NTA JEE Mains Apr 2026 Paper I

Section : **Mathematics Section A**

Q.1 A bag contains 6 blue and 6 green balls. Pairs of balls are drawn without replacement until the bag is empty. The probability that each drawn pair consists of one blue and one green ball is :

Options

1. $\frac{64}{925}$
2. $\frac{16}{231}$
3. $\frac{63}{925}$
4. $\frac{17}{231}$

Question Type : **MCQ**
Question ID : **6911211209**
Option 1 ID : **6911214116**
Option 2 ID : **6911214115**
Option 3 ID : **6911214113**
Option 4 ID : **6911214114**
Status : **Not Answered**
Chosen Option : **--**

Q.2

The shortest distance between the lines $\frac{x-4}{1}=\frac{y-3}{2}=\frac{z-2}{-3}$ and $\frac{x+2}{2}=\frac{y-6}{4}=\frac{z-5}{-5}$ is :

Options

1. $3\sqrt{5}$
2. $4\sqrt{5}$
3. $2\sqrt{5}$
4. $\frac{5\sqrt{6}}{6}$

Question Type : **MCQ**
Question ID : **6911211214**
Option 1 ID : **6911214135**
Option 2 ID : **6911214136**
Option 3 ID : **6911214134**
Option 4 ID : **6911214133**
Status : **Not Answered**
Chosen Option : **--**

Q.3

Let $A=\begin{bmatrix}1 & 3 & -1\\ 2 & 1 & \alpha\\ 0 & 1 & -1\end{bmatrix}$ be a singular matrix. Let $f(x)=\int_0^x\left(t^2+2t+3\right)dt$, $x \in [1, \alpha]$. If M and m are respectively the maximum and the minimum values of f in $[1, \alpha]$, then $3(M-m)$ is equal to :

Options

1. 68
2. 64
3. 76
4. 72

Question Type : **MCQ**
Question ID : **6911211217**
Option 1 ID : **6911214146**
Option 2 ID : **6911214145**
Option 3 ID : **6911214148**
Option 4 ID : **6911214147**
Status : **Answered**
Chosen Option : **1**

Q.4

Let $\lim_{x \to 2} \frac{(\tan(x-2))\left(rx^2+(p-2)x-2p\right)}{(x-2)^2} = 5$ for some r, $p \in \mathbf{R}$. If the set of all possible values of q, such that the roots of the equation $rx^2 - px + q = 0$ lie in (0, 2), be the interval $(\alpha, \beta]$, then $4(\alpha+\beta)$ equals :

Options

1. 11
2. 13
3. 17
4. 21

Question Type : **MCQ**
Question ID : **6911211216**
Option 1 ID : **6911214141**
Option 2 ID : **6911214142**
Option 3 ID : **6911214143**
Option 4 ID : **6911214144**
Status : **Answered**
Chosen Option : **3**

Q.5

Let $f: \mathbf{R} \to \mathbf{R}$ be defined as $f(x) = \frac{2x^2 - 3x + 2}{3x^2 + x + 3}$. Then f is :

Options

1. one-one but not onto
2. onto but not one-one
3. both one-one and onto
4. neither one-one nor onto

Question Type : **MCQ**
Question ID : **6911211201**
Option 1 ID : **6911214082**
Option 2 ID : **6911214083**
Option 3 ID : **6911214081**
Option 4 ID : **6911214084**
Status : **Not Answered**
Chosen Option : **--**

Q.6 Let $\vec{a}=2\hat{i}+3\hat{j}+3\hat{k}$ and $\vec{b}=6\hat{i}+3\hat{j}+3\hat{k}$. Then the square of the area of the triangle with adjacent sides determined by the vectors $\left(2\vec{a}+3\vec{b}\right)$ and $\left(\vec{a}-\vec{b}\right)$ is :

Options

1. 2400
2. 1800
3. 900
4. 450

Question Type : **MCQ**
Question ID : **6911211215**
Option 1 ID : **6911214140**
Option 2 ID : **6911214139**
Option 3 ID : **6911214138**
Option 4 ID : **6911214137**
Status : **Answered**
Chosen Option : **2**

Q.7

The eccentricity of an ellipse E with centre at the origin O is $\frac{\sqrt{3}}{2}$ and its directrices are $x = \pm\frac{4\sqrt{6}}{3}$.

Let $H: \frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ be a hyperbola whose eccentricity is equal to the length of semi-major axis of E, and whose length of latus rectum is equal to the length of minor axis of E. Then the distance between the foci of H is :

Options

1. $\frac{4}{\sqrt{7}}$

2. $\frac{4\sqrt{2}}{\sqrt{7}}$

3. $\frac{4\sqrt{2}}{7}$

4. $\frac{8}{7}$

Question Type : **MCQ**
Question ID : **6911211211**
Option 1 ID : **6911214123**
Option 2 ID : **6911214121**
Option 3 ID : **6911214122**
Option 4 ID : **6911214124**
Status : **Answered**
Chosen Option : **4**

Q.8

The value of the integral $\int_{-1}^{1}\left(\frac{x^3+|x|+1}{x^2+2|x|+1}\right)dx$ is equal to :

Options

1. $3\log_e 2$
2. $2\log_e 2$
3. $3\log_e 3$
4. $5\log_e 3$

Question Type : **MCQ**
Question ID : **6911211220**
Option 1 ID : **6911214157**
Option 2 ID : **6911214158**
Option 3 ID : **6911214160**
Option 4 ID : **6911214159**
Status : **Not Answered**
Chosen Option : **--**

Q.9

Let C be a circle having centre in the first quadrant and touching the x-axis at a distance of 3 units from the origin. If the circle C has an intercept of length $6\sqrt{3}$ on y-axis, then the length of the chord of the circle C on the line $x-y=3$ is :

Options

1. $8\sqrt{2}$
2. 6
3. $6\sqrt{2}$
4. 8

Question Type : **MCQ**
Question ID : **6911211210**
Option 1 ID : **6911214120**
Option 2 ID : **6911214118**
Option 3 ID : **6911214119**
Option 4 ID : **6911214117**
Status : **Not Answered**
Chosen Option : **--**

Q.10

If $\sin\left(\tan^{-1}(x\sqrt{2})\right)=\cot\left(\sin^{-1}\sqrt{1-x^2}\right)$, $x\in(0,1)$, then the value of x is :

Options

1. $\frac{5}{8}$
2. $\frac{1}{3}$
3. $\frac{2}{3}$
4. $\frac{1}{2}$

Question Type : **MCQ**
Question ID : **6911211213**
Option 1 ID : **6911214132**
Option 2 ID : **6911214130**
Option 3 ID : **6911214131**
Option 4 ID : **6911214129**
Status : **Not Answered**
Chosen Option : **--**

Q.11

Let the mean and the variance of seven observations 2, 4, α, 8, β, 12, 14, $\alpha<\beta$, be 8 and 16 respectively. Then the quadratic equation whose roots are $3\alpha+2$ and $2\beta+1$ is :

Options

1. $x^2-45x+506=0$
2. $x^2-37x+342=0$
3. $x^2-35x+306=0$
4. $x^2-41x+420=0$

Question Type : **MCQ**
Question ID : **6911211208**
Option 1 ID : **6911214111**
Option 2 ID : **6911214112**
Option 3 ID : **6911214109**
Option 4 ID : **6911214110**
Status : **Answered**
Chosen Option : **4**

Q.12

The area of the region $\{(x, y) : x^2 - 8x \leq y \leq -x\}$ is :

Options

1. $\frac{343}{6}$
2. $\frac{637}{6}$
3. $\frac{523}{6}$
4. $\frac{437}{6}$

Question Type : **MCQ**
Question ID : **6911211219**
Option 1 ID : **6911214153**
Option 2 ID : **6911214154**
Option 3 ID : **6911214156**
Option 4 ID : **6911214155**
Status : **Answered**
Chosen Option : **1**

Q.13

The sum of all possible values of $\theta \in [0, 2\pi]$, for which the system of equations :

$$x\cos 3\theta - 8y - 12z = 0$$
$$x\cos 2\theta + 3y + 3z = 0$$
$$x + y + 3z = 0$$

has a non-trivial solution, is equal to :

Options

1. 4π
2. 3π
3. 2π
4. π

Question Type : **MCQ**
Question ID : **6911211204**
Option 1 ID : **6911214096**
Option 2 ID : **6911214095**
Option 3 ID : **6911214094**
Option 4 ID : **6911214093**
Status : **Not Answered**
Chosen Option : **--**

Q.14

The sum $1+\frac{1}{2}(1^2+2^2)+\frac{1}{3}(1^2+2^2+3^2)+\ldots$ upto 10 terms is equal to :

Options

1. $\frac{315}{2}$
2. 155
3. $\frac{325}{2}$
4. 130

Question Type : **MCQ**
Question ID : **6911211206**
Option 1 ID : **6911214103**
Option 2 ID : **6911214102**
Option 3 ID : **6911214104**
Option 4 ID : **6911214101**
Status : **Not Answered**
Chosen Option : **--**

Q.15

Let $A=\begin{bmatrix}1&0&0\\3&1&0\\9&3&1\end{bmatrix}$ and $B=[b_{ij}]$, $1\le i,j\le 3$. If $B=A^{99}-I$, then the value of $\frac{b_{31}-b_{21}}{b_{32}}$ is :

Options

1. 99
2. 199
3. 149
4. 159

Question Type : **MCQ**
Question ID : **6911211205**
Option 1 ID : **6911214097**
Option 2 ID : **6911214098**
Option 3 ID : **6911214099**
Option 4 ID : **6911214100**
Status : **Not Answered**
Chosen Option : **--**

Q.16 A building has ground floor and 10 more floors. Nine persons enter in a lift at the ground floor. The lift goes up to the 10^{th} floor. The number of ways, in which any 4 persons exit at a floor and the remaining 5 persons exit at a different floor, if the lift does not stop at the first and the second floors, is equal to :

Options

1. 3064
2. 11340
3. 2184
4. 7056

Question Type : **MCQ**
Question ID : **6911211207**
Option 1 ID : **6911214106**
Option 2 ID : **6911214108**
Option 3 ID : **6911214105**
Option 4 ID : **6911214107**
Status : **Not Answered**
Chosen Option : **--**

Q.17 Let $x = 9$ be a directrix of an ellipse E, whose centre is at the origin and eccentricity is $\frac{1}{3}$. Let P $(\alpha, 0)$, $\alpha > 0$, be a focus of E and AB be a chord passing through P. Then the locus of the mid point of AB is :

Options

1. $9y^2 = 8x\,(1-x)$
2. $3y^2 = 4x\,(1-x)$
3. $9y^2 = 8x\,(x-1)$
4. $3y^2 = 4x\,(x-1)$

Question Type : **MCQ**
Question ID : **6911211212**
Option 1 ID : **6911214125**
Option 2 ID : **6911214126**
Option 3 ID : **6911214127**
Option 4 ID : **6911214128**
Status : **Not Answered**
Chosen Option : **--**

Q.18 Let $S=\{z \in \mathbb{C} : z^2+\sqrt{6}\,iz-3=0\}$. Then $\sum_{z \in S} z^8$ is equal to :

Options

1. 162
2. 262
3. 184
4. 324

Question Type : **MCQ**
Question ID : **6911211203**
Option 1 ID : **6911214089**
Option 2 ID : **6911214091**
Option 3 ID : **6911214090**
Option 4 ID : **6911214092**
Status : **Not Answered**
Chosen Option : **--**

Q.19 Consider the quadratic equation $(n^2-2n+2)x^2-3x+(n^2-2n+2)^2=0$, $n \in \mathbf{R}$. Let α be the minimum value of the product of its roots and β be the maximum value of the sum of its roots. Then the sum of the first six terms of the G.P., whose first term is α and the common ratio is $\frac{\alpha}{\beta}$, is :

Options

1. $\frac{61}{37}$
2. $\frac{121}{81}$
3. $\frac{364}{243}$
4. $\frac{1093}{729}$

Question Type : **MCQ**
Question ID : **6911211202**
Option 1 ID : **6911214085**
Option 2 ID : **6911214086**
Option 3 ID : **6911214087**
Option 4 ID : **6911214088**
Status : **Not Answered**
Chosen Option : **--**

Q.20 Let $f: \mathbf{R} \to \mathbf{R}$ be such that $f(xy) = f(x)f(y)$, for all $x, y \in \mathbf{R}$ and $f(0) \neq 0$. Let $g : [1, \infty) \to \mathbf{R}$ be a differentiable function such that

$$x^2 g(x) = \int_1^x \left(t^2 f(t) - tg(t)\right) dt.$$

Then g(2) is equal to :

Options

1. $\frac{11}{16}$
2. $\frac{17}{64}$
3. $\frac{13}{8}$
4. $\frac{15}{32}$

Question Type : **MCQ**
Question ID : **6911211218**
Option 1 ID : **6911214150**
Option 2 ID : **6911214152**
Option 3 ID : **6911214149**
Option 4 ID : **6911214151**
Status : **Not Answered**
Chosen Option : **--**

Section : **Mathematics Section B**

Q.21 Let the image of the point P(0, −5, 0) in the line $\frac{x-1}{2} = \frac{y}{1} = \frac{z+1}{-2}$ be the point R and the image of the point $Q\left(0, \frac{-1}{2}, 0\right)$ in the line $\frac{x-1}{-1} = \frac{y+9}{4} = \frac{z+1}{1}$ be the point S. Then the square of the area of the parallelogram PQRS is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **6911211224**
Status : **Not Answered**

Q.22 Let the line $x - y = 4$ intersect the circle C : $(x-4)^2 + (y+3)^2 = 9$ at the points Q and R. If $P(\alpha, \beta)$ is a point on C such that PQ = PR, then $(6\alpha + 8\beta)^2$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **6911211223**
Status : **Not Answered**

Q.23

Let $f(x) = \begin{cases} x^3 + 8\,; & x < 0\,, \\ x^2 - 4\,; & x \geq 0\,, \end{cases}$ and $g(x) = \begin{cases} (x-8)^{1/3}\,; & x < 0, \\ (x+4)^{1/2}\,; & x \geq 0\,. \end{cases}$

Then the number of points, where the function gof is discontinuous, is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **6911211225**
Status : **Not Answered**

Q.24

If $(1-x^3)^{10} = \sum_{r=0}^{10} a_r x^r (1-x)^{30-2r}$, then $\frac{9a_9}{a_{10}}$ is equal to _____.

Given --
Answer :

Question Type : **SA**
Question ID : **6911211222**
Status : **Not Answered**

Q.25

Let $R = \{(x, y) \in \mathbf{N} \times \mathbf{N} : \log_e(x + y) \leq 2\}$. Then the minimum number of elements, required to be added in R to make it a transitive relation, is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **6911211221**
Status : **Not Answered**

Section : **Physics Section A**

Q.26 Two identical bodies A and B of equal masses have initial velocities $\vec{v}_1 = 4\hat{i}$ m/s and $\vec{v}_2 = 4\hat{j}$ m/s respectively. The body A has acceleration $\vec{a}_1 = 6\hat{i} + 6\hat{j}$ m/s^2 while the acceleration of the other body B is zero. The centre of mass of the two bodies moves in _____ path.

Options

1. straight line
2. elliptical
3. parabolic
4. circular

Question Type : **MCQ**
Question ID : **6911211232**
Option 1 ID : **6911214192**
Option 2 ID : **6911214193**
Option 3 ID : **6911214191**
Option 4 ID : **6911214190**
Status : **Answered**
Chosen Option : **1**

Q.27 A square loop of side 2 cm is placed in a time varying magnetic field with magnitude as $B = 0.4 \sin(300t)$ Tesla. The normal to the plane of loop makes an angle of 60° with the field. The maximum induced emf produced in the loop is _____ mV.

Options

1. 12
2. 24
3. 18
4. 21

Question Type : **MCQ**
Question ID : **6911211239**
Option 1 ID : **6911214218**
Option 2 ID : **6911214221**
Option 3 ID : **6911214219**
Option 4 ID : **6911214220**
Status : **Answered**
Chosen Option : **2**

Q.28 For an electromagnetic wave propagating through vacuum, $\vec{k}$, $\vec{E}$ and ω represent propagation vector, electric field and angular frequency, respectively. The magnetic field associated with this wave is represented by :

Options

1. $\omega\left(\vec{E} \times \vec{k}\right)$
2. $\omega\left(\vec{k} \times \vec{E}\right)$
3. $\dfrac{\vec{E} \times \vec{k}}{\omega}$
4. $\dfrac{\vec{k} \times \vec{E}}{\omega}$

Question Type : **MCQ**
Question ID : **6911211231**
Option 1 ID : **6911214188**
Option 2 ID : **6911214189**
Option 3 ID : **6911214186**
Option 4 ID : **6911214187**
Status : **Answered**
Chosen Option : **4**

Q.29 The electric potential as a function of x, y is given by $V=5(x^2-y^2)$ V. The electric field at a point (2, 3) m is _____ V/m.

Options

1. $\left(-4\hat{i}+6\hat{j}\right)$
2. $\left(20\hat{i}-30\hat{j}\right)$
3. $\left(-20\hat{i}+30\hat{j}\right)$
4. $\left(20\hat{i}+45\hat{j}\right)$

Question Type : **MCQ**
Question ID : **6911211237**
Option 1 ID : **6911214213**
Option 2 ID : **6911214211**
Option 3 ID : **6911214210**
Option 4 ID : **6911214212**
Status : **Answered**
Chosen Option : **3**

Q.30 A cylinder with adiabatic walls is closed at both ends and is divided into two compartments by a frictionless adiabatic piston. Ideal gas is filled in both (left and right) the compartments at same P, V, T. Heating is started from left side until pressure changes to $^{27}P/_{8}$. If initial volume of each compartment was 9 litres then the final volume in right-hand side compartment is _____ litres. (for this ideal gas $C_P/C_V=1.5$)

Options

1. 4
2. 9
3. 14
4. 3

Question Type : **MCQ**
Question ID : **6911211230**
Option 1 ID : **6911214183**
Option 2 ID : **6911214185**
Option 3 ID : **6911214184**
Option 4 ID : **6911214182**
Status : **Answered**
Chosen Option : **3**

Q.31 A spring stretches by 2 mm when it is loaded with a mass of 200 g. From equilibrium position the mass is further pulled down by 2 mm and released. The frequency associated with the system and maxmimum energy in the spring are _____ Hz and _____ J, respectively.
(Take g = 10 m/s^2)

Options

1. $\frac{5\sqrt{50}}{\pi}$ and 16×10^{-3}

2. $\frac{5\sqrt{50}}{\pi}$ and 8

3. $10\sqrt{50}$ and 2×10^{-3}

4. $\frac{5\sqrt{50}}{\pi}$ and 8×10^{-3}

Question Type : **MCQ**
Question ID : **6911211236**
Option 1 ID : **6911214209**
Option 2 ID : **6911214207**
Option 3 ID : **6911214208**
Option 4 ID : **6911214206**
Status : **Answered**
Chosen Option : **4**

Q.32 A sphere of capacitance 100 pF is charged to a potential of 100 V. Another identical uncharged metal sphere is brought in contact with the charged sphere, then the change in the total energy stored on these spheres, when they touch is $\alpha \times 10^{-7}$ J. The value of α is _____.
(combined capacitance of spheres is 200 pF)

Options

1. $\frac{5}{2}$
2. 5
3. $\frac{7}{2}$
4. $\frac{9}{2}$

Question Type : **MCQ**
Question ID : **6911211240**
Option 1 ID : **6911214223**
Option 2 ID : **6911214222**
Option 3 ID : **6911214224**
Option 4 ID : **6911214225**
Status : **Answered**
Chosen Option : **1**

Q.33 A cylindrical vessel of 40 cm radius is completely filled with water and its capacity is 528 dm^3 (dm : decimeter) The vessel is placed on a solid block of exactly same height as vessel. If a small hole is made at 70 cm below the top of water level, then horizontal range of water falling on the ground in the beginning is _____ cm.

Options

1. $120\sqrt{2}$
2. $140\sqrt{3}$
3. $120\sqrt{3}$
4. $140\sqrt{2}$

Question Type : **MCQ**
Question ID : **6911211234**
Option 1 ID : **6911214198**
Option 2 ID : **6911214200**
Option 3 ID : **6911214201**
Option 4 ID : **6911214199**
Status : **Answered**
Chosen Option : **2**

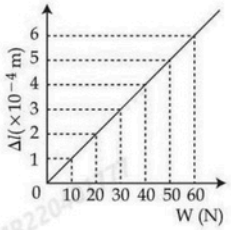
Q.34 If 2 mole of an ideal monoatomic gas at temperature T, is mixed with 6 mole of another ideal monoatomic gas at temperature $2T$ then the temperature of mixture is :

Options

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

Question Type : **MCQ**
Question ID : **6911211235**
Option 1 ID : **6911214204**
Option 2 ID : **6911214203**
Option 3 ID : **6911214202**
Option 4 ID : **6911214205**
Status : **Answered**
Chosen Option : **4**

Q.35 Figure represents the extension (Δl) of a wire of length 1 meter, suspended from the ceiling of the room at one end with a load W connected to the other end. If the cross-sectional area of the wire is 10^{-5} m^2 then the Young's modulus of the wire is _____ N/m^2.

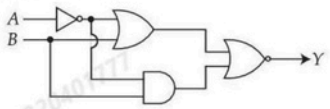


Options

1. 1.0×10^{10}
2. 1.0×10^{11}
3. 2.0×10^{10}
4. 2.0×10^{11}

Question Type : **MCQ**
Question ID : **6911211233**
Option 1 ID : **6911214196**
Option 2 ID : **6911214194**
Option 3 ID : **6911214195**
Option 4 ID : **6911214197**
Status : **Answered**
Chosen Option : **1**

Q.36 Refer to the logic circuit given below. For two inputs $(A=1, B=1)$ and $(A=0, B=1)$, output (Y) will be _____.



Options

1. 1, 1 respectively
2. 1, 0 respectively
3. 0, 0 respectively
4. 0, 1 respectively

Question Type : **MCQ**
Question ID : **6911211243**
Option 1 ID : **6911214237**
Option 2 ID : **6911214234**
Option 3 ID : **6911214236**
Option 4 ID : **6911214235**
Status : **Answered**
Chosen Option : **3**

Q.37

Match **List - I** with **List - II**.

	List - I		List - II
A.	Boltzmann constant	I.	$[M^{-1}L^{3}T^{-2}]$
B.	Stefan's constant	II.	$[ML^{2}T^{-1}]$
C.	Planck's constant	III.	$[ML^{2}T^{-2}K^{-1}]$
D.	Gravitational constant	IV.	$[ML^{0}T^{-3}K^{-4}]$

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

Options

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

Question Type : **MCQ**
Question ID : **6911211227**
Option 1 ID : **6911214171**
Option 2 ID : **6911214172**
Option 3 ID : **6911214173**
Option 4 ID : **6911214170**
Status : **Answered**
Chosen Option : **2**

Q.38

The energy released if hydrogen atoms are combined to form $^{4}_{2}He$ is _____ MeV.

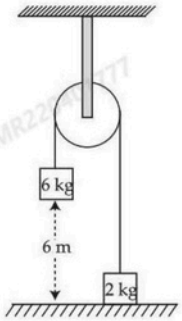
(Take binding energies per nucleon of $^{2}_{1}H$ and $^{4}_{2}He$ as 1.1 MeV and 7.2 MeV, respectively)

Options

1. 6.1
2. 24.4
3. 5
4. 26.6

Question Type : **MCQ**
Question ID : **6911211241**
Option 1 ID : **6911214226**
Option 2 ID : **6911214227**
Option 3 ID : **6911214229**
Option 4 ID : **6911214228**
Status : **Answered**
Chosen Option : **2**

Q.39 The velocity at which 6 kg mass (shown in figure) strikes the ground when it is released from a height of 6 m above the ground is _____ m/s. Assume pulley is massless and string is light and inextensible. (Take $g = 10\ m/s^2$)



Options

1. 4.50
2. 6.55
3. 7.74
4. 7.20

Question Type : **MCQ**
Question ID : **6911211244**
Option 1 ID : **6911214241**
Option 2 ID : **6911214240**
Option 3 ID : **6911214238**
Option 4 ID : **6911214239**
Status : **Answered**
Chosen Option : **3**

Q.40 A current of 30 A each flows in opposite directions in two conducting wires, placed parallel to each other at a distance of 8 cm. The magnetic field at the mid point between the two wires is _____ μT.

$(\frac{\mu_o}{4\pi}=10^{-7}\ N/A^2)$

Options

1. 300
2. 150
3. 30
4. 0.0

Question Type : **MCQ**
Question ID : **6911211238**
Option 1 ID : **6911214215**
Option 2 ID : **6911214216**
Option 3 ID : **6911214214**
Option 4 ID : **6911214217**
Status : **Answered**
Chosen Option : **1**

Q.41 The percentage error in the calculated volume of a sphere, if there is 2% error in its diameter measurement, is _____.

Options

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

Question Type : **MCQ**
Question ID : **6911211226**
Option 1 ID : **6911214169**
Option 2 ID : **6911214166**
Option 3 ID : **6911214167**
Option 4 ID : **6911214168**
Status : **Answered**
Chosen Option : **4**

Q.42 A solid sphere (A) of mass $5m$ and a spherical shell (B) of mass m, both having same radius, are placed on a rough surface. When a force of same magnitude is applied tangentially at the highest points of A and B, they start rolling without slipping with an acceleration of a_A and a_B, respectively. The ratio of a_A and a_B is _____.

Options

1. 6 : 10
2. 5 : 21
3. 21 : 25
4. 1 : 5

Question Type : **MCQ**
Question ID : **6911211228**
Option 1 ID : **6911214175**
Option 2 ID : **6911214174**
Option 3 ID : **6911214176**
Option 4 ID : **6911214177**
Status : **Answered**
Chosen Option : **2**

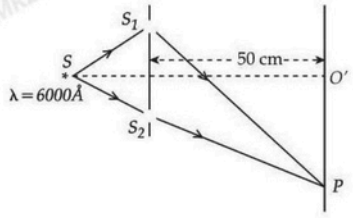
Q.43 A body of mass 1 kg moves along a straight line with a velocity $v = 2x^2$. The work done by the body during displacement from $x = 0$ to 5 m is _____ J.

Options

1. 0
2. 1000
3. 250
4. 1250

Question Type : **MCQ**
Question ID : **6911211229**
Option 1 ID : **6911214178**
Option 2 ID : **6911214181**
Option 3 ID : **6911214179**
Option 4 ID : **6911214180**
Status : **Answered**
Chosen Option : **4**

Q.44 In a Young double slit experiment, the wavelength of incident light is 6000 Å, the separation between slits S_1 and S_2 is 5 cm and the distance between slits plane and screen is 50 cm, as shown in the figure below. If the resultant intensity at P is equal to the intensity due to individual slits, the path difference between interfering waves is _____ Å.



Options

1. 2000
2. 3000
3. 1000
4. 4000

Question Type : **MCQ**
Question ID : **6911211245**
Option 1 ID : **6911214244**
Option 2 ID : **6911214243**
Option 3 ID : **6911214245**
Option 4 ID : **6911214242**
Status : **Answered**
Chosen Option : **1**

Q.45 Angle of minimum deviation is equal to the half of the angle of prism in an equilateral prism. The refractive index of the prism is _____.

Options

1. 1.65
2. $\sqrt{3}$
3. 1.5
4. $\sqrt{2}$

Question Type : **MCQ**
Question ID : **6911211242**
Option 1 ID : **6911214233**
Option 2 ID : **6911214231**
Option 3 ID : **6911214230**
Option 4 ID : **6911214232**
Status : **Answered**
Chosen Option : **4**

Section : **Physics Section B**

Q.46 A block takes t time to slide down a plane inclined at 45° to the horizontal. If the surface is made smooth (frictionless), the block takes time $\frac{t}{2}$ to slide down the plane. The coefficient of friction between the block and the inclined plane is $\left(\frac{\alpha}{100}\right)$. The value of α is _____.

Given **75**
Answer :

Question Type : **SA**
Question ID : **6911211246**
Status : **Answered**

Q.47 Two cells of emfs 1 V and 2 V and internal resistance 2 Ω and 1 Ω, respectively connected in parallel, gave a current of 1 A through an external resistance. If the polarity of one cell is reversed, then value of current through the external resistance will be $\frac{\alpha}{5}$ A. The value of α is _____.

Given **3**
Answer :

Question Type : **SA**
Question ID : **6911211249**
Status : **Answered**

Q.48 A moving coil of galvanometer when shunted with 2 Ω resistance gives a full scale deflection for a current of 500 mA. When a resistance of 470 Ω is connected in series it gives a full scale deflection for 10 V potential applied on it. The value of resistance of galvanometer coil is _____ Ω.

Given **50**
Answer :

Question Type : **SA**
Question ID : **6911211248**
Status : **Answered**

Q.49 The de Broglie wavelength for an electron accelerated through the potential difference of V_1 volt is λ_1. When the potential difference is changed to V_2 volt, the associated de Broglie wavelength is increased by 50%. If $(V_1/V_2)=(9/\alpha)$, then the value of α is _____.

Given **4**
Answer :

Question Type : **SA**
Question ID : **6911211247**
Status : **Answered**

Q.50 A concave mirror of focal length 10 cm forms an image which is double the size of object when the object is placed at two different positions. The distance between the two positions of the object is _____ cm.

Given Answer : **10**

Question Type : **SA**
Question ID : **6911211250**
Status : **Answered**

Section : **Chemistry Section A**

Q.51 '*x*' is the product which is obtained by the hydrolysis of prop-1-yne in the presence of mercuric sulphate under dilute acidic medium at 333 K. '*y*' is the product which is obtained by the reaction of ethane nitrile with methyl magnesium bromide in dry ether followed by hydrolysis. IUPAC name of product obtained from '*x*' and '*y*' in the presence of barium hydroxide followed by heating is :

Options

1. 2 - Methylpent-3-one
2. 2 - Methylpent-4-en-3-one
3. 4 - Methylpent-3-en-2-one
4. 4 - Methylpent-1-ene

Question Type : **MCQ**
Question ID : **6911211264**
Option 1 ID : **6911214306**
Option 2 ID : **6911214303**
Option 3 ID : **6911214304**
Option 4 ID : **6911214305**
Status : **Answered**
Chosen Option : **2**

Q.52 The Bohr radius of a hydrogen like species is 70.53 pm. The species and the stationary state (n) are respectively

(Given : Hydrogen atom Bohr radius is 52.9 pm)

Options

1. $Li^{2+}, 2$
2. $He^{+}, 2$
3. $Li^{2+}, 3$
4. $He^{+}, 3$

Question Type : **MCQ**
Question ID : **6911211252**
Option 1 ID : **6911214258**
Option 2 ID : **6911214257**
Option 3 ID : **6911214255**
Option 4 ID : **6911214256**
Status : **Answered**
Chosen Option : **1**

Q.53 Given below are two statements :

Statement I : The number of compounds among SO_2, SO_3, SF_4, SF_6 and H_2S in which sulphur does not obey the Octet rule is 3.

Statement II : Among $[H_2O, ClF_3, SF_4]$, $[NH_3, BrF_5, SF_4]$, $[BrF_5, ClF_3, XeF_4]$ and $[XeF_4, ClF_3, H_2O]$, the number of sets in which all the molecules have one lone pair of electrons on the central atom is 1.

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

Options

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

Question Type : **MCQ**
Question ID : **6911211253**
Option 1 ID : **6911214262**
Option 2 ID : **6911214259**
Option 3 ID : **6911214260**
Option 4 ID : **6911214261**
Status : **Answered**
Chosen Option : **1**

Q.54 Given is a concentrated solution of a weak electrolyte A_xB_y of concentration 'c' and dissociation constant 'K'. The degree of dissociation is given by :

Options

1. $\left(\frac{K}{c^{x+y-1}\,x^x y^y}\right)^{\frac{1}{x+y}}$

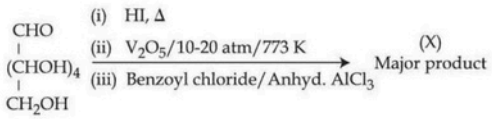
2. $\left(\frac{c^{x+y-1}\,x^x y^y}{K}\right)^{x+y}$

3. $\left(\frac{c^{x+y-1}\,x^x y^y}{K}\right)^{\frac{1}{x+y}}$

4. $\left[K \times c^{x+y-1} x^x y^y\right]^{x+y}$

Question Type : **MCQ**
Question ID : **6911211256**
Option 1 ID : **6911214272**
Option 2 ID : **6911214273**
Option 3 ID : **6911214274**
Option 4 ID : **6911214271**
Status : **Answered**
Chosen Option : **1**

Q.55 Consider the following reactions. Total number of electrons in the π bonds and lone pair of electrons in the product (X) is :



Options

1. 12
2. 18
3. 16
4. 14

Question Type : **MCQ**
Question ID : **6911211269**
Option 1 ID : **6911214323**
Option 2 ID : **6911214326**
Option 3 ID : **6911214324**
Option 4 ID : **6911214325**
Status : **Answered**
Chosen Option : **3**

Q.56 The correct order of first (Δ_iH_1) and second (Δ_iH_2) ionisation enthalpy values of Cr and Mn are :

A. Δ_iH_1 : Cr > Mn
B. Δ_iH_2 : Cr > Mn
C. Δ_iH_1 : Mn > Cr
D. Δ_iH_2 : Mn > Cr

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

Options

1. A and B only
2. B and C only
3. A and D only
4. C and D only

Question Type : **MCQ**
Question ID : **6911211260**
Option 1 ID : **6911214287**
Option 2 ID : **6911214288**
Option 3 ID : **6911214289**
Option 4 ID : **6911214290**
Status : **Answered**
Chosen Option : **2**

Q.57 Given below are two statements :

Chamber 1	Semi-permeable membrane	Chamber 2
18 g glucose in 100 mL aqueous solution		30 g glucose in 250 mL aqueous solution

Statement I : H_2O molecules move from the chamber 1 to chamber 2.

Statement II : The osmotic pressure of a solution prepared by dissolving 50 mg of potassium sulphate (molar mass = 174 g/mol) in 2 L of water (at 27 °C) is 0.0107 bar. (Given: $R = 0.083\ dm^3\ bar\ K^{-1}\ mol^{-1}$ and assume complete dissociation of electrolyte)

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

Options

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

Question Type : **MCQ**
Question ID : **6911211255**
Option 1 ID : **6911214268**
Option 2 ID : **6911214267**
Option 3 ID : **6911214270**
Option 4 ID : **6911214269**
Status : **Answered**
Chosen Option : **3**

Q.58 Which of the following contain the same number of atoms ?
(Given : Molar mass in g mol^{-1} of H, He, O and S are 1, 4, 16 and 32 respectively)

A. 2 g of O_2 gas
B. 4 g of SO_2 gas
C. 1400 mL of O_2 at STP
D. 0.05 L of He at STP
E. 0.0625 mol of H_2 gas

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

Options

1. B and C only
2. A and B only
3. A, C and E only
4. C and D only

Question Type : **MCQ**
Question ID : **6911211251**
Option 1 ID : **6911214252**
Option 2 ID : **6911214251**
Option 3 ID : **6911214254**
Option 4 ID : **6911214253**
Status : **Answered**
Chosen Option : **3**

Q.59

For a general redox reaction

Anode $\quad Red_1 \rightarrow Ox_1^{n_1^+} + n_1e^-$

Cathode $\quad Ox_2 + n_2e^- \rightarrow Red_2^{n_2-}$

Which of the following statement is **incorrect** ?

Options 1.

If the reaction is carried out reversibly, the electrical work done is equal to the ratio of charge and potential difference through which charge is moved.

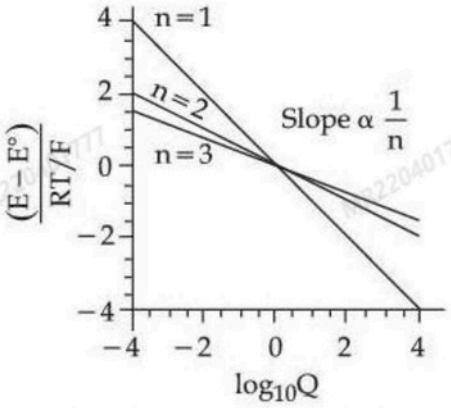
2.

The overall reaction can be written as $n_2Red_1 + n_1\ Ox_2 \rightleftharpoons n_2Ox_1^{n_1^+} + n_1Red_2^{n_2-}$

3.

The electrons do not appear in the overall reaction because electrons produced at the anode are consumed at the cathode.

4.



Here n is the number of electrons transferred in redox reaction.

Question Type : **MCQ**
Question ID : **6911211257**
Option 1 ID : **6911214278**
Option 2 ID : **6911214275**
Option 3 ID : **6911214276**
Option 4 ID : **6911214277**
Status : **Answered**
Chosen Option : **3**

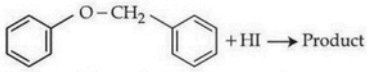
Q.60 An optically active alkyl bromide C_4H_9Br, reacts with ethanolic KOH to form major compound [A] which reacts with bromine to give compound [B]. Compound [B] reacts with ethanolic KOH and sodamide to give compound [C]. One molecule of water adds to compound [C] on warming with mercuric sulphate and dilute sulphuric acid at 333 K to form compound [D]. The functional group in compound D will be confirmed by :

Options

1. Haloform test
2. Benedict test
3. Silver mirror test
4. Lucas test

Question Type : **MCQ**
Question ID : **6911211265**
Option 1 ID : **6911214307**
Option 2 ID : **6911214310**
Option 3 ID : **6911214309**
Option 4 ID : **6911214308**
Status : **Answered**
Chosen Option : **1**

Q.61 Consider the following reaction.



Statement I : In the above reaction, product formed will be a mixture of benzyl alcohol and iodobenzene.

Statement II : In the above reaction, the $-O-CH_2-$ bond is cleaved to give the product.

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

Options

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

Question Type : **MCQ**
Question ID : **6911211266**
Option 1 ID : **6911214314**
Option 2 ID : **6911214312**
Option 3 ID : **6911214311**
Option 4 ID : **6911214313**
Status : **Answered**
Chosen Option : **1**

Q.62 Which of the following sequences of hybridisation, geometry and magnetic nature are **correct** for the given coordination compounds ?

A. $[NiCl_4]^{2-}$ – sp^3, tetrahedral, paramagnetic

B. $[Ni(NH_3)_6]^{2+}$ – sp^3d^2, octahedral, paramagnetic

C. $[Ni(CO)_4]$ – sp^3, tetrahedral, paramagnetic

D. $[Ni(CN)_4]^{2-}$ – dsp^2, square planar, diamagnetic

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

Options

1. B, C and D only
2. A, C and D only
3. A, B, C and D
4. A, B and D only

Question Type : **MCQ**
Question ID : **6911211261**
Option 1 ID : **6911214292**
Option 2 ID : **6911214293**
Option 3 ID : **6911214291**
Option 4 ID : **6911214294**
Status : **Answered**
Chosen Option : **4**

Q.63 Shown below is the structure of methyl acetate with three different α, β and γ carbon - oxygen bonds.

$H_3C-\overset{\overset{O}{\|}\alpha}{\underset{\beta}{C}}-\underset{\gamma}{O}-CH_3$. The correct order of bond lengths of these bonds is :

Options

1. $\alpha = \beta = \gamma$
2. $\alpha < \beta = \gamma$
3. $\alpha > \beta > \gamma$
4. $\alpha < \beta < \gamma$

Question Type : **MCQ**
Question ID : **6911211263**
Option 1 ID : **6911214301**
Option 2 ID : **6911214302**
Option 3 ID : **6911214299**
Option 4 ID : **6911214300**
Status : **Answered**
Chosen Option : **4**

Q.64 In a period, the first ionisation enthalpy of the element at extreme left and the negative electron gain enthalpy of the extreme right element, except noble gases, are respectively.

Options

1. highest and lowest
2. lowest and highest
3. lowest and lowest
4. highest and highest

Question Type : **MCQ**
Question ID : **6911211258**
Option 1 ID : **6911214280**
Option 2 ID : **6911214281**
Option 3 ID : **6911214279**
Option 4 ID : **6911214282**
Status : **Answered**
Chosen Option : **2**

Q.65 Given below are two statements :

Statement I : A mixture of $C_{12}H_{22}O_{11}$ (sugar) and NaCl can be separated by dissolving sugar in alcohol, due to differential solubility.

Statement II : Rose essence from rose petals is seperated by steam distillation due to its high volatility and insolubility in H_2O.

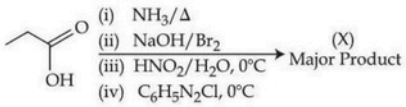
In the light of the above statements, choose the **correct** answer from the options given below :

Options

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

Question Type : **MCQ**
Question ID : **6911211262**
Option 1 ID : **6911214298**
Option 2 ID : **6911214296**
Option 3 ID : **6911214297**
Option 4 ID : **6911214295**
Status : **Answered**
Chosen Option : **4**

Q.66 Consider the following organic reaction sequence. Choose the final product (X) from the following (consider the major product in all intermediate reactions)



Options

1. Propanol
2. Benzene
3. Chlorobenzene
4. Phenol

Question Type : **MCQ**
Question ID : **6911211267**
Option 1 ID : **6911214317**
Option 2 ID : **6911214315**
Option 3 ID : **6911214318**
Option 4 ID : **6911214316**
Status : **Answered**
Chosen Option : **4**

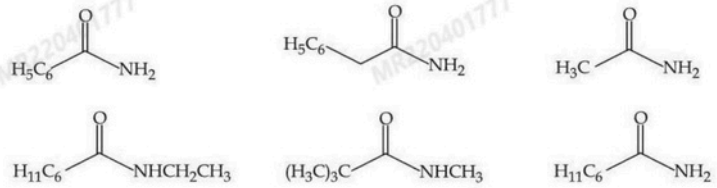
Q.67 Treatment of a gas 'X' with a freshly prepared ferrous sulphate solution gives a compound 'Y' as a brown ring. The compounds X and Y are.

Options

1. N_2O_4 and $[Fe(N_2O_4)]SO_4$
2. NO and $[Fe(NO)]SO_4$
3. N_2O and $[Fe(N_2O)]SO_4$
4. NO_2 and $[Fe(NO_2)]SO_4$

Question Type : **MCQ**
Question ID : **6911211270**
Option 1 ID : **6911214330**
Option 2 ID : **6911214327**
Option 3 ID : **6911214329**
Option 4 ID : **6911214328**
Status : **Answered**
Chosen Option : **4**

Q.68 The number of compounds from the following which can undergo reaction with Br_2/KOH (alcoholic) to give respective products and these respective products can also be obtained separately by Gabriel phthalimide reaction is :



Options

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

Question Type : **MCQ**
Question ID : **6911211268**
Option 1 ID : **6911214320**
Option 2 ID : **6911214319**
Option 3 ID : **6911214321**
Option 4 ID : **6911214322**
Status : **Answered**
Chosen Option : **3**

Q.69

Match **List - I** with **List - II**.

Given V_1 and V_2 are initial and final volumes respectively.

	List - I (Isothermal process)		**List - II (Expression)**
A.	Reversible expansion	I.	$q = 0$
B.	Free expansion	II.	$q = nRT \ln \frac{V_2}{V_1}$
C.	Irreversible Compression	III.	$w = -p_{ext}(V_1 - V_2)$
D.	Cyclic reversible	IV.	$\frac{q_{rev}}{T} = 0$

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

Options

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

Question Type : **MCQ**
Question ID : **6911211254**
Option 1 ID : **6911214264**
Option 2 ID : **6911214263**
Option 3 ID : **6911214266**
Option 4 ID : **6911214265**
Status : **Answered**
Chosen Option : **4**

Q.70 Given below are two statements :

Statement I : $F_2O < H_2O < Cl_2O$ is the correct trend in terms of bond angle.

Statement II : SiF_4, SnF_4 and PbF_4 are ionic in nature.

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

Options

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

Question Type : **MCQ**
Question ID : **6911211259**
Option 1 ID : **6911214285**
Option 2 ID : **6911214283**
Option 3 ID : **6911214286**
Option 4 ID : **6911214284**
Status : **Answered**
Chosen Option : **2**

Section : **Chemistry Section B**

Q.71 An alkane (Y) requires 8 moles of oxygen for complete combustion and on chlorination with $Cl_2/h\nu$, (Y) gives only one monochlorinated product (Z). The total number of primary carbon atoms in (Y) is _____.

Given Answer : **4**

Question Type : **SA**
Question ID : **6911211272**
Status : **Answered**

Q.72 An excess of $AgNO_3$ is added to 100 mL of a 0.05 M solution of tetraaquadichloridochromium (III) chloride. The number of moles of AgCl precipitated will be _____ $\times 10^{-3}$.
(Nearest integer)

Given Answer : **5**

Question Type : **SA**
Question ID : **6911211271**
Status : **Answered**

Q.73 Decomposition of a hydrocarbon follows the equation $k = (5.5 \times 10^{11} s^{-1})\ e^{\frac{-28000K}{T}}$. The activation energy of reaction is _____ kJ mol^{-1}. (Nearest Integer)
Given : R = 8.3 J K^{-1} mol^{-1}

Given --
Answer :

Question Type : **SA**
Question ID : **6911211275**
Status : **Not Answered**

Q.74 500 mL of 0.2 M MnO_4^- solution in basic medium when mixed with 500 mL of 1.5 M KI solution, oxidises iodide ions to liberate molecular iodine. This liberated iodine is then titrated with a standard x M thiosulphate solution in presence of starch till the end point. If 300 mL of thiosulphate was consumed, then the value of x is _____.

Given --
Answer :

Question Type : **SA**
Question ID : **6911211273**
Status : **Not Answered**

Q.75 In a closed flask at 600 K, one mole of $X_2Y_4(g)$ attains equilibrium as given below :

$$X_2Y_4(g) \rightleftharpoons 2XY_2(g)$$

At equilibrium, 75% $X_2Y_4(g)$ was dissociated and the total pressure is 1 atm. The magnitude of $\Delta_r G^\ominus$ (in kJ mol^{-1}) at this temperature is _____. (Nearest Integer)
(Given : R = 8.3 J mol^{-1} K^{-1}; ln 10 = 2.3, log 2 = 0.3, log 3 = 0.48, log 5 = 0.69, log 7 = 0.84)

Given **82**
Answer :

Question Type : **SA**
Question ID : **6911211274**
Status : **Answered**

Exam Summary

B. Tech

Section Name	No. of Questions	Answered	Not Answered	Marked for Review	Answered & Marked for Review	Not Visited
Mathematics Section A	20	6	14	0	0	0
Mathematics Section B	5	0	5	0	0	0
Physics Section A	20	20	0	0	0	0
Physics Section B	5	5	0	0	0	0
Chemistry Section A	20	20	0	0	0	0
Chemistry Section B	5	3	2	0	0	0

"