National Testing Agency

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Display Marks:	Yes

B TECH

Group Number :	1
Group Id :	86435163
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 :	864351373
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 :	864351373
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 8643515581 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 :

86435116741. $\sqrt{\frac{3\pi}{8}}$

86435116742. $\sqrt{\frac{8\pi}{3}}$

86435116743. $\sqrt{\frac{8}{3}}$

86435116744. $\sqrt{\frac{3}{3}}$

Question Number : 2 Question Id : 8643515582 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 :

86435116745. $1 : 1$

86435116746. $1 : 2$

86435116747. $2 : 1$

86435116748. $3 : 1$

Question Number : 3 Question Id : 8643515583 Question Type : MCQ Optio

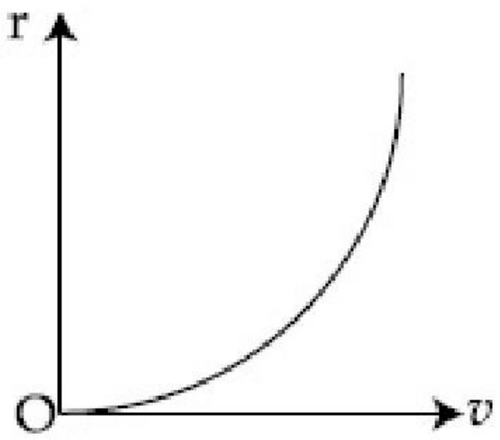
A particle of mass m moves in a circular orbit under the central potential field, $U(r) = -\frac{C}{r}$,

where C is a positive constant.

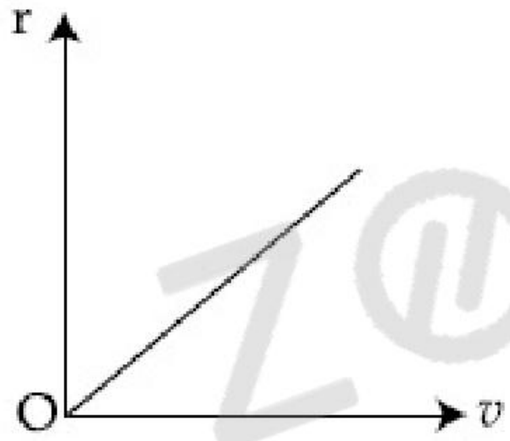
The correct radius – velocity graph of the particle's motion is :

Options :

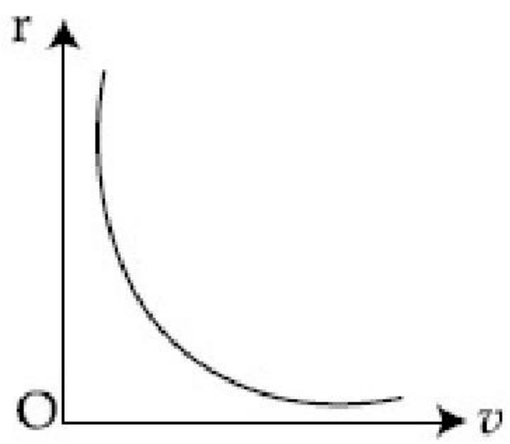
86435116749.



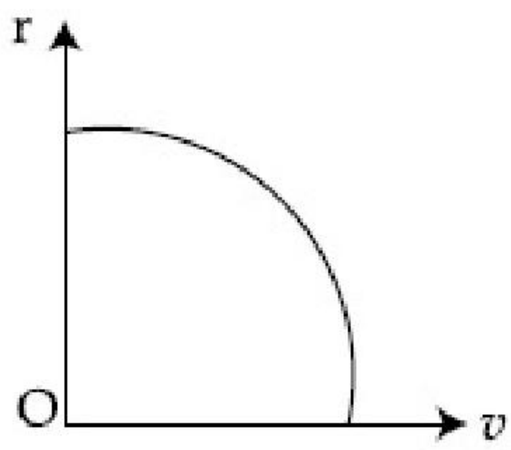
86435116750.



86435116751.

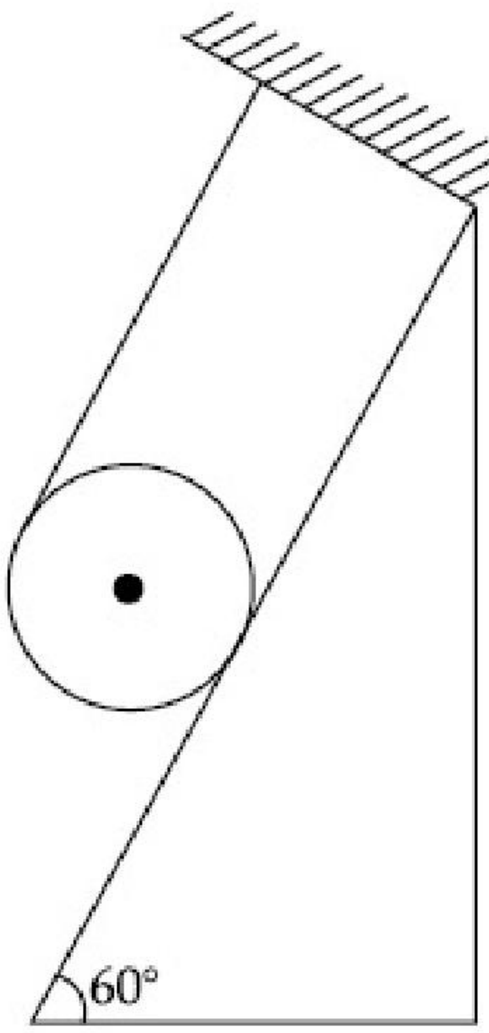


86435116752.



Correct Marks : 4 Wrong Marks : 1

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 :



[The coefficient of static friction, μ_s, is 0.4]

Options :

86435116753. $\frac{mg}{5}$

86435116754. $5\ mg$

86435116755. $\frac{7}{2}\ mg$

86435116756. 0

Question Number : 5 Question Id : 8643515585 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 :

86435116757. does not change

86435116758. 1200 minutes

86435116759. 60 minutes

86435116760. 84 minutes

Question Number : 6 Question Id : 8643515586 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

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 :

Options :

86435116761. $\frac{ML^2}{\pi^2}$

86435116762. $\frac{1}{2}\frac{ML^2}{\pi^2}$

86435116763. $\frac{1}{4}\frac{ML^2}{\pi^2}$

86435116764. $\frac{2}{5}\frac{ML^2}{\pi^2}$

Question Number : 7 Question Id : 8643515587 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 1×10^7 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 :

86435116765. 1837

86435116766. $\frac{1}{1837}$

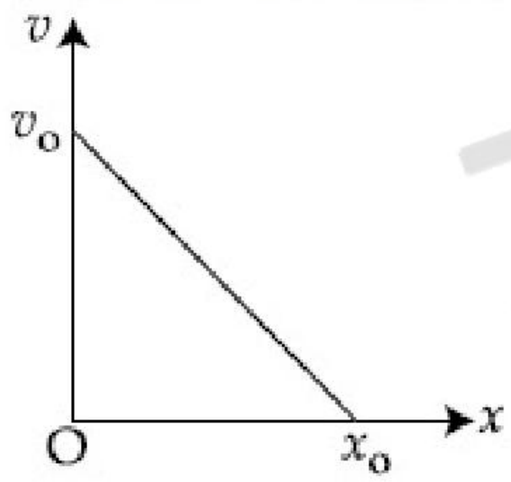
86435116767. $\frac{1}{\sqrt{1837}}$

86435116768. $\sqrt{1837}$

Question Number : 8 Question Id : 8643515588 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

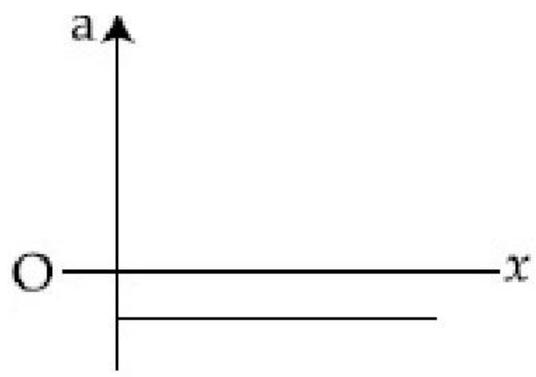
The velocity - displacement graph of a particle is shown in the figure.



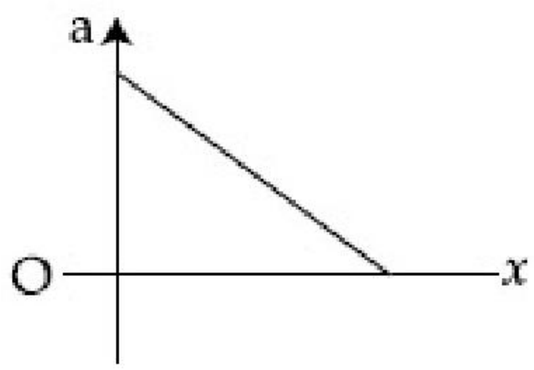
The acceleration - displacement graph of the same particle is represented by :

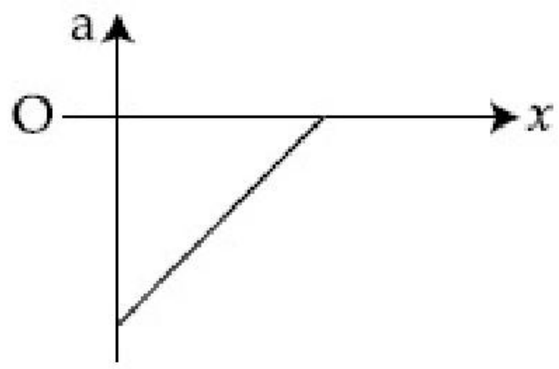
Options :

86435116769.

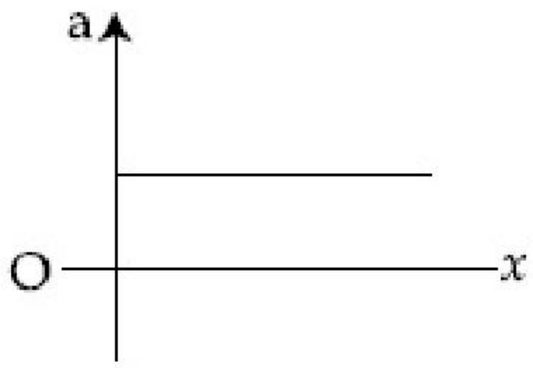


86435116770.





86435116771.



86435116772.

Question Number : 9 Question Id : 8643515589 Question Type : MCQ Option Shuffling : Yes Is 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 γ is the ratio of specific heats) :

Options :

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

86435116773.

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

86435116774.

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

86435116775.

$\frac{dV}{V}$

86435116776.

Question Number : 10 Question Id : 8643515590 Question Type : MCQ Opti

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 :

86435116777. $\frac{L}{M}$

86435116778. $\frac{L}{2M}$

86435116779. $\frac{2L}{M}$

86435116780. $\frac{4L}{M}$

Question Number : 11 Question Id : 8643515591 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 :

86435116781. $S_1 \times S_2$

86435116782. $S_1 - S_2$

86435116783. $S_1 + S_2$

86435116784. $\frac{S_1}{S_2}$

Question Number : 12 Question Id : 8643515592 Question Type : MCQ Opti

The function of time representing a simple harmonic motion with a period of $\frac{\pi}{\omega}$ is :

Options :

86435116785. $\sin(\omega t) + \cos(\omega t)$

86435116786. $\sin^2(\omega t)$

86435116787. $3\cos\left(\frac{\pi}{4} - 2\omega t\right)$

86435116788. $\cos(\omega t) + \cos(2\omega t) + \cos(3\omega t)$

Question Number : 13 Question Id : 8643515593 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 Ω and the capacitive reactance (X_C) is 4 Ω. The resistance (R) in the circuit is 6 Ω.

The power factor of the circuit is :

Options :

86435116789. $\frac{1}{\sqrt{2}}$

86435116790. $\frac{\sqrt{3}}{2}$

86435116791. $\frac{1}{2}$

86435116792. $\frac{1}{2\sqrt{2}}$

Question Number : 14 Question Id : 8643515594 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

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 χ is its magnetic susceptibility.

Choose the **correct** answer from the options given below :

Options :

86435116793. (B) and (D) only

86435116794. (B) and (C) only

86435116795. (A) and (B) only

86435116796. (C) and (E) only

Question Number : 15 Question Id : 8643515595 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct relation between α (ratio of collector current to emitter current) and β (ratio of collector current to base current) of a transistor is :

Options :

86435116797. $\beta = \frac{\alpha}{1+\alpha}$

86435116798. $\alpha = \frac{\beta}{1-\alpha}$

86435116799. $\beta = \frac{1}{1-\alpha}$

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

86435116800.

Question Number : 16 Question Id : 8643515596 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A proton and an α-particle, having kinetic energies K_p and K_α respectively, enter into a magnetic field at right angles.

The ratio of the radii of trajectory of proton to that of α-particle is 2 : 1. The ratio of $K_p : K_\alpha$ is :

Options :

86435116801. $1:4$

86435116802. $4:1$

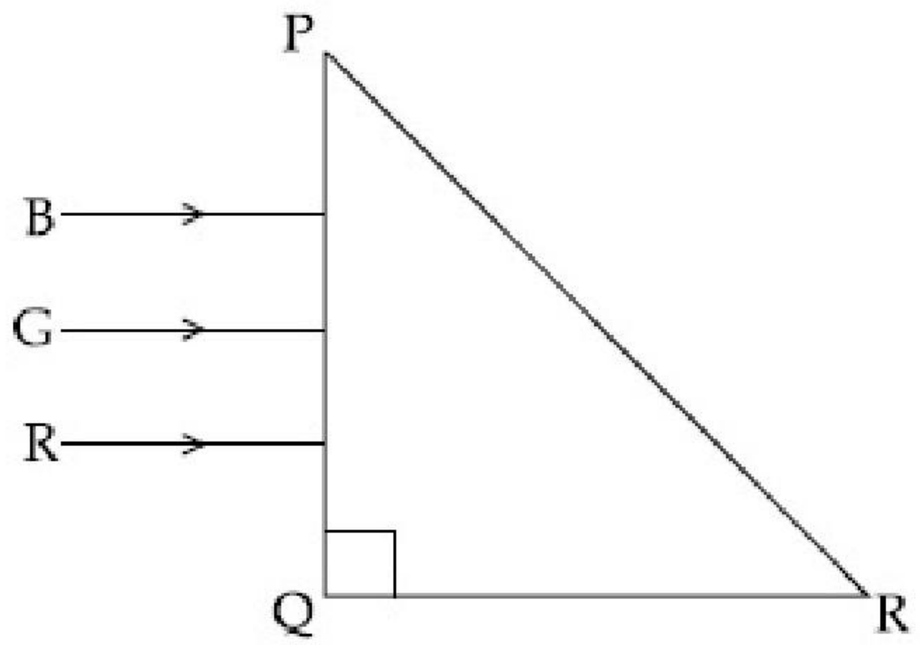
86435116803. $8:1$

86435116804. $1:8$

Question Number : 17 Question Id : 8643515597 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 1.40 respectively. The colour of the ray(s) emerging

86435116805. blue and green

86435116806. blue

86435116807. green

86435116808. red

Question Number : 18 Question Id : 8643515598 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 :

86435116809. $\frac{L}{R}\ln 2$

86435116810. $\frac{L}{R}\ln 5$

86435116811. $\frac{L}{R}\ln 10$

86435116812. infinite

Question Number : 19 Question Id : 8643515599 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 $\left(\vec{E}\right)$ and magnetic field $\left(\vec{B}\right)$ components.

Options :

86435116813. E_y, B_y or E_z, B_z

86435116814. E_x , B_y or E_y , B_x

86435116815. E_x , B_z or E_z , B_x

86435116816. E_y , B_x or E_x , B_y

Question Number : 20 Question Id : 8643515600 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 :

86435116817. not possible as proton mass is less than the neutron mass

86435116818. possible only inside the nucleus

86435116819. always possible as it is associated only with β^+ decay

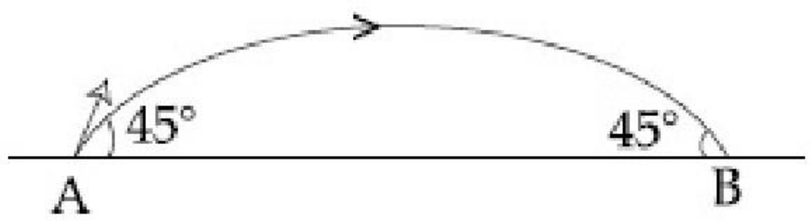
86435116820. not possible but neutron to proton conversion is possible

Physics Section B

Section Id :	864351374
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 :	864351374
Question Shuffling Allowed :	Yes

Question Number : 21 Question Id : 8643515601 Question Type : SA

The projectile motion of a particle of mass 5 g is shown in the figure.



The initial velocity of the particle is $5\sqrt{2}$ ms^{-1} and the air resistance is assumed to be negligible.

The magnitude of the change in momentum between the points A and B is $x \times 10^{-2}$ kgms^{-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 : 22 Question Id : 8643515602 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

An infinite number of point charges, each carrying 1 μC charge, are placed along the y-axis at $y = 1$ m, 2 m, 4 m, 8 m ..... .

The total force on a 1 C point charge, placed at the origin, is $x \times 10^3$ N.

The value of x, to the nearest integer, is _____.

[Take $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$]

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 : 8643515603 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Two wires of same length and thickness having specific resistances 6 Ω cm and 3 Ω cm respectively are connected in parallel. The effective resistivity is ρ Ω cm. The value of ρ, 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

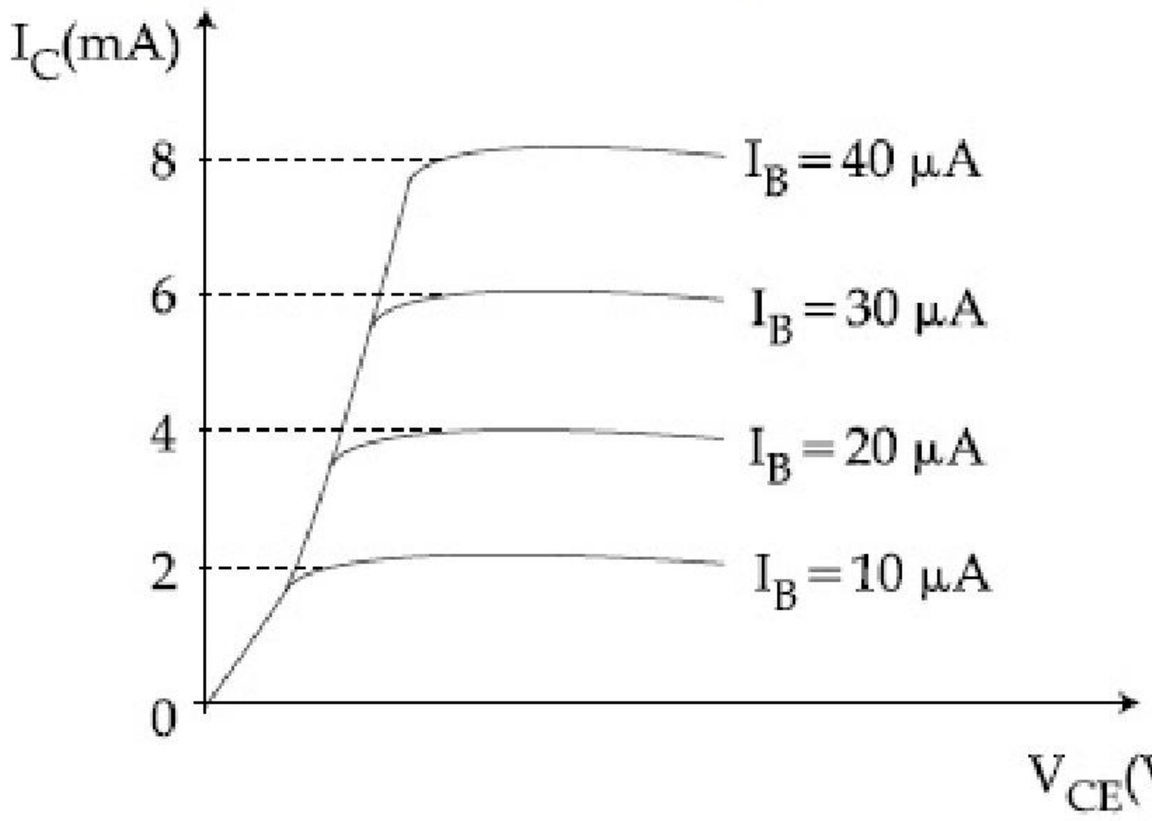
Question Number : 24 Question Id : 8643515604 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

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 : 25 Question Id : 8643515605 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The typical output characteristics curve for a transistor working in the common-emitter configuration is shown in the figure.

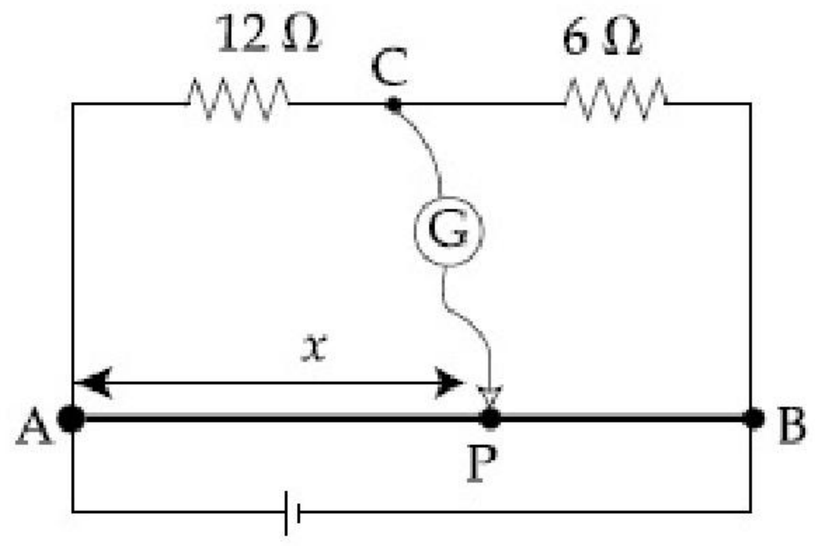


The estimated current gain from the figure is _____.

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

Question Number : 26 Question Id : 8643515606 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

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 n to the nearest integer is

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

Question Number : 27 Question Id : 8643515607 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 3×10^8 ms^{-1}]

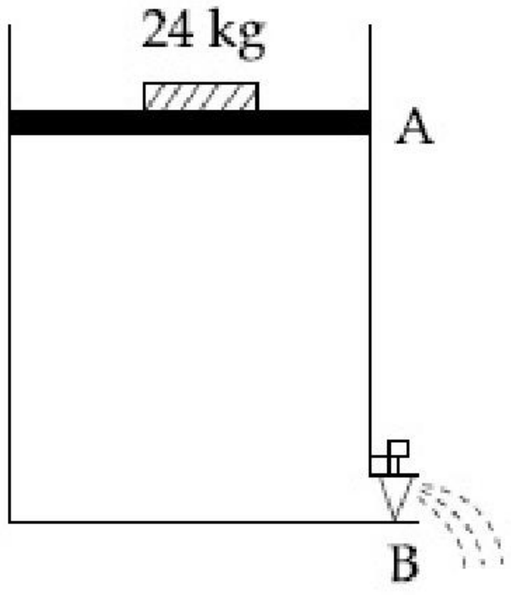
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 28 Question Id : 8643515608 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

Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 29 Question Id : 8643515609 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
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 30 Question Id : 8643515610 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

Chemistry Section A

Section Id : 864351375

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 :	864351375
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 8643515611 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 :

86435116831. Ionic solid

86435116832. Covalent solid

86435116833. Metallic solid

86435116834. Molecular solid

Question Number : 32 Question Id : 8643515612 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 :

86435116835. Both statement I and statement II are true.

86435116836. Both statement I and statement II are false.

86435116838. Statement I is false but statement II is true.

Question Number : 33 Question Id : 8643515613 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The charges on the colloidal CdS sol and TiO_2 sol are, respectively :

Options :

86435116839. positive and positive

86435116840. negative and positive

86435116841. positive and negative

86435116842. negative and negative

Question Number : 34 Question Id : 8643515614 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 :

86435116843. argon, chlorine and sodium

86435116844. chlorine, lithium and sodium

86435116845. argon, lithium and sodium

86435116846. neon, sodium and chlorine

Question Number : 35 Question Id : 8643515615 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
(a)	Mercury	(i)	Vapour phase refining
(b)	Copper	(ii)	Distillation Refining
(c)	Silicon	(iii)	Electrolytic Refining
(d)	Nickel	(iv)	Zone Refining

Choose the **most appropriate** answer from the option given below :

Options :

86435116847. (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

86435116848. (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)

86435116849. (a)-(ii), (b)-(iii), (c)-(i), (d)-(iv)

86435116850. (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

Question Number : 36 Question Id : 8643515616 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In basic medium, H_2O_2 exhibits which of the following reactions ?

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

(B) $I_2 \rightarrow I^-$

(C) $PbS \rightarrow PbSO_4$

Choose the **most appropriate** answer from the options given below :

Options :

86435116851. (A) only

86435116852. (B) only

86435116853. (A), (B) only

86435116854. (A), (C) only

Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II :

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

Choose the most appropriate answer from the option given below :

Options :

86435116855. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

86435116856. (a)-(iii), (b)-(iv), (c)-(ii), (d)-(v)

86435116857. (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

86435116858. (a)-(iii), (b)-(iv), (c)-(v), (d)-(ii)

Question Number : 38 Question Id : 8643515618 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The oxidation states of nitrogen in NO, NO_2, N_2O and NO_3^- are in the order of :

Options :

86435116859. $NO > NO_2 > N_2O > NO_3^-$

86435116860. $N_2O > NO_2 > NO > NO_3^-$

86435116861. $NO_2 > NO_3^- > NO > N_2O$

86435116862. $NO_3^- > NO_2 > NO > N_2O$

Question Number : 39 Question Id : 8643515619 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

The oxide that shows magnetic property is :

Options :

86435116863. SiO_2

86435116864. Mn_3O_4

86435116865. MgO

86435116866. Na_2O

Question Number : 40 Question Id : 8643515620 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 $CuSO_4 \cdot 5H_2O$, respectively, are :

Options :

86435116867. 4 and 1

86435116868. 6 and 4

86435116869. 5 and 1

86435116870. 6 and 5

Question Number : 41 Question Id : 8643515621 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 :

Both statement I and statement II are true

86435116872. Both statement I and statement II are false.

86435116873. Statement I is true but statement II is false.

86435116874. Statement I is false but statement II is true.

Question Number : 42 Question Id : 8643515622 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : C_2H_5OH and AgCN both can generate nucleophile.

Statement II : KCN and AgCN both will generate nitrile nucleophile with all reaction conditions.

Choose the **most appropriate** option :

Options :

86435116875. Both statement I and statement II are true.

86435116876. Both statement I and statement II are false.

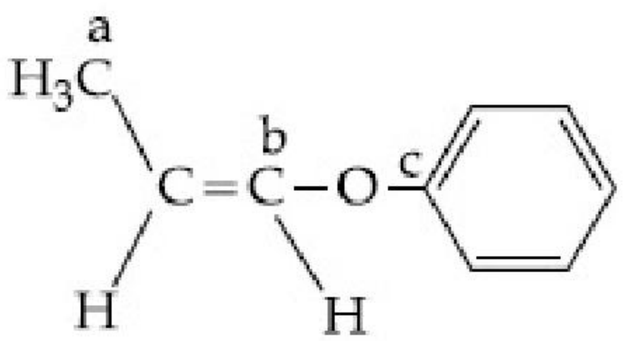
86435116877. Statement I is true but statement II is false.

86435116878. Statement I is false but statement II is true.

Question Number : 43 Question Id : 8643515623 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In the following molecule,



Hybridisation of Carbon a, b and c respectively are :

Options :

sp^3 sp^2 sp^2

86435116880. sp^3, sp^2, sp

86435116881. sp^3, sp, sp

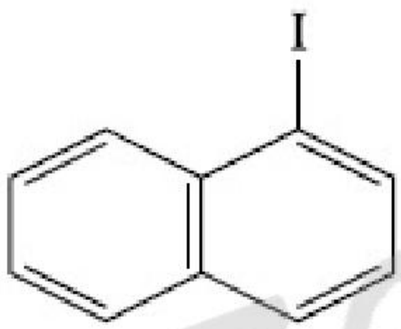
86435116882. sp^3, sp, sp^2

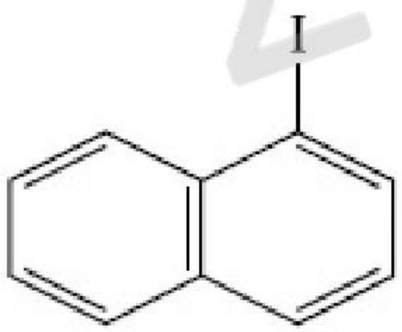
Question Number : 44 Question Id : 8643515624 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

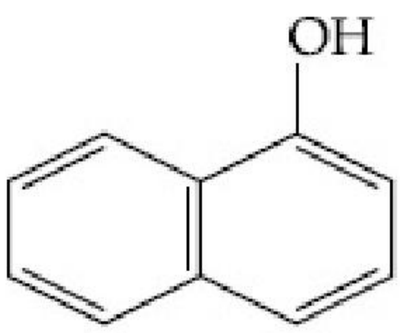
Correct Marks : 4 Wrong Marks : 1

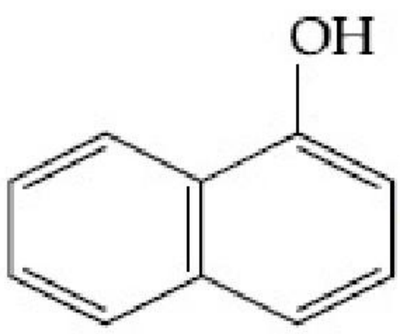
Main Products formed during a reaction of 1-methoxy naphthalene with hydroiodic acid are :

Options :

86435116883.  and CH_3I

86435116884.  and CH_3OH

86435116885.  and CH_3OH

86435116886.  and CH_3I

Correct Marks : 4 Wrong Marks : 1

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

Options :

86435116887. CO

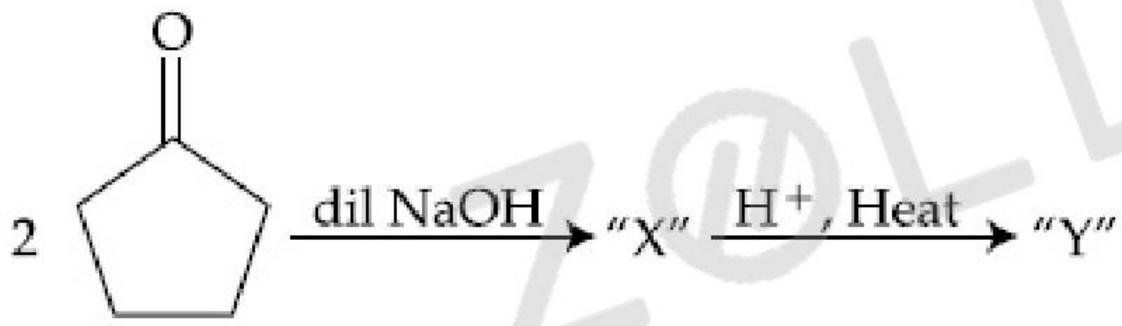
86435116888. CO_2

86435116889. CO_3^{2-}

86435116890. HCO_3^-

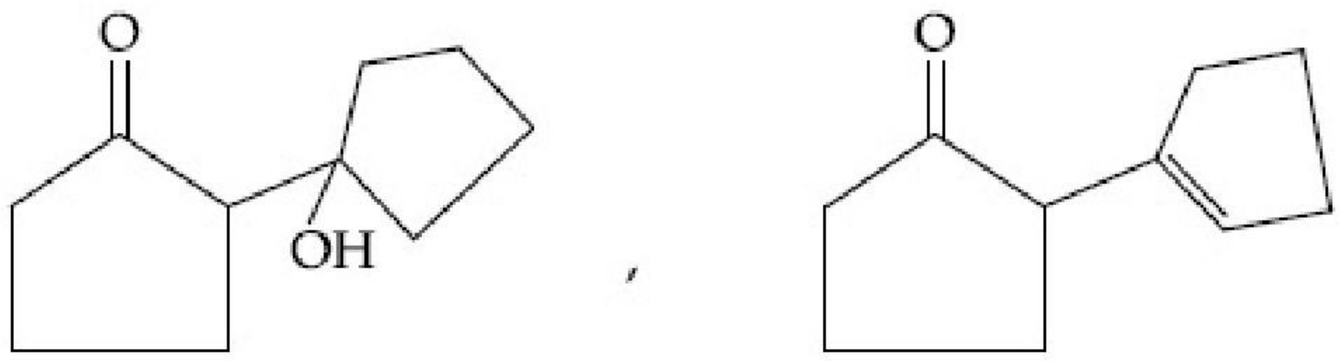
Question Number : 46 Question Id : 8643515626 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

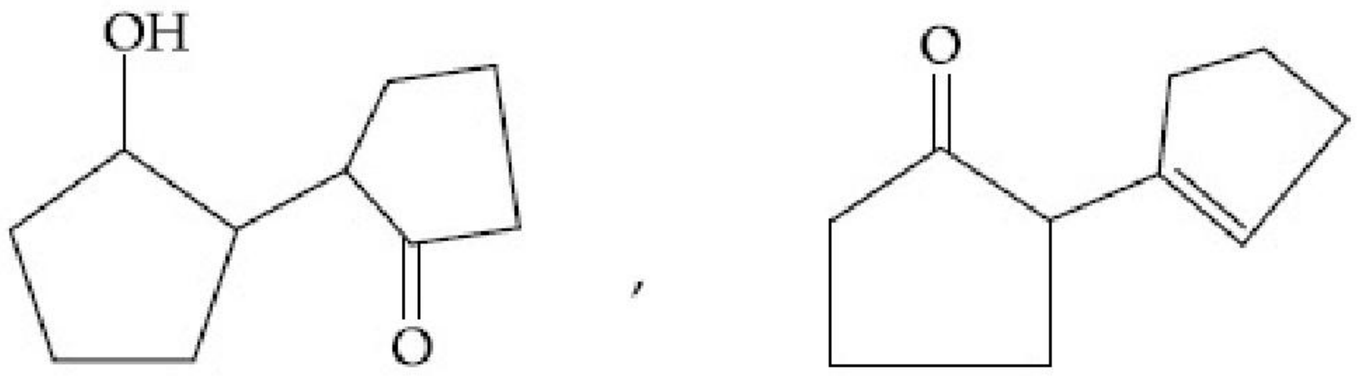
Correct Marks : 4 Wrong Marks : 1

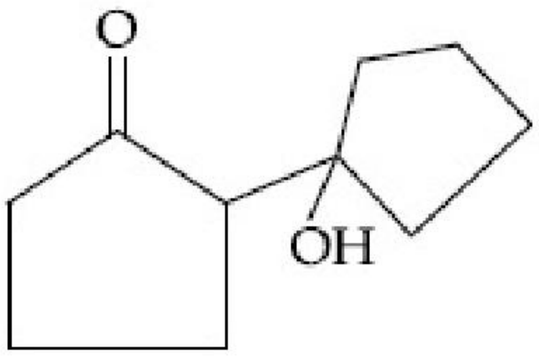
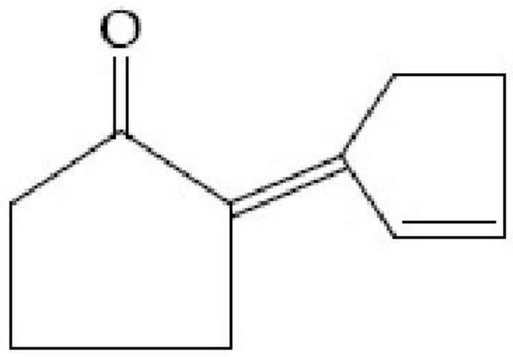


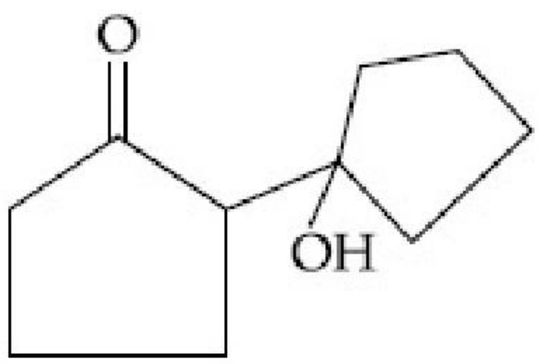
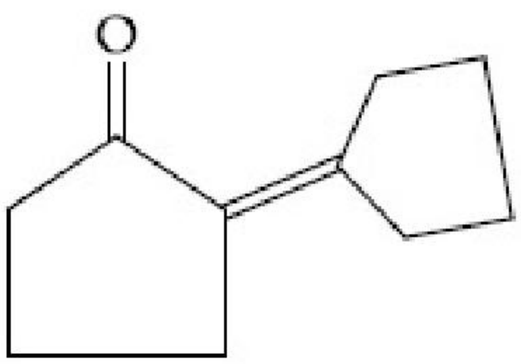
Consider the above reaction, the product 'X' and 'Y' respectively are :

Options :

86435116891. 

86435116892. 

86435116893.  , 

86435116894.  , 

Question Number : 47 Question Id : 8643515627 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

86435116895. $C_6H_5-CH_2\,NH\,CH_3$

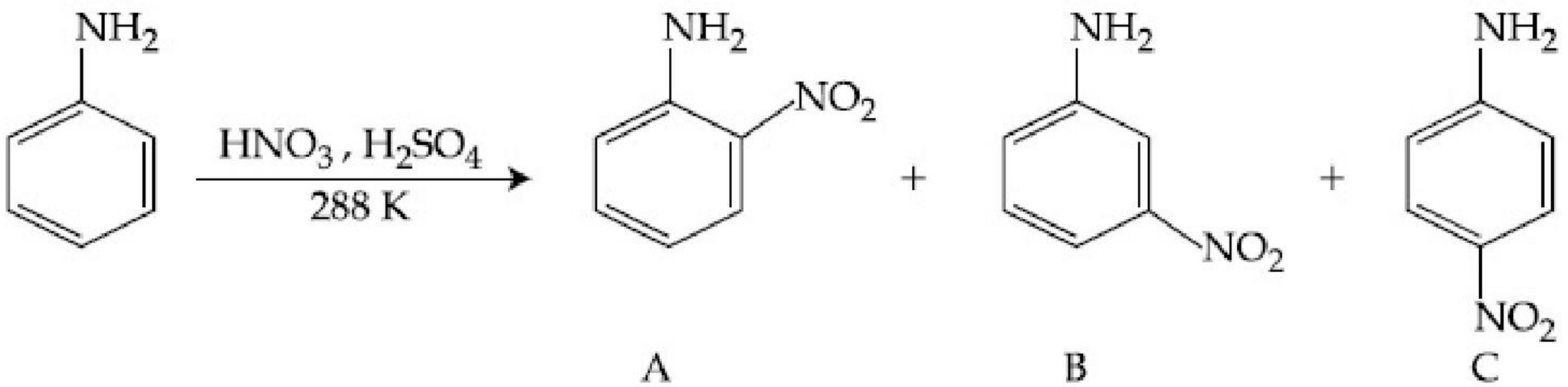
86435116896. $C_6H_5-N-(CH_3)_2$

86435116897. $C_6H_5-NHCH_2CH_3$

86435116898. $C_6H_5-\underset{\displaystyle CH_3}{\underset{|}{CH}}-NH_2$

Question Number : 48 Question Id : 8643515628 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1



Consider the given reaction, percentage yield of :

Options :

86435116899. A > C > B

86435116900. C > A > B

86435116901. B > C > A

86435116902. C > B > A

Question Number : 49 Question Id : 8643515629 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II :

List - I (Class of Chemicals)		List - II (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 :

86435116903. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

86435116904. (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

86435116905. (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

86435116906. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

Question Number : 50 Question Id : 8643515630 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Deficiency of vitamin K causes :

Options :

86435116907. Increase in blood clotting time

86435116908. Decrease in blood clotting time

86435116909. Cheilosis

86435116910. Increase in fragility of RBC's

Chemistry Section B

Section Id :	864351376
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 :	864351376
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 8643515631 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

10.0 mL of Na_2CO_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_2CO_3 solution is _____ mM.

(Round off to the Nearest Integer)

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

Question Number : 52 Question Id : 8643515632 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

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

Question Number : 53 Question Id : 8643515633 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The gas phase reaction

$$2A(g) \rightleftharpoons A_2(g)$$

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

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

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

$\log_{10} 2 = 0.30$, 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 : 54 Question Id : 8643515634 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 : 55 Question Id : 8643515635 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The solubility of $CdSO_4$ in water is 8.0×10^{-4} mol L^{-1}. Its solubility in 0.01 M H_2SO_4 solution is _____ $\times 10^{-6}$ mol L^{-1}. (Round off to the Nearest Integer).

(Assume that solubility is much less than 0.01 M)

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

Question Number : 56 Question Id : 8643515636 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

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 :

Question Number : 57 Question Id : 8643515637 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

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]

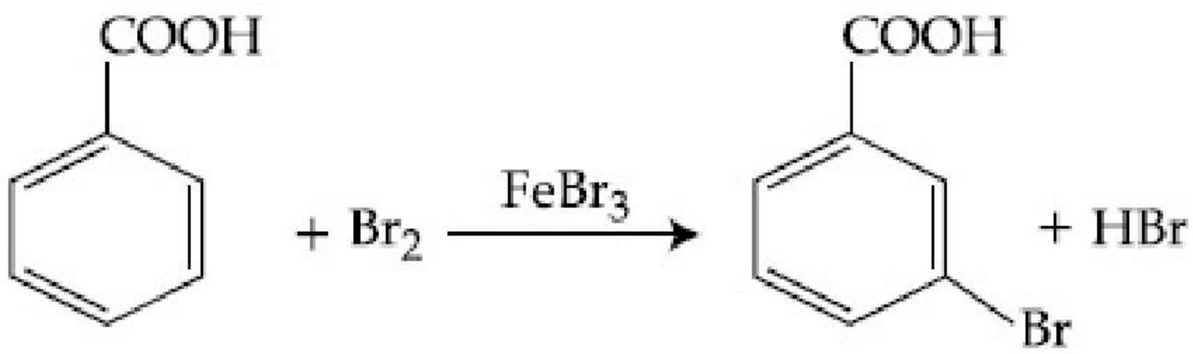
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 58 Question Id : 8643515638 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A xenon compound 'A' upon partial hydrolysis gives XeO_2F_2. 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 : 59 Question Id : 8643515639 Question Type : SA
Correct Marks : 4 Wrong Marks : 0



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).

[Given : Atomic masses : C : 12.0 u, H : 1.0 u, O : 16.0 u, Br : 80.0 u]

Response Type : Numeric

Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 60 Question Id : 8643515640 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

In Tollen's test for aldehyde, the overall number of electron(s) transferred to the Tollen's reagent formula $[Ag(NH_3)_2]^+$ 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

Mathematics Section A

Section Id :	864351377
Section Number :	5
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 :	864351377
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 8643515641 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 $\alpha \in R$, then the value of $27\sec^6\alpha + 8\operatorname{cosec}^6\alpha$ is equal to :

Options :

86435116921. 500

400

86435116923. 350

86435116924. 250

Question Number : 62 Question Id : 8643515642 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 :

86435116925. $((P \Rightarrow Q) \wedge \sim Q) \Rightarrow P$

86435116926. $((P \Rightarrow Q) \wedge \sim Q) \Rightarrow Q$

86435116927. $((P \Rightarrow Q) \wedge \sim Q) \Rightarrow \sim P$

86435116928. $((P \Rightarrow Q) \wedge \sim Q) \Rightarrow (P \wedge Q)$

Question Number : 63 Question Id : 8643515643 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 ΔABC is 2, then the height of the pole is equal to :

Options :

86435116929. $\frac{2\sqrt{3}}{3}$

86435116930. $2\sqrt{3}$

86435116931. $\frac{1}{\sqrt{3}}$

Question Number : 64 Question Id : 8643515644 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 :

86435116933. 925

86435116934. 425

86435116935. 650

86435116936. 250

Question Number : 65 Question Id : 8643515645 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 :

86435116937. $\frac{40}{243}$

86435116938. $\frac{80}{243}$

86435116939. $\frac{128}{625}$

86435116940. $\frac{32}{625}$

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 :

86435116941. $\frac{115}{16}$

86435116942. $\frac{85}{14}$

86435116943. $\frac{127}{20}$

86435116944. $\frac{25}{4}$

Question Number : 67 Question Id : 8643515647 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 ΔABC, then $(R+r)$ is equal to :

Options :

86435116945. $2\sqrt{2}$

86435116946. $\frac{9}{\sqrt{2}}$

86435116947. $7\sqrt{2}$

86435116948. $3\sqrt{2}$

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 θ such that the sum of intercepts on axes made by this tangent is minimum

is equal to :

Options :

86435116949. $\frac{\pi}{3}$

86435116950. $\frac{\pi}{6}$

86435116951. $\frac{\pi}{8}$

86435116952. $\frac{\pi}{4}$

Question Number : 69 Question Id : 8643515649 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 $\frac{dy}{dx} = (y+1)\left((y+1)e^{x^2/2} - x\right)$,

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

Options :

86435116953. $\frac{e^{5/2}}{(1+e^2)^2}$

86435116954. $-\frac{2e^2}{(1+e^2)^2}$

86435116955. $\frac{5e^{1/2}}{(e^2+1)^2}$

86435116956. $\frac{-e^{3/2}}{(e^2+1)^2}$

Question Number : 70 Question Id : 8643515650 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 :

86435116957. $\frac{3\pi}{8}$

86435116958. $\frac{\pi}{16}$

86435116959. $\frac{\pi}{8}$

86435116960. $\frac{3\pi}{2}$

Question Number : 71 Question Id : 8643515651 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 $\frac{1}{3} \le f(t) \le 1$ for all $t \in [0, 1]$ and $0 \le f(t) \le \frac{1}{2}$ for all $t \in (1, 3]$. The largest possible interval in which $g(3)$ lies is :

Options :

86435116961. $\left[\frac{1}{3}, 2\right]$

86435116962. $\left[-1,-\frac{1}{2}\right]$

86435116963. $[1,3]$

86435116964. $\left[-\frac{3}{2},-1\right]$

Question Number : 72 Question Id : 8643515652 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

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

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

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

Options :

86435116965. $-\frac{5}{2}$

86435116966. -3

86435116967. -2

86435116968. $-\frac{3}{2}$

Question Number : 73 Question Id : 8643515653 Question Type : MCQ Opti

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 :

86435116969. 7000

86435116970. 5000

86435116971. 3000

86435116972. 1000

Question Number : 74 Question Id : 8643515654 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 :

86435116973. $\left(2, \pm \frac{3}{2}\right)$

86435116974. $\left(0, \pm \sqrt{3}\right)$

86435116975. $(1, \pm 2)$

86435116976. $\left(\frac{1}{2}, \pm \frac{\sqrt{5}}{2}\right)$

Question Number : 75 Question Id : 8643515655 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let the system of linear equations

$4x + \lambda y + 2z = 0$

$2x - y + z = 0$

$\mu x + 2y + 3z = 0,\ \lambda,\ \mu \in \mathbf{R}.$

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

Options :

86435116977. $\lambda = 3,\ \ \mu \in \mathbf{R}$

86435116978. $\mu = -6,\ \ \lambda \in \mathbf{R}$

86435116979. $\lambda = 2,\ \ \mu \in \mathbf{R}$

86435116980. $\mu = 6,\ \ \lambda \in \mathbf{R}$

Question Number : 76 Question Id : 8643515656 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Let $g : \mathbf{R} \to \mathbf{R}$ be given as $g(x) = 2x - 3$. Then, the sum of all the values of x for which $f^{-1}(x) + g^{-1}(x) = \dfrac{13}{2}$ is equal to.

Options :

86435116981. 2

86435116982. 5

86435116983. 3

86435116984. 7

Question Number : 77 Question Id : 8643515657 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 :

86435116985. $\frac{1}{2}$

86435116986. 2

86435116987. $\frac{1}{4}$

86435116988. 4

Question Number : 78 Question Id : 8643515658 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 :

86435116989. R is reflexive, symmetric but not transitive

86435116990. R is reflexive, transitive but not symmetric

86435116991. R is symmetric, transitive but not reflexive,

86435116992. R is an equivalence relation

Question Number : 79 Question Id : 8643515659 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 ΔQFR is equal to .

Options :

86435116993. $\sqrt{6}-1$

86435116994. $\frac{7}{\sqrt{6}}-2$

86435116995. $4\sqrt{6}-1$

86435116996. $4\sqrt{6}$

Question Number : 80 Question Id : 8643515660 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 :

86435116997. $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$

86435116998. $\cos^{-1}\left(\frac{1}{\sqrt{2}}\right)$

86435116999. $\sin^{-1}\left(\frac{1}{\sqrt{3}}\right)$

$\sin^{-1}\left(\frac{1}{\quad}\right)$

Mathematics Section B

Section Id :	864351378
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 :	864351378
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 8643515661 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 _____.

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

Question Number : 82 Question Id : 8643515662 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Let I be an identity matrix of order 2×2 and $P = \begin{bmatrix} 2 & -1 \\ 5 & -3 \end{bmatrix}$. Then the value of $n \in N$ 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 :

Question Number : 83 Question Id : 8643515663 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

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
Text Areas : PlainText
Possible Answers :
100

Question Number : 84 Question Id : 8643515664 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

If $\sum_{r=1}^{10} r!\left(r^3+6r^2+2r+5\right)=\alpha(11!)$,

then the value of α 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 : 8643515665 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

Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 86 Question Id : 8643515666 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Let $y=y(x)$ be the solution of the differential equation $x\,dy-y\,dx=\sqrt{\left(x^2-y^2\right)}\,dx$, $x\geqslant 1$, with $y(1)=0$. If the area bounded by the line $x=1$, $x=e^{\pi}$, $y=0$ and $y=y(x)$ is $\alpha e^{2\pi}+\beta$, then the value of $10(\alpha+\beta)$ 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 : 87 Question Id : 8643515667 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 _____.

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 : 8643515668 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Let the mirror image of the point (1, 3, a) with respect to the plane $\vec{r}\cdot\left(2\hat{i}-\hat{j}+\hat{k}\right)-b=0$ 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 : 89 Question Id : 8643515669 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Let ${}^nC_r$ denote the binomial coefficient of x^r in the expansion of $(1+x)^n$.

If $\sum_{k=0}^{10}(2^2+3k)\,{}^nC_k=\alpha.3^{10}+\beta.2^{10}$, $\alpha, \beta\in R$, then $\alpha+\beta$ 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 : 90 Question Id : 8643515670 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

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

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

_____.

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