of a right angled prism PQR as shown in the figure.

The refractive indices of the material of the prism for red, green and blue wavelength are 1.27, 1.42 and 1.49 respectively. The colour of the ray(s) emerging out of the face PR is:

Options:
86435118695. blue and green
86435118696. blue
86435118697. green
86435118698. red

Question Number : 17 Question Id : 8643516227 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1
The time taken for the magnetic energy to reach 25% of its maximum value, when a solenoid of resistance R, inductance L is connected to a battery, is:

Options:

\[ \frac{L}{R} \ln 2 \]
86435118699.

\[ \frac{L}{R} \ln 5 \]
86435118700.
\[
\frac{L}{R} \ln 10
\]

86435118701.

\[
\text{infinite}
\]

86435118702.

**Question Number : 18**  
**Question Id : 8643516228**  
**Question Type : MCQ**  
**Option Shuffling : Yes**  
**Is Question Mandatory : No**  
**Correct Marks : 4**  
**Wrong Marks : 1**

ニッケル R がいている。電磁流 L とそれに対応する 25% の保持力を持つものを求める。

**Options :**

\[
\frac{L}{R} \ln 2
\]

86435118699.

\[
\frac{L}{R} \ln 5
\]

86435118700.

\[
\frac{L}{R} \ln 10
\]

86435118701.

\[
\frac{L}{R} \ln 4
\]

86435118702.

**Question Number : 19**  
**Question Id : 8643516229**  
**Question Type : MCQ**  
**Option Shuffling : Yes**  
**Is Question Mandatory : No**  
**Correct Marks : 4**  
**Wrong Marks : 1**

A plane electromagnetic wave propagating along y-direction can have the following pair of electric field \((\vec{E})\) and magnetic field \((\vec{B})\) components.

**Options :**

\[E_y, B_y \text{ or } E_z, B_z\]

86435118703.

\[E_x, B_y \text{ or } E_y, B_x\]

86435118704.
Question Number : 19  Question Id : 8643516229  Question Type : MCQ  Option Shuffling : Yes  Is Question Mandatory : No
Correct Marks : 4  Wrong Marks : 1

\[ \vec{E}, \vec{B}_z \text{ or } \vec{E}_z, \vec{B}_x \]

\[ \vec{E}_y, \vec{B}_x \text{ or } \vec{E}_x, \vec{B}_y \]

Options :
86435118705. \[ \vec{E}_x, \vec{B}_y \text{ or } \vec{E}_y, \vec{B}_x \]
86435118706. \[ \vec{E}_y, \vec{B}_x \text{ or } \vec{E}_x, \vec{B}_y \]

Question Number : 20  Question Id : 8643516230  Question Type : MCQ  Option Shuffling : Yes  Is Question Mandatory : No
Correct Marks : 4  Wrong Marks : 1

The decay of a proton to neutron is :
Options :
not possible as proton mass is less than the neutron mass
86435118707.
possible only inside the nucleus
86435118708.
always possible as it is associated only with \( \beta^+ \) decay
86435118709.
not possible but neutron to proton conversion is possible
86435118710.
Question Number : 20 Question Id : 8643516230 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Options :

86435118707. 

86435118708. 

86435118709. 

86435118710. 

Physics Section B

Section Id : 864351416
Section Number : 2
Section type : Online
Mandatory or Optional : Mandatory
Number of Questions : 10
Number of Questions to be attempted : 5
Section Marks : 20
Mark As Answered Required? : Yes
Sub-Section Number : 1
Sub-Section Id : 864351416
Question Shuffling Allowed : Yes

Question Number : 21 Question Id : 8643516231 Question Type : SA Correct Marks : 4 Wrong Marks : 0
The projectile motion of a particle of mass 5 g is shown in the figure.

The initial velocity of the particle is $5\sqrt{2}$ m s$^{-1}$ and the air resistance is assumed to be negligible. The magnitude of the change in momentum between the points A and B is $x \times 10^{-2}$ kg m s$^{-1}$. The value of $x$, to the nearest integer, is ________.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Equal
Text Areas: PlainText
Possible Answers: 100

Question Number: 21 Question Id: 8643516231 Question Type: SA
Correct Marks: 4 Wrong Marks: 0

Question Number: 22 Question Id: 8643516232 Question Type: SA
Correct Marks: 4 Wrong Marks: 0
An infinite number of point charges, each carrying $1 \mu \text{C}$ charge, are placed along the $y$-axis at $y = 1 \text{ m}$, $2 \text{ m}$, $4 \text{ m}$, $8 \text{ m}$ .................

The total force on a $1 \text{ C}$ point charge, placed at the origin, is $x \times 10^3 \text{ N}$. The value of $x$, to the nearest integer, is ________.

$[\text{Take } \frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 \text{Nm}^2/\text{C}^2]$

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers : $100$

Question Number : 22 Question Id : 8643516232 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Two wires of same length and thickness having specific resistances $6 \Omega \text{ cm}$ and $3 \Omega \text{ cm}$ respectively are connected in parallel. The effective resistivity is $\rho \Omega \text{ cm}$. The value of $\rho$, to the nearest integer, is __________.

$[\text{Take } \frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 \text{Nm}^2/\text{C}^2]$

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers : $100$

Question Number : 23 Question Id : 8643516233 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Two wires of same length and thickness having specific resistances $6 \Omega \text{ cm}$ and $3 \Omega \text{ cm}$ respectively are connected in parallel. The effective resistivity is $\rho \Omega \text{ cm}$. The value of $\rho$, to the nearest integer, is __________.
Question Number : 23 Question Id : 8643516233 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A ball of mass 4 kg, moving with a velocity of 10 ms\(^{-1}\), collides with a spring of length 8 m and force constant 100 Nm\(^{-1}\). The length of the compressed spring is \(x\) m. The value of \(x\), to the nearest integer, is _________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 24 Question Id : 8643516234 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A ball of mass 4 kg, moving with a velocity of 10 ms\(^{-1}\), collides with a spring of length 8 m and force constant 100 Nm\(^{-1}\). The length of the compressed spring is \(x\) m. The value of \(x\), to the nearest integer, is _________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 24 Question Id : 8643516234 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A ball of mass 4 kg, moving with a velocity of 10 ms\(^{-1}\), collides with a spring of length 8 m and force constant 100 Nm\(^{-1}\). The length of the compressed spring is \(x\) m. The value of \(x\), to the nearest integer, is _________.

Response Type : Numeric
Evaluation Required For SA : Yes
The typical output characteristics curve for a transistor working in the common-emitter configuration is shown in the figure.

The estimated current gain from the figure is ________.
Consider a 72 cm long wire AB as shown in the figure. The galvanometer jockey is placed at P on AB at a distance x cm from A. The galvanometer shows zero deflection.

The value of x, to the nearest integer, is ________.
Question Number : 26 Question Id : 8643516236 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A galaxy is moving away from the earth at a speed of 286 kms\(^{-1}\). The shift in the wavelength of a redline at 630 nm is \(x \times 10^{-10}\) m.

The value of \(x\), to the nearest integer, is \__________\.

[Take the value of speed of light \(c\), as \(3 \times 10^8\) ms\(^{-1}\)]

Response Type : Numeric
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Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :

100

Question Number : 27 Question Id : 8643516237 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

\[286 \text{ km/s} \times \frac{m}{10^{-10} \text{ m}} \times 630 \text{ nm} \times \frac{3 \times 10^8 \text{ ms}^{-1}}{1} = \text{__________} \]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :

100

Question Number : 28 Question Id : 8643516238 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Consider a water tank as shown in the figure. It’s cross-sectional area is 0.4 m\(^2\). The tank has an opening B near the bottom whose cross-section area is 1 cm\(^2\). A load of 24 kg is applied on the water at the top when the height of the water level is 40 cm above the bottom, the velocity of water coming out the opening B is \(v\) ms\(^{-1}\).

The value of \(v\), to the nearest integer, is __________.

[Take value of \(g\) to be 10 ms\(^{-2}\)]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Question Number : 28 Question Id : 8643516238 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A rectangular area of length 0.4 m² is first

B area of 1 cm² is then

40 cm long and 24 kg mass. 24 kg mass is then

B again. The mass of 24 kg mass is

\[ g = 10 \text{ m/s}^2 \]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 29 Question Id : 8643516239 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A TV transmission tower antenna is at a height of 20 m. Suppose that the receiving antenna is at.

(i) ground level

(ii) a height of 5 m.

The increase in antenna range in case (ii) relative to case (i) is n%.

The value of n, to the nearest integer, is __________.

Response Type : Numeric
Question Number : 29 Question Id : 8643516239 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The TV sets are kept 20 m apart. Evaluate (i) the angle between (ii) the angles between

(i) (ii) 5 m

The radius of a sphere is measured to be (7.50 ± 0.85) cm. Suppose the percentage error in its volume is x.

The value of x, to the nearest x, is ___________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers : 100

Question Number : 30 Question Id : 8643516240 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The radius of a sphere is measured to be (7.50 ± 0.85) cm. Suppose the percentage error in its volume is x.

The value of x, to the nearest x, is ___________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers : 100
A hard substance melts at high temperature and is an insulator in both solid and in molten state. This solid is most likely to be a/an:

Options:

86435118721. Ionic solid

86435118722. Covalent solid

86435118723. Metallic solid

86435118724. Molecular solid
Question Number : 32  Question Id : 8643516242  Question Type : MCQ  Option Shuffling : Yes  Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : Bohr’s theory accounts for the stability and line spectrum of Li$^+$ ion.
Statement II : Bohr’s theory was unable to explain the splitting of spectral lines in the presence of a magnetic field.

In the light of the above statements, choose the most appropriate answer from the options given below :

Options :

86435118725. Both statement I and statement II are true.

86435118726. Both statement I and statement II are false.

86435118727. Statement I is true but statement II is false.

86435118728. Statement I is false but statement II is true.
3/18/2021

Question Number: 33  Question Id: 8643516243  Question Type: MCQ  Option Shuffling: Yes  Is Question Mandatory: No  Correct Marks: 4  Wrong Marks: 1

The charges on the colloidal CdS sol and TiO₂ sol are, respectively:

Options:
86435118729. positive and positive
86435118730. negative and positive
86435118731. positive and negative
86435118732. negative and negative
The first ionization energy of magnesium is smaller as compared to that of elements X and Y, but higher than that of Z. The elements X, Y and Z, respectively, are:

**Options:**

- argon, chlorine and sodium
- chlorine, lithium and sodium
- argon, lithium and sodium
- neon, sodium and chlorine
### Question 35

**Question Id:** 8643516245  
**Question Type:** MCQ  
**Option Shuffling:** Yes  
**Is Question Mandatory:** No  
**Correct Marks:** 4  
**Wrong Marks:** 1

**Match List - I with List - II:**

<table>
<thead>
<tr>
<th>List - I</th>
<th>List - II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Mercury</td>
<td>(i) Vapour phase refining</td>
</tr>
<tr>
<td>(b) Copper</td>
<td>(ii) Distillation Refining</td>
</tr>
<tr>
<td>(c) Silicon</td>
<td>(iii) Electrolytic Refining</td>
</tr>
<tr>
<td>(d) Nickel</td>
<td>(iv) Zone Refining</td>
</tr>
</tbody>
</table>

Choose the most appropriate answer from the option given below:

**Options:**
- (a)-(i), (b)-(iii), (c)-(iv), (d)-(i)
- (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)
- (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)
- (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

### Question 36

**Question Id:** 8643516245  
**Question Type:** MCQ  
**Option Shuffling:** Yes  
**Is Question Mandatory:** No  
**Correct Marks:** 4  
**Wrong Marks:** 1

**List - II ने अवधारणाका अनुसार अवधारणाका विभागमा:**

<table>
<thead>
<tr>
<th>अवधारणा- I</th>
<th>अवधारणा- II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) खैर</td>
<td>(i) शांत शांत शांत शांत</td>
</tr>
<tr>
<td>(b) शरीर</td>
<td>(ii) शरीर शरीर शरीर</td>
</tr>
<tr>
<td>(c) धारा</td>
<td>(iii) धारा धारा धारा</td>
</tr>
<tr>
<td>(d) पूर्व</td>
<td>(iv) पूर्व पूर्व पूर्व (लेख ओझाराक्रिया)</td>
</tr>
</tbody>
</table>

**जवाब:**
- (d)- (i)
In basic medium, $\text{H}_2\text{O}_2$ exhibits which of the following reactions?

(A) $\text{Mn}^{2+} \rightarrow \text{Mn}^{4+}$

(B) $\text{I}_2 \rightarrow \text{I}^-$

(C) $\text{PbS} \rightarrow \text{PbSO}_4$

Choose the most appropriate answer from the options given below:

Options:

(A) only

(B) only

(A), (B) only

(A), (C) only
86435118741. (A) లంచోర్చేం

86435118742. (B) లంచోర్చేం

86435118743. (A), (B) లంచోర్చేం

86435118744. (A), (C) లంచోర్చేం

**Question Number : 37**  
**Question Id : 8643516247**  
**Question Type : MCQ**  
**Option Shuffling : Yes**  
**Is Question Mandatory : No**  
**Correct Marks : 4**  **Wrong Marks : 1**

**Match List - I with List - II :**

<table>
<thead>
<tr>
<th>List - I</th>
<th>List - II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Be</td>
<td>(i) treatment of cancer</td>
</tr>
<tr>
<td>(b) Mg</td>
<td>(ii) extraction of metals</td>
</tr>
<tr>
<td>(c) Ca</td>
<td>(iii) incendiary bombs and signals</td>
</tr>
<tr>
<td>(d) Ra</td>
<td>(iv) windows of X-ray tubes</td>
</tr>
<tr>
<td></td>
<td>(v) bearings for motor engines.</td>
</tr>
</tbody>
</table>

Choose the most appropriate answer from the option given below :

**Options :**

86435118745.  
(a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

86435118746.  
(a)-(iii), (b)-(iv), (c)-(ii), (d)-(v)

86435118747.  
(a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

86435118748.  
(a)-(iii), (b)-(iv), (c)-(v), (d)-(ii)

---

**Question Number : 37**  
**Question Id : 8643516247**  
**Question Type : MCQ**  
**Option Shuffling : Yes**  
**Is Question Mandatory : No**  
**Correct Marks : 4**  **Wrong Marks : 1**
Question Number : 38 Question Id : 8643516248 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1
The oxidation states of nitrogen in NO, NO₂, N₂O and NO₃ are in the order of :
Options :
86435118749. NO > NO₂ > N₂O > NO₃⁻
86435118750. N₂O > NO₂ > NO > NO₃⁻
86435118751. NO₂ > NO₃⁻ > NO > N₂O
86435118752. NO₃⁻ > NO₂ > NO > N₂O
Question Number : 38 Question Id : 8643516248 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

NO, NO₂, N₂O, NO₃⁻ के तुलनात्मक संरचना से कौन सा है सही?

Options :

1. NO > NO₂ > N₂O > NO₃⁻
2. N₂O > NO₂ > NO > NO₃⁻
3. NO₂ > NO₃⁻ > NO > N₂O
4. NO₃⁻ > NO₂ > NO > N₂O

Question Number : 39 Question Id : 8643516249 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The oxide that shows magnetic property is :

Options :

1. SiO₂
2. Mn₃O₄
3. MgO
4. Na₂O

Question Number : 39 Question Id : 8643516249 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

सस्त्रकंर्म डायमंड के क्षण कोण की आत्यता?

Options :

1. SiO₂
2. Mn₃O₄
MgO

Na₂O

Question Number : 40 Question Id : 8643516250 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1
The secondary valency and the number of hydrogen bonded water molecule(s) in CuSO₄·5H₂O, respectively, are :
Options :
86435118757. 4 and 1
86435118758. 6 and 4
86435118759. 5 and 1
86435118760. 6 and 5

Question Number : 40 Question Id : 8643516250 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1
CuSO₄·5H₂O లో రాసిన విభాగపత్రి విద్యార్థుల ప్రతి అప్పుడు నిష్టానికి మరింత అనుమతి (x) బాగా
Options :
86435118757. 4 పెట్టడా 1
86435118758. 6 పెట్టడా 4
86435118759. 5 పెట్టడా 1
86435118760. 6 పెట్టడా 5

Question Number : 41 Question Id : 8643516251 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1
Given below are two statements:

Statement I: Non-biodegradable wastes are generated by the thermal power plants.
Statement II: Bio-degradable detergents leads to eutrophication.

In the light of the above statements, choose the most appropriate answer from the options given below:

Options:

86435118761. Both statement I and statement II are true.
86435118762. Both statement I and statement II are false.
86435118763. Statement I is true but statement II is false.
86435118764. Statement I is false but statement II is true.

---

Question Number : 41 Question Id : 8643516251 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Options:

86435118761. विविध रूप्याच्या संज्ञेच्या सूचनाचा प्रयोग केला जाऊ शकते नाही, संत्रभानुषाचा प्रयोग होता.
86435118762. विविध रूप्याच्या संज्ञेच्या सूचनाचा प्रयोग केला जाऊ शकता नाही.
86435118763. विविध रूप्याच्या संज्ञेच्या सूचनाचा प्रयोग केला जाऊ शकता.
86435118764. विविध रूप्याच्या संज्ञेच्या सूचनाचा प्रयोग केला जाऊ शकता.

---

Question Number : 42 Question Id : 8643516252 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Options:

86435118761. विविधांच्या रूपांतराच्या बांधकामी प्रमाणे नाही.
86435118762. विविधांच्या रूपांतराच्या बांधकामी प्रमाणे नाही.
86435118763. विविधांच्या रूपांतराच्या बांधकामी प्रमाणे \( \neq \) नाही.
86435118764. विविधांच्या रूपांतराच्या बांधकामी प्रमाणे \( \neq \) नाही.
Given below are two statements:

**Statement I:** \( \text{C}_2\text{H}_5\text{OH} \) and \( \text{AgCN} \) both can generate nucleophile.

**Statement II:** \( \text{KCN} \) and \( \text{AgCN} \) both will generate nitrile nucleophile with all reaction conditions.

Choose the **most appropriate** option:

**Options:**

86435118765. Both statement I and statement II are true.

86435118766. Both statement I and statement II are false.

86435118767. Statement I is true but statement II is false.

86435118768. Statement I is false but statement II is true.

---

**Question Number : 42**  
**Question Id : 8643516252**  
**Question Type : MCQ**  
**Option Shuffling : Yes**  
**Is Question Mandatory : No**  
**Correct Marks : 4**  
**Wrong Marks : 1**
Question Number : 43 Question Id : 8643516253 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

In the following molecule,

![Molecule Diagram]

Hybridisation of Carbon a, b and c respectively are :

Options :
86435118769. $sp^3$, $sp^2$, $sp^2$
86435118770. $sp^3$, $sp^2$, $sp$
86435118771. $sp^3$, $sp$, $sp$
86435118772. $sp^3$, $sp$, $sp^2$

---

Question Number : 43 Question Id : 8643516253 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

(ఉండండి అనుభాషించండి,

![Molecule Diagram]

a, b మరియు c అంతర్గత రోడులవాటి ఆయనలు :

Options :
86435118769. $sp^3$, $sp^2$, $sp^2$
86435118770. $sp^3$, $sp^2$, $sp$
86435118771. $sp^3$, $sp$, $sp$
Question Number: 44 Question Id: 8643516254 Question Type: MCQ Option Shuffling: Yes Is Question Mandatory: No
Correct Marks: 4 Wrong Marks: 1
Main Products formed during a reaction of 1-methoxy naphthalene with hydroiodic acid are:
Options:

86435118772. \( sp^3, sp, sp^2 \)

86435118773.

86435118774.

86435118775.

86435118776.
Question Number : 45 Question Id : 8643516255 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

In the reaction of hypobromite with amide, the carbonyl carbon is lost as:

Options:

86435118777. CO

86435118778. CO₂

86435118779. CO₂⁻

86435118780. HCO₃⁻
Question Number : 46
Question Id : 8643516256
Question Type : MCQ
Option Shuffling : Yes
Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Consider the above reaction, the product ‘X’ and ‘Y’ respectively are:

Options :

86435118781.

86435118782.
Question Number : 46 Question Id : 8643516256 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

\[
\begin{align*}
2 \text{ cyclopentane} & \xrightarrow{\text{dil NaOH}} \text{X} \xrightarrow{\text{H}^+, \text{Heat}} \text{Y}
\end{align*}
\]

Options:

86435118781.

86435118782.
An organic compound “A” on treatment with benzene sulphonyl chloride gives compound B. B is soluble in dil. NaOH solution. Compound A is:

Options:

86435118785. \( \text{C}_6\text{H}_5-\text{CH}_2\text{NHCH}_3 \)

86435118786. \( \text{C}_6\text{H}_5-\text{N-(CH}_3)_2 \)

86435118787. \( \text{C}_6\text{H}_5-\text{NHCH}_2\text{CH}_3 \)

86435118788. \( \text{C}_6\text{H}_5-\text{CH-NH}_2 \)

86435118789. \( \text{C}_6\text{H}_5-\text{CH-NH}_2 \)
Consider the given reaction, percentage yield of:

Options:

86435118789. A > C > B

86435118790. C > A > B

86435118791. B > C > A

86435118792. C > B > A
Question Number : 49  Question Id : 8643516259  Question Type : MCQ  Option Shuffling : Yes  Is Question Mandatory : No  Correct Marks : 4  Wrong Marks : 1

Match List - I with List - II:

List - I                      List - II
(Class of Chemicals)         (Example)
(a) Antifertility drug       (i) Meprobamate
(b) Antibiotic              (ii) Alitame
(c) Tranquilizer            (iii) Norethindrone
(d) Artificial Sweetener    (iv) Salvarsan

Choose the most appropriate match:

Options:
86435118793.  (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
86435118794.  (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
86435118795.  (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
86435118796. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

Question Number : 49 Question Id : 8643516259 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Options :
86435118793. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
86435118794. (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
86435118795. (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
86435118796. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

Question Number : 50 Question Id : 8643516260 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Options :
86435118797. Increase in blood clotting time
86435118798. Decrease in blood clotting time
86435118799. Cheilosis

86435118800. Increase in fragility of RBC’s

Question Number : 50 Question Id : 8643516260 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

వెలుగులో కండి కండి మీ మనస్తాత్మక ఆధారాన్ని కనుగొనండి?

Options :

86435118797.

86435118798.

86435118799.

86435118800. RBC ను విచిత్ర సంధానం

Chemistry Section B

Section Id : 864351418
Section Number : 4
Section type : Online
Mandatory or Optional : Mandatory
Number of Questions : 10
Number of Questions to be attempted : 5
Section Marks : 20
Mark As Answered Required? : Yes
Sub-Section Number : 1
Sub-Section Id : 864351418
Question Shuffling Allowed : Yes

Question Number : 51 Question Id : 8643516261 Question Type : SA Correct Marks : 4 Wrong Marks : 0
10.0 mL of Na$_2$CO$_3$ solution is titrated against 0.2 M HCl solution. The following titre values were obtained in 5 readings:

4.8 mL, 4.9 mL, 5.0 mL, 5.0 mL and 5.0 mL.

Based on these readings, and convention of titrimetric estimation the concentration of Na$_2$CO$_3$ solution is _________ mM.

(Round off to the Nearest Integer).

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

---

10.0 mL of Na$_2$CO$_3$ solution against 0.2 M HCl solution. The following titre values were obtained in 5 readings:

4.8 mL, 4.9 mL, 5.0 mL, 5.0 mL and 5.0 mL.

The concentration of Na$_2$CO$_3$ solution is _________ mM.

(Round off to the Nearest Integer).

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

---

The number of species below that have two lone pairs of electrons in their central atom is _________. (Round off to the Nearest Integer).

SF$_4^-$, BF$_4^-$, ClF$_3$, AsF$_3$, PCl$_5$, BrF$_5$, XeF$_4$, SF$_6$

Response Type : Numeric
Question Number : 52 Question Id : 8643516262 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

(ఒడింది కాని ఎక్కడు రెండు సాధనాలు గుర్తించండి అనే విధానం ఉండే నిషిద్దులు కానుండి __________.

(ఇది సాధనాలు నిషిద్దుల అనే సమస్యలు).

\[ \text{SF}_4, \, \text{BF}_4^-, \, \text{ClF}_3, \, \text{AsF}_3, \, \text{PCl}_5, \, \text{BrF}_5, \, \text{XeF}_4, \, \text{SF}_6 \]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :

100

Question Number : 53 Question Id : 8643516263 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The gas phase reaction

\[ 2A(g) \rightleftharpoons A_2(g) \]

at 400 K has \( \Delta G^\circ = +25.2 \text{ kJ mol}^{-1} \).

The equilibrium constant \( K_C \) for this reaction is \( \ldots \times 10^{-2} \). (Round off to the Nearest Integer).

[Use : \( R=8.3 \text{ J mol}^{-1} \text{ K}^{-1} \), \( \ln 10 = 2.3 \)

\[ \log_{10} 2 = 0.30, \text{ 1 atm = 1 bar} \]

[antilog \((-0.3)=0.501\]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :

100
Question Number : 53 Question Id : 8643516263 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

400 K లో మిగిలినప్పటి అమలు చేస్తున్నాలను, ఏంటి ప్రతి?

\[ 2A(g) \rightleftharpoons A_2(g) \]

\[ \Delta G^\circ = +25.2 \text{ kJ mol}^{-1}. \]

\[ \log_{10} 2 = 0.30, \ 1 \text{ atm} = 1 \text{ bar} \]

\[ \text{antilog} (-0.3) = 0.501 \]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 54 Question Id : 8643516264 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A solute A dimerizes in water. The boiling point of a 2 molal solution of A is 100.52°C. The percentage association of A is __________. (Round off to the Nearest Integer).

[Use : K_b for water = 0.52 K kg mol\(^{-1}\)

Boiling point of water = 100°C]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 54 Question Id : 8643516264 Question Type : SA
Correct Marks : 4 Wrong Marks : 0
The solubility of CdSO₄ in water is $8.0 \times 10^{-4}$ mol L⁻¹. Its solubility in 0.01 M H₂SO₄ solution is $\text{__________} \times 10^{-6}$ mol L⁻¹. (Round off to the Nearest Integer).

(Assume that solubility is much less than 0.01 M)
The molar conductivities at infinite dilution of barium chloride, sulphuric acid and hydrochloric acid are 280, 860 and 426 S cm$^{-2}$ mol$^{-1}$ respectively. The molar conductivity at infinite dilution of barium sulphate is ________ S cm$^{-2}$ mol$^{-1}$. (Round off to the Nearest Integer).

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Equal
Text Areas: PlainText
Possible Answers: 100

A reaction has a half life of 1 min. The time required for 99.9% completion of the reaction is ________ min. (Round off to the Nearest Integer).

[Use: ln 2 = 0.69; ln 10 = 2.3]

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Equal
Text Areas: PlainText
Possible Answers:

100

Question Number : 57 Question Id : 8643516267 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

least number of minutes to 1 min. is 99.9% 1 min. to 1 hour for seven minutes ________ min.

(Repeat as 20 0.99 10.76 to 10.76).

[ In 2 = 0.69; In 10 = 2.3]
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers:
100

Question Number : 58 Question Id : 8643516268 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A xenon compound 'A' upon partial hydrolysis gives XeO₂F₂. The number of lone pair of electrons present in compound A is _________. (Round off to the Nearest Integer)
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers:
100

Question Number : 58 Question Id : 8643516268 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

least number of minutes to 1 min. is 99.9% 1 min. to 1 hour for seven minutes ________ min.

(Repeat as 20 0.99 10.76 to 10.76).
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers:
Consider the above reaction where 6.1 g of Benzoic acid is used to get 7.8 g of m-bromo benzoic acid. The percentage yield of the product is \( ________ \).
(Round off to the Nearest Integer).


Question Number : 59  Question Id : 8643516269  Question Type : SA
Correct Marks : 4  Wrong Marks : 0
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100
In Tollon’s test for aldehyde, the overall number of electron(s) transferred to the Tollon’s reagent formula [Ag(NH₃)₂]+ per aldehyde group to form silver mirror is ________. (Round off to the Nearest Integer).

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Equal
Text Areas: PlainText
Possible Answers:
100
Question Shuffling Allowed : Yes

Question Number : 61 Question Id : 8643516271 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1
If $15\sin^4\alpha + 10\cos^4\alpha = 6$, for some $\alpha \in \mathbb{R}$, then the value of $27\sec^6\alpha + 8\csc^6\alpha$ is equal to :
Options :
86435118811. 500
86435118812. 400
86435118813. 350
86435118814. 250

Question Number : 62 Question Id : 8643516272 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1
If $P$ and $Q$ are two statements, then which of the following compound statement is a tautology ?
Options :
86435118815. $((P \Rightarrow Q) \land \neg Q) \Rightarrow P$
86435118816. $((P \Rightarrow Q) \land \neg Q) \Rightarrow Q$
86435118817. \((P \Rightarrow Q) \land \sim Q \Rightarrow \sim P\)

86435118818. \((P \Rightarrow Q) \land \sim Q \Rightarrow (P \land Q)\)

**Question Number : 62** Question Id : 8643516272 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Options:
86435118815. \((P \Rightarrow Q) \land \sim Q \Rightarrow P\)

86435118816. \((P \Rightarrow Q) \land \sim Q \Rightarrow Q\)

86435118817. \((P \Rightarrow Q) \land \sim Q \Rightarrow \sim P\)

86435118818. \((P \Rightarrow Q) \land \sim Q \Rightarrow (P \land Q)\)

**Question Number : 63** Question Id : 8643516273 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

A pole stands vertically inside a triangular park ABC. Let the angle of elevation of the top of the pole from each corner of the park be \(\frac{\pi}{3}\). If the radius of the circumcircle of \(\Delta ABC\) is 2, then the height of the pole is equal to:

Options:

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

86435118819.

\[2\sqrt{3}\]

86435118820.

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

86435118821.

\[\sqrt{3}\]

86435118822.
Question Number : 63 Question Id : 8643516273 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Let in a series of 2n observations, half of them are equal to a and remaining half are equal to \(-a\). Also by adding a constant b in each of these observations, the mean and standard deviation of new set become 5 and 20, respectively. Then the value of \(a^2 + b^2\) is equal to :

Options :

86435118823. 925
86435118824. 425
86435118825. 650
86435118826. 250
Let in a Binomial distribution, consisting of 5 independent trials, probabilities of exactly 1 and 2 successes be 0.4096 and 0.2048 respectively. Then the probability of getting exactly 3 successes is equal to:

Options:

\[
\begin{align*}
\frac{40}{243} \\
\frac{80}{243} \\
\frac{128}{625} \\
\frac{32}{625}
\end{align*}
\]
In a triangle $ABC$, if $|\overrightarrow{BC}| = 8$, $|\overrightarrow{CA}| = 7$, $|\overrightarrow{AB}| = 10$, then the projection of the vector $\overrightarrow{AB}$ on $\overrightarrow{AC}$ is equal to:

Options:

\[
\begin{array}{c}
\frac{115}{16} \\
86435118831.
\end{array}
\]

\[
\begin{array}{c}
\frac{85}{14} \\
86435118832.
\end{array}
\]

\[
\begin{array}{c}
\frac{127}{20} \\
86435118833.
\end{array}
\]

\[
\begin{array}{c}
\frac{25}{4} \\
86435118834.
\end{array}
\]
Correct Marks : 4 Wrong Marks : 1

\[ \overrightarrow{BC} = 8, \quad \overrightarrow{CA} = 7, \quad \overrightarrow{AB} = 10, \quad \text{Therefore, } \overrightarrow{AC} \perp \overrightarrow{AB} \text{ hence } \text{the answer} = \frac{115}{16} \]

86435118831.

\[ \frac{85}{14} \]

86435118832.

\[ \frac{127}{20} \]

86435118833.

\[ \frac{25}{4} \]

86435118834.

Question Number : 67 Question Id : 8643516277 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Let the centroid of an equilateral triangle ABC be at the origin. Let one of the sides of the equilateral triangle be along the straight line \( x + y = 3 \). If \( R \) and \( r \) be the radius of circumcircle and incircle respectively of \( \triangle ABC \), then \( (R + r) \) is equal to :

Options :

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

86435118835.

\[ \frac{9}{\sqrt{2}} \]

86435118836.

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

86435118837.

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

86435118838.

Question Number : 67 Question Id : 8643516277 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1
Let a tangent be drawn to the ellipse \( \frac{x^2}{27} + y^2 = 1 \) at \((3\sqrt{3}\cos\theta, \sin\theta)\) where \( \theta \in \left(0, \frac{\pi}{2}\right)\).

Then the value of \( \theta \) such that the sum of intercepts on axes made by this tangent is minimum is equal to:

Options:

\[ \frac{\pi}{3} \]

86435118839.

\[ \frac{\pi}{6} \]

86435118840.

\[ \frac{\pi}{8} \]

86435118841.

\[ \frac{\pi}{4} \]

86435118842.
Question Mandatory: No  
Correct Marks: 4 Wrong Marks: 1

\[ \theta \in \left(0, \frac{\pi}{2}\right), \quad (3\sqrt{3}\cos \theta, \sin \theta) \quad \text{such that} \quad \frac{x^2}{27} + y^2 = 1 \]

\[ 86435118839. \]

\[ \frac{\pi}{3} \]

\[ 86435118840. \]

\[ \frac{\pi}{6} \]

\[ 86435118841. \]

\[ \frac{\pi}{8} \]

\[ 86435118842. \]

Question Number: 69  Question Id: 8643516279  Question Type: MCQ  Option Shuffling: Yes  Is  
Question Mandatory: No  
Correct Marks: 4 Wrong Marks: 1

Let \( y = y(x) \) be the solution of the differential equation \( \frac{dy}{dx} = (y + 1) \left( (y + 1)e^{x/2} - x \right) \),

\[ 0 < x < 2.1, \text{ with } y(2) = 0. \text{ Then the value of } \frac{dy}{dx} \text{ at } x = 1 \text{ is equal to:} \]

Options:

\[ \frac{e^{5/2}}{(1 + e^2)^2} \]

\[ 86435118843. \]

\[-\frac{2e^2}{(1 + e^2)^2} \]

\[ 86435118844. \]
\[
\frac{5e^{1/2}}{(e^2 + 1)^2}
\]
86435118845.

\[
-\frac{e^{3/2}}{(e^2 + 1)^2}
\]
86435118846.

Question Number : 69 Question Id : 8643516279 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1
\[\frac{dy}{dx} = (y + 1) \left( (y + 1)e^{3/2} - x \right), 0 < x < 2.1, y(2) = 0. \text{ Find } y = y(x)\]
\[\text{Consider } x = 1 \text{ and } \frac{dy}{dx} \text{, then } y = \text{?}\]
Options :
\[
\frac{e^{5/2}}{(1 + e^2)^2}
\]
86435118843.

\[
-\frac{2e^2}{(1 + e^2)^2}
\]
86435118844.

\[
\frac{5e^{1/2}}{(e^2 + 1)^2}
\]
86435118845.

\[
-\frac{e^{3/2}}{(e^2 + 1)^2}
\]
86435118846.

Question Number : 70 Question Id : 8643516280 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1
The area bounded by the curve \(4y^2 = x^2(4 - x)(x - 2)\) is equal to :
Options :
\[ \frac{3\pi}{8} \]
86435118847.

\[ \frac{\pi}{16} \]
86435118848.

\[ \frac{\pi}{8} \]
86435118849.

\[ \frac{3\pi}{2} \]
86435118850.

Question Number : 70 Question Id : 8643516280 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

\[ 4y^2 = x^2(4 - x)(x - 2) \] नीर्देशित \( y \) \( x \) \( \text{चरों} \) \( \text{चरों} \) \( \text{चरों} \) \( \text{चरों} \) :

Options :

\[ \frac{3\pi}{8} \]
86435118847.

\[ \frac{\pi}{16} \]
86435118848.

\[ \frac{\pi}{8} \]
86435118849.

\[ \frac{3\pi}{2} \]
86435118850.

Question Number : 71 Question Id : 8643516281 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Let \( g(x) = \int_0^x f(t) \, dt \), where \( f \) is continuous function in \([0, 3]\) such that \( \frac{1}{3} \leq f(t) \leq 1 \) for all \( t \in [0, 1] \) and \( 0 \leq f(t) \leq \frac{1}{2} \) for all \( t \in (1, 3] \). The largest possible interval in which \( g(3) \) lies is :

Options :
\[
\begin{bmatrix}
\frac{1}{3} & 2
\end{bmatrix}
\]

86435118851.

\[
\begin{bmatrix}
-1, -\frac{1}{2}
\end{bmatrix}
\]

86435118852.

\[
[1, 3]
\]

86435118853.

\[
\begin{bmatrix}
-\frac{3}{2}, -1
\end{bmatrix}
\]

86435118854.

**Question Number : 71**  
**Question Id : 8643516281**  
**Question Type : MCQ**  
**Option Shuffling : Yes**  
**Is Question Mandatory : No**  
**Correct Marks : 4**  
**Wrong Marks : 1**

\[
[0, 3] \subseteq \text{domain of } f \text{ and } f(t) \in [0, 1] \text{ for } t \in [0, 1] \text{ and } \frac{1}{3} \leq f(t) \leq 1, \text{ for } t \in (1, 3] \text{ and } 0 \leq f(t) \leq \frac{1}{2} \text{ for } t \in (0, 1].
\]

\[
g(x) = \int_0^x f(t) \, dt,
\]

\[
\Rightarrow g(3) \text{ is the answer.}
\]

**Options :**

\[
\begin{bmatrix}
\frac{1}{3} & 2
\end{bmatrix}
\]

86435118851.

\[
\begin{bmatrix}
-1, -\frac{1}{2}
\end{bmatrix}
\]

86435118852.

\[
[1, 3]
\]

86435118853.

\[
\begin{bmatrix}
-\frac{3}{2}, -1
\end{bmatrix}
\]

86435118854.

**Question Number : 72**  
**Question Id : 8643516282**  
**Question Type : MCQ**  
**Option Shuffling : Yes**  
**Is Question Mandatory : No**
Correct Marks : 4 Wrong Marks : 1

Let $f : \mathbb{R} \to \mathbb{R}$ be a function defined as

$$f(x) = \begin{cases} 
\frac{\sin (a + 1) x + \sin 2x}{2x}, & \text{if } x < 0 \\
b, & \text{if } x = 0 \\
\frac{\sqrt{x + bx^3} - \sqrt{x}}{b x^{\frac{5}{2}}}, & \text{if } x > 0 
\end{cases}$$

If $f$ is continuous at $x = 0$, then the value of $a + b$ is equal to :

Options :

- $\frac{5}{2}$

86435118855.

86435118856. $-3$

86435118857. $-2$

86435118858. $-\frac{3}{2}$

---

Question Number : 72 Question Id : 8643516282 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

$f : \mathbb{R} \to \mathbb{R}$ ఎంపికం చేసుకోండి

$$f(x) = \begin{cases} 
\frac{\sin (a + 1) x + \sin 2x}{2x}, & x < 0 \text{ లో కూడా} \\
b, & x = 0 \text{ లో కూడా} \\
\frac{\sqrt{x + bx^3} - \sqrt{x}}{b x^{\frac{5}{2}}}, & x > 0 \text{ లో కూడా} 
\end{cases}$$

ఈ ఎంపికాలంభించినట్లు. $x = 0$, తో $f$ ఎంపికం చేసుకోండి, $a + b$ నండ్లు ఎంటి?
Let $S_1$ be the sum of first $2n$ terms of an arithmetic progression. Let $S_2$ be the sum of first $4n$ terms of the same arithmetic progression. If $(S_2 - S_1)$ is $1000$, then the sum of the first $6n$ terms of the arithmetic progression is equal to:

Options:

- $\frac{5}{2}$
- $-3$
- $-2$
- $\frac{3}{2}$

Question Number : 73 Question Id : 8643516283 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Let $S_1$ be the sum of first $2n$ terms of an arithmetic progression. Let $S_2$ be the sum of first $4n$ terms of the same arithmetic progression. If $(S_2 - S_1)$ is $1000$, then the sum of the first $6n$ terms of the arithmetic progression is equal to:

Options:

- $7000$
- $5000$
- $3000$
- $1000$
Let \( S_1 : x^2 + y^2 = 9 \) and \( S_2 : (x - 2)^2 + y^2 = 1 \). Then the locus of center of a variable circle \( S \) which touches \( S_1 \) internally and \( S_2 \) externally always passes through the points:

Options:

\[
\left(2, \pm \frac{3}{2}\right)
\]

\[
\left(0, \pm \sqrt{3}\right)
\]

\[
\left(1, \pm 2\right)
\]

\[
\left(\frac{1}{2}, \pm \frac{\sqrt{5}}{2}\right)
\]
\[
\left(\frac{1}{2} \pm \frac{\sqrt{5}}{2}\right)
\]

86435118866.

**Question Number : 75**  **Question Id : 8643516285**  **Question Type : MCQ**  **Option Shuffling : Yes**  **Is Question Mandatory : No**  
**Correct Marks : 4**  **Wrong Marks : 1**

Let the system of linear equations
\[
\begin{align*}
4x + \lambda y + 2z &= 0 \\
2x - y + z &= 0 \\
\mu x + 2y + 3z &= 0, \quad \lambda, \mu \in \mathbb{R}.
\end{align*}
\]

has a non-trivial solution. Then which of the following is true? 

**Options :**

86435118867. \( \lambda = 3, \quad \mu \in \mathbb{R} \)

86435118868. \( \mu = -6, \quad \lambda \in \mathbb{R} \)

86435118869. \( \lambda = 2, \quad \mu \in \mathbb{R} \)

86435118870. \( \mu = 6, \quad \lambda \in \mathbb{R} \)

---

**Question Number : 75**  **Question Id : 8643516285**  **Question Type : MCQ**  **Option Shuffling : Yes**  **Is Question Mandatory : No**  
**Correct Marks : 4**  **Wrong Marks : 1**

\[
\begin{align*}
4x + \lambda y + 2z &= 0 \\
2x - y + z &= 0 \\
\mu x + 2y + 3z &= 0, \quad \lambda, \mu \in \mathbb{R}.
\end{align*}
\]

సుమారుగా సమరథంతం ఉంటుంది. ఎలా తారాధ్యం లేదు అంట్లోంది?

**Options :**

86435118867. \( \lambda = 3, \quad \mu \in \mathbb{R} \)

86435118868. \( \mu = -6, \quad \lambda \in \mathbb{R} \)

86435118869. \( \lambda = 2, \quad \mu \in \mathbb{R} \)
\[ \mu = 6, \quad \lambda \in \mathbb{R} \]

**Question Number : 76  Question Id : 8643516286  Question Type : MCQ  Option Shuffling : Yes  Is Question Mandatory : No  Correct Marks : 4  Wrong Marks : 1**

Let \( f : \mathbb{R} - \{3\} \to \mathbb{R} - \{1\} \) be defined by \( f(x) = \frac{x - 2}{x - 3} \).

Let \( g : \mathbb{R} \to \mathbb{R} \) be given as \( g(x) = 2x - 3 \). Then, the sum of all the values of \( x \) for which
\[ f^{-1}(x) + g^{-1}(x) = \frac{13}{2} \]

is equal to.

**Options :**

86435118871. 2

86435118872. 5

86435118873. 3

86435118874. 7

**Question Number : 76  Question Id : 8643516286  Question Type : MCQ  Option Shuffling : Yes  Is Question Mandatory : No  Correct Marks : 4  Wrong Marks : 1**

\[ f : \mathbb{R} - \{3\} \to \mathbb{R} - \{1\}, \quad f(x) = \frac{x - 2}{x - 3} \]

\( g(x) = 2x - 3, \quad g : \mathbb{R} \to \mathbb{R} \) एक फंक्शन है। \( f^{-1}(x) + g^{-1}(x) = \frac{13}{2} \) \( x \) का मान ज्ञात कीजियें।

**Options :**

86435118871. 2

86435118872. 5

86435118873. 3

86435118874. 7
Let a complex number be \( w = 1 - \sqrt{3} \, i \). Let another complex number \( z \) be such that \( |zw| = 1 \) and \( \arg(z) - \arg(w) = \frac{\pi}{2} \). Then the area of the triangle with vertices origin, \( z \) and \( w \) is equal to:

Options:

\[
\begin{align*}
\frac{1}{2} & \\
86435118875. \\
2 & \\
86435118876. \\
\frac{1}{4} & \\
86435118877. \\
4 & \\
86435118878.
\end{align*}
\]
Question Number : 78 Question Id : 8643516288 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Define a relation $R$ over a class of $n \times n$ real matrices $A$ and $B$ as

"ARB iff there exists a non-singular matrix $P$ such that $PAP^{-1} = B$".

Then which of the following is true?

Options:
86435118879. $R$ is reflexive, symmetric but not transitive
86435118880. $R$ is reflexive, transitive but not symmetric
86435118881. $R$ is symmetric, transitive but not reflexive,
86435118882. $R$ is an equivalence relation

Question Number : 79 Question Id : 8643516289 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

“ARB $\iff$ PAP$^{-1}$ = B అంచే సమాధానం లేదు మరియు P మిద్దించడం.”

86435118879.
86435118880.
86435118881.
86435118882.
86435118883.
86435118884.
86435118885.
86435118886.
86435118887.
86435118888.
86435118889.
86435118890.
86435118891.
86435118892.
Consider a hyperbola $H: x^2 - 2y^2 = 4$. Let the tangent at a point $P \ (4, \sqrt{6})$ meet the $x$-axis at $Q$ and latus rectum at $R \ (x_1, y_1), \ x_1 > 0$. If $F$ is a focus of $H$ which is nearer to the point $P$, then the area of $\Delta QFR$ is equal to.

Options:

1. $\sqrt{6} - 1$
2. $\frac{7}{\sqrt{6}} - 2$
3. $4\sqrt{6} - 1$
4. $4\sqrt{6}$

---

Consider a hyperbola $H: x^2 - 2y^2 = 4$. Let the tangent at a point $P \ (4, \sqrt{6})$ meet the $x$-axis at $Q$ and latus rectum at $R \ (x_1, y_1), \ x_1 > 0$. If $F$ is a focus of $H$ which is nearer to the point $P$, then the area of $\Delta QFR$ is equal to.

Options:

1. $\sqrt{6} - 1$
2. $\frac{7}{\sqrt{6}} - 2$
3. $4\sqrt{6} - 1$
4. $4\sqrt{6}$
Let \( \vec{a} \) and \( \vec{b} \) be two non-zero vectors perpendicular to each other and \( |\vec{a}| = |\vec{b}| \). If

\[
|\vec{a} \times \vec{b}| = |\vec{a}|
\]

then the angle between the vectors \( (\vec{a} + \vec{b} + (\vec{a} \times \vec{b})) \) and \( \vec{a} \) is equal to:

Options:

\[
\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)
\]

86435118887.

\[
\cos^{-1}\left(\frac{1}{\sqrt{2}}\right)
\]

86435118888.

\[
\sin^{-1}\left(\frac{1}{\sqrt{3}}\right)
\]

86435118889.

\[
\sin^{-1}\left(\frac{1}{\sqrt{6}}\right)
\]

86435118890.

---

Let \( \vec{a} \) be a vector and \( \vec{b} \) be a vector such that \( |\vec{a}| = |\vec{b}| \) and \( \vec{a} \times \vec{b} \) is perpendicular to both \( \vec{a} \) and \( \vec{b} \). If

\[
|\vec{a} \times \vec{b}| = |\vec{a}|
\]

then the angle between the vectors \( (\vec{a} + \vec{b} + (\vec{a} \times \vec{b})) \) and \( \vec{a} \) is equal to:

Options:

\[
\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)
\]

86435118887.

\[
\cos^{-1}\left(\frac{1}{\sqrt{2}}\right)
\]

86435118888.

\[
\sin^{-1}\left(\frac{1}{\sqrt{3}}\right)
\]

86435118889.
\[ \sin^{-1}\left( \frac{1}{\sqrt{6}} \right) \]

86435118890.

**Mathematics Section B**

Section Id : 864351420
Section Number : 6
Section type : Online
Mandatory or Optional : Mandatory
Number of Questions : 10
Number of Questions to be attempted : 5
Section Marks : 20
Mark As Answered Required? : Yes
Sub-Section Number : 1
Sub-Section Id : 864351420
Question Shuffling Allowed : Yes

Question Number : 81
Question Id : 8643516291
Question Type : SA
Correct Marks : 4 Wrong Marks : 0

If \( f(x) \) and \( g(x) \) are two polynomials such that the polynomial \( P(x) = f(x^3) + x \ g(x^3) \) is divisible by \( x^2 + x + 1 \), then \( P(1) \) is equal to \( \underline{\text{__________}} \).

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :

100

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Question Number : 81
Question Id : 8643516291
Question Type : SA
Correct Marks : 4 Wrong Marks : 0

\[ \text{หาค่าที่} \quad P(x) = f(x^3) + x \ g(x^3) \ \text{ถ้า} \quad x^2 + x + 1 \ \text{ถือว่า} \quad f(x) \ \text{มี} \quad P(x) = \underline{\text{__________}}. \]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Let $I$ be an identity matrix of order $2 \times 2$ and $P = \begin{bmatrix} 2 & -1 \\ 5 & -3 \end{bmatrix}$. Then the value of $n \in \mathbb{N}$ for which $P^n = 5I - 8P$ is equal to ________.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Equal
Text Areas: PlainText
Possible Answers:
100

The term independent of $x$ in the expansion of $\left( \frac{x + 1}{x^{2/3} - x^{1/3} + 1} - \frac{x - 1}{x - x^{1/2}} \right)^{10}$, $x \neq 1$, is equal to ________.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Equal
Question Number : 83
Question Id : 8643516293
Question Type : SA
Correct Marks : 4
Wrong Marks : 0

\[ \left[ \frac{x + 1}{x^{2/3} - x^{1/3} + 1} - \frac{x - 1}{x - x^{1/2}} \right]^{10}, \quad x \neq 1, \quad \text{is equal to} \quad \underline{\text{__________}}. \]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 84
Question Id : 8643516294
Question Type : SA
Correct Marks : 4
Wrong Marks : 0

\[ \sum_{r=1}^{10} r! \left( r^3 + 6r^2 + 2r + 5 \right) = \alpha (11!), \] then the value of \( \alpha \) is equal to \underline{__________}.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 84
Question Id : 8643516294
Question Type : SA
Correct Marks : 4
Wrong Marks : 0

\[ \sum_{r=1}^{10} r! \left( r^3 + 6r^2 + 2r + 5 \right) = \alpha (11!), \quad \alpha \text{ is equal to} \quad \underline{__________}. \]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
Question Number : 85 Question Id : 8643516295 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Let $P(x)$ be a real polynomial of degree 3 which vanishes at $x = -3$. Let $P(x)$ have local 
minima at $x = 1$, local maxima at $x = -1$ and $\int_{-1}^{1} P(x)dx = 18$, then the sum of all the coefficients 
of the polynomial $P(x)$ is equal to __________.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 85 Question Id : 8643516296 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

$x = -3 \therefore y = 0$, area $3 \therefore \text{sum of roots} = \text{multiplicity} \ P(x) = \text{polynomial}$. $P(x)$ is $x = 1 \therefore \text{local }$ 
minima, $x = -1 \therefore \text{local maxima}$ again. $\int_{-1}^{1} P(x)dx = 18$, therefore multiplicity $P(x)$ is $\text{root }$

$\therefore \text{sum of roots} = \text{multiplicity} = \text{answer}$.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 86 Question Id : 8643516296 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Let $y = y(x)$ be the solution of the differential equation $xdy - ydx = \sqrt{x^2 - y^2} \ dx$, $x \geq 1$, with 
y(1) = 0. If the area bounded by the line $x = 1$, $x = e^\pi$, $y = 0$ and $y = y(x)$ is $ae^{2\pi} + \beta$, then the 
value of $10(\alpha + \beta)$ is equal to __________.
Question Number : 86
Question Id : 8643516296
Question Type : SA
Correct Marks : 4
Wrong Marks : 0

\[ xy - y \, dx = \sqrt{x^2 - y^2} \, dx, \quad x \geq 1, \quad y(1) = 0 \quad \text{இரு நாள்கள் நிலையை செய்யு செய்து நீர்வு நீம்பு செய்து} \quad y - y(x) \quad \text{இல்லை.}
\]
\[ x = 1, \quad x = e^\pi, \quad y = 0 \quad \text{என்று} \quad y = y(x) \quad \text{என்று} \quad \text{செய்யலாக} \quad \text{தேர்வு விளையும்} \quad \alpha e^{2\pi} + \beta, \]
\[ 
\quad \text{என்று} \quad 10(\alpha + \beta) \quad 	ext{இல்லை} \quad 	ext{இல்லை} = \underline{\underline{\quad}}.
\]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 87
Question Id : 8643516297
Question Type : SA
Correct Marks : 4
Wrong Marks : 0

Let \( P \) be a plane containing the line \[ \frac{x-1}{3} = \frac{y+6}{4} = \frac{z+5}{2} \]
and parallel to the line \[ \frac{x-3}{4} = \frac{y-2}{-3} = \frac{z+5}{7}. \]
If the point \((1, -1, \alpha)\) lies on the plane \( P \), then the value of \(|5\alpha|\) is equal to \underline{\underline{\quad}}.

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 87
Question Id : 8643516297
Question Type : SA
Correct Marks : 4
Wrong Marks : 0
Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Equal
Text Areas: PlainText
Possible Answers:
100

Question Number: 88 Question Id: 8643516298 Question Type: SA
Correct Marks: 4 Wrong Marks: 0

Let the mirror image of the point (1, 3, a) with respect to the plane \( \mathbf{r} \cdot (2 \hat{i} - \hat{j} + \hat{k}) - b = 0 \) be \((-3, 5, 2)\). Then, the value of \(|a+b|\) is equal to __________.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Equal
Text Areas: PlainText
Possible Answers:
100

Question Number: 88 Question Id: 8643516298 Question Type: SA
Correct Marks: 4 Wrong Marks: 0

\[ \mathbf{r} \cdot (2 \hat{i} - \hat{j} + \hat{k}) - b = 0 \] exists for the point \((1, 3, a)\) to have a mirror image \((-3, 5, 2)\). Then, \(|a+b|\) is equal to __________.

Response Type: Numeric
Evaluation Required For SA: Yes
Show Word Count: Yes
Answers Type: Equal
Text Areas: PlainText
Possible Answers:
100

Question Number: 89 Question Id: 8643516299 Question Type: SA
Correct Marks: 4 Wrong Marks: 0
Let \( \binom{n}{r} \) denote the binomial coefficient of \( x^r \) in the expansion of \( (1+x)^n \).

If \( \sum_{k=0}^{10} (2^2 + 3k) \binom{n}{k} = \alpha \cdot 3^{10} + \beta \cdot 2^{10}, \alpha, \beta \in \mathbb{R} \), then \( \alpha + \beta \) is equal to \( \underline{\quad} \).

**Response Type**: Numeric

**Evaluation Required For SA**: Yes

**Show Word Count**: Yes

**Answers Type**: Equal

**Text Areas**: PlainText

**Possible Answers**:

100

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Question Number: 89  Question Id: 8643516299  Question Type: SA

Correct Marks: 4  Wrong Marks: 0

\[(1+x)^n \text{ మీయితే } x^r \text{ మీయితే } \binom{n}{r} \text{ మీయితే}.

\[
\sum_{k=0}^{10} (2^2 + 3k) \binom{n}{k} = \alpha \cdot 3^{10} + \beta \cdot 2^{10}, \alpha, \beta \in \mathbb{R}, \text{ అంటే } \alpha + \beta = \underline{\quad}.
\]

**Response Type**: Numeric

**Evaluation Required For SA**: Yes

**Show Word Count**: Yes

**Answers Type**: Equal

**Text Areas**: PlainText

**Possible Answers**:

100

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Question Number: 90  Question Id: 8643516300  Question Type: SA

Correct Marks: 4  Wrong Marks: 0

Let \( f: \mathbb{R} \to \mathbb{R} \) satisfy the equation \( f(x+y) = f(x) \cdot f(y) \) for all \( x, y \in \mathbb{R} \) and \( f(x) \neq 0 \) for any \( x \in \mathbb{R} \).

If the function \( f \) is differentiable at \( x = 0 \) and \( f'(0) = 3 \), then \( \lim_{h \to 0} \frac{1}{h} \left( f(h) - 1 \right) \) is equal to \( \underline{\quad} \).

**Response Type**: Numeric

**Evaluation Required For SA**: Yes

**Show Word Count**: Yes

**Answers Type**: Equal

**Text Areas**: PlainText

**Possible Answers**:

100
Question Number : 90  
Question Id : 8643516300  
Question Type : SA  
Correct Marks : 4  
Wrong Marks : 0  

\[ f : \mathbb{R} \rightarrow \mathbb{R} \text{  where  } f(x) \neq 0 \text{ for all } x \in \mathbb{R} \text{ and } f(x + y) = f(x) \cdot f(y) \text{ is true for all } x, y. \]

\[ f(0) = 3 \text{  and  } \lim_{h \to 0} \frac{1}{h} (f(h) - 1) = \_\_\_. \]

Response Type : Numeric  
Evaluation Required For SA : Yes  
Show Word Count : Yes  
Answers Type : Equal  
Text Areas : PlainText  
Possible Answers :  
100