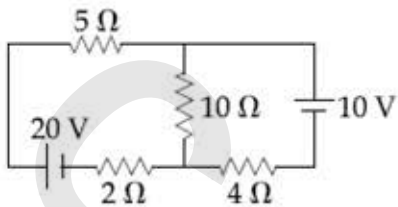


JEE 2nd to 6th Sep 2020

Application No.	
Candidate Name	
Roll No.	
Test Date	
Test Time	
Subject	

Section : Physics

Q.1



In the figure shown, the current in the 10 V battery is close to :

- Options
1. 0.71 A from positive to negative terminal
 2. 0.42 A from positive to negative terminal
 3. 0.21 A from positive to negative terminal
 4. 0.36 A from negative to positive terminal

Question Type : MCQ

Question ID : 40503611543

Option 1 ID : 40503641846

Option 2 ID : 40503641845

Option 3 ID : 40503641844

Option 4 ID : 40503641847

Status : Answered

Chosen Option : 4

Q.2 A charged particle going around in a circle can be considered to be a current loop. A particle of mass m carrying charge q is moving in a plane with speed v under the influence of magnetic field \vec{B} . The magnetic moment of this moving particle :

Options

1. $\frac{mv^2 \vec{B}}{2 B^2}$

2. $-\frac{mv^2 \vec{B}}{2 \pi B^2}$

3. $-\frac{mv^2 \vec{B}}{B^2}$

4. $-\frac{mv^2 \vec{B}}{2 B^2}$

Question Type : MCQ

Question ID : 40503611544

Option 1 ID : 40503641848

Option 2 ID : 40503641850

Option 3 ID : 40503641851

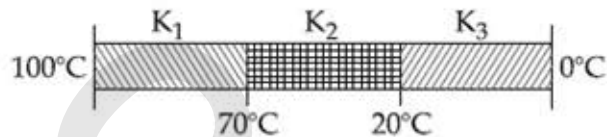
Option 4 ID : 40503641849

Status : Answered

Chosen Option : 1

Q.3

Three rods of identical cross-section and lengths are made of three different materials of thermal conductivity K_1 , K_2 and K_3 , respectively. They are joined together at their ends to make a long rod (see figure). One end of the long rod is maintained at 100°C and the other at 0°C (see figure). If the joints of the rod are at 70°C and 20°C in steady state and there is no loss of energy from the surface of the rod, the correct relationship between K_1 , K_2 and K_3 is :



Options

1. $K_1 : K_3 = 2 : 3,$
 $K_2 : K_3 = 2 : 5$
2. $K_1 < K_2 < K_3$
3. $K_1 : K_2 = 5 : 2,$
 $K_1 : K_3 = 3 : 5$
4. $K_1 > K_2 > K_3$

Question Type : MCQ

Question ID : 40503611538

Option 1 ID : 40503641827

Option 2 ID : 40503641825

Option 3 ID : 40503641826

Option 4 ID : 40503641824

Status : Answered

Chosen Option : 1

Q.4 Two identical electric point dipoles have

dipole moments $\vec{p}_1 = p \hat{i}$ and $\vec{p}_2 = -p \hat{i}$ and are held on the x axis at distance ' a ' from each other. When released, they move along the x -axis with the direction of their dipole moments remaining unchanged. If the mass of each dipole is ' m ', their speed when they are infinitely far apart is :

Options

1. $\frac{p}{a} \sqrt{\frac{1}{\pi \epsilon_0 m a}}$

2. $\frac{p}{a} \sqrt{\frac{1}{2\pi \epsilon_0 m a}}$

3. $\frac{p}{a} \sqrt{\frac{2}{\pi \epsilon_0 m a}}$

4. $\frac{p}{a} \sqrt{\frac{3}{2\pi \epsilon_0 m a}}$

Question Type : MCQ

Question ID : 40503611542

Option 1 ID : 40503641841

Option 2 ID : 40503641840

Option 3 ID : 40503641843

Option 4 ID : 40503641842

Status : Answered

Chosen Option : 3

Q.5

For a plane electromagnetic wave, the magnetic field at a point x and time t is

$$\vec{B}(x, t) = [1.2 \times 10^{-7} \sin(0.5 \times 10^3 x + 1.5 \times 10^{11} t) \hat{k}] \text{ T}$$

The instantaneous electric field \vec{E}

corresponding to \vec{B} is :

(speed of light $c = 3 \times 10^8 \text{ ms}^{-1}$)

Options

1. $\vec{E}(x, t) = [-36 \sin(0.5 \times 10^3 x + 1.5 \times 10^{11} t) \hat{j}] \frac{\text{V}}{\text{m}}$

2. $\vec{E}(x, t) = [36 \sin(1 \times 10^3 x + 0.5 \times 10^{11} t) \hat{j}] \frac{\text{V}}{\text{m}}$

3. $\vec{E}(x, t) = [36 \sin(0.5 \times 10^3 x + 1.5 \times 10^{11} t) \hat{k}] \frac{\text{V}}{\text{m}}$

4. $\vec{E}(x, t) = [36 \sin(1 \times 10^3 x + 1.5 \times 10^{11} t) \hat{i}] \frac{\text{V}}{\text{m}}$

Question Type : MCQ

Question ID : 40503611546

Option 1 ID : 40503641857

Option 2 ID : 40503641856

Option 3 ID : 40503641859

Option 4 ID : 40503641858

Status : Answered

Chosen Option : 1

Q.6 Two planets have masses M and $16M$ and their radii are a and $2a$, respectively. The separation between the centres of the planets is $10a$. A body of mass m is fired from the surface of the larger planet towards the smaller planet along the line joining their centres. For the body to be able to reach at the surface of smaller planet, the minimum firing speed needed is :

Options

1. $2\sqrt{\frac{GM}{a}}$

2. $4\sqrt{\frac{GM}{a}}$

3. $\sqrt{\frac{GM^2}{ma}}$

4. $\frac{3}{2}\sqrt{\frac{5GM}{a}}$

Question Type : MCQ

Question ID : 40503611536

Option 1 ID : 40503641819

Option 2 ID : 40503641816

Option 3 ID : 40503641818

Option 4 ID : 40503641817

Status : Answered

Chosen Option : 4

Q.7 A particle moving in the xy plane experiences a velocity dependent force

$$\vec{F} = k \left(v_y \hat{i} + v_x \hat{j} \right), \text{ where } v_x \text{ and } v_y \text{ are}$$

the x and y components of its velocity \vec{v} .

If \vec{a} is the acceleration of the particle, then which of the following statements is true for the particle ?

- Options
1. quantity $\vec{v} \times \vec{a}$ is constant in time
 2. \vec{F} arises due to a magnetic field
 3. kinetic energy of particle is constant in time
 4. quantity $\vec{v} \cdot \vec{a}$ is constant in time

Question Type : MCQ

Question ID : 40503611533

Option 1 ID : 40503641807

Option 2 ID : 40503641804

Option 3 ID : 40503641806

Option 4 ID : 40503641805

Status : Answered

Chosen Option : 2

Q.8

Particle A of mass m_1 moving with velocity

$(\sqrt{3}\hat{i} + \hat{j})\text{ms}^{-1}$ collides with another

particle B of mass m_2 which is at rest

initially. Let \vec{v}_1 and \vec{v}_2 be the velocities

of particles A and B after collision

respectively. If $m_1 = 2m_2$ and after

collision $\vec{v}_1 = (\hat{i} + \sqrt{3}\hat{j})\text{ms}^{-1}$, the angle

between \vec{v}_1 and \vec{v}_2 is :

- Options
1. 15°
 2. 60°
 3. -45°
 4. 105°

Question Type : MCQ

Question ID : 40503641534

Option 1 ID : 40503641811

Option 2 ID : 40503641809

Option 3 ID : 40503641808

Option 4 ID : 40503641810

Status : Answered

Chosen Option : 3

Q.9

When a car is at rest, its driver sees rain drops falling on it vertically. When driving the car with speed v , he sees that rain drops are coming at an angle 60° from the horizontal. On further increasing the speed of the car to $(1 + \beta)v$, this angle changes to 45° . The value of β is close to :

- Options
1. 0.50
 2. 0.41
 3. 0.37
 4. 0.73

Question Type : MCQ

Question ID : 40503641532

Option 1 ID : 40503641801

Option 2 ID : 40503641800

Option 3 ID : 40503641802

Option 4 ID : 40503641803

Status : Answered

Chosen Option : 2

Q.10 Given the masses of various atomic particles $m_p = 1.0072 \text{ u}$, $m_n = 1.0087 \text{ u}$, $m_e = 0.000548 \text{ u}$, $m_{\bar{\nu}} = 0$, $m_d = 2.0141 \text{ u}$, where $p \equiv$ proton, $n \equiv$ neutron, $e \equiv$ electron, $\bar{\nu} \equiv$ antineutrino and $d \equiv$ deuteron. Which of the following process is allowed by momentum and energy conservation ?

- Options
1. $n + n \rightarrow$ deuterium atom (electron bound to the nucleus)
 2. $p \rightarrow n + e^+ + \bar{\nu}$
 3. $n + p \rightarrow d + \gamma$
 4. $e^+ + e^- \rightarrow \gamma$

Question Type : MCQ
 Question ID : 40503611548
 Option 1 ID : 40503641867
 Option 2 ID : 40503641864
 Option 3 ID : 40503641866
 Option 4 ID : 40503641865
 Status : Answered
 Chosen Option : 2

Q.11 A circuit to verify Ohm's law uses ammeter and voltmeter in series or parallel connected correctly to the resistor. In the circuit :

- Options
1. ammeter is always used in parallel and voltmeter is series
 2. Both ammeter and voltmeter must be connected in parallel
 3. ammeter is always connected in series and voltmeter in parallel
 4. Both, ammeter and voltmeter must be connected in series

Question Type : MCQ
 Question ID : 40503611550
 Option 1 ID : 40503641872
 Option 2 ID : 40503641875
 Option 3 ID : 40503641873
 Option 4 ID : 40503641874
 Status : Answered
 Chosen Option : 1

Q.12 Consider the force F on a charge ' q ' due to a uniformly charged spherical shell of radius R carrying charge Q distributed uniformly over it. Which one of the following statements is true for F , if ' q ' is placed at distance r from the centre of the shell ?

Options

1. $F = \frac{1}{4\pi\epsilon_0} \frac{Qq}{R^2}$ for $r < R$

2. $\frac{1}{4\pi\epsilon_0} \frac{qQ}{R^2} > F > 0$ for $r < R$

3. $F = \frac{1}{4\pi\epsilon_0} \frac{Qq}{r^2}$ for $r > R$

4. $F = \frac{1}{4\pi\epsilon_0} \frac{Qq}{r^2}$ for all r

Question Type : MCQ

Question ID : 40503611541

Option 1 ID : 40503641837

Option 2 ID : 40503641839

Option 3 ID : 40503641838

Option 4 ID : 40503641836

Status : Answered

Chosen Option : 4

Q.13 A student measuring the diameter of a pencil of circular cross-section with the help of a vernier scale records the following four readings 5.50 mm, 5.55 mm, 5.45 mm ; 5.65 mm. The average of these four readings is 5.5375 mm and the standard deviation of the data is 0.07395 mm. The average diameter of the pencil should therefore be recorded as :

Options 1. (5.5375 ± 0.0739) mm

2. (5.5375 ± 0.0740) mm

3. (5.538 ± 0.074) mm

4. (5.54 ± 0.07) mm

Question Type : MCQ

Question ID : 40503611531

Option 1 ID : 40503641799

Option 2 ID : 40503641796

Option 3 ID : 40503641797

Option 4 ID : 40503641798

Status : Answered

Chosen Option : 4

Q.14 A double convex lens has power P and same radii of curvature R of both the surfaces. The radius of curvature of a surface of a plano-convex lens made of the same material with power $1.5 P$ is :

- Options
1. $2R$
 2. $\frac{R}{2}$
 3. $\frac{3R}{2}$
 4. $\frac{R}{3}$

Question Type : MCQ

Question ID : 40503611547

Option 1 ID : 40503641862

Option 2 ID : 40503641861

Option 3 ID : 40503641863

Option 4 ID : 40503641860

Status : Answered

Chosen Option : 3

Q.15 A square loop of side $2a$ and carrying current I is kept in xz plane with its centre at origin. A long wire carrying the same current I is placed parallel to z -axis and passing through point $(0, b, 0)$, ($b \gg a$). The magnitude of torque on the loop about z -axis will be :

- Options
1. $\frac{2\mu_0 I^2 a^2}{\pi b}$
 2. $\frac{2\mu_0 I^2 a^2 b}{\pi(a^2 + b^2)}$
 3. $\frac{\mu_0 I^2 a^2 b}{2\pi(a^2 + b^2)}$
 4. $\frac{\mu_0 I^2 a^2}{2\pi b}$

Question Type : MCQ

Question ID : 40503611545

Option 1 ID : 40503641852

Option 2 ID : 40503641853

Option 3 ID : 40503641854

Option 4 ID : 40503641855

Status : Answered

Chosen Option : 4

Q.16 A fluid is flowing through a horizontal pipe of varying cross-section, with speed $v \text{ ms}^{-1}$ at a point where the pressure is P Pascal .

At another point where pressure is $\frac{P}{2}$ Pascal its speed is $V \text{ ms}^{-1}$. If the density of the fluid is $\rho \text{ kg m}^{-3}$ and the flow is streamline, then V is equal to :

Options

1. $\sqrt{\frac{P}{\rho} + v}$

2. $\sqrt{\frac{2P}{\rho} + v^2}$

3. $\sqrt{\frac{P}{2\rho} + v^2}$

4. $\sqrt{\frac{P}{\rho} + v^2}$

Question Type : MCQ

Question ID : 40503611537

Option 1 ID : 40503641822

Option 2 ID : 40503641821

Option 3 ID : 40503641823

Option 4 ID : 40503641820

Status : Answered

Chosen Option : 2

Q.17 When a particle of mass m is attached to a vertical spring of spring constant k and released, its motion is described by $y(t) = y_0 \sin^2 \omega t$, where ' y ' is measured from the lower end of unstretched spring. Then ω is :

Options

1. $\frac{1}{2} \sqrt{\frac{g}{y_0}}$

2. $\sqrt{\frac{g}{y_0}}$

3. $\sqrt{\frac{g}{2y_0}}$

4. $\sqrt{\frac{2g}{y_0}}$

Question Type : MCQ

Question ID : 40503611540

Option 1 ID : 40503641835

Option 2 ID : 40503641832

Option 3 ID : 40503641834

Option 4 ID : 40503641833

Status : Answered

Chosen Option : 2

Q.18 In a dilute gas at pressure P and temperature T , the mean time between successive collisions of a molecule varies with T as :

Options 1. T

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

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

4. \sqrt{T}

Question Type : MCQ

Question ID : 40503611539

Option 1 ID : 40503641828

Option 2 ID : 40503641831

Option 3 ID : 40503641829

Option 4 ID : 40503641830

Status : Answered

Chosen Option : 1

Q.19 Assuming the nitrogen molecule is moving with r.m.s. velocity at 400 K, the de-Broglie wavelength of nitrogen molecule is close to :

(Given : nitrogen molecule weight : 4.64×10^{-26} kg,

Boltzman constant : 1.38×10^{-23} J/K,

Planck constant : 6.63×10^{-34} J.s)

Options 1. 0.24 \AA

2. 0.20 \AA

3. 0.34 \AA

4. 0.44 \AA

Question Type : MCQ

Question ID : 40503611549

Option 1 ID : 40503641871

Option 2 ID : 40503641868

Option 3 ID : 40503641869

Option 4 ID : 40503641870

Status : Answered

Chosen Option : 3

Q.20

The linear mass density of a thin rod AB of length L varies from A to B as

$$\lambda(x) = \lambda_0 \left(1 + \frac{x}{L} \right), \text{ where } x \text{ is the}$$

distance from A. If M is the mass of the rod then its moment of inertia about an axis passing through A and perpendicular to the rod is :

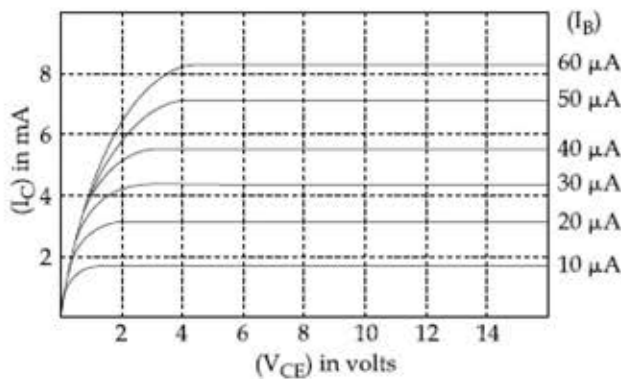
Options

1. $\frac{5}{12} ML^2$
2. $\frac{7}{18} ML^2$
3. $\frac{2}{5} ML^2$
4. $\frac{3}{7} ML^2$

Question Type : MCQ
 Question ID : 40503611535
 Option 1 ID : 40503641812
 Option 2 ID : 40503641813
 Option 3 ID : 40503641814
 Option 4 ID : 40503641815
 Status : Answered
 Chosen Option : 3

Q.21

The output characteristics of a transistor is shown in the figure. When V_{CE} is 10 V and $I_C = 4.0 \text{ mA}$, then value of β_{ac} is _____.



Given --
 Answer :

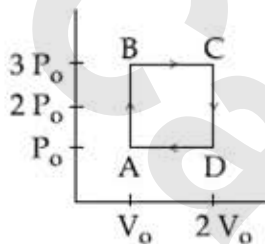
Question Type : SA
 Question ID : 40503611555
 Status : Not Answered

- Q.22 The centre of mass of a solid hemisphere of radius 8 cm is x cm from the centre of the flat surface. Then value of x is _____.

Given --
Answer :

Question Type : SA
Question ID : 40503611551
Status : Not Answered

- Q.23 An engine operates by taking a monatomic ideal gas through the cycle shown in the figure. The percentage efficiency of the engine is close to _____.



Given --
Answer :

Question Type : SA
Question ID : 40503611552
Status : Not Answered

- Q.24 A Young's double-slit experiment is performed using monochromatic light of wavelength λ . The intensity of light at a point on the screen, where the path difference is λ , is K units. The intensity of light at a point where the path difference is $\frac{\lambda}{6}$ is given by $\frac{nK}{12}$, where n is an integer. The value of n is _____.

Given --
Answer :

Question Type : SA
Question ID : 40503611554
Status : Not Answered

- Q.25** In a series LR circuit, power of 400 W is dissipated from a source of 250 V, 50 Hz. The power factor of the circuit is 0.8. In order to bring the power factor to unity, a capacitor of value C is added in series to the L and R. Taking the value of C as $\left(\frac{n}{3\pi}\right) \mu\text{F}$, then value of n is _____.

Given --
Answer :

Question Type : SA
Question ID : 40503611553
Status : Not Answered

Section : Chemistry

- Q.1** For a reaction,

$$4 \text{M(s)} + n \text{O}_2(\text{g}) \rightarrow 2 \text{M}_2\text{O}_n(\text{s}),$$
 the free energy change is plotted as a function of temperature. The temperature below which the oxide is stable could be inferred from the plot as the point at which :

- Options
1. the slope changes from negative to positive
 2. the free energy change shows a change from negative to positive value
 3. the slope changes from positive to negative
 4. the slope changes from positive to zero

Question Type : MCQ
Question ID : 40503611572
Option 1 ID : 40503641945
Option 2 ID : 40503641947
Option 3 ID : 40503641946
Option 4 ID : 40503641948
Status : Answered
Chosen Option : 4

Q.2 The average molar mass of chlorine is 35.5 g mol^{-1} . The ratio of ^{35}Cl to ^{37}Cl in naturally occurring chlorine is close to :

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

Question Type : MCQ

Question ID : 40503611570

Option 1 ID : 40503641940

Option 2 ID : 40503641939

Option 3 ID : 40503641938

Option 4 ID : 40503641937

Status : Answered

Chosen Option : 2

Q.3 Which one of the following statements is not true ?

- Options
- Lactose contains α -glycosidic linkage
1. between C_1 of galactose and C_4 of glucose.
 2. Lactose is a reducing sugar and it gives Fehling's test.
 3. Lactose ($\text{C}_{11}\text{H}_{22}\text{O}_{11}$) is a disaccharide and it contains 8 hydroxyl groups.
On acid hydrolysis, lactose gives one
 4. molecule of D(+)-glucose and one molecule of D(+)-galactose.

Question Type : MCQ

Question ID : 40503611556

Option 1 ID : 40503641884

Option 2 ID : 40503641883

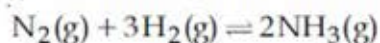
Option 3 ID : 40503641881

Option 4 ID : 40503641882

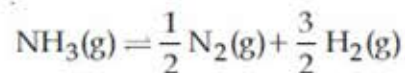
Status : Answered

Chosen Option : 2

Q.4 The value of K_c is 64 at 800 K for the reaction



The value of K_c for the following reaction is :



Options 1. 1/64

2. 8

3. 1/4

4. 1/8

Question Type : MCQ

Question ID : 40503611574

Option 1 ID : 40503641953

Option 2 ID : 40503641954

Option 3 ID : 40503641956

Option 4 ID : 40503641955

Status : Answered

Chosen Option : 1

Q.5 Dihydrogen of high purity (> 99.95%) is obtained through :

Options 1. the reaction of Zn with dilute HCl.

2. the electrolysis of acidified water using Pt electrodes.

3. the electrolysis of brine solution.

4. the electrolysis of warm $\text{Ba}(\text{OH})_2$ solution using Ni electrodes.

Question Type : MCQ

Question ID : 40503611564

Option 1 ID : 40503641915

Option 2 ID : 40503641913

Option 3 ID : 40503641914

Option 4 ID : 40503641916

Status : Answered

Chosen Option : 2

Q.6 The reaction of NO with N_2O_4 at 250 K gives :

- Options
1. N_2O
 2. NO_2
 3. N_2O_3
 4. N_2O_5

Question Type : MCQ

Question ID : 40503611566

Option 1 ID : 40503641924

Option 2 ID : 40503641921

Option 3 ID : 40503641922

Option 4 ID : 40503641923

Status : Answered

Chosen Option : 4

Q.7 The correct match between Item - I (starting material) and Item - II (reagent) for the preparation of benzaldehyde is :

Item - I	Item - II
(I) Benzene	(P) HCl and $SnCl_2, H_3O^+$
(II) Benzonitrile	(Q) $H_2, Pd-BaSO_4, S$ and quinoline
(III) Benzoyl Chloride	(R) CO, HCl and $AlCl_3$

- Options
1. (I) - (Q), (II) - (R) and (III) - (P)
 2. (I) - (P), (II) - (Q) and (III) - (R)
 3. (I) - (R), (II) - (P) and (III) - (Q)
 4. (I) - (R), (II) - (Q) and (III) - (P)

Question Type : MCQ

Question ID : 40503611559

Option 1 ID : 40503641895

Option 2 ID : 40503641896

Option 3 ID : 40503641893

Option 4 ID : 40503641894

Status : Answered

Chosen Option : 3

Q.8 A crystal is made up of metal ions ' M_1 ' and ' M_2 ' and oxide ions. Oxide ions form a ccp lattice structure. The cation ' M_1 ' occupies 50% of octahedral voids and the cation ' M_2 ' occupies 12.5% of tetrahedral voids of oxide lattice. The oxidation numbers of ' M_1 ' and ' M_2 ' are, respectively :

- Options
1. +2, +4
 2. +1, +3
 3. +3, +1
 4. +4, +2

Question Type : MCQ

Question ID : 40503611571

Option 1 ID : 40503641941

Option 2 ID : 40503641943

Option 3 ID : 40503641944

Option 4 ID : 40503641942

Status : Answered

Chosen Option : 3

Q.9 The element that can be refined by distillation is :

- Options
1. nickel
 2. zinc
 3. tin
 4. gallium

Question Type : MCQ

Question ID : 40503611563

Option 1 ID : 40503641910

Option 2 ID : 40503641909

Option 3 ID : 40503641911

Option 4 ID : 40503641912

Status : Answered

Chosen Option : 1

Q.10 For a d^4 metal ion in an octahedral field, the correct electronic configuration is :

- Options
1. $t_{2g}^3 e_g^1$ when $\Delta_o < P$
 2. $t_{2g}^3 e_g^1$ when $\Delta_o > P$
 3. $t_{2g}^4 e_g^0$ when $\Delta_o < P$
 4. $e_g^2 t_{2g}^2$ when $\Delta_o < P$

Question Type : MCQ

Question ID : 40503611569

Option 1 ID : 40503641934

Option 2 ID : 40503641933

Option 3 ID : 40503641935

Option 4 ID : 40503641936

Status : Answered

Chosen Option : 4

Q.11 Match the following :

Test / Method	Reagent
(i) Lucas Test	(a) $C_6H_5SO_2Cl$ / aq. KOH
(ii) Dumas method	(b) HNO_3 / $AgNO_3$
(iii) Kjeldahl's method	(c) CuO/CO_2
(iv) Hinsberg Test	(d) Conc. HCl and $ZnCl_2$
	(e) H_2SO_4

- Options
1. (i)-(d), (ii)-(c), (iii)-(b), (iv)-(e)
 2. (i)-(b), (ii)-(d), (iii)-(e), (iv)-(a)
 3. (i)-(d), (ii)-(c), (iii)-(e), (iv)-(a)
 4. (i)-(b), (ii)-(a), (iii)-(c), (iv)-(d)

Question Type : MCQ

Question ID : 40503611562

Option 1 ID : 40503641906

Option 2 ID : 40503641905

Option 3 ID : 40503641908

Option 4 ID : 40503641907

Status : Answered

Chosen Option : 2

Q.12 Match the following compounds (Column-I) with their uses (Column-II) :

S. No.	Column - I	S. No.	Column - II
(I)	Ca(OH)_2	(A)	casts of statues
(II)	NaCl	(B)	white wash
(III)	$\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$	(C)	antacid
(IV)	CaCO_3	(D)	washing soda preparation

- Options
1. (I)-(D), (II)-(A), (III)-(C), (IV)-(B)
 2. (I)-(B), (II)-(D), (III)-(A), (IV)-(C)
 3. (I)-(B), (II)-(C), (III)-(D), (IV)-(A)
 4. (I)-(C), (II)-(D), (III)-(B), (IV)-(A)

Question Type : MCQ

Question ID : 40503611565

Option 1 ID : 40503641917

Option 2 ID : 40503641919

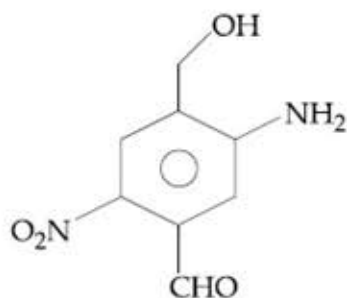
Option 3 ID : 40503641920

Option 4 ID : 40503641918

Status : Answered

Chosen Option : 1

Q.13 The IUPAC name of the following compound is :



- Options
1. 2-nitro-4-hydroxymethyl-5-amino benzaldehyde
 2. 3-amino-4-hydroxymethyl-5-nitrobenzaldehyde
 3. 5-amino-4-hydroxymethyl-2-nitrobenzaldehyde
 4. 4-amino-2-formyl-5-hydroxymethyl nitrobenzene

Question Type : MCQ

Question ID : 40503611561

Option 1 ID : 40503641903

Option 2 ID : 40503641901

Option 3 ID : 40503641902

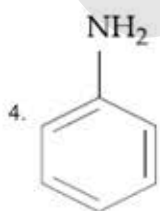
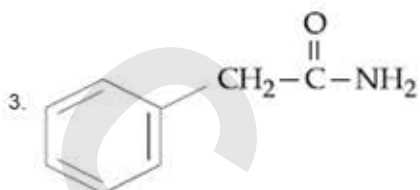
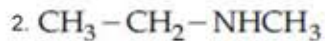
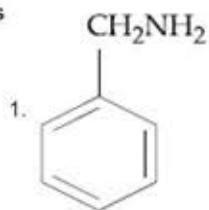
Option 4 ID : 40503641904

Status : Answered

Chosen Option : 3

Q.14 Which of the following compounds can be prepared in good yield by Gabriel phthalimide synthesis ?

Options



Question Type : MCQ

Question ID : 40503611558

Option 1 ID : 40503641890

Option 2 ID : 40503641891

Option 3 ID : 40503641889

Option 4 ID : 40503641892

Status : Answered

Chosen Option : 3

Q.15 A set of solutions is prepared using 180 g of water as a solvent and 10 g of different non-volatile solutes A, B and C. The relative lowering of vapour pressure in the presence of these solutes are in the order [Given, molar mass of $A = 100 \text{ g mol}^{-1}$; $B = 200 \text{ g mol}^{-1}$; $C = 10,000 \text{ g mol}^{-1}$]

Options 1. $B > C > A$

2. $C > B > A$

3. $A > B > C$

4. $A > C > B$

Question Type : MCQ

Question ID : 40503611573

Option 1 ID : 40503641950

Option 2 ID : 40503641951

Option 3 ID : 40503641949

Option 4 ID : 40503641952

Status : Answered

Chosen Option : 3

Q.16 For the given cell ;
 $\text{Cu(s)}|\text{Cu}^{2+}(\text{C}_1 \text{ M})||\text{Cu}^{2+}(\text{C}_2 \text{ M})|\text{Cu(s)}$
change in Gibbs energy (ΔG) is negative,
if :

- Options
1. $C_1 = C_2$
 2. $C_2 = C_1/\sqrt{2}$
 3. $C_1 = 2 C_2$
 4. $C_2 = \sqrt{2} C_1$

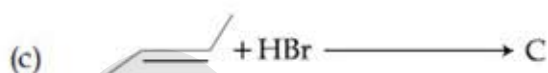
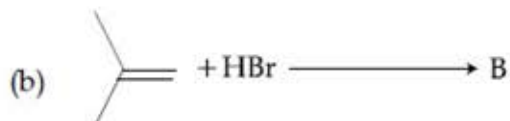
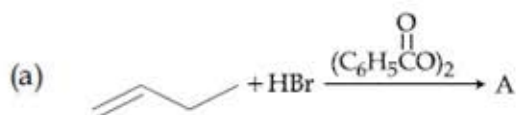
Question Type : MCQ
Question ID : 40503611575
Option 1 ID : 40503641957
Option 2 ID : 40503641958
Option 3 ID : 40503641960
Option 4 ID : 40503641959
Status : Answered
Chosen Option : 1

Q.17 Reaction of an inorganic sulphite X with dilute H_2SO_4 generates compound Y. Reaction of Y with NaOH gives X. Further, the reaction of X with Y and water affords compound Z. Y and Z, respectively, are :

- Options
1. SO_2 and Na_2SO_3
 2. SO_3 and NaHSO_3
 3. SO_2 and NaHSO_3
 4. S and Na_2SO_3

Question Type : MCQ
Question ID : 40503611567
Option 1 ID : 40503641928
Option 2 ID : 40503641927
Option 3 ID : 40503641926
Option 4 ID : 40503641925
Status : Answered
Chosen Option : 2

Q.18 The increasing order of the boiling points of the major products A, B and C of the following reactions will be :



- Options
1. $\text{B} < \text{C} < \text{A}$
 2. $\text{C} < \text{A} < \text{B}$
 3. $\text{A} < \text{B} < \text{C}$
 4. $\text{A} < \text{C} < \text{B}$

Question Type : MCQ

Question ID : 40503611560

Option 1 ID : 40503641898

Option 2 ID : 40503641899

Option 3 ID : 40503641897

Option 4 ID : 40503641900

Status : Answered

Chosen Option : 4

Q.19 Mischmetal is an alloy consisting mainly of :

- Options
1. lanthanoid metals
 2. actinoid and transition metals
 3. lanthanoid and actinoid metals
 4. actinoid metals

Question Type : MCQ

Question ID : 40503611568

Option 1 ID : 40503641929

Option 2 ID : 40503641932

Option 3 ID : 40503641931

Option 4 ID : 40503641930

Status : Answered

Chosen Option : 3

Q.20 The correct match between Item - I and Item - II is :

- | Item - I | Item - II |
|--------------------|-------------------------------------|
| (a) Natural rubber | (I) 1, 3-butadiene + styrene |
| (b) Neoprene | (II) 1, 3-butadiene + acrylonitrile |
| (c) Buna-N | (III) Chloroprene |
| (d) Buna-S | (IV) Isoprene |

- Options
1. (a) - (III), (b) - (IV), (c) - (I), (d) - (II)
 2. (a) - (III), (b) - (IV), (c) - (II), (d) - (I)
 3. (a) - (IV), (b) - (III), (c) - (II), (d) - (I)
 4. (a) - (IV), (b) - (III), (c) - (I), (d) - (II)

Question Type : MCQ

Question ID : 40503641557

Option 1 ID : 40503641885

Option 2 ID : 40503641886

Option 3 ID : 40503641888

Option 4 ID : 40503641887

Status : Answered

Chosen Option : 2

Q.21 If the solubility product of AB_2 is $3.20 \times 10^{-11} M^3$, then the solubility of AB_2 in pure water is $\dots \times 10^{-4} mol L^{-1}$.

[Assuming that neither kind of ion reacts with water]

Given --
Answer :

Question Type : SA

Question ID : 40503611577

Status : Not Answered

Q.22 For Freundlich adsorption isotherm, a plot of $\log(x/m)$ (y -axis) and $\log p$ (x -axis) gives a straight line. The intercept and slope for the line is 0.4771 and 2, respectively. The mass of gas, adsorbed per gram of adsorbent if the initial pressure is 0.04 atm, is $\text{_____} \times 10^{-4}\text{g}$. ($\log 3 = 0.4771$)

Given --
Answer :

Question Type : SA
Question ID : 40503611579
Status : Not Answered

Q.23 A solution of phenol in chloroform when treated with aqueous NaOH gives compound P as a major product. The mass percentage of carbon in P is _____ . (to the nearest integer)
(Atomic mass : C = 12; H = 1; O = 16)

Given --
Answer :

Question Type : SA
Question ID : 40503611580
Status : Not Answered

Q.24 The atomic number of Unnilunium is _____ .

Given --
Answer :

Question Type : SA
Question ID : 40503611576
Status : Not Answered

Q.25 The rate of a reaction decreased by 3.555 times when the temperature was changed from 40 °C to 30 °C. The activation energy (in kJ mol^{-1}) of the reaction is _____ .
Take; $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$ $\ln 3.555 = 1.268$

Given --
Answer :

Question Type : SA
Question ID : 40503611578
Status : Not Answered

Section : Mathematics

Q.1 The integral $\int_1^2 e^x \cdot x^x (2 + \log_e x) dx$

equals :

- Options
1. $e(4e + 1)$
 2. $4e^2 - 1$
 3. $e(4e - 1)$
 4. $e(2e - 1)$

Question Type : MCQ

Question ID : 40503611591

Option 1 ID : 40503642009

Option 2 ID : 40503642006

Option 3 ID : 40503642008

Option 4 ID : 40503642007

Status : Answered

Chosen Option : 4

Q.2 The area (in sq. units) of the region enclosed by the curves $y = x^2 - 1$ and $y = 1 - x^2$ is equal to :

- Options
1. $\frac{4}{3}$
 2. $\frac{8}{3}$
 3. $\frac{7}{2}$
 4. $\frac{16}{3}$

Question Type : MCQ

Question ID : 40503611592

Option 1 ID : 40503642013

Option 2 ID : 40503642012

Option 3 ID : 40503642011

Option 4 ID : 40503642010

Status : Answered

Chosen Option : 3

Q.3 The angle of elevation of the summit of a mountain from a point on the ground is 45° . After climbing up one km towards the summit at an inclination of 30° from the ground, the angle of elevation of the summit is found to be 60° . Then the height (in km) of the summit from the ground is :

Options

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

Question Type : MCQ

Question ID : 40503611599

Option 1 ID : 40503642040

Option 2 ID : 40503642038

Option 3 ID : 40503642039

Option 4 ID : 40503642041

Status : Answered

Chosen Option : 3

Q.4 The set of all real values of λ for which the function $f(x) = (1 - \cos^2 x) \cdot (\lambda + \sin x)$, $x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, has exactly one maxima and exactly one minima, is :

Options

1. $\left(-\frac{1}{2}, \frac{1}{2}\right) - \{0\}$
2. $\left(-\frac{3}{2}, \frac{3}{2}\right)$
3. $\left(-\frac{1}{2}, \frac{1}{2}\right)$
4. $\left(-\frac{3}{2}, \frac{3}{2}\right) - \{0\}$

Question Type : MCQ

Question ID : 40503611590

Option 1 ID : 40503642002

Option 2 ID : 40503642005

Option 3 ID : 40503642003

Option 4 ID : 40503642004

Status : Answered

Chosen Option : 3

Q.5 If α and β are the roots of the equation $2x(2x+1)=1$, then β is equal to :

- Options
1. $2\alpha(\alpha+1)$
 2. $-2\alpha(\alpha+1)$
 3. $2\alpha(\alpha-1)$
 4. $2\alpha^2$

Question Type : MCQ

Question ID : 40503611582

Option 1 ID : 40503641970

Option 2 ID : 40503641971

Option 3 ID : 40503641973

Option 4 ID : 40503641972

Status : Answered

Chosen Option : 4

Q.6 For all twice differentiable functions $f: \mathbb{R} \rightarrow \mathbb{R}$, with $f(0)=f(1)=f'(0)=0$,

- Options
1. $f''(x) \neq 0$ at every point $x \in (0, 1)$
 2. $f''(x) = 0$, for some $x \in (0, 1)$
 3. $f''(0) = 0$
 4. $f''(x) = 0$, at every point $x \in (0, 1)$

Question Type : MCQ

Question ID : 40503611587

Option 1 ID : 40503641990

Option 2 ID : 40503641992

Option 3 ID : 40503641991

Option 4 ID : 40503641993

Status : Answered

Chosen Option : 3

Q.7

If $y = \left(\frac{2}{\pi}x - 1\right) \operatorname{cosec} x$ is the solution of the differential equation,

$$\frac{dy}{dx} + p(x)y = \frac{2}{\pi} \operatorname{cosec} x, \quad 0 < x < \frac{\pi}{2},$$

then the function $p(x)$ is equal to :

- Options
1. $\cot x$
 2. $\operatorname{cosec} x$
 3. $\sec x$
 4. $\tan x$

Question Type : MCQ

Question ID : 40503611593

Option 1 ID : 40503642017

Option 2 ID : 40503642015

Option 3 ID : 40503642014

Option 4 ID : 40503642016

Status : Answered

Chosen Option : 2

Q.8

Let L denote the line in the xy -plane with x and y intercepts as 3 and 1 respectively. Then the image of the point $(-1, -4)$ in this line is :

- Options
1. $\left(\frac{11}{5}, \frac{28}{5}\right)$
 2. $\left(\frac{29}{5}, \frac{8}{5}\right)$
 3. $\left(\frac{8}{5}, \frac{29}{5}\right)$
 4. $\left(\frac{29}{5}, \frac{11}{5}\right)$

Question Type : MCQ

Question ID : 40503611594

Option 1 ID : 40503642021

Option 2 ID : 40503642019

Option 3 ID : 40503642018

Option 4 ID : 40503642020

Status : Answered

Chosen Option : 3

Q.9 If the tangent to the curve, $y=f(x)=x\log_e x$, ($x>0$) at a point $(c, f(c))$ is parallel to the line - segment joining the points $(1, 0)$ and (e, e) , then c is equal to :

- Options
1. $\frac{e-1}{e}$
 2. $e\left(\frac{1}{e-1}\right)$
 3. $e\left(\frac{1}{1-e}\right)$
 4. $\frac{1}{e-1}$

Question Type : MCQ

Question ID : 40503611589

Option 1 ID : 40503642000

Option 2 ID : 40503641998

Option 3 ID : 40503641999

Option 4 ID : 40503642001

Status : Answered

Chosen Option : 1

Q.10 Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be a function defined by $f(x) = \max\{x, x^2\}$. Let S denote the set of all points in \mathbb{R} , where f is not differentiable. Then :

- Options
1. $\{0, 1\}$
 2. $\{0\}$
 3. ϕ (an empty set)
 4. $\{1\}$

Question Type : MCQ

Question ID : 40503611588

Option 1 ID : 40503641995

Option 2 ID : 40503641996

Option 3 ID : 40503641994

Option 4 ID : 40503641997

Status : Answered

Chosen Option : 1

Q.11

Let $\theta = \frac{\pi}{5}$ and $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$. If

$B = A + A^4$, then $\det(B)$:

- Options
1. is one.
 2. lies in (2, 3).
 3. is zero.
 4. lies in (1, 2).

Question Type : MCQ

Question ID : 40503611584

Option 1 ID : 40503641979

Option 2 ID : 40503641980

Option 3 ID : 40503641978

Option 4 ID : 40503641981

Status : Answered

Chosen Option : 4

Q.12

A plane P meets the coordinate axes at A, B and C respectively. The centroid of ΔABC is given to be (1, 1, 2). Then the equation of the line through this centroid and perpendicular to the plane P is :

- Options
1. $\frac{x-1}{2} = \frac{y-1}{1} = \frac{z-2}{1}$
 2. $\frac{x-1}{1} = \frac{y-1}{1} = \frac{z-2}{2}$
 3. $\frac{x-1}{2} = \frac{y-1}{2} = \frac{z-2}{1}$
 4. $\frac{x-1}{1} = \frac{y-1}{2} = \frac{z-2}{2}$

Question Type : MCQ

Question ID : 40503611597

Option 1 ID : 40503642031

Option 2 ID : 40503642030

Option 3 ID : 40503642033

Option 4 ID : 40503642032

Status : Answered

Chosen Option : 2

Q.13 The common difference of the A.P. b_1, b_2, \dots, b_m is 2 more than the common difference of A.P. a_1, a_2, \dots, a_n . If $a_{40} = -159$, $a_{100} = -399$ and $b_{100} = a_{70}$, then b_1 is equal to :

- Options
1. 81
 2. -127
 3. -81
 4. 127

Question Type : MCQ
Question ID : 40503611586
Option 1 ID : 40503641986
Option 2 ID : 40503641989
Option 3 ID : 40503641987
Option 4 ID : 40503641988
Status : Answered
Chosen Option : 2

Q.14 If the normal at an end of a latus rectum of an ellipse passes through an extremity of the minor axis, then the eccentricity e of the ellipse satisfies :

- Options
1. $e^4 + 2e^2 - 1 = 0$
 2. $e^2 + e - 1 = 0$
 3. $e^4 + e^2 - 1 = 0$
 4. $e^2 + 2e - 1 = 0$

Question Type : MCQ
Question ID : 40503611596
Option 1 ID : 40503642028
Option 2 ID : 40503642026
Option 3 ID : 40503642029
Option 4 ID : 40503642027
Status : Answered
Chosen Option : 2

Q.15 For a suitably chosen real constant a , let a function, $f : \mathbb{R} - \{-a\} \rightarrow \mathbb{R}$ be defined by $f(x) = \frac{a-x}{a+x}$. Further suppose that for any real number $x \neq -a$ and $f(x) \neq -a$, $(f \circ f)(x) = x$. Then $f\left(-\frac{1}{2}\right)$ is equal to :

- Options
1. $\frac{1}{3}$
 2. $-\frac{1}{3}$
 3. -3
 4. 3

Question Type : MCQ
 Question ID : 40503611581
 Option 1 ID : 40503641968
 Option 2 ID : 40503641969
 Option 3 ID : 40503641967
 Option 4 ID : 40503641966
 Status : Answered
 Chosen Option : 3

Q.16 If the constant term in the binomial expansion of $\left(\sqrt{x} - \frac{k}{x^2}\right)^{10}$ is 405, then $|k|$ equals :

- Options
1. 9
 2. 1
 3. 3
 4. 2

Question Type : MCQ
 Question ID : 40503611585
 Option 1 ID : 40503641985
 Option 2 ID : 40503641982
 Option 3 ID : 40503641983
 Option 4 ID : 40503641984
 Status : Answered
 Chosen Option : 3

Q.17 The centre of the circle passing through the point $(0, 1)$ and touching the parabola $y = x^2$ at the point $(2, 4)$ is :

Options

1. $\left(\frac{-53}{10}, \frac{16}{5}\right)$

2. $\left(\frac{6}{5}, \frac{53}{10}\right)$

3. $\left(\frac{3}{10}, \frac{16}{5}\right)$

4. $\left(\frac{-16}{5}, \frac{53}{10}\right)$

Question Type : MCQ

Question ID : 40503611595

Option 1 ID : 40503642022

Option 2 ID : 40503642025

Option 3 ID : 40503642023

Option 4 ID : 40503642024

Status : Answered

Chosen Option : 3

Q.18 Let $z = x + iy$ be a non-zero complex number such that $z^2 = i|z|^2$, where $i = \sqrt{-1}$, then z lies on the :

Options

1. line, $y = -x$

2. imaginary axis

3. line, $y = x$

4. real axis

Question Type : MCQ

Question ID : 40503611583

Option 1 ID : 40503641977

Option 2 ID : 40503641974

Option 3 ID : 40503641976

Option 4 ID : 40503641975

Status : Answered

Chosen Option : 2

Q.19 Consider the statement : "For an integer n , if $n^3 - 1$ is even, then n is odd." The contrapositive statement of this statement is :

- Options
1. For an integer n , if n is even, then $n^3 - 1$ is odd.
 2. For an integer n , if $n^3 - 1$ is not even, then n is not odd.
 3. For an integer n , if n is even, then $n^3 - 1$ is even.
 4. For an integer n , if n is odd, then $n^3 - 1$ is even.

Question Type : MCQ

Question ID : 40503611600

Option 1 ID : 40503642042

Option 2 ID : 40503642043

Option 3 ID : 40503642045

Option 4 ID : 40503642044

Status : Answered

Chosen Option : 1

Q.20 The probabilities of three events A, B and C are given by $P(A) = 0.6$, $P(B) = 0.4$ and $P(C) = 0.5$. If $P(A \cup B) = 0.8$, $P(A \cap C) = 0.3$, $P(A \cap B \cap C) = 0.2$, $P(B \cap C) = \beta$ and $P(A \cup B \cup C) = \alpha$, where $0.85 \leq \alpha \leq 0.95$, then β lies in the interval :

- Options
1. $[0.35, 0.36]$
 2. $[0.25, 0.35]$
 3. $[0.20, 0.25]$
 4. $[0.36, 0.40]$

Question Type : MCQ

Question ID : 40503611598

Option 1 ID : 40503642034

Option 2 ID : 40503642036

Option 3 ID : 40503642037

Option 4 ID : 40503642035

Status : Answered

Chosen Option : 3

Q.21 Suppose that a function $f: \mathbb{R} \rightarrow \mathbb{R}$ satisfies $f(x+y) = f(x)f(y)$ for all $x, y \in \mathbb{R}$ and $f(1) = 3$.

If $\sum_{i=1}^n f(i) = 363$, then n is equal to

_____.

Given --
Answer :

Question Type : SA
Question ID : 40503611603
Status : Not Answered

Q.22 The sum of distinct values of λ for which the system of equations

$$(\lambda - 1)x + (3\lambda + 1)y + 2\lambda z = 0$$

$$(\lambda - 1)x + (4\lambda - 2)y + (\lambda + 3)z = 0$$

$$2x + (3\lambda + 1)y + 3(\lambda - 1)z = 0,$$

has non-zero solutions, is _____.

Given --
Answer :

Question Type : SA
Question ID : 40503611601
Status : Not Answered

Q.23 If \vec{x} and \vec{y} be two non-zero vectors such

that $|\vec{x} + \vec{y}| = |\vec{x}|$ and $2\vec{x} + \lambda\vec{y}$ is

perpendicular to \vec{y} , then the value of λ is

_____.

Given --
Answer :

Question Type : SA
Question ID : 40503611604
Status : Not Answered

Q.24

Consider the data on x taking the values $0, 2, 4, 8, \dots, 2^n$ with frequencies ${}^nC_0, {}^nC_1, {}^nC_2, \dots, {}^nC_n$ respectively. If the mean of this data is $\frac{728}{2^n}$, then n is equal to _____.

Given --
Answer :

Question Type : SA
Question ID : 40503611605
Status : Not Answered

Q.25

The number of words (with or without meaning) that can be formed from all the letters of the word "LETTER" in which vowels never come together is _____.

Given --
Answer :

Question Type : SA
Question ID : 40503611602
Status : Not Answered