**JEE April 2024**

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| Test Date | 04/04/2024 |
| Test Time | 9:00 AM - 12:00 PM |
| Subject | B. Tech |

Section : **Mathematics Section A**

**Q.1**

Let $\alpha \in (0, \infty)$ and $A = \begin{bmatrix} 1 & 2 & \alpha \\ 1 & 0 & 1 \\ 0 & 1 & 2 \end{bmatrix}$. If $\det(\text{adj}(2A - A^T) \cdot \text{adj}(A - 2A^T)) = 2^8$, then $(\det(A))^2$ is equal to :

**Options**

1. 49
2. 16
3. 1
4. 36

Question Type : **MCQ**
Question ID : **87827055432**
Option 1 ID : **878270218260**
Option 2 ID : **878270218258**
Option 3 ID : **878270218257**
Option 4 ID : **878270218259**
Status : **Not Answered**
Chosen Option : **--**

**Q.2**

If 2 and 6 are the roots of the equation $ax^2 + bx + 1 = 0$, then the quadratic equation, whose roots are $\frac{1}{2a + b}$ and $\frac{1}{6a + b}$, is :

**Options**

1. $x^2 + 10x + 16 = 0$
2. $2x^2 + 11x + 12 = 0$
3. $x^2 + 8x + 12 = 0$
4. $4x^2 + 14x + 12 = 0$

Question Type : **MCQ**
Question ID : **87827055430**
Option 1 ID : **878270218252**
Option 2 ID : **878270218251**
Option 3 ID : **878270218249**
Option 4 ID : **878270218250**
Status : **Answered**
Chosen Option : **1**

**Q.3**

Let $f: \mathbf{R} \to \mathbf{R}$ be a function given by

$$f(x) = \begin{cases} \frac{1-\cos 2x}{x^2}, & x < 0 \\ \alpha, & x = 0, \\ \frac{\beta\sqrt{1-\cos x}}{x}, & x > 0 \end{cases}$$

where $\alpha, \beta \in \mathbf{R}$. If $f$ is continuous at $x = 0$, then $\alpha^2 + \beta^2$ is equal to :

**Options**

1. 48
2. 12
3. 3
4. 6

Question Type : **MCQ**
Question ID : **87827055433**
Option 1 ID : **878270218264**
Option 2 ID : **878270218263**
Option 3 ID : **878270218261**
Option 4 ID : **878270218262**
Status : **Not Answered**
Chosen Option : **--**

**Q.4**

One of the points of intersection of the curves $y = 1 + 3x - 2x^2$ and $y = \frac{1}{x}$ is $\left(\frac{1}{2}, 2\right)$. Let the area of the region enclosed by these curves be $\frac{1}{24}(l\sqrt{5} + m) - n\log_e(1 + \sqrt{5})$, where $l, m, n \in \mathbf{N}$. Then $l + m + n$ is equal to

**Options**

1. 29
2. 31
3. 30
4. 32

Question Type : **MCQ**
Question ID : **87827055440**
Option 1 ID : **878270218290**
Option 2 ID : **878270218291**
Option 3 ID : **878270218289**
Option 4 ID : **878270218292**
Status : **Not Answered**
Chosen Option : **--**

**Q.5**

If the system of equations

$$x+\left(\sqrt{2}\sin\alpha\right)y+\left(\sqrt{2}\cos\alpha\right)z=0$$
$$x+(\cos\alpha)y+(\sin\alpha)z=0$$
$$x+(\sin\alpha)y-(\cos\alpha)z=0$$

has a non-trivial solution, then $\alpha\in\left(0,\frac{\pi}{2}\right)$ is equal to :

**Options**

1. $\frac{11\pi}{24}$
2. $\frac{7\pi}{24}$
3. $\frac{5\pi}{24}$
4. $\frac{3\pi}{4}$

Question Type : **MCQ**
Question ID : **87827055431**
Option 1 ID : **878270218256**
Option 2 ID : **878270218254**
Option 3 ID : **878270218255**
Option 4 ID : **878270218253**
Status : **Not Answered**
Chosen Option : **--**

**Q.6**

The vertices of a triangle are A(−1, 3), B(−2, 2) and C(3, −1). A new triangle is formed by shifting the sides of the triangle by one unit inwards. Then the equation of the side of the new triangle nearest to origin is :

**Options**

1. $x+y+\left(2-\sqrt{2}\right)=0$
2. $-x+y-\left(2-\sqrt{2}\right)=0$
3. $x+y-\left(2-\sqrt{2}\right)=0$
4. $x-y-\left(2+\sqrt{2}\right)=0$

Question Type : **MCQ**
Question ID : **87827055443**
Option 1 ID : **878270218302**
Option 2 ID : **878270218304**
Option 3 ID : **878270218301**
Option 4 ID : **878270218303**
Status : **Not Answered**
Chosen Option : **--**

**Q.7** Let $f(x)=x^5+2e^{x/4}$ for all $x \in \mathbf{R}$. Consider a function $g(x)$ such that $(gof)(x)=x$ for all $x \in \mathbf{R}$. Then the value of $8g'(2)$ is :

**Options**

1. 4
2. 8
3. 16
4. 2

Question Type : **MCQ**
Question ID : **87827055438**
Option 1 ID : **878270218282**
Option 2 ID : **878270218283**
Option 3 ID : **878270218284**
Option 4 ID : **878270218281**
Status : **Answered**
Chosen Option : **2**

**Q.8** Let $\alpha$ and $\beta$ be the sum and the product of all the non-zero solutions of the equation $(\bar{z})^2+|z|=0$, $z \in \mathbf{C}$. Then $4(\alpha^2+\beta^2)$ is equal to :

**Options**

1. 6
2. 2
3. 8
4. 4

Question Type : **MCQ**
Question ID : **87827055429**
Option 1 ID : **878270218247**
Option 2 ID : **878270218245**
Option 3 ID : **878270218248**
Option 4 ID : **878270218246**
Status : **Not Answered**
Chosen Option : **--**

**Q.9** If the solution $y = y(x)$ of the differential equation $(x^4 + 2x^3 + 3x^2 + 2x + 2)dy - (2x^2 + 2x + 3)dx = 0$ satisfies $y(-1) = -\frac{\pi}{4}$, then $y(0)$ is equal to :

**Options**

1. $\frac{\pi}{4}$
2. $0$
3. $\frac{\pi}{2}$
4. $-\frac{\pi}{12}$

Question Type : **MCQ**
Question ID : **87827055441**
Option 1 ID : **878270218293**
Option 2 ID : **878270218295**
Option 3 ID : **878270218294**
Option 4 ID : **878270218296**
Status : **Not Answered**
Chosen Option : **--**

**Q.10** A square is inscribed in the circle $x^2 + y^2 - 10x - 6y + 30 = 0$. One side of this square is parallel to $y = x + 3$. If $(x_i, y_i)$ are the vertices of the square, then $\Sigma\left(x_i^2 + y_i^2\right)$ is equal to :

**Options**

1. $148$
2. $156$
3. $152$
4. $160$

Question Type : **MCQ**
Question ID : **87827055442**
Option 1 ID : **878270218297**
Option 2 ID : **878270218299**
Option 3 ID : **878270218298**
Option 4 ID : **878270218300**
Status : **Not Answered**
Chosen Option : **--**

**Q.11** There are 5 points $P_1, P_2, P_3, P_4, P_5$ on the side AB, excluding A and B, of a triangle ABC. Similarly there are 6 points $P_6, P_7, \ldots, P_{11}$ on the side BC and 7 points $P_{12}, P_{13}, \ldots, P_{18}$ on the side CA of the triangle. The number of triangles, that can be formed using the points $P_1, P_2, \ldots, P_{18}$ as vertices, is :

**Options**

1. 771
2. 776
3. 796
4. 751

Question Type : **MCQ**
Question ID : **87827055434**
Option 1 ID : **878270218265**
Option 2 ID : **878270218266**
Option 3 ID : **878270218267**
Option 4 ID : **878270218268**
Status : **Not Answered**
Chosen Option : **--**

**Q.12** Let the first three terms 2, p and q, with $q \neq 2$, of a G.P. be respectively the $7^{th}$, $8^{th}$ and $13^{th}$ terms of an A.P. If the $5^{th}$ term of the G.P. is the $n^{th}$ term of the A.P., then n is equal to :

**Options**

1. 177
2. 151
3. 163
4. 169

Question Type : **MCQ**
Question ID : **87827055436**
Option 1 ID : **878270218276**
Option 2 ID : **878270218273**
Option 3 ID : **878270218274**
Option 4 ID : **878270218275**
Status : **Answered**
Chosen Option : **2**

**Q.13**

Let the sum of the maximum and the minimum values of the function $f(x)=\frac{2x^2-3x+8}{2x^2+3x+8}$ be $\frac{m}{n}$, where gcd(m, n) = 1. Then m + n is equal to :

**Options**

1. 195
2. 217
3. 201
4. 182

Question Type : **MCQ**
Question ID : **87827055439**
Option 1 ID : **878270218286**
Option 2 ID : **878270218288**
Option 3 ID : **878270218287**
Option 4 ID : **878270218285**
Status : **Not Answered**
Chosen Option : **--**

**Q.14**

Let a unit vector which makes an angle of 60° with $2\hat{i}+2\hat{j}-\hat{k}$ and an angle of 45° with $\hat{i}-\hat{k}$ be $\vec{c}$. Then $\vec{c}+\left(-\frac{1}{2}\hat{i}+\frac{1}{3\sqrt{2}}\hat{j}-\frac{\sqrt{2}}{3}\hat{k}\right)$ is :

**Options**

1. $-\frac{\sqrt{2}}{3}\hat{i}+\frac{\sqrt{2}}{3}\hat{j}+\left(\frac{1}{2}+\frac{2\sqrt{2}}{3}\right)\hat{k}$
2. $\frac{\sqrt{2}}{3}\hat{i}+\frac{1}{3\sqrt{2}}\hat{j}-\frac{1}{2}\hat{k}$
3. $\left(\frac{1}{\sqrt{3}}+\frac{1}{2}\right)\hat{i}+\left(\frac{1}{\sqrt{3}}-\frac{1}{3\sqrt{2}}\right)\hat{j}+\left(\frac{1}{\sqrt{3}}+\frac{\sqrt{2}}{3}\right)\hat{k}$
4. $\frac{\sqrt{2}}{3}\hat{i}-\frac{1}{2}\hat{k}$

Question Type : **MCQ**
Question ID : **87827055445**
Option 1 ID : **878270218310**
Option 2 ID : **878270218312**
Option 3 ID : **878270218309**
Option 4 ID : **878270218311**
Status : **Not Answered**
Chosen Option : **--**

**Q.15**

If the domain of the function $\sin^{-1}\left(\frac{3x-22}{2x-19}\right)+\log_e\left(\frac{3x^2-8x+5}{x^2-3x-10}\right)$ is $(\alpha, \beta]$, then $3\alpha+10\beta$ is equal to :

**Options**

1. 100
2. 97
3. 98
4. 95

Question Type : **MCQ**
Question ID : **87827055428**
Option 1 ID : **878270218244**
Option 2 ID : **878270218242**
Option 3 ID : **878270218243**
Option 4 ID : **878270218241**
Status : **Not Answered**
Chosen Option : **--**

**Q.16**

Let $\alpha, \beta \in \mathbf{R}$. Let the mean and the variance of 6 observations $-3, 4, 7, -6, \alpha, \beta$ be 2 and 23, respectively. The mean deviation about the mean of these 6 observations is :

**Options**

1. $\frac{11}{3}$
2. $\frac{16}{3}$
3. $\frac{14}{3}$
4. $\frac{13}{3}$

Question Type : **MCQ**
Question ID : **87827055447**
Option 1 ID : **878270218317**
Option 2 ID : **878270218318**
Option 3 ID : **878270218319**
Option 4 ID : **878270218320**
Status : **Not Answered**
Chosen Option : **--**

**Q.17**

The sum of all rational terms in the expansion of $\left(2^{\frac{1}{5}} + 5^{\frac{1}{3}}\right)^{15}$ is equal to :

**Options**

1. 931
2. 6131
3. 3133
4. 633

Question Type : **MCQ**
Question ID : **87827055435**
Option 1 ID : **878270218269**
Option 2 ID : **878270218272**
Option 3 ID : **878270218270**
Option 4 ID : **878270218271**
Status : **Not Answered**
Chosen Option : **--**

**Q.18**

Three urns A, B and C contain 7 red, 5 black; 5 red, 7 black and 6 red, 6 black balls, respectively. One of the urn is selected at random and a ball is drawn from it. If the ball drawn is black, then the probability that it is drawn from urn A is :

**Options**

1. $\frac{5}{16}$
2. $\frac{5}{18}$
3. $\frac{7}{18}$
4. $\frac{4}{17}$

Question Type : **MCQ**
Question ID : **87827055446**
Option 1 ID : **878270218313**
Option 2 ID : **878270218315**
Option 3 ID : **878270218316**
Option 4 ID : **878270218314**
Status : **Not Answered**
Chosen Option : **--**

**Q.19** Let $f(x)=\begin{cases}-2, & -2 \le x \le 0 \\ x-2, & 0<x \le 2\end{cases}$ and $h(x)=f(|x|)+|f(x)|$. Then $\int_{-2}^{2} h(x)\,dx$ is equal to :

**Options**

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

Question Type : **MCQ**
Question ID : **87827055437**
Option 1 ID : **878270218279**
Option 2 ID : **878270218280**
Option 3 ID : **878270218278**
Option 4 ID : **878270218277**
Status : **Not Answered**
Chosen Option : **--**

**Q.20** Let the point, on the line passing through the points P(1, −2, 3) and Q (5, −4, 7), farther from the origin and at a distance of 9 units from the point P, be $(\alpha, \beta, \gamma)$. Then $\alpha^2+\beta^2+\gamma^2$ is equal to :

**Options**

1. 155
2. 160
3. 165
4. 150

Question Type : **MCQ**
Question ID : **87827055444**
Option 1 ID : **878270218308**
Option 2 ID : **878270218307**
Option 3 ID : **878270218306**
Option 4 ID : **878270218305**
Status : **Not Answered**
Chosen Option : **--**

Section : **Mathematics Section B**

**Q.21** If $\int_0^{\frac{\pi}{4}} \frac{\sin^2 x}{1+\sin x \cos x}dx = \frac{1}{a}\log_e\left(\frac{a}{3}\right) + \frac{\pi}{b\sqrt{3}}$, where $a,b \in \mathbf{N}$, then $a+b$ is equal to _____.

Given Answer : **--**

Question Type : **SA**
Question ID : **87827055452**
Status : **Not Answered**

**Q.22**

Let $a = 1 + \frac{{}^2C_2}{3!} + \frac{{}^3C_2}{4!} + \frac{{}^4C_2}{5!} + \ldots,$

$b = 1 + \frac{{}^1C_0 + {}^1C_1}{1!} + \frac{{}^2C_0 + {}^2C_1 + {}^2C_2}{2!} + \frac{{}^3C_0 + {}^3C_1 + {}^3C_2 + {}^3C_3}{3!} + \ldots.$

Then $\frac{2b}{a^2}$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055450**
Status : **Not Answered**

**Q.23**

In a survey of 220 students of a higher secondary school, it was found that at least 125 and at most 130 students studied Mathematics; at least 85 and at most 95 studied Physics; at least 75 and at most 90 studied Chemistry; 30 studied both Physics and Chemistry; 50 studied both Chemistry and Mathematics; 40 studied both Mathematics and Physics and 10 studied none of these subjects. Let m and n respectively be the least and the most number of students who studied all the three subjects. Then m+n is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055448**
Status : **Not Answered**

**Q.24**

Let ABC be a triangle of area $15\sqrt{2}$ and the vectors $\overrightarrow{AB} = \hat{i} + 2\hat{j} - 7\hat{k}$, $\overrightarrow{BC} = a\hat{i} + b\hat{j} + c\hat{k}$ and $\overrightarrow{AC} = 6\hat{i} + d\hat{j} - 2\hat{k}$, $d > 0$. Then the square of the length of the largest side of the triangle ABC is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055457**
Status : **Not Answered**

**Q.25**

Let A be a $3\times3$ matrix of non-negative real elements such that $A\begin{bmatrix}1\\1\\1\end{bmatrix} = 3\begin{bmatrix}1\\1\\1\end{bmatrix}$.

Then the maximum value of det(A) is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055449**
Status : **Not Answered**

**Q.26**

If the shortest distance between the lines $\frac{x+2}{2} = \frac{y+3}{3} = \frac{z-5}{4}$ and $\frac{x-3}{1} = \frac{y-2}{-3} = \frac{z+4}{2}$ is $\frac{38}{3\sqrt{5}}$ k, and $\int_0^k [x^2]\,dx = \alpha - \sqrt{\alpha}$, where $[x]$ denotes the greatest integer function, then $6\alpha^3$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055456**
Status : **Not Answered**

**Q.27** Let the solution $y=y(x)$ of the differential equation $\frac{dy}{dx} - y = 1 + 4\sin x$ satisfy $y(\pi)=1$. Then $y\left(\frac{\pi}{2}\right) + 10$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055453**
Status : **Not Answered**

**Q.28** Let A be a square matrix of order 2 such that $|A|=2$ and the sum of its diagonal elements is $-3$. If the points $(x, y)$ satisfying $A^2+xA+yI=O$ lie on a hyperbola, whose transverse axis is parallel to the $x$-axis, eccentricity is e and the length of the latus rectum is $l$, then $e^4+l^4$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055454**
Status : **Not Answered**

**Q.29** If $\lim\limits_{x\to 1} \frac{(5x+1)^{1/3} - (x+5)^{1/3}}{(2x+3)^{1/2} - (x+4)^{1/2}} = \frac{m\sqrt{5}}{n(2n)^{2/3}}$, where gcd(m, n)=1, then $8m+12n$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055451**
Status : **Not Answered**

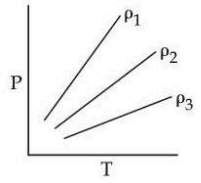
**Q.30** Let the length of the focal chord PQ of the parabola $y^2=12x$ be 15 units. If the distance of PQ from the origin is p, then $10p^2$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055455**
Status : **Not Answered**

Section : **Physics Section A**

**Q.31** P-T diagram of an ideal gas having three different densities $\rho_1$, $\rho_2$, $\rho_3$ (in three different cases) is shown in the figure. Which of the following is correct :




**Options**

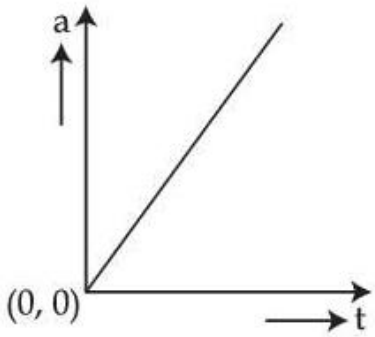
1. $\rho_1 > \rho_2$
2. $\rho_2 < \rho_3$
3. $\rho_1 = \rho_2 = \rho_3$
4. $\rho_1 < \rho_2$

Question Type : **MCQ**
Question ID : **87827055466**
Option 1 ID : **878270218366**
Option 2 ID : **878270218364**
Option 3 ID : **878270218365**
Option 4 ID : **878270218363**
Status : **Answered**
Chosen Option : **3**

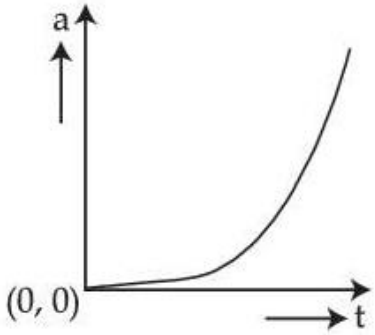
**Q.32** A wooden block, initially at rest on the ground, is pushed by a force which increases linearly with time t. Which of the following curve best describes acceleration of the block with time :

**Options**

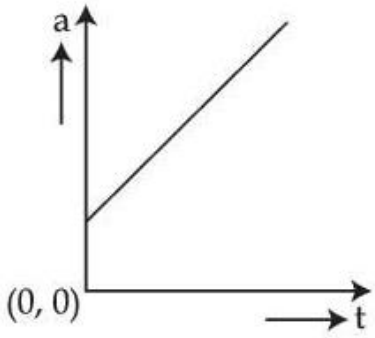
1.



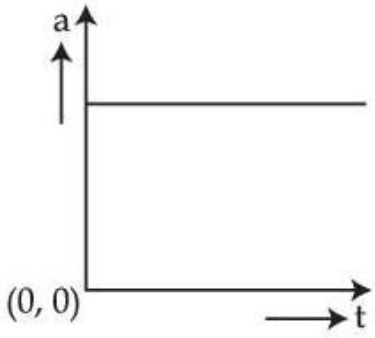

2.




3.




4.




Question Type : **MCQ**
Question ID : **87827055460**
Option 1 ID : **878270218340**
Option 2 ID : **878270218339**
Option 3 ID : **878270218341**
Option 4 ID : **878270218342**
Status : **Answered**
Chosen Option : **3**

**Q.33** An effective power of a combination of 5 identical convex lenses which are kept in contact along the principal axis is 25 D. Focal length of each of the convex lens is :

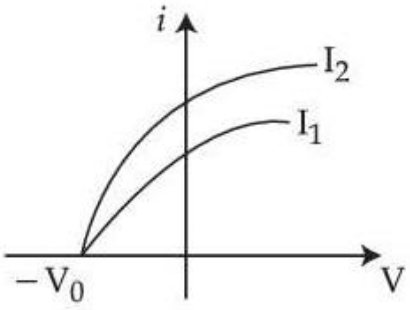
**Options**

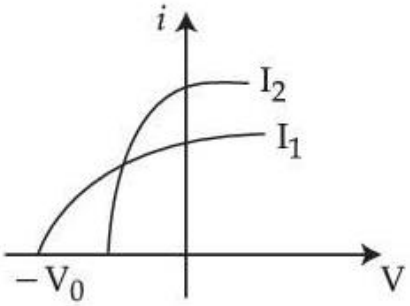
1. 25 cm
2. 20 cm
3. 50 cm
4. 500 cm

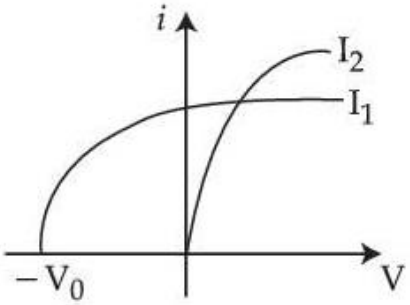
Question Type : **MCQ**
Question ID : **87827055472**
Option 1 ID : **878270218390**
Option 2 ID : **878270218387**
Option 3 ID : **878270218388**
Option 4 ID : **878270218389**
Status : **Not Answered**
Chosen Option : **--**

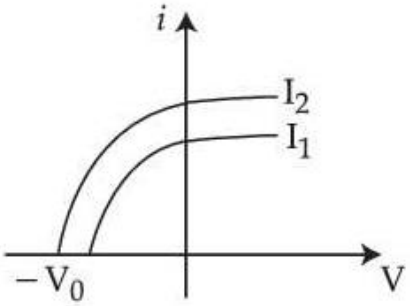
**Q.34** Which figure shows the correct variation of applied potential difference (V) with photoelectric current (I) at two different intensities of light ($I_1 < I_2$) of same wavelengths :

**Options**

1.


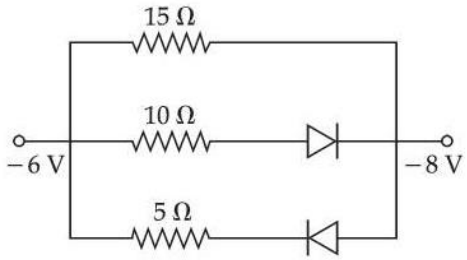

2.



3.



4.



Question Type : **MCQ**
Question ID : **87827055473**
Option 1 ID : **878270218392**
Option 2 ID : **878270218391**
Option 3 ID : **878270218393**
Option 4 ID : **878270218394**
Status : **Answered**
Chosen Option : **1**

**Q.35** The value of net resistance of the network as shown in the given figure is :




**Options**

1. $(15/4)\ \Omega$
2. $6\ \Omega$
3. $(5/2)\ \Omega$
4. $(30/11)\ \Omega$

Question Type : **MCQ**
Question ID : **87827055475**
Option 1 ID : **878270218400**
Option 2 ID : **878270218402**
Option 3 ID : **878270218401**
Option 4 ID : **878270218399**
Status : **Answered**
Chosen Option : **4**

**Q.36** In an experiment to measure focal length ($f$) of convex lens, the least counts of the measuring scales for the position of object (u) and for the position of image (v) are $\Delta u$ and $\Delta v$, respectively. The error in the measurement of the focal length of the convex lens will be :

**Options**

1. $\frac{\Delta u}{u} + \frac{\Delta v}{v}$
2. $f^2\left[\frac{\Delta u}{u^2} + \frac{\Delta v}{v^2}\right]$
3. $2f\left[\frac{\Delta u}{u} + \frac{\Delta v}{v}\right]$
4. $f\left[\frac{\Delta u}{u} + \frac{\Delta v}{v}\right]$

Question Type : **MCQ**
Question ID : **87827055476**
Option 1 ID : **878270218405**
Option 2 ID : **878270218406**
Option 3 ID : **878270218404**
Option 4 ID : **878270218403**
Status : **Not Answered**
Chosen Option : **--**

**Q.37** An electron is projected with uniform velocity along the axis inside a current carrying long solenoid. Then :

**Options**

1. the electron path will be circular about the axis.

2. the electron will continue to move with uniform velocity along the axis of the solenoid.

3. the electron will experience a force at 45° to the axis and execute a helical path.

4. the electron will be accelerated along the axis.

Question Type : **MCQ**
Question ID : **87827055469**
Option 1 ID : **878270218376**
Option 2 ID : **878270218378**
Option 3 ID : **878270218377**
Option 4 ID : **878270218375**
Status : **Answered**
Chosen Option : **3**

**Q.38** A body travels 102.5 m in $n^{th}$ second and 115.0 m in $(n+2)^{th}$ second. The acceleration is :

**Options**

1. $6.25\ m/s^2$

2. $12.5\ m/s^2$

3. $5\ m/s^2$

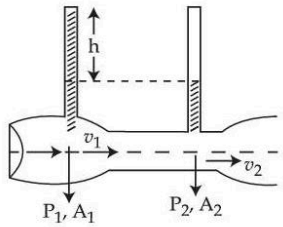
4. $9\ m/s^2$

Question Type : **MCQ**
Question ID : **87827055461**
Option 1 ID : **878270218344**
Option 2 ID : **878270218345**
Option 3 ID : **878270218343**
Option 4 ID : **878270218346**
Status : **Answered**
Chosen Option : **1**

**Q.39** Given below are two statements :

**Statement I :** When speed of liquid is zero everywhere, pressure difference at any two points depends on equation $P_1 - P_2 = \rho g(h_2 - h_1)$.

**Statement II :** In ventury tube shown $2gh = v_1^2 - v_2^2$




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

**Options**

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

Question Type : **MCQ**
Question ID : **87827055464**
Option 1 ID : **878270218357**
Option 2 ID : **878270218355**
Option 3 ID : **878270218358**
Option 4 ID : **878270218356**
Status : **Not Answered**
Chosen Option : **--**

**Q.40** Which of the following nuclear fragments corresponding to nuclear fission between neutron $\left({}_0^1\mathrm{n}\right)$ and uranium isotope $\left({}_{92}^{235}\mathrm{U}\right)$ is correct :

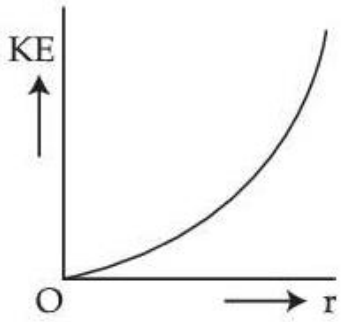
**Options**

1. ${}_{51}^{153}\mathrm{Sb} + {}_{41}^{99}\mathrm{Nb} + 3{}_0^1\mathrm{n}$
2. ${}_{56}^{144}\mathrm{Ba} + {}_{36}^{89}\mathrm{Kr} + 3{}_0^1\mathrm{n}$
3. ${}_{56}^{140}\mathrm{Xe} + {}_{38}^{94}\mathrm{Sr} + 3{}_0^1\mathrm{n}$
4. ${}_{56}^{144}\mathrm{Ba} + {}_{36}^{89}\mathrm{Kr} + 4{}_0^1\mathrm{n}$

Question Type : **MCQ**
Question ID : **87827055474**
Option 1 ID : **878270218395**
Option 2 ID : **878270218396**
Option 3 ID : **878270218397**
Option 4 ID : **878270218398**
Status : **Not Answered**
Chosen Option : **--**

**Q.41** An infinitely long positively charged straight thread has a linear charge density $\lambda$ $Cm^{-1}$. An electron revolves along a circular path having axis along the length of the wire. The graph that correctly represents the variation of the kinetic energy of electron as a function of radius of circular path from the wire is :

**Options**

1.
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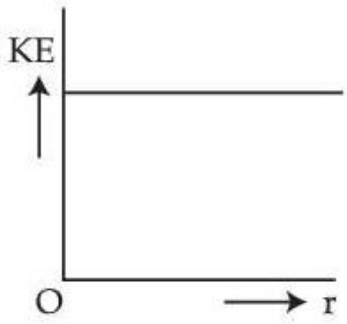
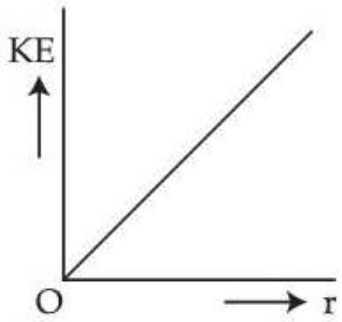
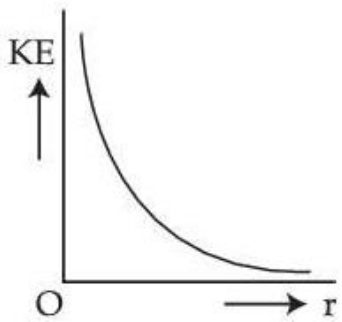



3.



4.



Question Type : **MCQ**
Question ID : **87827055467**
Option 1 ID : **878270218368**
Option 2 ID : **878270218370**
Option 3 ID : **878270218369**
Option 4 ID : **878270218367**
Status : **Not Answered**
Chosen Option : **--**

**Q.42** To measure the internal resistance of a battery, potentiometer is used. For $R = 10\ \Omega$, the balance point is observed at $l = 500$ cm and for $R = 1\ \Omega$ the balance point is observed at $l = 400$ cm. The internal resistance of the battery is approximately :

**Options**

1. $0.4\ \Omega$
2. $0.3\ \Omega$
3. $0.1\ \Omega$
4. $0.2\ \Omega$

Question Type : **MCQ**
Question ID : **87827055477**
Option 1 ID : **878270218410**
Option 2 ID : **878270218409**
Option 3 ID : **878270218407**
Option 4 ID : **878270218408**
Status : **Answered**
Chosen Option : **3**

**Q.43** The electric field in an electromagnetic wave is given by $\vec{E} = \hat{i}\ 40 \cos\omega\left(t - z/c\right) N C^{-1}$. The magnetic field induction of this wave is (in SI unit) :

**Options**

1. $\vec{B} = \hat{j}\ \frac{40}{c} \cos\omega\left(t - z/c\right)$
2. $\vec{B} = \hat{i}\ \frac{40}{c} \cos\omega\left(t - z/c\right)$
3. $\vec{B} = \hat{k}\ \frac{40}{c} \cos\omega\left(t - z/c\right)$
4. $\vec{B} = \hat{j}\ 40 \cos\omega\left(t - z/c\right)$

Question Type : **MCQ**
Question ID : **87827055471**
Option 1 ID : **878270218385**
Option 2 ID : **878270218386**
Option 3 ID : **878270218384**
Option 4 ID : **878270218383**
Status : **Answered**
Chosen Option : **1**

**Q.44** In an ac circuit, the instantaneous current is zero, when the instantaneous voltage is maximum. In this case, the source may be connected to :

A. pure inductor.
B. pure capacitor.
C. pure resistor.
D. combination of an inductor and capacitor.

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

**Options**

1. A, B and C only

2. A, B and D only

3. B, C and D only

4. A and B only

Question Type : **MCQ**
Question ID : **87827055470**
Option 1 ID : **878270218379**
Option 2 ID : **878270218381**
Option 3 ID : **878270218380**
Option 4 ID : **878270218382**
Status : **Not Answered**
Chosen Option : **--**

**Q.45** The co-ordinates of a particle moving in $x$-$y$ plane are given by :
$x = 2 + 4t,\ y = 3t + 8t^2$.
The motion of the particle is :

**Options**

1. uniform motion along a straight line.

2. uniformly accelerated having motion along a straight line.

3. non-uniformly accelerated.

4. uniformly accelerated having motion along a parabolic path.

Question Type : **MCQ**
Question ID : **87827055459**
Option 1 ID : **878270218338**
Option 2 ID : **878270218336**
Option 3 ID : **878270218335**
Option 4 ID : **878270218337**
Status : **Not Answered**
Chosen Option : **--**

**Q.46** The resistances of the platinum wire of a platinum resistance thermometer at the ice point and steam point are 8 Ω and 10 Ω respectively. After inserting in a hot bath of temperature 400°C, the resistance of platinum wire is :

**Options**

1. $10\ \Omega$
2. $2\ \Omega$
3. $16\ \Omega$
4. $8\ \Omega$

Question Type : **MCQ**
Question ID : **87827055468**
Option 1 ID : **878270218372**
Option 2 ID : **878270218374**
Option 3 ID : **878270218373**
Option 4 ID : **878270218371**
Status : **Answered**
Chosen Option : **3**

**Q.47** A metal wire of uniform mass density having length L and mass M is bent to form a semicircular arc and a particle of mass m is placed at the centre of the arc. The gravitational force on the particle by the wire is :

**Options**

1. $\frac{GMm\pi}{2L^2}$
2. $0$
3. $\frac{GmM\pi^2}{L^2}$
4. $\frac{2GmM\pi}{L^2}$

Question Type : **MCQ**
Question ID : **87827055463**
Option 1 ID : **878270218354**
Option 2 ID : **878270218351**
Option 3 ID : **878270218352**
Option 4 ID : **878270218353**
Status : **Answered**
Chosen Option : **2**

**Q.48** If a rubber ball falls from a height h and rebounds upto the height of h/2. The percentage loss of total energy of the initial system as well as velocity ball before it strikes the ground, respectively, are :

**Options**

1. $50\%, \sqrt{gh}$
2. $50\%, \sqrt{2gh}$
3. $40\%, \sqrt{2gh}$
4. $50\%, \sqrt{\frac{gh}{2}}$

Question Type : **MCQ**
Question ID : **87827055462**
Option 1 ID : **878270218347**
Option 2 ID : **878270218348**
Option 3 ID : **878270218349**
Option 4 ID : **878270218350**
Status : **Answered**
Chosen Option : **2**

**Q.49** The equation of stationary wave is :

$$y = 2a \sin\left(\frac{2\pi nt}{\lambda}\right)\cos\left(\frac{2\pi x}{\lambda}\right).$$

Which of the following is NOT correct :

**Options**

1. The dimensions of nt is [L]
2. The dimensions of n is $[LT^{-1}]$
3. The dimensions of $x$ is [L]
4. The dimensions of $n/\lambda$ is [T]

Question Type : **MCQ**
Question ID : **87827055458**
Option 1 ID : **878270218331**
Option 2 ID : **878270218333**
Option 3 ID : **878270218332**
Option 4 ID : **878270218334**
Status : **Answered**
Chosen Option : **1**

**Q.50** On celcius scale the temperature of body increases by 40°C. The increase in temperature on Fahrenheit scale is :

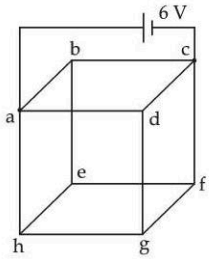
**Options**

1. 68°F
2. 72°F
3. 70°F
4. 75°F

Question Type : **MCQ**
Question ID : **87827055465**
Option 1 ID : **878270218362**
Option 2 ID : **878270218359**
Option 3 ID : **878270218360**
Option 4 ID : **878270218361**
Status : **Answered**
Chosen Option : **2**

Section : **Physics Section B**

**Q.51** Twelve wires each having resistance 2 Ω are joined to form a cube. A battery of 6 V emf is joined across point a and c. The voltage difference between e and f is _____ V.




Given --
Answer :

Question Type : **SA**
Question ID : **87827055483**
Status : **Not Answered**

**Q.52** A solid sphere and a hollow cylinder roll up without slipping on same inclined plane with same initial speed $v$. The sphere and the cylinder reaches upto maximum heights $h_1$ and $h_2$, respectively, above the initial level. The ratio $h_1 : h_2$ is $\frac{n}{10}$. The value of n is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055479**
Status : **Not Answered**

**Q.53** A alternating current at any instant is given by $i = \left[6 + \sqrt{56}\sin(100\pi t + \pi/3)\right]$ A. The *rms* value of the current is _____ A.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055485**
Status : **Not Answered**

**Q.54** A hydrogen atom changes its state from n = 3 to n = 2. Due to recoil, the percentage change in the wave length of emitted light is approximately $1 \times 10^{-n}$. The value of n is _____.
[Given Rhc = 13.6 eV, hc = 1242 eV nm, h = $6.6 \times 10^{-34}$ J s mass of the hydrogenatom = $1.6 \times 10^{-27}$ kg]

Given --
Answer :

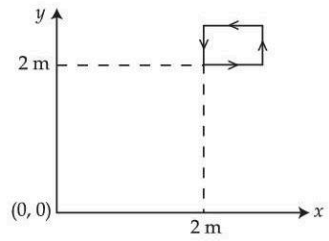
Question Type : **SA**
Question ID : **87827055487**
Status : **Not Answered**

**Q.55** A soap bubble is blown to a diameter of 7 cm. 36960 erg of work is done in blowing it further. If surface tension of soap solution is 40 dyne/cm then the new radius is _____ cm Take $\left(\pi = \frac{22}{7}\right)$.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055480**
Status : **Not Answered**

**Q.56** The magnetic field existing in a region is given by $\vec{B} = 0.2\,(1 + 2x)\hat{k}\,T$. A square loop of edge 50 cm carrying 0.5 A current is placed in *x*-*y* plane with its edges parallel to the *x*-*y* axes, as shown in figure. The magnitude of the net magnetic force experienced by the loop is _____ mN.




Given --
Answer :

Question Type : **SA**
Question ID : **87827055484**
Status : **Not Answered**

**Q.57** An infinite plane sheet of charge having uniform surface charge density $+\sigma_s$ C/m$^2$ is placed on *x*-*y* plane. Another infinitely long line charge having uniform linear charge density $+\lambda_e$ C/m is placed at *z* = 4 m plane and parallel to *y*-axis. If the magnitude values $|\sigma_s| = 2\,|\lambda_e|$ then at point (0, 0, 2), the ratio of magnitudes of electric field values due to sheet charge to that of line charge is $\pi\sqrt{n} : 1$. The value of n is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055482**
Status : **Not Answered**

**Q.58** Two wavelengths $\lambda_1$ and $\lambda_2$ are used in Young's double slit experiment. $\lambda_1 = 450$ nm and $\lambda_2 = 650$ nm. The minimum order of fringe produced by $\lambda_2$ which overlaps with the fringe produced by $\lambda_1$ is n. The value of n is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055486**
Status : **Not Answered**

**Q.59** Two forces $\bar{F}_1$ and $\bar{F}_2$ are acting on a body. One force has magnitude thrice that of the other force and the resultant of the two forces is equal to the force of larger magnitude. The angle between $\vec{F}_1$ and $\vec{F}_2$ is $\cos^{-1}\left(\frac{1}{n}\right)$. The value of |n| is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055478**
Status : **Not Answered**

**Q.60** An elastic spring under tension of 3 N has a length $a$. Its length is $b$ under tension 2 N. For its length $(3a-2b)$, the value of tension will be _____ N.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055481**
Status : **Not Answered**

Section : **Chemistry Section A**

**Q.61** The element which shows only one oxidation state other than its elemental form is :

**Options**

1. Titanium
2. Scandium
3. Cobalt
4. Nickel

Question Type : **MCQ**
Question ID : **87827055496**
Option 1 ID : **878270218455**
Option 2 ID : **878270218454**
Option 3 ID : **878270218453**
Option 4 ID : **878270218456**
Status : **Answered**
Chosen Option : **4**

**Q.62** One of the commonly used electrode is calomel electrode. Under which of the following categories, calomel electrode comes ?

**Options**

1. Gas - Ion electrodes
2. Metal ion - Metal electrodes
3. Metal - Insoluble Salt - Anion electrodes
4. Oxidation - Reduction electrodes

Question Type : **MCQ**
Question ID : **87827055491**
Option 1 ID : **878270218433**
Option 2 ID : **878270218434**
Option 3 ID : **878270218435**
Option 4 ID : **878270218436**
Status : **Not Answered**
Chosen Option : **--**

**Q.63** Number of molecules/ions from the following in which the central atom is involved in $sp^3$ hybridization is _____.

$NO_3^-, BCl_3, ClO_2^-, ClO_3$

**Options**

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

Question Type : **MCQ**
Question ID : **87827055495**
Option 1 ID : **878270218452**
Option 2 ID : **878270218450**
Option 3 ID : **878270218449**
Option 4 ID : **878270218451**
Status : **Answered**
Chosen Option : **2**

**Q.64** The correct sequence of ligands in the order of decreasing field strength is :

**Options**

1. $NCS^- > EDTA^{4-} > CN^- > CO$
2. $CO > H_2O > F^- > S^{2-}$
3. $^-OH > F^- > NH_3 > CN^-$
4. $S^{2-} > ^-OH > EDTA^{4-} > CO$

Question Type : **MCQ**
Question ID : **87827055497**
Option 1 ID : **878270218458**
Option 2 ID : **878270218457**
Option 3 ID : **878270218459**
Option 4 ID : **878270218460**
Status : **Not Answered**
Chosen Option : **--**

**Q.65** The correct order of first ionization enthalpy values of the following elements is :

(A) O
(B) N
(C) Be
(D) F
(E) B

Choose the correct answer from the options given below :

**Options**

1. $B < D < C < E < A$
2. $E < C < A < B < D$
3. $C < E < A < B < D$
4. $A < B < D < C < E$

Question Type : **MCQ**
Question ID : **87827055493**
Option 1 ID : **878270218442**
Option 2 ID : **878270218443**
Option 3 ID : **878270218444**
Option 4 ID : **878270218441**
Status : **Answered**
Chosen Option : **3**

**Q.66** What pressure (bar) of $H_2$ would be required to make emf of hydrogen electrode zero in pure water at 25°C ?

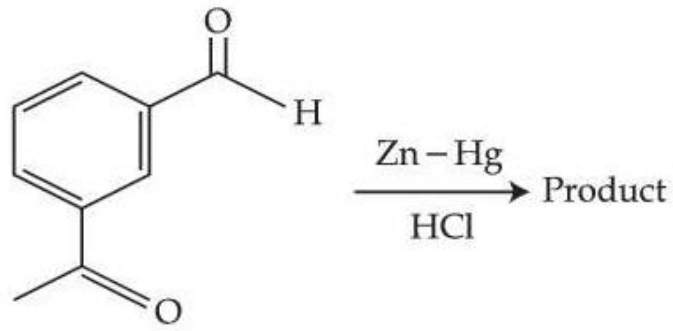
**Options**

1. $10^{-7}$
2. $1$
3. $10^{-14}$
4. $0.5$

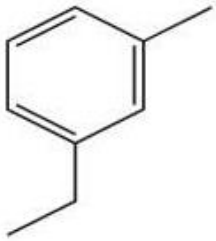
Question Type : **MCQ**
Question ID : **87827055492**
Option 1 ID : **878270218437**
Option 2 ID : **878270218439**
Option 3 ID : **878270218438**
Option 4 ID : **878270218440**
Status : **Not Answered**
Chosen Option : **--**

**Q.67**

Identify the product in the following reaction :




**Options**

1.


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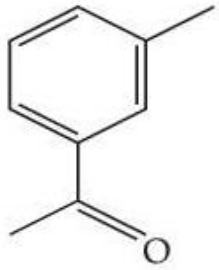
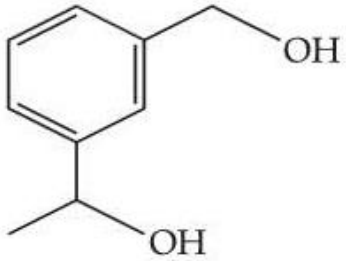
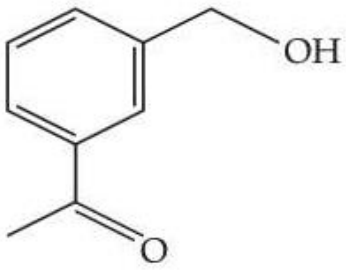
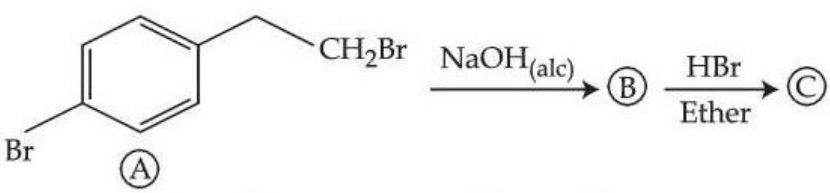



3.



4.



Question Type : **MCQ**
Question ID : **87827055506**
Option 1 ID : **878270218493**
Option 2 ID : **878270218494**
Option 3 ID : **878270218496**
Option 4 ID : **878270218495**
Status : **Answered**
Chosen Option : **1**

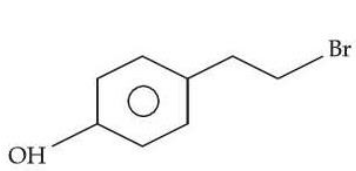
**Q.68**

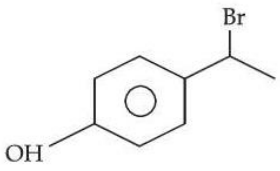



Identify (B) and (C) and how are (A) and (C) related ?

**(B)** **(C)**

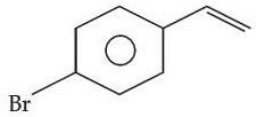
**Options** 1.

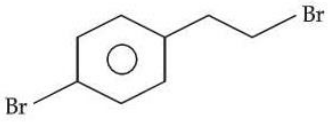



; Derivative

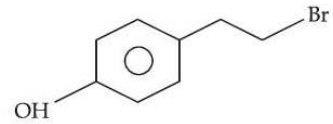
2.

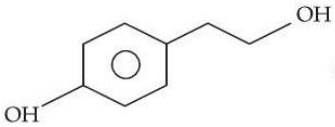



; chain isomers

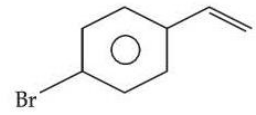
3.

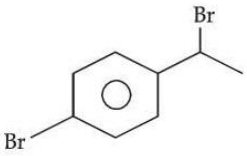



; functional group isomers

4.




; positon isomers

Question Type : **MCQ**
Question ID : **87827055503**
Option 1 ID : **878270218484**
Option 2 ID : **878270218483**
Option 3 ID : **878270218481**
Option 4 ID : **878270218482**
Status : **Answered**
Chosen Option : **1**

**Q.69** Which one of the following molecules has maximum dipole moment ?

**Options**

1. $NH_3$
2. $CH_4$
3. $NF_3$
4. $PF_5$

Question Type : **MCQ**
Question ID : **87827055489**
Option 1 ID : **878270218426**
Option 2 ID : **878270218427**
Option 3 ID : **878270218425**
Option 4 ID : **878270218428**
Status : **Not Answered**
Chosen Option : **--**

**Q.70** Which of the following nitrogen containing compound does not give Lassaigne's test ?

**Options**

1. Phenyl hydrazine
2. Hydrazine
3. Urea
4. Glycene

Question Type : **MCQ**
Question ID : **87827055500**
Option 1 ID : **878270218472**
Option 2 ID : **878270218471**
Option 3 ID : **878270218469**
Option 4 ID : **878270218470**
Status : **Not Answered**
Chosen Option : **--**

**Q.71** Given below are two statements :
**Statements I :** Acidity of α-hydrogens of aldehydes and ketones is responsible for Aldol reaction.
**Statement II :** Reaction between benzaldehyde and ethanal will NOT give Cross - Aldol product.
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. Both **Statement I** and **Statement II** are correct

3.

**Statement I** is correct but **Statement II** is incorrect

4. Both **Statement I** and **Statement II** are incorrect

Question Type : **MCQ**
Question ID : **87827055505**
Option 1 ID : **878270218492**
Option 2 ID : **878270218489**
Option 3 ID : **878270218491**
Option 4 ID : **878270218490**
Status : **Not Answered**
Chosen Option : **--**

**Q.72** Which among the following is **incorrect** statement ?

**Options** 1.

The organic compound shows electromeric effect in the presence of the reagent only.

2. Electromeric effect dominates over inductive effect

3. The electromeric effect is, temporary effect

4.

Hydrogen ion ($H^+$) shows negative electromeric effect

Question Type : **MCQ**
Question ID : **87827055502**
Option 1 ID : **878270218477**
Option 2 ID : **878270218479**
Option 3 ID : **878270218478**
Option 4 ID : **878270218480**
Status : **Answered**
Chosen Option : **2**

**Q.73** The Molarity (M) of an aqueous solution containing 5.85 g of NaCl in 500 mL water is :
(Given : Molar Mass Na : 23 and Cl : 35.5 $gmol^{-1}$)

**Options**

1. 4
2. 20
3. 0.2
4. 2

Question Type : **MCQ**
Question ID : **87827055488**
Option 1 ID : **878270218421**
Option 2 ID : **878270218422**
Option 3 ID : **878270218423**
Option 4 ID : **878270218424**
Status : **Not Answered**
Chosen Option : **--**

**Q.74** What will be the decreasing order of basic strength of the following conjugate bases ?
$^{-}OH, R\bar{O}, CH_3C\bar{O}O, C\bar{l}$

**Options**

1. $C\bar{l} > R\bar{O} > {}^{-}OH > CH_3C\bar{O}O$
2. $^{-}OH > R\bar{O} > CH_3C\bar{O}O > C\bar{l}$
3. $C\bar{l} > {}^{-}OH > R\bar{O} > CH_3C\bar{O}O$
4. $R\bar{O} > {}^{-}OH > CH_3C\bar{O}O > C\bar{l}$

Question Type : **MCQ**
Question ID : **87827055490**
Option 1 ID : **878270218432**
Option 2 ID : **878270218429**
Option 3 ID : **878270218431**
Option 4 ID : **878270218430**
Status : **Answered**
Chosen Option : **2**

**Q.75** Number of elements from the following that CANNOT form compounds with valencies which match with their respective group valencies is _____.
B, C, N, S, O, F, P, Al, Si

**Options**

1. 5
2. 7
3. 6
4. 3

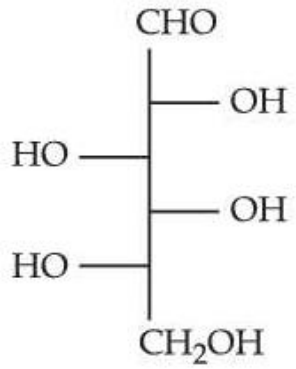
Question Type : **MCQ**
Question ID : **87827055494**
Option 1 ID : **878270218445**
Option 2 ID : **878270218448**
Option 3 ID : **878270218447**
Option 4 ID : **878270218446**
Status : **Answered**
Chosen Option : **2**

**Q.76**

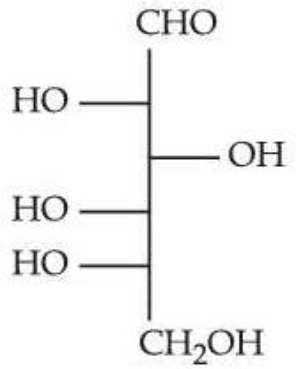
Which of the following is the correct structure of L-Glucose ?

**Options**

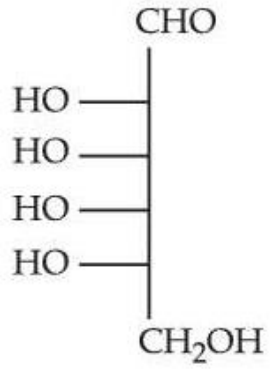
1.



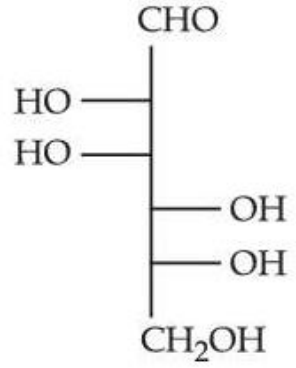

2.




3.

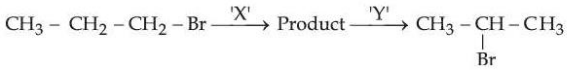



4.




Question Type : **MCQ**
Question ID : **87827055507**
Option 1 ID : **878270218497**
Option 2 ID : **878270218499**
Option 3 ID : **878270218500**
Option 4 ID : **878270218498**
Status : **Not Answered**
Chosen Option : **--**

**Q.77** Identify the correct set of reagents or reaction conditions 'X' and 'Y' in the following set of transformation.



**Options**

1. X = dil.aq. NaOH, 20°C, Y = HBr/acetic acid
2. X = conc.alc. NaOH, 80°C, Y = HBr/acetic acid
3. X = dil.aq. NaOH, 20°C, Y = $Br_2/CHCl_3$
4. X = conc.alc. NaOH, 80°C, Y = $Br_2/CHCl_3$

Question Type : **MCQ**
Question ID : **87827055504**
Option 1 ID : **878270218485**
Option 2 ID : **878270218486**
Option 3 ID : **878270218487**
Option 4 ID : **878270218488**
Status : **Answered**
Chosen Option : **1**

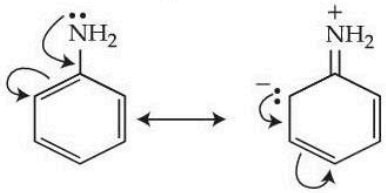
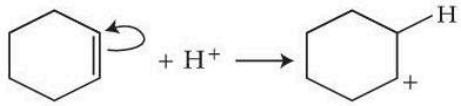
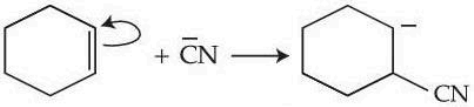
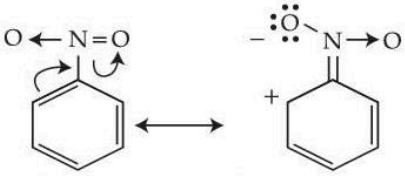
**Q.78** In the precipitation of the iron group (III) in qualitative analysis, ammonium chloride is added before adding ammonium hydroxide to :

**Options**

1. decrease concentration of $^{-}OH$ ions
2. prevent interference by phosphate ions
3. increase concentration of $Cl^{-}$ ions
4. increase concentration of $NH_4^{+}$ ions

Question Type : **MCQ**
Question ID : **87827055499**
Option 1 ID : **878270218465**
Option 2 ID : **878270218466**
Option 3 ID : **878270218467**
Option 4 ID : **878270218468**
Status : **Not Answered**
Chosen Option : **--**

**Q.79** Match **List I** with **List II** :

| **List - I**<br>**Mechanism steps** | | **List - II**<br>**Effect** |
|---|---|---|
| (A) |  | (I) − E effect |
| (B) |  | (II) − R effect |
| (C) |  | (III) + E effect |
| (D) |  | (IV) + R effect |

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

**Options**

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

Question Type : **MCQ**
Question ID : **87827055501**
Option 1 ID : **878270218476**
Option 2 ID : **878270218475**
Option 3 ID : **878270218474**
Option 4 ID : **878270218473**
Status : **Answered**
Chosen Option : **2**

**Q.80** Number of complexes from the following with even number of unpaired "d" electrons is _____.
$[V(H_2O)_6]^{3+}$,$[Cr(H_2O)_6]^{2+}$, $[Fe(H_2O)_6]^{3+}$, $[Ni(H_2O)_6]^{3+}$, $[Cu(H_2O)_6]^{2+}$
[Given atomic numbers : V = 23, Cr = 24, Fe = 26, Ni = 28 Cu = 29]

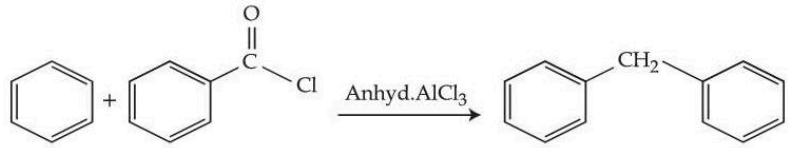
**Options**

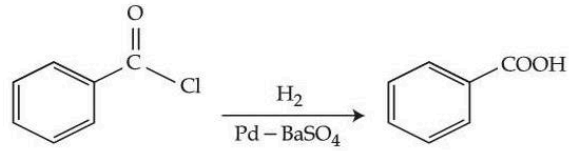
1. 5
2. 2
3. 1
4. 4

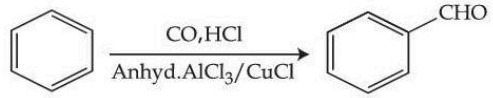
Question Type : **MCQ**
Question ID : **87827055498**
Option 1 ID : **878270218464**
Option 2 ID : **878270218462**
Option 3 ID : **878270218461**
Option 4 ID : **878270218463**
Status : **Not Answered**
Chosen Option : **--**

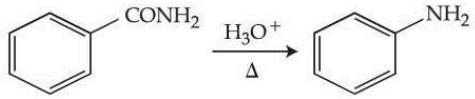
Section : **Chemistry Section B**

**Q.81** The number of the correct reaction(s) among the following is _____.

(A) 


(B) 


(C) 


(D) 


Given **--**
Answer :

Question Type : **SA**
Question ID : **87827055516**
Status : **Not Answered**

**Q.82** The de-Broglie's wavelength of an electron in the $4^{th}$ orbit is _____ $\pi a_0$. ($a_0$ = Bohr's radius)

Given **--**
Answer :

Question Type : **SA**
Question ID : **87827055508**
Status : **Not Answered**

**Q.83** Consider the following transformation involving first order elementary reaction in each step at constant temperature as shown below.

$$A + B \underset{\text{Step 3}}{\overset{\text{Step 1}}{\rightleftharpoons}} C \xrightarrow{\text{Step 2}} P$$

Some details of the above reactions are listed below.

| Step | Rate constant ($sec^{-1}$) | Activation energy ($kJ\ mol^{-1}$) |
|---|---|---|
| 1 | $k_1$ | 300 |
| 2 | $k_2$ | 200 |
| 3 | $k_3$ | $Ea_3$ |

If the overall rate constant of the above transformation (k) is given as $k = \frac{k_1 k_2}{k_3}$ and the overall activation energy ($E_a$) is 400 kJ $mol^{-1}$, then the value of $Ea_3$ is _____ kJ $mol^{-1}$ (nearest integer)

Given --
Answer :

Question Type : **SA**
Question ID : **87827055512**
Status : **Not Answered**

**Q.84** Number of molecules/species from the following having one unpaired electron is _____.
$O_2$, $O_2^{-1}$, NO, $CN^{-1}$, $O_2^{2-}$

Given --
Answer :

Question Type : **SA**
Question ID : **87827055509**
Status : **Not Answered**

**Q.85** 2.5 g of a non-volatile, non-electrolyte is dissolved in 100 g of water at 25°C. The solution showed a boiling point elevation by 2°C. Assuming the solute concentration is negligible with respect to the solvent concentration, the vapor pressure of the resulting aqueous solution is _____ mm of Hg (nearest integer)
[Given : Molal boiling point elevation constant of water ($K_b$) = 0.52 K. kg $mol^{-1}$,
1 atm pressure = 760 mm of Hg, molar mass of water = 18 g $mol^{-1}$]

Given --
Answer :

Question Type : **SA**
Question ID : **87827055511**
Status : **Not Answered**

**Q.86** The number of different chain isomers for $C_7H_{16}$ is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055515**
Status : **Not Answered**

**Q.87** Consider the following reaction
$MnO_2 + KOH + O_2 \rightarrow A + H_2O$.
Product 'A' in neutral or acidic medium disproportionate to give products 'B' and 'C' along with water. The sum of spin-only magnetic moment values of B and C is _____ BM. (nearest integer) (Given atomic number of Mn is 25)

Given --
Answer :

Question Type : **SA**
Question ID : **87827055513**
Status : **Not Answered**

**Q.88** The enthalpy of formation of ethane ($C_2H_6$) from ethylene by addition of hydrogen where the bond-energies of C−H, C−C, C=C, H−H are 414 kJ, 347 kJ, 615 kJ and 435 kJ respectively is −_____ kJ

Given --
Answer :

Question Type : **SA**
Question ID : **87827055510**
Status : **Not Answered**

**Q.89** X g of ethylamine is subjected to reaction with $NaNO_2$/HCl followed by water; evolved dinitrogen gas which occupied 2.24 L volume at STP. X is _____ $\times 10^{-1}$ g.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055517**
Status : **Not Answered**

**Q.90** Only 2 mL of $KMnO_4$ solution of unknown molarity is required to reach the end point of a titration of 20 mL of oxalic acid (2 M) in acidic medium. The molarity of $KMnO_4$ solution should be _____ M.

Given --
Answer :

Question Type : **SA**
Question ID : **87827055514**
Status : **Not Answered**