Test Date: 22-01-2026

Application No: [redacted]

Test Time: 9:00 am - 12:00 pm

NTA JEE Mains Jan 2026

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

MATHEMATICS

Q.2 Let the relation R on the set M = {1, 2, 3,...,16} be given by R={(x, y) : 4y = 5x − 3, x, y ∈ M}.

Then the minimum number of elements required to be added in R, in order to make the relation symmetric, is equal to

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

Question Type : MCQ
Question ID : 444792151
Option 1 ID : 444792514
Option 2 ID : 444792513
Option 3 ID : 444792512
Option 4 ID : 444792511
Status : Not Attempted and Marked For Revie
Chosen Option : --

Q.3 Let the line $x = -1$ divide the area of the region $\{(x, y) : 1 + x^2 \le y \le 3 - x\}$ in the ratio $m : n$, gcd $(m, n) = 1$. Then $m + n$ is equal to

Options
1. 27

Question Type : MCQ
Question ID : 444792168
Option 1 ID : 444792581

Q.6 If a random variable x has the probability distribution

x	0	1	2	3	4	5	6	7
$P(x)$	0	$2k$	k	$3k$	$2k^2$	$2k$	$k^2 + k$	$7k^2$

then $P(3 < x \le 6)$ is equal to

Options
1. 0.64
2. 0.33
3. 0.34
4. 0.22

Question Type : MCQ
Question ID : 444792158
Option 1 ID : 444792540
Option 2 ID : 444792542
Option 3 ID : 444792539
Option 4 ID : 444792541
Status : Not Answered
Chosen Option : --

Q.8 Let P(α, β, γ) be the point on the line $\frac{x-1}{2}=\frac{y+1}{-3}=z$ at a distance $4\sqrt{14}$ from the point (1, −1, 0) and nearer to the origin. Then the shortest distance, between the lines $\frac{x-\alpha}{1}=\frac{y-\beta}{2}=\frac{z-\gamma}{3}$ and $\frac{x+5}{2}=\frac{y-10}{1}=\frac{z-3}{1}$, is equal to

Options
1. $4\sqrt{\frac{5}{7}}$
2. $2\sqrt{\frac{7}{4}}$
3. $7\sqrt{\frac{5}{4}}$
4. $4\sqrt{\frac{7}{5}}$

Question Type : MCQ
Question ID : 444792164
Option 1 ID : 444792563
Option 2 ID : 444792564
Option 3 ID : 444792565
Option 4 ID : 444792566
Status : Answered
Chosen Option : 1

Q.9 Let the solution curve of the differential equation $xdy - ydx = \sqrt{x^2 + y^2}dx, x > 0$, $y(1) = 0$, be $y = y(x)$. Then $y(3)$ is equal to

Options
1. 2
2. 4
3. 6
4. 1

Question Type : MCQ
Question ID : 444792169
Option 1 ID : 444792584
Option 2 ID : 444792585
Option 3 ID : 444792586
Option 4 ID : 444792583
Status : Answered
Chosen Option : 3

Q.13 If the chord joining the points $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$ on the parabola $y^2 = 12x$ subtends a right angle at the vertex of the parabola, then $x_1x_2 - y_1y_2$ is equal to

Options
1. 288
2. 280
3. 284
4. 292

Question Type : MCQ
Question ID : 444792160
Option 1 ID : 444792549
Option 2 ID : 444792547
Option 3 ID : 444792548
Option 4 ID : 444792550
Status : Not Answered
Chosen Option : --

Q.15

The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}}\left(\frac{1}{[x]+4}\right)dx$, where [•] denotes the greatest integer function, is

Options

1. $\frac{1}{60}(\pi-7)$
2. $\frac{1}{60}(21\pi-1)$
3. $\frac{7}{60}(\pi-3)$
4. $\frac{7}{60}(3\pi-1)$

Question Type : MCQ
Question ID : 444792170
Option 1 ID : 444792589
Option 2 ID : 444792590
Option 3 ID : 444792588
Option 4 ID : 444792587
Status : Not Answered
Chosen Option : --

Q.17

Two distinct numbers a and b are selected at random from 1, 2, 3,..., 50. The probability, that their product ab is divisible by 3, is

Options

1. $\frac{8}{25}$
2. $\frac{664}{1225}$
3. $\frac{561}{1225}$
4. $\frac{272}{1225}$

Question Type : MCQ
Question ID : 444792157
Option 1 ID : 444792538
Option 2 ID : 444792535
Option 3 ID : 444792537
Option 4 ID : 444792536
Status : Not Attempted and Marked For Revie
Chosen Option : --

Q.18

Let the set of all values of r, for which the circles $(x+1)^2+(y+4)^2=r^2$ and $x^2+y^2-4x-2y-4=0$ intersect at two distinct points be the interval (α, β). Then $\alpha\beta$ is equal to

Options

1. 25
2. 21
3. 24
4. 20

Question Type : MCQ
Question ID : 444792161
Option 1 ID : 444792551
Option 2 ID : 444792553
Option 3 ID : 444792552
Option 4 ID : 444792554
Status : Not Answered
Chosen Option : --

Q.19

The number of solutions of $\tan^{-1}4x+\tan^{-1}6x=\frac{\pi}{6}$, where $-\frac{1}{2\sqrt{6}}<x<\frac{1}{2\sqrt{6}}$, is equal to

Options

1. 1
2. 3
3. 0
4. 2

Question Type : MCQ
Question ID : 444792162
Option 1 ID : 444792556
Option 2 ID : 444792558
Option 3 ID : 444792555
Option 4 ID : 444792557
Status : Marked For Review
Chosen Option : 1

Q.20

Let $\overrightarrow{AB}=2\hat{i}+4\hat{j}-5\hat{k}$ and $\overrightarrow{AD}=\hat{i}+2\hat{j}+\lambda\hat{k}, \lambda\in\mathbb{R}$. Let the projection of the vector $\vec{v}=\hat{i}+\hat{j}+\hat{k}$ on the diagonal $\overrightarrow{AC}$ of the parallelogram ABCD be of length one unit. If α, β, where $\alpha>\beta$, be the roots of the equation $\lambda^2x^2-6\lambda x+5=0$, then $2\alpha-\beta$ is equal to

Options

1. 3
2. 1
3. 4
4. 6

Question Type : MCQ
Question ID : 444792163
Option 1 ID : 444792560
Option 2 ID : 444792559
Option 3 ID : 444792561
Option 4 ID : 444792562
Status : Not Answered
Chosen Option : --

Q.21

Let ABC be a triangle. Consider four points p_1, p_2, p_3, p_4 on the side AB, five points p_5, p_6, p_7, p_8, p_9 on the side BC, and four points $p_{10}, p_{11}, p_{12}, p_{13}$ on the side AC. None of these points is a vertex of the triangle ABC. Then the total number of pentagons, that can be formed by taking all the vertices from the points $p_1, p_2, \cdots, p_{13}$, is _____

Given Answer : --

Question Type : SA
Question ID : 444792173
Status : Not Attempted and Marked For Revie

Q.22

Let A be a 3×3 matrix such that $A+A^T=O$. If $A\begin{bmatrix}1\\-1\\0\end{bmatrix}=\begin{bmatrix}3\\3\\2\end{bmatrix}, A^2\begin{bmatrix}1\\-1\\0\end{bmatrix}=\begin{bmatrix}-3\\19\\-24\end{bmatrix}$

and $det(adj(2\ adj\ (A+I)))=(2)^{\alpha}\cdot(3)^{\beta}\cdot(11)^{\gamma}$, α, β, γ are non-negative integers, then $\alpha+\beta+\gamma$ is equal to _____

Given Answer : --

Question Type : SA
Question ID : 444792172
Status : Not Answered

Q.23

Let $\alpha=\frac{-1+i\sqrt{3}}{2}$ and $\beta=\frac{-1-i\sqrt{3}}{2}$, $i=\sqrt{-1}$. If

$(7-7\alpha+9\beta)^{20}+(9+7\alpha-7\beta)^{20}+(-7+9\alpha+7\beta)^{20}+(14+7\alpha+7\beta)^{20}=m^{10}$,

then m is _____

Given Answer : --

Question Type : SA
Question ID : 444792171
Status : Not Answered

Q.24

If $\int(\sin x)^{\frac{-11}{2}}(\cos x)^{\frac{-5}{2}}dx=$

$-\frac{p_1}{q_1}(\cot x)^{\frac{9}{2}}-\frac{p_2}{q_2}(\cot x)^{\frac{5}{2}}-\frac{p_3}{q_3}(\cot x)^{\frac{1}{2}}+\frac{p_4}{q_4}(\cot x)^{\frac{-3}{2}}+C$, where p_i and q_i are positive integers with $gcd(p_i, q_i)=1$ for $i=1, 2, 3, 4$ and C is the constant of integration, then $\frac{15p_1p_2p_3p_4}{q_1q_2q_3q_4}$ is equal to _____

Given Answer : --

Question Type : SA
Question ID : 444792175
Status : Not Answered

Q.25 If $\frac{\cos^2 48° - \sin^2 12°}{\sin^2 24° - \sin^2 6°} = \frac{\alpha + \beta\sqrt{5}}{2}$, where $\alpha, \beta \in \mathbb{N}$, then $\alpha + \beta$ is equal to _____

Question Type : SA
Question ID : 444792174
Status : Answered

Given Answer : 2

PHYSICS

Q.27 Three identical coils C_1, C_2 and C_3 are closely placed such that they share a common axis. C_2 is exactly midway. C_1 carries current I in anti-clockwise direction while C_3 carries current I in clockwise direction. An induced current flows through C_2 will be in clockwise direction when

Question Type : MCQ
Question ID : 444792190
Option 1 ID : 444792652
Option 2 ID : 444792655
Option 3 ID : 444792653
Option 4 ID : 444792654
Status : Not Answered
Chosen Option : --

Options
1. C_1 and C_3 move with equal speeds towards C_2
2. C_1 moves away from C_2 and C_3 moves towards C_2
3. C_1 and C_3 move with equal speeds away from C_2
4. C_1 moves towards C_2 and C_3 moves away from C_2

Q.30 7.9 MeV α-particle scatters from a target material of atomic number 79. From the given data the estimated diameter of nuclei of the target material is (approximately) _____m.

$\left[\frac{1}{4\pi\epsilon_o} = 9\times10^9\ \text{Nm}^2/\text{C}^2 \text{ and electron charge} = 1.6\times10^{-19}\ \text{C}\right]$

Question Type : MCQ
Question ID : 444792193
Option 1 ID : 444792664
Option 2 ID : 444792665
Option 3 ID : 444792667
Option 4 ID : 444792666
Status : Answered
Chosen Option : 2

Options
1. 1.69×10^{-12}
2. 2.88×10^{-14}
3. 5.76×10^{-14}
4. 1.44×10^{-13}

Q.32 Given below are two statements:

Statement I: Pressure of a fluid is exerted only on a solid surface in contact as the fluid-pressure does not exist everywhere in a still fluid.

Statement II: Excess potential energy of the molecules on the surface of a liquid, when compared to interior, results in surface tension.

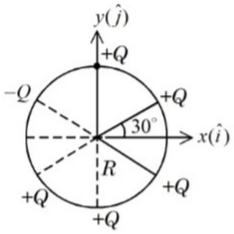
In the light of the above statements, choose the ***correct*** answer from the options given below

Question Type : MCQ
Question ID : 444792183
Option 1 ID : 444792625
Option 2 ID : 444792626
Option 3 ID : 444792624
Option 4 ID : 444792627
Status : Not Answered
Chosen Option : --

Options
1. Both Statement I and Statement II are false
2. Statement I is true but Statement II is false
3. Both Statement I and Statement II are true
4. Statement I is false but Statement II is true

Q.33 Six point charges are kept 60° apart from each other on the circumference of a circle of radius R as shown in figure. The net electric field at the center of the circle is _____.

(ϵ_o is permittivity of free space)

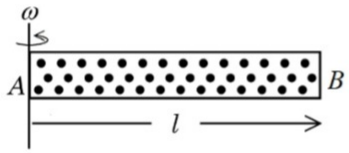


Question Type : MCQ
Question ID : 444792187
Option 1 ID : 444792642
Option 2 ID : 444792641
Option 3 ID : 444792640
Option 4 ID : 444792643
Status : Not Answered
Chosen Option : --

Options
1. $-\frac{Q}{4\pi\epsilon_o R^2}\left(\sqrt{3}\,\hat{i} - \hat{j}\right)$
2. $-\left(\frac{5Q}{8\pi\epsilon_o R^2}\right)\left(\hat{i} - 3\hat{j}\right)$
3. $-\frac{5Q}{8\pi\epsilon_o R^2}\left(\hat{i} + \sqrt{3}\hat{j}\right)$
4. $\frac{Q}{4\pi\epsilon_o R^2}\left(\sqrt{3}\,\hat{i} - \hat{j}\right)$

Q.38

A cylindrical tube AB of length l, closed at both ends contains an ideal gas of 1 mol having molecular weight M. The tube is rotated in a horizontal plane with constant angular velocity ω about an axis perpendicular to AB and passing through the edge at end A, as shown in the figure. If P_A and P_B are the pressures at A and B respectively, then
(Consider the temperature is same at all points in the tube)

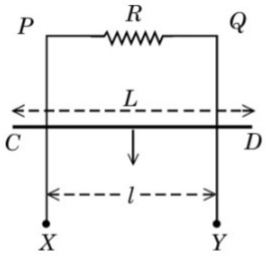


Options
1. $P_B = P_A \exp(M\omega^2 l^2/3RT)$
2. $P_B = P_A$
3. $P_B = P_A \exp(M\omega^2 l^2/RT)$
4. $P_B = P_A \exp(M\omega^2 l^2/2RT)$

Question Type : MCQ
Question ID : 444792184
Option 1 ID : 444792630
Option 2 ID : 444792628
Option 3 ID : 444792631
Option 4 ID : 444792629
Status : Answered
Chosen Option : 1

Q.39

$XPQY$ is a vertical smooth long loop having a total resistance R where PX is parallel to QY and separation between them is l. A constant magnetic field B perpendicular to the plane of the loop exists in the entire space. A rod CD of length L ($L > l$) and mass m is made to slide down from rest under the gravity as shown in figure. The terminal speed acquired by the rod is _____ m/s. (g = acceleration due to gravity)



Options
1. $\frac{mgR}{B^2l^2}$
2. $\frac{8mgR}{B^2l^2}$
3. $\frac{2mgR}{B^2L^2}$
4. $\frac{2mgR}{B^2l^2}$

Question Type : MCQ
Question ID : 444792186
Option 1 ID : 444792636
Option 2 ID : 444792639
Option 3 ID : 444792638
Option 4 ID : 444792637
Status : Not Answered
Chosen Option : --

Q.40

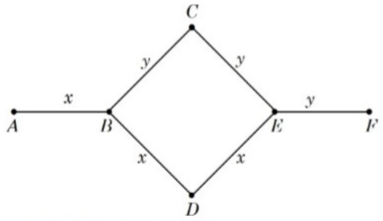
Electric field in a region is given by $\vec{E} = Ax\hat{i} + By\hat{j}$, where $A = 10$ V/m^2 and $B = 5$ V/m^2. If the electric potential at a point (10, 20) is 500 V, then the electric potential at origin is_____V.

Options
1. 500
2. 1000
3. 0
4. 2000

Question Type : MCQ
Question ID : 444792189
Option 1 ID : 444792649
Option 2 ID : 444792650
Option 3 ID : 444792648
Option 4 ID : 444792651
Status : Answered
Chosen Option : 2

Q.44

Rods x and y of equal dimensions but of different materials are joined as shown in figure. Temperatures of end points A and F are maintained at 100 °C and 40 °C respectively. Given the thermal conductivity of rod x is three times of that of rod y, the temperature at junction points B and E are (close to):



Options
1. 80 °C and 70 °C respectively
2. 89 °C and 73 °C respectively
3. 80 °C and 60 °C respectively
4. 60 °C and 45 °C respectively

Question Type : MCQ
Question ID : 444792182
Option 1 ID : 444792623
Option 2 ID : 444792622
Option 3 ID : 444792620
Option 4 ID : 444792621
Status : Answered
Chosen Option : 4

Q.45

Consider an equilateral prism (refractive index $\sqrt{2}$). A ray of light is incident on its one surface at a certain angle i. If the emergent ray is found to graze along the other surface then the angle of refraction at the incident surface is close to _____.

Options
1. 30°
2. 40°
3. 15°
4. 20°

Question Type : MCQ
Question ID : 444792192
Option 1 ID : 444792661
Option 2 ID : 444792663
Option 3 ID : 444792660
Option 4 ID : 444792662
Status : Answered
Chosen Option : 4

Q.46

The electric field of a plane electromagnetic wave, travelling in an unknown non-magnetic medium is given by,

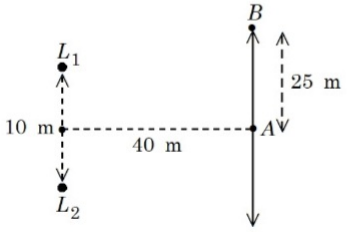
$E_y = 20 \sin(3 \times 10^6 x - 4.5 \times 10^{14} t)$ V/m
(where x, t and other values have S.I. units). The dielectric constant of the medium is _____
(speed of light in free space is 3×10^8 m/s)

Given Answer --

Question Type : SA
Question ID : 444792199
Status : Not Answered

Q.47

Two loudspeakers (L_1 and L_2) are placed with a separation of 10 m, as shown in figure. Both speakers are fed with an audio input signal of same frequency with constant volume. A voice recorder, initially at point A, at equidistance to both loud speakers, is moved by 25 m along the line AB while monitoring the audio signal. The measured signal was found to undergo 10 cycles of minima and maxima during the movement. The frequency of the input signal is _____Hz
(Speed of sound in air is 324 m/s and $\sqrt{5} = 2.23$)



Given Answer : --

Question Type : SA
Question ID : 444792197
Status : Not Answered

Q.48

A circular disc has radius R_1 and thickness T_1. Another circular disc made of the same material has radius R_2 and thickness T_2. If the moment of inertia of both discs are same and $\frac{R_1}{R_2} = 2$ then $\frac{T_1}{T_2} = \frac{1}{\alpha}$. The value of α is _____.

Given Answer : --

Question Type : SA
Question ID : 444792196
Status : Not Answered

Q.49

A parallel beam of light travelling in air (refractive index 1.0) is incident on a convex spherical glass surface of radius of curvature 50 cm. Refractive index of glass is 1.5. The rays converge to a point at a distance x cm from the centre of the curvature of the spherical surface. The value of x is _____ cm.

Given Answer : 150

Question Type : SA
Question ID : 444792200
Status : Answered

Q.50

Inductance of a coil with 10^4 turns is 10 mH and it is connected to a dc source of 10 V with internal resistance of 10 Ω. The energy density in the inductor when the current reaches $\left(\frac{1}{e}\right)$ of its maximum value is $\alpha\pi \times \frac{1}{e^2}$ J / m^3. The value of α is _____.

($\mu_0 = 4\pi \times 10^{-7}$ Tm/A).

Given Answer : --

Question Type : SA
Question ID : 444792198
Status : Not Answered

CHEMISTRY

Q.52

Given below are two statements:

Statement I: Sucrose is dextrorotatory. However, sucrose upon hydrolysis gives a solution having mixture of products. This solution shows laevorotation.

Statement II: Hydrolysis of sucrose gives glucose and fructose. Since the laevorotation of glucose is more than the dextrorotation of fructose, the resulting solution becomes laevorotatory.

In the light of the above statements, choose the ***correct*** answer from the options given below

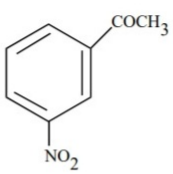
Options
1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Question Type : MCQ
Question ID : 444792220
Option 1 ID : 444792757
Option 2 ID : 444792758
Option 3 ID : 444792759
Option 4 ID : 444792760
Status : Not Answered
Chosen Option : --

Q.53

Given below are two statements:

Statement I: Benzene is nitrated to give nitrobenzene, which on further treatment with $CH_3COCl / AlCl_3$ will give



Statement II: $-NO_2$ group is a *m*-directing, and deactivating group.

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

Options
1. Statement I is incorrect but Statement II is correct
2. Statement I is correct but Statement II is incorrect
3. Both Statement I and Statement II are incorrect
4. Both Statement I and Statement II are correct

Question Type : MCQ
Question ID : 444792215
Option 1 ID : 444792740
Option 2 ID : 444792739
Option 3 ID : 444792738
Option 4 ID : 444792737
Status : Answered
Chosen Option : 4

Q.55 The correct order of reactivity of CH_3Br in methanol with the following nucleophiles is

F^-, I^-, $C_2H_5O^-$ and $C_6H_5O^-$

Options
1. $I^- > C_2H_5O^- > C_6H_5O^- > F^-$
2. $I^- > F^- > C_6H_5O^- > C_2H_5O^-$
3. $I^- > C_6H_5O^- > F^- > C_2H_5O^-$
4. $I^- > C_2H_5O^- > F^- > C_6H_5O^-$

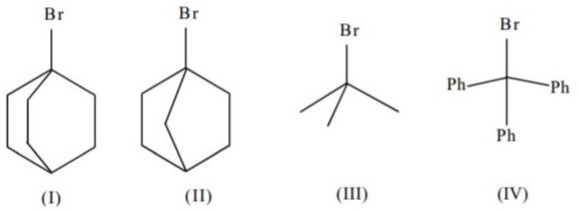
Question Type : MCQ
Question ID : 444792214
Option 1 ID : 444792735
Option 2 ID : 444792733
Option 3 ID : 444792734
Option 4 ID : 444792736
Status : Not Answered
Chosen Option : --

Q.59 A 'p'-block element (E) and hydrogen form a binary cation $(EH_x)^+$, while EH_3 on treatment with K_2HgI_4 in alkaline medium gives a precipitate of basic mercury(II)amido-iodine. Given below are first ionisation enthalpy values (kJ mol^{-1}) for first element each from group 13, 14, 15 and 16. Identify the correct first ionisation enthalpy value for element E.

Options
1. 1402
2. 801
3. 1086
4. 1312

Question Type : MCQ
Question ID : 444792207
Option 1 ID : 444792707
Option 2 ID : 444792705
Option 3 ID : 444792706
Option 4 ID : 444792708
Status : Not Answered
Chosen Option : --

Q.60 The correct order of the rate of reaction of the following reactants with nucleophile by S_N1 mechanism is :
(Given : Structures I and II are rigid)



(I) (II) (III) (IV)

Options
1. IV < III < II < I
2. III < I < II < IV
3. I < II < III < IV
4. II < I < III < IV

Question Type : MCQ
Question ID : 444792216
Option 1 ID : 444792743
Option 2 ID : 444792741
Option 3 ID : 444792742
Option 4 ID : 444792744
Status : Answered
Chosen Option : 3

Q.62 Consider the transition metal ions Mn^{3+}, Cr^{3+}, Fe^{3+} and Co^{3+} and all form low spin octahedral complexes. The correct decreasing order of unpaired electrons in their respective d-orbitals of the complexes is

Options
1. $Cr^{3+} > Mn^{3+} > Fe^{3+} > Co^{3+}$
2. $Cr^{3+} > Fe^{3+} > Co^{3+} > Mn^{3+}$
3. $Mn^{3+} > Fe^{3+} > Co^{3+} > Cr^{3+}$
4. $Fe^{3+} > Co^{3+} > Mn^{3+} > Cr^{3+}$

Question Type : MCQ
Question ID : 444792212
Option 1 ID : 444792728
Option 2 ID : 444792725
Option 3 ID : 444792726
Option 4 ID : 444792727
Status : Answered
Chosen Option : 4

Q.63 A → product (First order reaction).
Three sets of experiment were performed for a reaction under similar experimental conditions:

Run 1 ⇒ 100 mL of 10 M solution of reactant A

Run 2 ⇒ 200 mL of 10 M solution of reactant A

Run 3 ⇒ 100 mL of 10 M solution of reactant A + 100 mL of H_2O added.

The correct variation of rate of reaction is

Options
1. Run 3 < Run 1 = Run 2
2. Run 1 < Run 2 < Run 3
3. Run 3 < Run 1 < Run 2
4. Run 1 = Run 2 = Run 3

Question Type : MCQ
Question ID : 444792208
Option 1 ID : 444792710
Option 2 ID : 444792712
Option 3 ID : 444792711
Option 4 ID : 444792709
Status : Not Answered
Chosen Option : --

Q.65 A first row transition metal (M) does not liberate H_2 gas from dilute HCl. 1 mol of aqueous solution of MSO_4 is treated with excess of aqueous KCN and then $H_2S(g)$ is passed through the solution. The amount of MS (metal sulphide) formed from the above reaction is _____ mol.

Options
1. 1
2. 2
3. 0
4. 3

Question Type : MCQ
Question ID : 444792211
Option 1 ID : 444792724
Option 2 ID : 444792722
Option 3 ID : 444792723
Option 4 ID : 444792721
Status : Not Answered
Chosen Option : --

Q.67 The energy required by electrons, present in the first Bohr orbit of hydrogen atom to be excited to second Bohr orbit is _____ J mol^{-1}.

Given: $R_H = 2.18 \times 10^{-11}$ ergs.

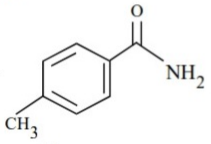
Options
1. 1.635×10^{-11}
2. 9.835×10^{12}
3. 1.635×10^{-18}
4. 9.835×10^{5}

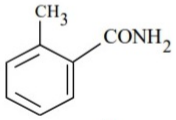
Question Type : MCQ
Question ID : 444792202
Option 1 ID : 444792685
Option 2 ID : 444792687
Option 3 ID : 444792688
Option 4 ID : 444792686
Status : Answered
Chosen Option : 1

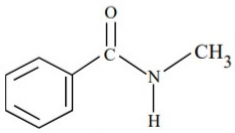
Q.68 'A' is a neutral organic compound (M. F : C_8H_9ON). On treatment with aqueous $Br_2/HO^{(-)}$, 'A' forms a compound 'B' which is soluble in dilute acid. 'B' on treatment with aqueous $NaNO_2$ / HCl (0-5 °C) produces a compound 'C' which on treatment with CuCN/NaCN produces 'D'. Hydrolysis of 'D' produces 'E' which is also obtainable from the hydrolysis of 'A'. 'E' on treatment with acidified $KMnO_4$ produces 'F'. 'F' contains two different types of hydrogen atoms. The structure of 'A' is

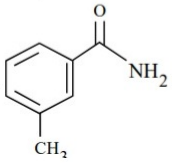
Question Type : MCQ
Question ID : 444792219
Option 1 ID : 444792754
Option 2 ID : 444792755
Option 3 ID : 444792753
Option 4 ID : 444792756
Status : Answered
Chosen Option : 2

Options

1. 

2. 

3. 

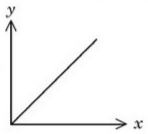
4. 

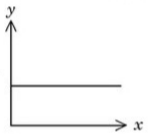
Q.70 Consider a solution of $CO_2(g)$ dissolved in water in a closed container.

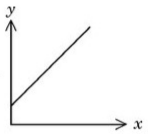
Which one of the following plots correctly represents variation of log (partial pressure of CO_2 in vapour phase above water) [y-axis] with log (mole fraction of CO_2 in water) [x-axis] at 25°C?

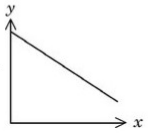
Question Type : MCQ
Question ID : 444792206
Option 1 ID : 444792701
Option 2 ID : 444792704
Option 3 ID : 444792703
Option 4 ID : 444792702
Status : Answered
Chosen Option : 1

Options

1. 

2. 

3. 

4. 

Q.71 Dissociation of a gas A_2 takes place according to the following chemical reaction. At equilibrium, the total pressure is 1 bar at 300K.

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

The standard Gibbs energy of formation of the involved substances has been provided below:

Substance	ΔG_f° / kJ mol^{-1}
A_2	−100.00
A	−50.832

The degree of dissociation of $A_2(g)$ is given by $(x \times 10^{-2})^{1/2}$ where x = _____. (Nearest integer).

[Given: R = 8 J mol^{-1} K^{-1}, log 2 = 0.3010, log 3 = 0.48]

Assume degree of dissociation is not negligible.

Question Type : SA
Question ID : 444792221
Status : Not Attempted and Marked For Revie

Given Answer : --

Q.73 Sodium fusion extract of an organic compound (Y) with $CHCl_3$ and chlorine water gives violet color to the $CHCl_3$ layer. 0.15g of (Y) gave 0.12 g of the silver halide precipitate in Carius method. Percentage of halogen in the compound (Y) is _____. (Nearest integer)

(Given : molar mass g mol^{-1} C : 12, H : 1, Cl : 35.5, Br : 80, I : 127)

Question Type : SA
Question ID : 444792225
Status : Answered

Given Answer : 55

Q.74 The cycloalkene (X) on bromination consumes one mole of bromine per mole of (X) and gives the product (Y) in which C:Br ratio is 3:1. The percentage of bromine in the product (Y) is _____%. (Nearest integer)

(Given : molar mass in g mol^{-1} H : 1, C : 12, O : 16, Br : 80)

Question Type : SA
Question ID : 444792224
Status : Not Answered

Given Answer : --

Q.75 The temperature at which the rate constants of the given below two gaseous reactions become equal is _____ K. (Nearest integer)

$X \longrightarrow Y \quad k_1 = 10^6 e^{\frac{-30000}{T}}$

$P \longrightarrow Q \quad k_2 = 10^4 e^{\frac{-24000}{T}}$

Given: ln 10 = 2.303

Question Type : SA
Question ID : 444792223
Status : Answered

Given Answer : 1304