

NTA JEE 2024_27 29 30 31 Jan 1st Feb 2024

Application No		
Candidate Name		
Roll No.		
Test Date	29/01/2024	
Test Time	3:00 PM - 6:00 PM	
Subject	B. Tech	

Section : Mathematics Section A

Q.1 If $\log_e a$, $\log_e b$, $\log_e c$ are in an A.P. and $\log_e a - \log_e 2b$, $\log_e 2b - \log_e 3c$, $\log_e 3c - \log_e a$ are also in an A.P, then $a : b : c$ is equal to

- Options
1. $9 : 6 : 4$
 2. $6 : 3 : 2$
 3. $25 : 10 : 4$
 4. $16 : 4 : 1$

Question Type : **MCQ**

Question ID : **405859749**

Option 1 ID : **4058592439**

Option 2 ID : **4058592440**

Option 3 ID : **4058592437**

Option 4 ID : **4058592438**

Status : **Answered**

Chosen Option : **4**

Q.2 If the mean and variance of five observations are $\frac{24}{5}$ and $\frac{194}{25}$ respectively and the mean of the first four observations is $\frac{7}{2}$, then the variance of the first four observations is equal to

- Options
1. $\frac{4}{5}$
 2. $\frac{105}{4}$
 3. $\frac{77}{12}$
 4. $\frac{5}{4}$

Question Type : **MCQ**

Question ID : **405859762**

Option 1 ID : **4058592489**

Option 2 ID : **4058592491**

Option 3 ID : **4058592492**

Option 4 ID : **4058592490**

Status : **Answered**

Chosen Option : **4**

Q.3 Let $x = \frac{m}{n}$ (m, n are co-prime natural numbers) be a solution of the equation

$$\cos\left(2\sin^{-1}x\right) = \frac{1}{9} \text{ and let } \alpha, \beta \text{ } (\alpha > \beta) \text{ be the roots of the equation } mx^2 - nx - m +$$

$n = 0$. Then the point (α, β) lies on the line

Options 1. $3x - 2y = -2$

2. $5x + 8y = 9$

3. $5x - 8y = -9$

4. $3x + 2y = 2$

Question Type : **MCQ**

Question ID : **405859763**

Option 1 ID : **4058592495**

Option 2 ID : **4058592494**

Option 3 ID : **4058592493**

Option 4 ID : **4058592496**

Status : **Not Attempted and
Marked For Review**

Chosen Option : --

Q.4 If $\sin\left(\frac{y}{x}\right) = \log_e|x| + \frac{\alpha}{2}$ is the solution of the differential equation

$$x \cos\left(\frac{y}{x}\right) \frac{dy}{dx} = y \cos\left(\frac{y}{x}\right) + x \text{ and } y(1) = \frac{\pi}{3}, \text{ then } \alpha^2 \text{ is equal to}$$

Options 1. 9

2. 3

3. 12

4. 4

Question Type : **MCQ**

Question ID : **405859755**

Option 1 ID : **4058592463**

Option 2 ID : **4058592461**

Option 3 ID : **4058592464**

Option 4 ID : **4058592462**

Status : **Not Attempted and
Marked For Review**

Chosen Option : --

Q.5 Let A be the point of intersection of the lines $3x + 2y = 14$, $5x - y = 6$ and B be the point of intersection of the lines $4x + 3y = 8$, $6x + y = 5$. The distance of the point $P(5, -2)$ from the line AB is

- Options
1. $\frac{5}{2}$
 2. $\frac{13}{2}$
 3. 6
 4. 8

Question Type : **MCQ**

Question ID : **405859756**

Option 1 ID : **4058592466**

Option 2 ID : **4058592465**

Option 3 ID : **4058592467**

Option 4 ID : **4058592468**

Status : **Answered**

Chosen Option : 3

Q.6 The distance of the point $(2, 3)$ from the line $2x - 3y + 28 = 0$, measured parallel to the line $\sqrt{3}x - y + 1 = 0$, is equal to

- Options
1. $6\sqrt{3}$
 2. $3 + 4\sqrt{2}$
 3. $4\sqrt{2}$
 4. $4 + 6\sqrt{3}$

Question Type : **MCQ**

Question ID : **405859757**

Option 1 ID : **4058592472**

Option 2 ID : **4058592470**

Option 3 ID : **4058592469**

Option 4 ID : **4058592471**

Status : **Not Attempted and Marked For Review**

Chosen Option : --

Q.7 Let $\vec{OA} = \vec{a}$, $\vec{OB} = 12\vec{a} + 4\vec{b}$ and $\vec{OC} = \vec{b}$, where O is the origin. If S is the parallelogram with adjacent sides OA and OC, then $\frac{\text{area of the quadrilateral OABC}}{\text{area of S}}$ is equal to _____

- Options
1. 6
 2. 8
 3. 7
 4. 10

Question Type : **MCQ**

Question ID : **405859760**

Option 1 ID : **4058592481**

Option 2 ID : **4058592483**

Option 3 ID : **4058592482**

Option 4 ID : **4058592484**

Status : **Not Attempted and Marked For Review**

Chosen Option : --

Q.8 If $\int \frac{\sin^{\frac{3}{2}} x + \cos^{\frac{3}{2}} x}{\sqrt{\sin^3 x \cos^3 x \sin(x-\theta)}} dx = A\sqrt{\cos\theta \tan x - \sin\theta} + B\sqrt{\cos\theta - \sin\theta \cot x} + C$, where C is the integration constant, then AB is equal to

- Options
1. $4 \sec\theta$
 2. $4 \operatorname{cosec}(2\theta)$
 3. $8 \operatorname{cosec}(2\theta)$
 4. $2 \sec\theta$

Question Type : **MCQ**

Question ID : **405859754**

Option 1 ID : **4058592460**

Option 2 ID : **4058592457**

Option 3 ID : **4058592459**

Option 4 ID : **4058592458**

Status : **Not Attempted and Marked For Review**

Chosen Option : --

Q.9 If R is the smallest equivalence relation on the set $\{1, 2, 3, 4\}$ such that $\{(1,2), (1,3)\} \subset R$, then the number of elements in R is _____

- Options
1. 8
 2. 10
 3. 12
 4. 15

Question Type : **MCQ**

Question ID : **405859745**

Option 1 ID : **4058592421**

Option 2 ID : **4058592422**

Option 3 ID : **4058592423**

Option 4 ID : **4058592424**

Status : **Answered**

Chosen Option : 1

Q.10 The function $f(x) = \frac{x}{x^2 - 6x - 16}$, $x \in \mathbb{R} - \{-2, 8\}$

- Options**
1. decreases in $(-2, 8)$ and increases in $(-\infty, -2) \cup (8, \infty)$
 2. decreases in $(-\infty, -2) \cup (-2, 8) \cup (8, \infty)$
 3. decreases in $(-\infty, -2)$ and increases in $(8, \infty)$
 4. increases in $(-\infty, -2) \cup (-2, 8) \cup (8, \infty)$

Question Type : **MCQ**

Question ID : **405859751**

Option 1 ID : **4058592446**

Option 2 ID : **4058592448**

Option 3 ID : **4058592445**

Option 4 ID : **4058592447**

Status : **Answered**

Chosen Option : **2**

Q.11 An integer is chosen at random from the integers 1, 2, 3, ..., 50. The probability that the chosen integer is a multiple of atleast one of 4, 6 and 7 is

- Options**
1. $\frac{8}{25}$
 2. $\frac{9}{50}$
 3. $\frac{21}{50}$
 4. $\frac{14}{25}$

Question Type : **MCQ**

Question ID : **405859761**

Option 1 ID : **4058592488**

Option 2 ID : **4058592487**

Option 3 ID : **4058592485**

Option 4 ID : **4058592486**

Status : **Answered**

Chosen Option : **3**

Q.12 Let $P(3, 2, 3)$, $Q(4, 6, 2)$ and $R(7, 3, 2)$ be the vertices of ΔPQR . Then, the angle $\angle QPR$ is

Options

1. $\cos^{-1}\left(\frac{1}{18}\right)$

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

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

4. $\cos^{-1}\left(\frac{7}{18}\right)$

Question Type : **MCQ**

Question ID : **405859758**

Option 1 ID : **4058592474**

Option 2 ID : **4058592476**

Option 3 ID : **4058592475**

Option 4 ID : **4058592473**

Status : **Answered**

Chosen Option : **2**

Q.13 The sum of the solutions $x \in \mathbb{R}$ of the equation $\frac{3\cos 2x + \cos^3 2x}{\cos^6 x - \sin^6 x} = x^3 - x^2 + 6$ is

Options 1. **0**

2. **3**

3. **1**

4. **-1**

Question Type : **MCQ**

Question ID : **405859764**

Option 1 ID : **4058592497**

Option 2 ID : **4058592500**

Option 3 ID : **4058592499**

Option 4 ID : **4058592498**

Status : **Not Attempted and Marked For Review**

Chosen Option : **--**

Q.14 Let r and θ respectively be the modulus and amplitude of the complex number

$$z = 2 - i \left(2 \tan \frac{5\pi}{8} \right), \text{ then } (r, \theta) \text{ is equal to}$$

Options

1. $\left(2 \sec \frac{5\pi}{8}, \frac{3\pi}{8} \right)$
2. $\left(2 \sec \frac{3\pi}{8}, \frac{3\pi}{8} \right)$
3. $\left(2 \sec \frac{3\pi}{8}, \frac{5\pi}{8} \right)$
4. $\left(2 \sec \frac{11\pi}{8}, \frac{11\pi}{8} \right)$

Question Type : **MCQ**

Question ID : **405859746**

Option 1 ID : **4058592427**

Option 2 ID : **4058592425**

Option 3 ID : **4058592428**

Option 4 ID : **4058592426**

Status : **Not Answered**

Chosen Option : --

Q.15

Let $A = \begin{bmatrix} 2 & 1 & 2 \\ 6 & 2 & 11 \\ 3 & 3 & 2 \end{bmatrix}$ and $P = \begin{bmatrix} 1 & 2 & 0 \\ 5 & 0 & 2 \\ 7 & 1 & 5 \end{bmatrix}$. The sum of the prime factors

of $|P^{-1}AP - 2I|$ is equal to

Options

1. 26
2. 66
3. 27
4. 23

Question Type : **MCQ**

Question ID : **405859747**

Option 1 ID : **4058592429**

Option 2 ID : **4058592432**

Option 3 ID : **4058592431**

Option 4 ID : **4058592430**

Status : **Answered**

Chosen Option : 1

Q.16 Number of ways of arranging 8 identical books into 4 identical shelves where any number of shelves may remain empty is equal to

- Options 1. 15
2. 18
3. 12
4. 16

Question Type : **MCQ**
Question ID : **405859748**
Option 1 ID : **4058592434**
Option 2 ID : **4058592436**
Option 3 ID : **4058592433**
Option 4 ID : **4058592435**
Status : **Answered**
Chosen Option : 3

Q.17 Let $y = \log_e \left(\frac{1-x^2}{1+x^2} \right)$, $-1 < x < 1$. Then at $x = \frac{1}{2}$, the value of $225(y' - y'')$ is equal to

- Options 1. 736
2. 746
3. 742
4. 732

Question Type : **MCQ**
Question ID : **405859753**
Option 1 ID : **4058592455**
Option 2 ID : **4058592453**
Option 3 ID : **4058592454**
Option 4 ID : **4058592456**
Status : **Not Attempted and Marked For Review**
Chosen Option : --

Q.18 The function $f(x) = 2x + 3(x)^{\frac{2}{3}}$, $x \in \mathbb{R}$, has

- Options 1. exactly two points of local maxima and exactly one point of local minima
2. exactly one point of local maxima and exactly one point of local minima
3. exactly one point of local minima and no point of local maxima
4. exactly one point of local maxima and no point of local minima

Question Type : **MCQ**
Question ID : **405859752**
Option 1 ID : **4058592452**
Option 2 ID : **4058592449**
Option 3 ID : **4058592451**
Option 4 ID : **4058592450**
Status : **Answered**
Chosen Option : 4

Q.19 Let a unit vector $\hat{u} = x\hat{i} + y\hat{j} + z\hat{k}$ make angles $\frac{\pi}{2}$, $\frac{\pi}{3}$ and $\frac{2\pi}{3}$ with the vectors $\frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{k}$, $\frac{1}{\sqrt{2}}\hat{j} + \frac{1}{\sqrt{2}}\hat{k}$ and $\frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{j}$ respectively. If $\vec{v} = \frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{j} + \frac{1}{\sqrt{2}}\hat{k}$, then $|\hat{u} - \vec{v}|^2$ is equal to

Options 1. 9

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

3. $\frac{11}{2}$

4. 7

Question Type : **MCQ**

Question ID : **405859759**

Option 1 ID : **4058592478**

Option 2 ID : **4058592480**

Option 3 ID : **4058592479**

Option 4 ID : **4058592477**

Status : **Not Attempted and Marked For Review**

Chosen Option : --

Q.20 If each term of a geometric progression a_1, a_2, a_3, \dots with $a_1 = \frac{1}{8}$ and $a_2 \neq a_1$ is the arithmetic mean of the next two terms and $S_n = a_1 + a_2 + \dots + a_n$, then $S_{20} - S_{18}$ is equal to

Options 1. -2^{15}

2. 2^{18}

3. 2^{15}

4. -2^{18}

Question Type : **MCQ**

Question ID : **405859750**

Option 1 ID : **4058592443**

Option 2 ID : **4058592442**

Option 3 ID : **4058592444**

Option 4 ID : **4058592441**

Status : **Answered**

Chosen Option : 3

Section : **Mathematics Section B**

Q.21 Let the slope of the line $45x + 5y + 3 = 0$ be $27r_1 + \frac{9r_2}{2}$ for some $r_1, r_2 \in \mathbb{R}$.

Then $\lim_{x \rightarrow 3} \left(\int_3^x \frac{8t^2}{\frac{3r_2x}{2} - r_2x^2 - r_1x^3 - 3x} dt \right)$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **405859769**
Status : **Not Attempted and Marked For Review**

Q.22 Let $P(\alpha, \beta)$ be a point on the parabola $y^2 = 4x$. If P also lies on the chord of the parabola $x^2 = 8y$ whose mid point is $\left(1, \frac{5}{4}\right)$, then $(\alpha - 28)(\beta - 8)$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **405859773**
Status : **Not Attempted and Marked For Review**

Q.23 Let for any three distinct consecutive terms a, b, c of an A.P, the lines $ax + by + c = 0$ be concurrent at the point P and $Q(\alpha, \beta)$ be a point such that the system of equations

$$x + y + z = 6,$$

$$2x + 5y + az = \beta \text{ and}$$

$$x + 2y + 3z = 4, \text{ has infinitely many solutions. Then } (PQ)^2 \text{ is equal to } \underline{\hspace{2cm}}.$$

Given --
Answer :

Question Type : **SA**
Question ID : **405859767**
Status : **Not Attempted and Marked For Review**

Q.24 Let $f(x) = \sqrt{\lim_{r \rightarrow x} \left\{ \frac{2r^2 \left[(f(r))^2 - f(x)f(r) \right]}{r^2 - x^2} - r^3 e^{\frac{f(r)}{r}} \right\}}$ be differentiable in $(-\infty, 0) \cup (0, \infty)$ and $f(1) = 1$. Then the value of ea , such that $f(a) = 0$, is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **405859772**
Status : **Not Answered**

Q.25

If $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \sqrt{1 - \sin 2x} \, dx = \alpha + \beta\sqrt{2} + \gamma\sqrt{3}$, where α , β and γ are rational numbers, then $3\alpha + 4\beta - \gamma$ is equal to _____.

Given --
Answer :

Question Type : SA
Question ID : 405859770
Status : Not Answered

Q.26 Let α, β be the roots of the equation $x^2 - \sqrt{6}x + 3 = 0$ such that $\text{Im}(\alpha) > \text{Im}(\beta)$.
Let a, b be integers not divisible by 3 and n be a natural number such that $\frac{\alpha^{99}}{\beta} + \alpha^{98} = 3^n(a + ib)$, $i = \sqrt{-1}$. Then $n + a + b$ is equal to _____.

Given --
Answer :

Question Type : SA
Question ID : 405859766
Status : Not Attempted and Marked For Review

Q.27 Let the area of the region $\{(x, y) : 0 \leq x \leq 3, 0 \leq y \leq \min\{x^2 + 2, 2x + 2\}\}$ be A.
Then $12A$ is equal to _____.

Given --
Answer :

Question Type : SA
Question ID : 405859771
Status : Not Answered

Q.28 Remainder when $64^{32^{32}}$ is divided by 9 is equal to _____.

Given 1
Answer :

Question Type : SA
Question ID : 405859768
Status : Answered

Q.29 Let O be the origin, and M and N be the points on the lines $\frac{x-5}{4} = \frac{y-4}{1} = \frac{z-5}{3}$ and $\frac{x+8}{12} = \frac{y+2}{5} = \frac{z+11}{9}$ respectively such that MN is the shortest distance between the given lines. Then $\overline{OM} \cdot \overline{ON}$ is equal to _____.

Given --
Answer :

Question Type : SA
Question ID : 405859774
Status : Not Answered

Q.30 Let the set $C = \{(x, y) \mid x^2 - 2^y = 2023, x, y \in \mathbb{N}\}$. Then $\sum_{(x,y) \in C} (x+y)$ is equal to

_____.

Given --
Answer :

Question Type : **SA**
Question ID : **405859765**
Status : **Not Answered**

Section : Physics Section A

Q.31 A physical quantity Q is found to depend on quantities a, b, c by the relation

$$Q = \frac{a^4 b^3}{c^2}. \text{ The percentage error in } a, b \text{ and } c \text{ are } 3\%, 4\% \text{ and } 5\% \text{ respectively.}$$

Then, the percentage error in Q is :

- Options
1. 14%
 2. 43%
 3. 34%
 4. 66%

Question Type : **MCQ**
Question ID : **405859775**
Option 1 ID : **4058592511**
Option 2 ID : **4058592514**
Option 3 ID : **4058592513**
Option 4 ID : **4058592512**
Status : **Answered**
Chosen Option : **3**

Q.32 The bob of a pendulum was released from a horizontal position. The length of the pendulum is 10 m. If it dissipates 10% of its initial energy against air resistance, the speed with which the bob arrives at the lowest point is:

[Use, $g : 10 \text{ ms}^{-2}$]

- Options
1. $6\sqrt{5} \text{ ms}^{-1}$
 2. $5\sqrt{5} \text{ ms}^{-1}$
 3. $5\sqrt{6} \text{ ms}^{-1}$
 4. $2\sqrt{5} \text{ ms}^{-1}$

Question Type : **MCQ**
Question ID : **405859779**
Option 1 ID : **4058592527**
Option 2 ID : **4058592528**
Option 3 ID : **4058592529**
Option 4 ID : **4058592530**
Status : **Answered**
Chosen Option : **1**

Q.33 Two sources of light emit with a power of 200W. The ratio of number of photons of visible light emitted by each source having wavelengths 300nm and 500nm respectively, will be :

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

Question Type : **MCQ**

Question ID : **405859790**

Option 1 ID : **4058592574**

Option 2 ID : **4058592571**

Option 3 ID : **4058592572**

Option 4 ID : **4058592573**

Status : **Answered**

Chosen Option : 1

Q.34 An electric field is given by $(6\hat{i} + 5\hat{j} + 3\hat{k})$ N/C. The electric flux through a surface area $30\hat{j}$ m² lying in YZ-plane (in SI unit) is :

- Options
1. 60
 2. 90
 3. 180
 4. 150

Question Type : **MCQ**

Question ID : **405859784**

Option 1 ID : **4058592550**

Option 2 ID : **4058592549**

Option 3 ID : **4058592547**

Option 4 ID : **4058592548**

Status : **Answered**

Chosen Option : 3

Q.35 A wire of length L and radius r is clamped at one end. If its other end is pulled by a force F , its length increases by l . If the radius of the wire and the applied force both are reduced to half of their original values keeping original length constant, the increase in length will become:

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

Question Type : **MCQ**

Question ID : **405859793**

Option 1 ID : **4058592586**

Option 2 ID : **4058592584**

Option 3 ID : **4058592583**

Option 4 ID : **4058592585**

Status : **Answered**

Chosen Option : 2

Q.36 Given below are two statements:

Statement I : Most of the mass of the atom and all its positive charge are concentrated in a tiny nucleus and the electrons revolve around it, is Rutherford's model.

Statement II : An atom is a spherical cloud of positive charges with electrons embedded in it, is a special case of Rutherford's model.

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

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

Question Type : **MCQ**

Question ID : **405859791**

Option 1 ID : **4058592577**

Option 2 ID : **4058592576**

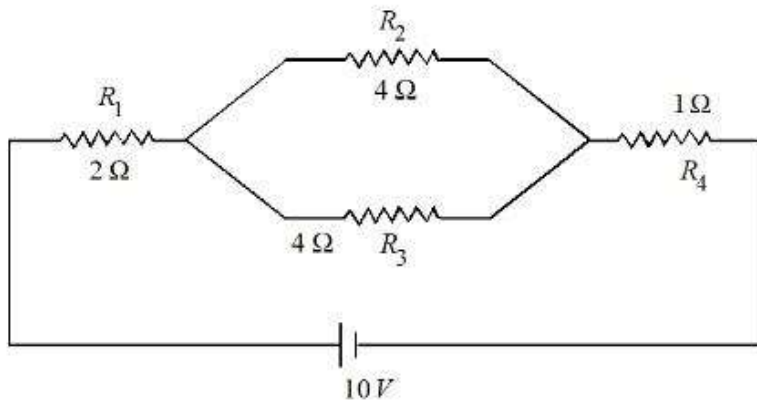
Option 3 ID : **4058592575**

Option 4 ID : **4058592578**

Status : **Answered**

Chosen Option : 1

Q.37 In the given circuit, the current in resistance R_3 is :



- Options
1. **2.5 A**
 2. **1 A**
 3. **2 A**
 4. **1.5 A**

Question Type : **MCQ**

Question ID : **405859785**

Option 1 ID : **4058592552**

Option 2 ID : **4058592554**

Option 3 ID : **4058592553**

Option 4 ID : **4058592551**

Status : **Answered**

Chosen Option : 2

Q.38 N moles of a polyatomic gas ($f=6$) must be mixed with two moles of a monoatomic gas so that the mixture behaves as a diatomic gas. The value of N is :

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

Question Type : **MCQ**
Question ID : **405859782**
Option 1 ID : **4058592540**
Option 2 ID : **4058592539**
Option 3 ID : **4058592542**
Option 4 ID : **4058592541**
Status : **Answered**
Chosen Option : **2**

Q.39 If the distance between object and its two times magnified virtual image produced by a curved mirror is 15 cm, the focal length of the mirror must be:

- Options
1. - 10 cm
 2. 15 cm
 3. - 12 cm
 4. 10/3 cm

Question Type : **MCQ**
Question ID : **405859794**
Option 1 ID : **4058592589**
Option 2 ID : **4058592588**
Option 3 ID : **4058592590**
Option 4 ID : **4058592587**
Status : **Answered**
Chosen Option : **1**

Q.40 A planet takes 200 days to complete one revolution around the Sun. If the distance of the planet from Sun is reduced to one fourth of the original distance, how many days will it take to complete one revolution :

- Options
1. 50
 2. 20
 3. 100
 4. 25

Question Type : **MCQ**
Question ID : **405859780**
Option 1 ID : **4058592533**
Option 2 ID : **4058592534**
Option 3 ID : **4058592531**
Option 4 ID : **4058592532**
Status : **Answered**
Chosen Option : **4**

Q.41 A small liquid drop of radius R is divided into 27 identical liquid drops. If the surface tension is T , then the work done in the process will be:

- Options
1. $8\pi R^2 T$
 2. $3\pi R^2 T$
 3. $\frac{1}{8}\pi R^2 T$
 4. $4\pi R^2 T$

Question Type : **MCQ**

Question ID : **405859781**

Option 1 ID : **4058592535**

Option 2 ID : **4058592537**

Option 3 ID : **4058592538**

Option 4 ID : **4058592536**

Status : **Answered**

Chosen Option : 1

Q.42 In an a.c. circuit, voltage and current are given by:

$$V = 100 \sin(100t) \text{ V and}$$

$$I = 100 \sin\left(100t + \frac{\pi}{3}\right) \text{ mA respectively.}$$

The average power dissipated in one cycle is:

- Options
1. 25 W
 2. 2.5 W
 3. 10 W
 4. 5 W

Question Type : **MCQ**

Question ID : **405859787**

Option 1 ID : **4058592560**

Option 2 ID : **4058592561**

Option 3 ID : **4058592559**

Option 4 ID : **4058592562**

Status : **Answered**

Chosen Option : 4

Q.43 Two particles X and Y having equal charges are being accelerated through the same potential difference. Thereafter they enter normally in a region of uniform magnetic field and describes circular paths of radii R_1 and R_2 respectively. The mass ratio of X and Y is :

Options

1. $\left(\frac{R_2}{R_1}\right)$

2. $\left(\frac{R_1}{R_2}\right)$

3. $\left(\frac{R_2}{R_1}\right)^2$

4. $\left(\frac{R_1}{R_2}\right)^2$

Question Type : **MCQ**

Question ID : **405859786**

Option 1 ID : **4058592557**

Option 2 ID : **4058592555**

Option 3 ID : **4058592558**

Option 4 ID : **4058592556**

Status : **Answered**

Chosen Option : **4**

Q.44 A plane electromagnetic wave of frequency 35 MHz travels in free space along the X -direction. At a particular point (in space and time) $\vec{E} = 9.6 \hat{j} V/m$. The value of magnetic field at this point is :

Options

1. $9.6 \hat{j} T$

2. $9.6 \times 10^{-8} \hat{k} T$

3. $3.2 \times 10^{-8} \hat{k} T$

4. $3.2 \times 10^{-8} \hat{i} T$

Question Type : **MCQ**

Question ID : **405859788**

Option 1 ID : **4058592566**

Option 2 ID : **4058592564**

Option 3 ID : **4058592565**

Option 4 ID : **4058592563**

Status : **Answered**

Chosen Option : **3**

Q.45 A particle is moving in a straight line. The variation of position ' x ' as a function of time ' t ' is given as $x = (t^3 - 6t^2 + 20t + 15) \text{ m}$. The velocity of the body when its acceleration becomes zero is :

- Options
1. 8 m/s
 2. 4 m/s
 3. 6 m/s
 4. 10 m/s

Question Type : **MCQ**

Question ID : **405859776**

Option 1 ID : **4058592515**

Option 2 ID : **4058592517**

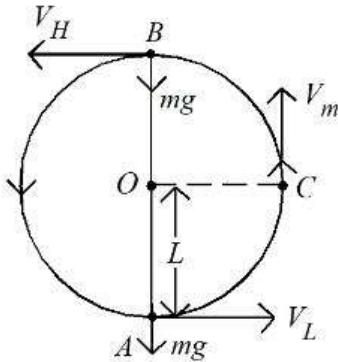
Option 3 ID : **4058592516**

Option 4 ID : **4058592518**

Status : **Answered**

Chosen Option : 1

Q.46 A bob of mass ' m ' is suspended by a light string of length ' L '. It is imparted a minimum horizontal velocity at the lowest point A such that it just completes half circle reaching the top most position B . The ratio of kinetic energies $\frac{(K.E)_A}{(K.E)_B}$ is :



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

Question Type : **MCQ**

Question ID : **405859777**

Option 1 ID : **4058592519**

Option 2 ID : **4058592520**

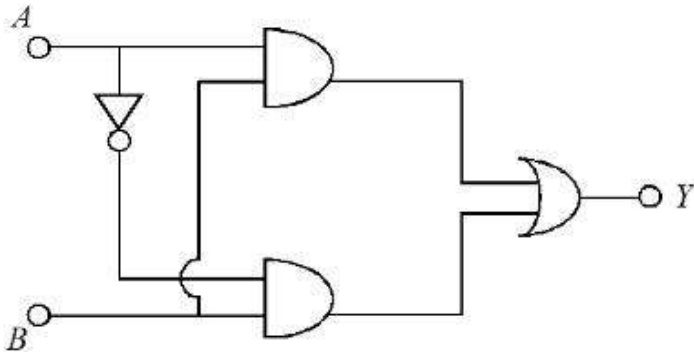
Option 3 ID : **4058592521**

Option 4 ID : **4058592522**

Status : **Answered**

Chosen Option : 2

Q.47 The truth table for this given circuit is :



Options

1.

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

2.

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

3.

A	B	Y
0	0	1
0	1	0
1	0	1
1	1	0

4.

A	B	Y
0	0	0
0	1	1
1	0	0
1	1	1

Question Type : **MCQ**

Question ID : **405859792**

Option 1 ID : **4058592582**

Option 2 ID : **4058592579**

Option 3 ID : **4058592581**

Option 4 ID : **4058592580**

Status : **Answered**

Chosen Option : **4**

Q.48 In Young's double slit experiment, light from two identical sources are superimposing on a screen. The path difference between the two lights reaching at a point on the screen is $7\frac{\lambda}{4}$. The ratio of intensity of fringe at this point with respect to the maximum intensity of the fringe is :

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

Question Type : **MCQ**

Question ID : **405859789**

Option 1 ID : **4058592570**

Option 2 ID : **4058592569**

Option 3 ID : **4058592568**

Option 4 ID : **4058592567**

Status : **Not Attempted and Marked For Review**

Chosen Option : --

Q.49 The temperature of a gas having 2.0×10^{25} molecules per cubic meter at 1.38 atm (Given, $k = 1.38 \times 10^{-23} \text{ JK}^{-1}$) is :

- Options
1. 300 K
 2. 200 K
 3. 500 K
 4. 100 K

Question Type : **MCQ**

Question ID : **405859783**

Option 1 ID : **4058592543**

Option 2 ID : **4058592545**

Option 3 ID : **4058592544**

Option 4 ID : **4058592546**

Status : **Answered**

Chosen Option : 3

Q.50 A stone of mass 900g is tied to a string and moved in a vertical circle of radius 1m making 10 rpm. The tension in the string, when the stone is at the lowest point is (if $\pi^2=9.8$ and $g=9.8 \text{ m/s}^2$):

- Options
1. 9.8 N
 2. 17.8 N
 3. 8.82 N
 4. 97 N

Question Type : **MCQ**

Question ID : **405859778**

Option 1 ID : **4058592526**

Option 2 ID : **4058592525**

Option 3 ID : **4058592523**

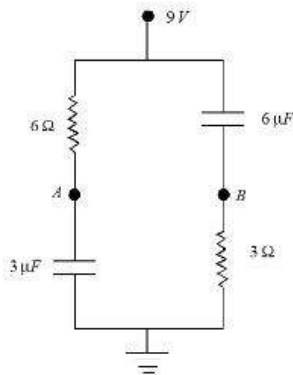
Option 4 ID : **4058592524**

Status : **Answered**

Chosen Option : **3**

Section : **Physics Section B**

Q.51 In the given figure, the charge stored in $6\mu\text{F}$ capacitor, when points A and B are joined by a connecting wire is _____ μC .



Given --
Answer :

Question Type : **SA**

Question ID : **405859799**

Status : **Not Answered**

Q.52 A charge of $4.0\mu\text{C}$ is moving with a velocity of $4.0 \times 10^6 \text{ ms}^{-1}$ along the positive y -axis under a magnetic field \vec{B} of strength $(2\hat{k})\text{T}$. The force acting on the charge is $x\hat{j}\text{N}$. The value of x is _____.

Given **32**
Answer :

Question Type : **SA**

Question ID : **405859801**

Status : **Answered**

Q.53 In a single slit diffraction pattern, a light of wavelength 6000 \AA is used. The distance between the first and third minima in the diffraction pattern is found to be 3 mm when the screen is placed 50 cm away from slits. The width of the slit is _____ $\times 10^{-4}$ m.

Given --
Answer :

Question Type : SA
Question ID : 405859803
Status : Not Attempted and Marked For Review

Q.54 Hydrogen atom is bombarded with electrons accelerated through a potential difference of V, which causes excitation of hydrogen atoms. If the experiment is being performed at $T = 0 \text{ K}$, the minimum potential difference needed to observe any Balmer series lines in the emission spectra will be $\frac{\alpha}{10} V$, where $\alpha = \underline{\hspace{2cm}}$.

Given --
Answer :

Question Type : SA
Question ID : 405859804
Status : Not Attempted and Marked For Review

Q.55 A particle is moving in a circle of radius 50 cm in such a way that at any instant the normal and tangential components of its acceleration are equal. If its speed at $t=0$ is 4m/s, the time taken to complete the first revolution will be $\frac{1}{\alpha} [1 - e^{-2\pi}]$ s, where $\alpha = \underline{\hspace{2cm}}$.

Given --
Answer :

Question Type : SA
Question ID : 405859795
Status : Not Answered

Q.56 A body of mass 5 kg moving with a uniform speed $3\sqrt{2} \text{ ms}^{-1}$ in X - Y plane along the line $y = x + 4$. The angular momentum of the particle about the origin will be _____ $\text{kg m}^2\text{s}^{-1}$.

Given 60
Answer :

Question Type : SA
Question ID : 405859796
Status : Answered

- Q.57** A simple harmonic oscillator has an amplitude A and time period 6π second. Assuming the oscillation starts from its mean position, the time required by it to travel from $x = A$ to $x = \frac{\sqrt{3}}{2}A$ will be $\frac{\pi}{x}$ s, where $x =$ _____.

Given --
Answer :

Question Type : SA

Question ID : 405859798

Status : Not Attempted and Marked For Review

- Q.58** Two metallic wires P and Q have same volume and are made up of same material. If their area of cross sections are in the ratio 4:1 and force F_1 is applied to P , an extension of Δl is produced. The force which is required to produce same extension in Q is F_2 .

The value of $\frac{F_1}{F_2}$ is _____.

Given 16
Answer :

Question Type : SA

Question ID : 405859797

Status : Answered

- Q.59** A horizontal straight wire 5 m long extending from east to west falling freely at right angle to horizontal component of earth's magnetic field $0.60 \times 10^{-4} \text{ Wbm}^{-2}$. The instantaneous value of emf induced in the wire when its velocity is 10 ms^{-1} is _____ $\times 10^{-3} \text{ V}$.

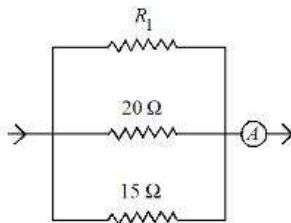
Given 3
Answer :

Question Type : SA

Question ID : 405859802

Status : Answered

- Q.60** In the given circuit, the current flowing through the resistance 20Ω is 0.3 A, while the ammeter reads 0.9 A. The value of R_1 is _____ Ω .



Given 25
Answer :

Question Type : SA

Question ID : 405859800

Status : Answered

Section : Chemistry Section A

Q.61 Match List I with List II

LIST I (Compound)		LIST II (pK _a value)	
A.	Ethanol	I.	10.0
B.	Phenol	II.	15.9
C.	m-Nitrophenol	III.	7.1
D.	p-Nitrophenol	IV.	8.3

Choose the correct answer from the options given below:

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

Question Type : **MCQ**

Question ID : **405859820**

Option 1 ID : **4058592661**

Option 2 ID : **4058592662**

Option 3 ID : **4058592663**

Option 4 ID : **4058592664**

Status : **Answered**

Chosen Option : **3**

Q.62 Chromatographic technique/s based on the principle of differential adsorption is / are

- A. Column chromatography
- B. Thin layer chromatography
- C. Paper chromatography

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

- Options
1. B only
 2. A only
 3. C only
 4. A & B only

Question Type : **MCQ**

Question ID : **405859812**

Option 1 ID : **4058592630**

Option 2 ID : **4058592629**

Option 3 ID : **4058592631**

Option 4 ID : **4058592632**

Status : **Answered**

Chosen Option : **4**

Q.63 Which of the following acts as a strong reducing agent? (Atomic number : Ce=58, Eu=63, Gd=64, Lu=71)

- Options
1. Gd^{3+}
 2. Ce^{4+}
 3. Lu^{3+}
 4. Eu^{2+}

Question Type : **MCQ**

Question ID : **405859809**

Option 1 ID : **4058592617**

Option 2 ID : **4058592619**

Option 3 ID : **4058592618**

Option 4 ID : **4058592620**

Status : **Answered**

Chosen Option : **2**

Q.64 Alkyl halide is converted into alkyl isocyanide by reaction with

- Options
1. NaCN
 2. AgCN
 3. NH_4CN
 4. KCN

Question Type : **MCQ**

Question ID : **405859817**

Option 1 ID : **4058592650**

Option 2 ID : **4058592651**

Option 3 ID : **4058592652**

Option 4 ID : **4058592649**

Status : **Answered**

Chosen Option : **2**

Q.65 On passing a gas, 'X', through Nessler's reagent, a brown precipitate is obtained.
The gas 'X' is

- Options
1. Cl_2
 2. H_2S
 3. NH_3
 4. CO_2

Question Type : **MCQ**

Question ID : **405859824**

Option 1 ID : **4058592677**

Option 2 ID : **4058592679**

Option 3 ID : **4058592678**

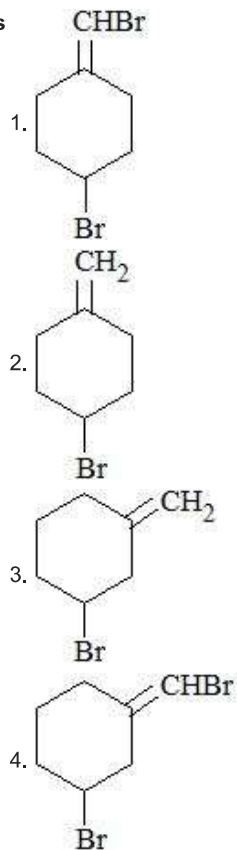
Option 4 ID : **4058592680**

Status : **Answered**

Chosen Option : **1**

Q.66 Which one of the following will show geometrical isomerism?

Options



Question Type : **MCQ**

Question ID : **405859813**

Option 1 ID : **4058592635**

Option 2 ID : **4058592634**

Option 3 ID : **4058592633**

Option 4 ID : **4058592636**

Status : **Answered**

Chosen Option : 1

Q.67 A reagent which gives brilliant red precipitate with Nickel ions in basic medium is

- Options
1. dimethyl glyoxime
 2. neutral FeCl_3
 3. meta-dinitrobenzene
 4. sodium nitroprusside

Question Type : **MCQ**

Question ID : **405859823**

Option 1 ID : **4058592674**

Option 2 ID : **4058592673**

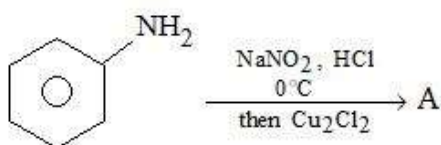
Option 3 ID : **4058592676**

Option 4 ID : **4058592675**

Status : **Answered**

Chosen Option : 4

Q.68 The product A formed in the following reaction is



Options

1. [NH3+]c1ccccc1.[Cl-]
2. Clc1ccccc1
3. Clc1cc(Cl)ccc1
4. Nc1cc(Cl)ccc1

Question Type : **MCQ**

Question ID : **405859816**

Option 1 ID : **4058592645**

Option 2 ID : **4058592646**

Option 3 ID : **4058592648**

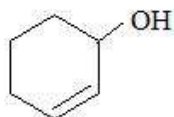
Option 4 ID : **4058592647**

Status : **Answered**

Chosen Option : **2**

Q.69

According to IUPAC system, the compound



is named as

- Options
1. Cyclohex-1-en-2-ol
 2. Cyclohex-2-en-1-ol
 3. 1-Hydroxyhex-2-ene
 4. Cyclohex-1-en-3-ol

Question Type : **MCQ**

Question ID : **405859814**

Option 1 ID : **4058592638**

Option 2 ID : **4058592639**

Option 3 ID : **4058592640**

Option 4 ID : **4058592637**

Status : **Answered**

Chosen Option : **2**

Q.70 The element having the highest first ionization enthalpy is

- Options
1. Si
 2. Al
 3. N
 4. C

Question Type : **MCQ**

Question ID : **405859806**

Option 1 ID : **4058592608**

Option 2 ID : **4058592606**

Option 3 ID : **4058592605**

Option 4 ID : **4058592607**

Status : **Answered**

Chosen Option : **3**

Q.71 Which of the following statements are correct about Zn, Cd and Hg?

- A. They exhibit high enthalpy of atomization as the d-subshell is full.
- B. Zn and Cd do not show variable oxidation state while Hg shows +I and +II.
- C. Compounds of Zn, Cd and Hg are paramagnetic in nature.
- D. Zn, Cd and Hg are called soft metals.

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

- Options
1. B, C only
 2. B, D only
 3. C, D only
 4. A, D only

Question Type : **MCQ**

Question ID : **405859810**

Option 1 ID : **4058592622**

Option 2 ID : **4058592623**

Option 3 ID : **4058592624**

Option 4 ID : **4058592621**

Status : **Answered**

Chosen Option : **2**

Q.72 Phenol treated with chloroform in presence of sodium hydroxide, which further hydrolyzed in presence of an acid results

- Options
1. 2-Hydroxybenzaldehyde
 2. Benzene-1,2-diol
 3. Salicylic acid
 4. Benzene-1,3-diol

Question Type : **MCQ**

Question ID : **405859819**

Option 1 ID : **4058592657**

Option 2 ID : **4058592659**

Option 3 ID : **4058592658**

Option 4 ID : **4058592660**

Status : **Answered**

Chosen Option : **1**

Q.73 Match List I with List II

LIST I (Spectral Series for Hydrogen)		LIST II (Spectral Region / Higher Energy State)	
A.	Lyman	I.	Infrared region
B.	Balmer	II.	UV region
C.	Paschen	III.	Infrared region
D.	Pfund	IV.	Visible region

Choose the correct answer from the options given below:

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

Question Type : MCQ

Question ID : 405859805

Option 1 ID : 4058592603

Option 2 ID : 4058592602

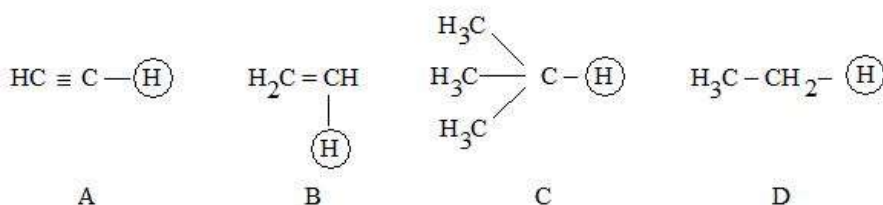
Option 3 ID : 4058592604

Option 4 ID : 4058592601

Status : Answered

Chosen Option : 1

Q.74 The ascending acidity order of the following H atoms is



- Options 1. D<C<B<A
 2. A<B<D<C
 3. A<B<C<D
 4. C<D<B<A

Question Type : MCQ

Question ID : 405859815

Option 1 ID : 4058592642

Option 2 ID : 4058592641

Option 3 ID : 4058592643

Option 4 ID : 4058592644

Status : Answered

Chosen Option : 1

Q.75 Anomalous behavior of oxygen is due to its

- Options
1. small size and high electronegativity
 2. large size and low electronegativity
 3. large size and high electronegativity
 4. small size and low electronegativity

Question Type : **MCQ**

Question ID : **405859807**

Option 1 ID : **4058592610**

Option 2 ID : **4058592609**

Option 3 ID : **4058592612**

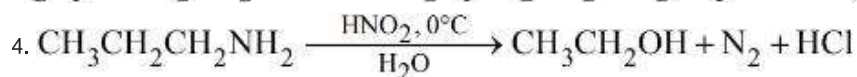
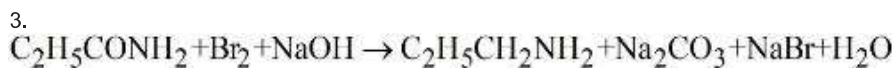
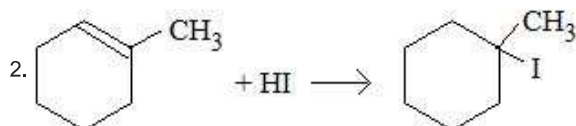
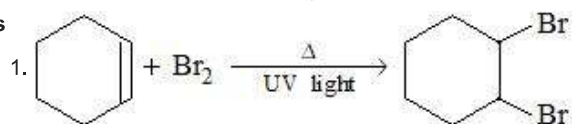
Option 4 ID : **4058592611**

Status : **Answered**

Chosen Option : 1

Q.76 Which of the following reaction is correct?

Options



Question Type : **MCQ**

Question ID : **405859821**

Option 1 ID : **4058592667**

Option 2 ID : **4058592668**

Option 3 ID : **4058592666**

Option 4 ID : **4058592665**

Status : **Answered**

Chosen Option : 2

Q.77 The correct IUPAC name of K_2MnO_4 is

- Options
1. Dipotassium tetraoxidomanganate (VII)
 2. Potassium tetraoxidomanganese (VI)
 3. Potassium tetraoxopermanganate (VI)
 4. Potassium tetraoxidomanganate (VI)

Question Type : **MCQ**

Question ID : **405859811**

Option 1 ID : **4058592628**

Option 2 ID : **4058592625**

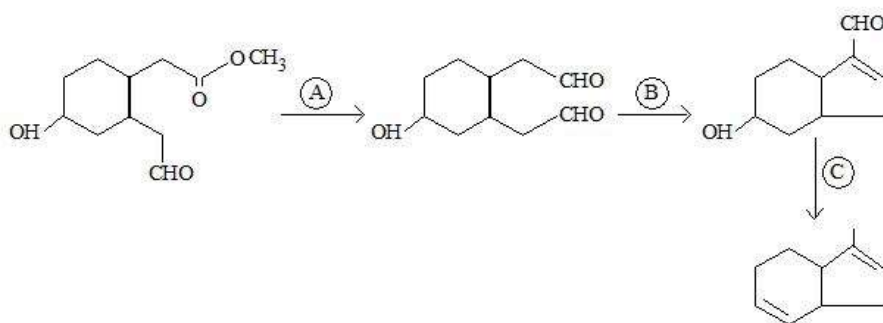
Option 3 ID : **4058592627**

Option 4 ID : **4058592626**

Status : **Answered**

Chosen Option : 4

Q.78 Identify the reagents used for the following conversion



Options 1.

1. A = LiAlH_4 , B = $\text{NaOH}_{(\text{aq})}$, C = $\text{NH}_2\text{-NH}_2/\text{KOH}$, ethylene glycol

2. A = DIBAL-H, B = $\text{NaOH}_{(\text{aq})}$, C = $\text{NH}_2\text{-NH}_2/\text{KOH}$, ethylene glycol

3. A = DIBAL-H, B = $\text{NaOH}_{(\text{alc})}$, C = Zn/HCl

4. A = LiAlH_4 , B = $\text{NaOH}_{(\text{alc})}$, C = Zn/HCl

Question Type : MCQ

Question ID : 405859818

Option 1 ID : 4058592656

Option 2 ID : 4058592655

Option 3 ID : 4058592653

Option 4 ID : 4058592654

Status : Answered

Chosen Option : 1

Q.79 Given below are two statements:

Statement I : Fluorine has most negative electron gain enthalpy in its group.

Statement II : Oxygen has least negative electron gain enthalpy in its group.

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

Options 1. Statement I is false but Statement II is true

2. Statement I is true but Statement II is false

3. Both Statement I and Statement II are false

4. Both Statement I and Statement II are true

Question Type : MCQ

Question ID : 405859808

Option 1 ID : 4058592616

Option 2 ID : 4058592615

Option 3 ID : 4058592614

Option 4 ID : 4058592613

Status : Answered

Chosen Option : 1

Q.80 Match List I with List II

LIST I (Bio Polymer)		LIST II (Monomer)	
A.	Starch	I.	nucleotide
B.	Cellulose	II.	α -glucose
C.	Nucleic acid	III.	β -glucose
D.	Protein	IV.	α -amino acid

Choose the correct answer from the options given below:

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

Question Type : **MCQ**

Question ID : **405859822**

Option 1 ID : **4058592671**

Option 2 ID : **4058592669**

Option 3 ID : **4058592672**

Option 4 ID : **4058592670**

Status : **Answered**

Chosen Option : 1

Section : Chemistry Section B

Q.81 The oxidation number of iron in the compound formed during brown ring test for NO_3^- ion is _____.

Given --
Answer :

Question Type : **SA**

Question ID : **405859831**

Status : **Not Attempted and
Marked For Review**

Q.82 The total number of anti bonding molecular orbitals, formed from 2s and 2p atomic orbitals in a diatomic molecule is _____.

Given 8
Answer :

Question Type : **SA**

Question ID : **405859826**

Status : **Answered**

Q.83 The following concentrations were observed at 500K for the formation of NH_3 from N_2 and H_2 . At equilibrium ; $[\text{N}_2] = 2 \times 10^{-2} \text{ M}$, $[\text{H}_2] = 3 \times 10^{-2} \text{ M}$ and $[\text{NH}_3] = 1.5 \times 10^{-2} \text{ M}$. Equilibrium constant for the reaction is _____.

Given 416
Answer :

Question Type : SA
Question ID : 405859830
Status : Marked For Review

Q.84 The half-life of radioisotope bromine - 82 is 36 hours. The fraction which remains after one day is _____ $\times 10^{-2}$.
(Given antilog $0.2006 = 1.587$)

Given --
Answer :

Question Type : SA
Question ID : 405859833
Status : Not Attempted and Marked For Review

Q.85 Molality of 0.8 M H_2SO_4 solution (density 1.06 g cm^{-3}) is _____ $\times 10^{-3} \text{ m}$.

Given 754
Answer :

Question Type : SA
Question ID : 405859829
Status : Marked For Review

Q.86 A constant current was passed through a solution of AuCl_4^- ion between gold electrodes. After a period of 10.0 minutes, the increase in mass of cathode was 1.314g. The total charge passed through the solution is _____ $\times 10^{-2} \text{ F}$.
(Given atomic mass of Au = 197)

Given --
Answer :

Question Type : SA
Question ID : 405859832
Status : Not Answered

Q.87 The total number of molecules with zero dipole moment among CH_4 , BF_3 , H_2O , HF , NH_3 , CO_2 and SO_2 is _____.

Given 3
Answer :

Question Type : SA
Question ID : 405859827
Status : Answered

Q.88 Standard enthalpy of vapourisation for CCl_4 is 30.5 kJ mol^{-1} . Heat required for vapourisation of 284g of CCl_4 at constant temperature is _____ kJ.

(Given molar mass in g mol^{-1} ; C=12, Cl=35.5)

Given --
Answer :

Question Type : **SA**
Question ID : **405859828**
Status : **Not Answered**

Q.89 The total number of 'Sigma' and 'Pi' bonds in 2-formylhex-4-enoic acid is _____.

Given **21**
Answer :

Question Type : **SA**
Question ID : **405859834**
Status : **Answered**

Q.90 If 50 mL of 0.5M oxalic acid is required to neutralise 25 mL of NaOH solution, the amount of NaOH in 50 mL of given NaOH solution is _____ g.

Given --
Answer :

Question Type : **SA**
Question ID : **405859825**
Status : **Not Answered**