SINCE 1984

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STUDY CENTRE, PALA

JEE MAIN 2026

SESSION-1

SHIFT-2 EVENING

VIDEO SOLUTION

SCAN ME

MEMORY BASED QUESTIONS

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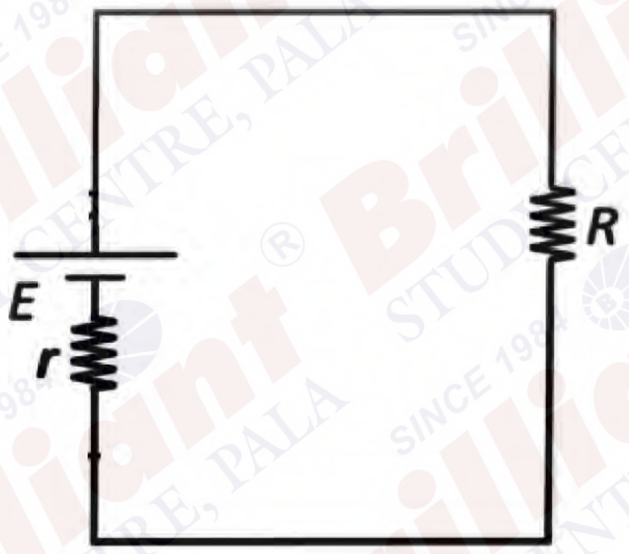
21-01-2026 SHIFT 2-EVENING

MEMORY BASED QUESTIONS

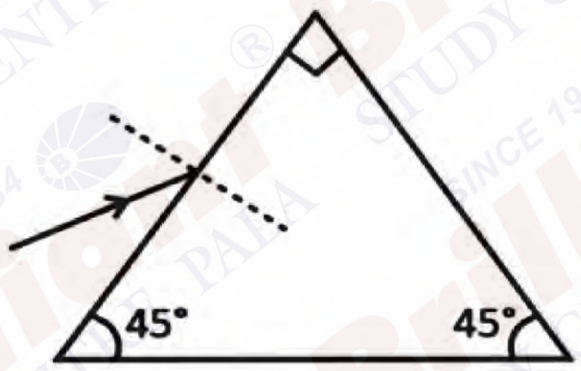
PHYSICS

QN In a circuit there is a battery with internal resistance r and Emf E, which is connected to external load resistance R as shown, Find value of R so that maximum power dissipates across R.

1) $R = r$ 2) $R = r/2$ 3) $R = \sqrt{2}r$ 4) $R = 2r$



QN Refractive index of prism is $\sqrt{2}$. What should be angle of incidence for a light ray such that the emerging ray grazes out the surface.

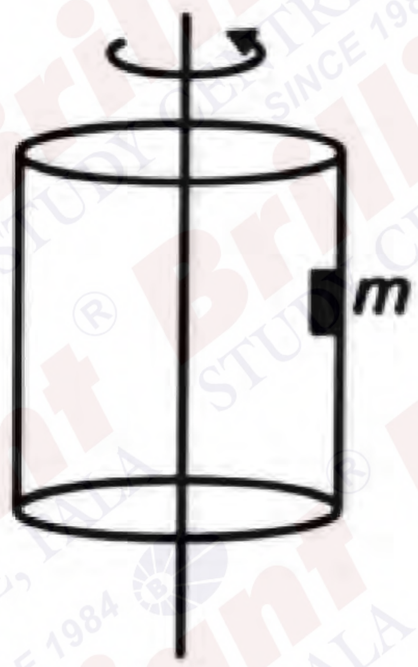


1) 90^0 2) 60^0 3) 30^0 4) 45^0

QN **A block of mass *m* is at rest w.r.t. hollow cylinder which is rotating with angular speed ω. Radius of cylinder is R. Find minimum coefficient of friction between block and cylinder.**

1 $\frac{3g}{2\omega^2 R}$ 2 $\frac{g}{\omega^2 R}$

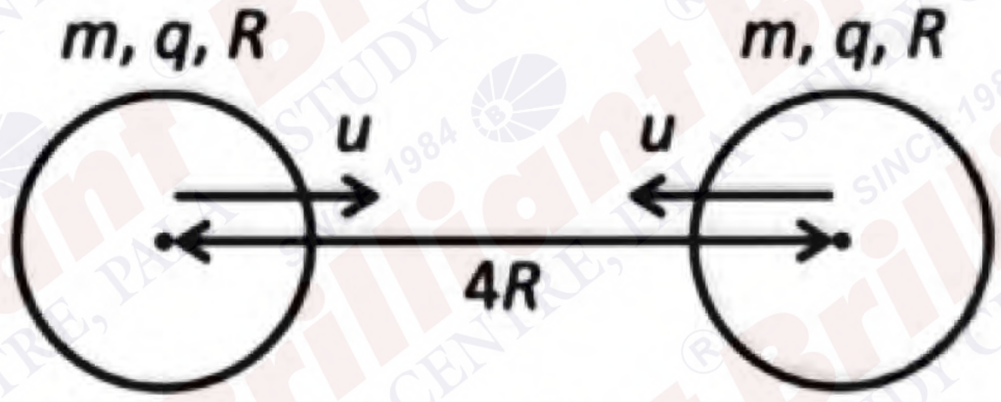
3 $\frac{g}{4\omega^2 R}$ 4 $\frac{2g}{\omega^2 R}$



QN What will be significant figure of summation of 0.153, 153.2 and 153.2?

1) 3 2) 4 3) 5 4) 6

QN **Two spheres having equal mass *m*, charge *q* and radius *R*, are moving towards each other. Both have speed *u* at an instant when distance between their centers is 4*R*. Minimum value of *u* so that they touch each other is**



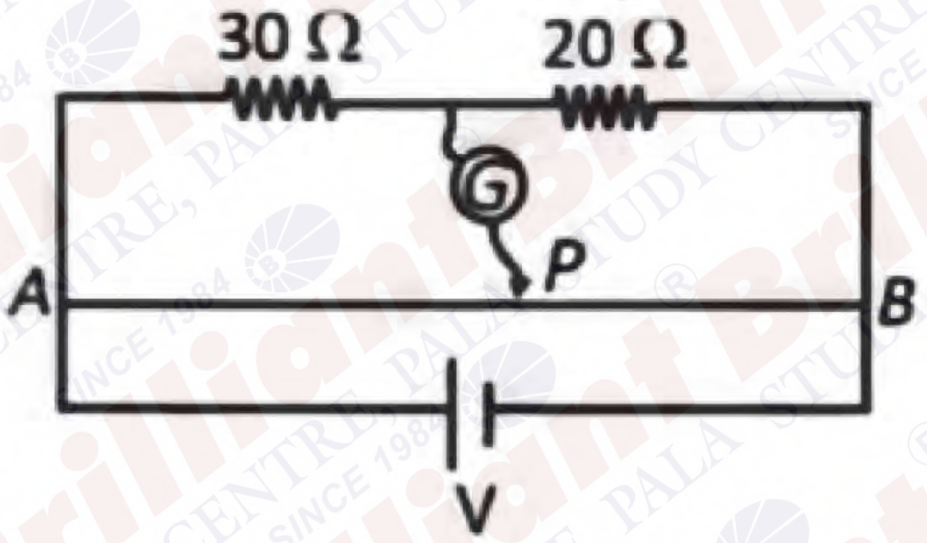
1 $\sqrt{\frac{q^2}{4\pi\varepsilon_0 mR}}$

2 $\sqrt{\frac{q^2}{16\pi\varepsilon_0 mR}}$

3 $\sqrt{\frac{q^2}{\pi\varepsilon_0 mR}}$

4 $\sqrt{\frac{q^2}{8\pi\varepsilon_0 mR}}$

QN **In a meter bridge two balancing resistances are 30 Ω and 20 Ω. If galvanometer shows zero deflection for the Jockey's shows zero deflection for the jockey's contact point *P*. Then find the length A.P.**

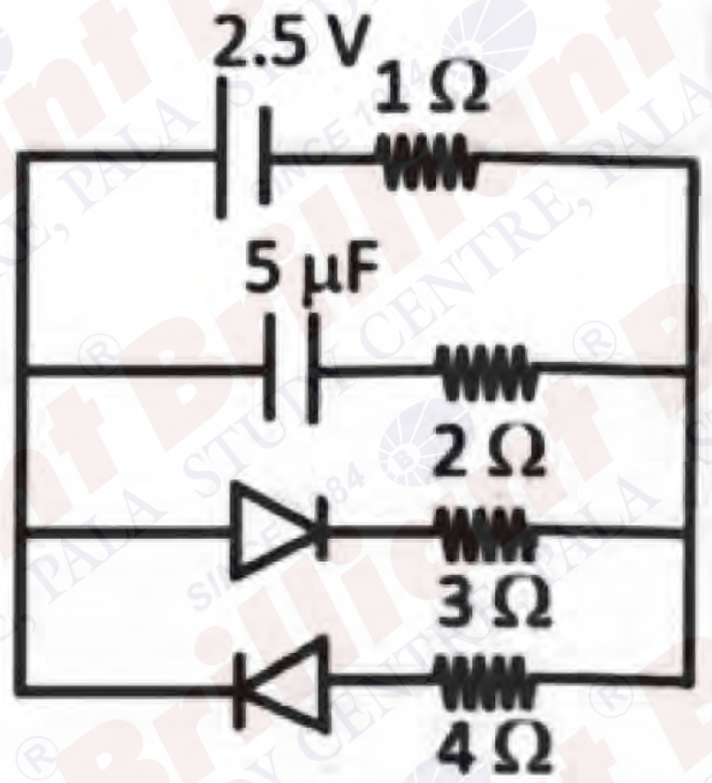


1) 40 cm 2) 30 cm 3) 60 cm 4) 70 cm

QN **RMS speed for H_2 and O_2 are same. If temperature of O_2 gas is 23°C. Find temperature of H_2 gas.**

1) 18.5K 2) 2.5^{0}C 3) 18^{0}C 4) 164K

QN For the given circuit arrangement, find the change on the capacitor in steady state.



1 $5\ \mu F$

2 $\frac{75}{8}\mu C$

3 $\frac{15}{2}\mu F$

4 $\frac{55}{4}\mu C$

QN What will be the ratio wavelength of 3rd line at Paschen Series to 2nd line of Balmer series of H-atom?

QN **An electron in a hydrogen like atom has energy equal to $-0.04\ E_0$, where E_0 is magnitude of energy of this electron in ground state in eV. If angular momentum of this electron is L, then value of $\frac{2\pi L}{h}$ is ($h \rightarrow$ Planck's constant)**

1) 1 2) 4 3) 5 4) 6

QN During SHM, K.E. of particle in SHM varies with frequency of 176 Hz. Find out frequency of SHM of the particle.

1) 352 2) 176 3) 88 4) 44

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MEMORY BASED QUESTIONS

CHEMISTRY

QN Given below are two statements

Statement I: The corrrect order for radius is $Al > Mg > Mg^{2+} > Al^{3+}$

Statement II : Atomic size always, depends on electronegativity

In the light of the above statements, choose the correct option

1) Statement I and II are correct

2) Both statement I and II are incorrect

3) Statement I is correct but Statement II incorrect

4) Statement I is incorrect but statement II correct

QN 1 g of an organic compound produce 1.49 of $Mg_2P_2O_7$. Determine % of P

QN Following 4 molecules are given and among them, one is optically active. Find % carbon in that compound

QN When 8.74g MnO_2 is treated with HCl, then what will be the weight of $Cl_2(g)$ obtained? Molar mass of $MnO_2 = 87.4$ g/mol

QN Some species are given Ni^{2+}, Fe^{2+}, Co^{2+}, V^{3+} and Ti^{2+}.

How many species has magnetic moment (spin only) less than 3 BM.

QN Find concentration of X^{2-} at equilibrium in 0.1 M H_2X . Given $K_{a_1} = 2.5\times10^{-7}$, $K_{a_2} = 1\times10^{-13}$

1) 2.5×10^{-7}

2) 1×10^{-13}

3) 6×10^{-12}

4) 5×10^{-10}

QN Match correctly from Column I & Column II

Column I	Column II
A) $H_2 / Pd - BaSO_4$	1) Etard oxidation
B) $CrO_2Cl_2 + Cs_2$	2) Stephen's reduction
C) $SnCl_2 + HCl$	3) Gattermann - Koch reaction
D) $CO + HCl + AlCl_3$	4) Rosemund reduction

QN What will be the ratio of wavelength of 3rd line at Paschen Series to 2nd line of Balmer series of H-atom?

1) $\frac{9}{4}$

2) $\frac{3}{2}$

3) $\frac{2}{3}$

4) $\frac{16}{4}$

QN $K_2Cr_2O_7$ is heated with KCl in pressure of H_2SO_4. Find the correct match of product with their oxidation state.

1) $CrO_2Cl_2, +6$

2) $Cr_2O_2Cl_2, +6$

3) $Cr_2O_2Cl_2, +5$

4) $CrO_2Cl_2, +5$

QN Among the following V^{+3}, Ti^{+2}, Ni^{+2}, Fe^{+2}, Co^{+2} for which of the following; the spin only magnetic moment > 3 & which can form high spin octahedral complex. Find the sum of unpaired $e^{\odot}$ in these complexes.

QN Osmotic pressure of a solution is 12 at. What is the concentration of NaCl solution which is isotonic to the given solution at 900K. $R = 0.082 Lit - atm\, K^{-1} mol^{-1}$. Assume 100% dissociation

1) 0.4878 M

2) 0.02439 M

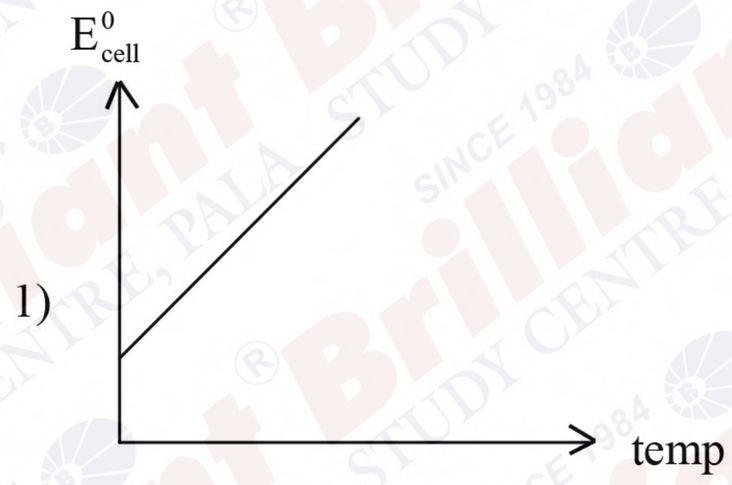
3) 0.2439 M

4) 0.0878 M

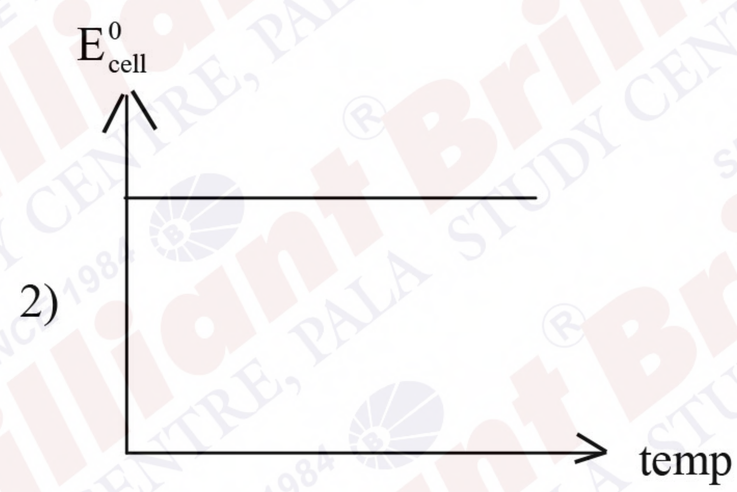
QN Elevation of Boiling of a solution containing 15 gm solute in 150 gm solvent is 0.5°C, and relative lowering in vapour pressure is $x \times 10^{-2}$ then find x. (Assume dilute solution) Given molar mass of solvent = 300 gm/mole. K_b = 5K-kg/mole

QN For a Daniel cell, select correct variation of E^0_{cell} with temperature

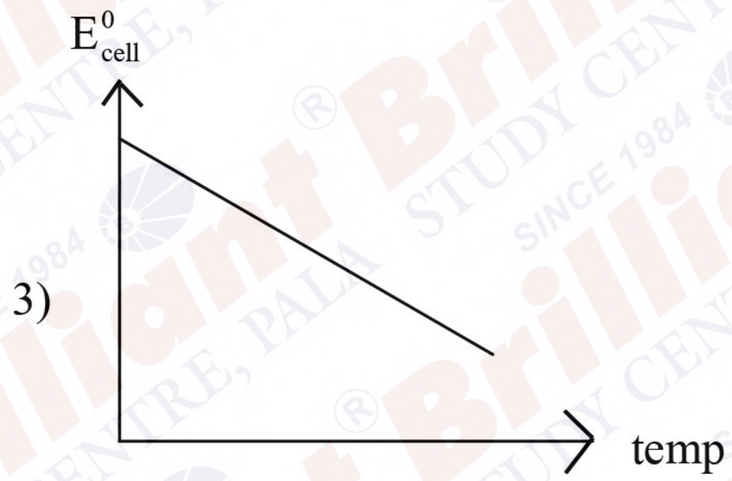
1)



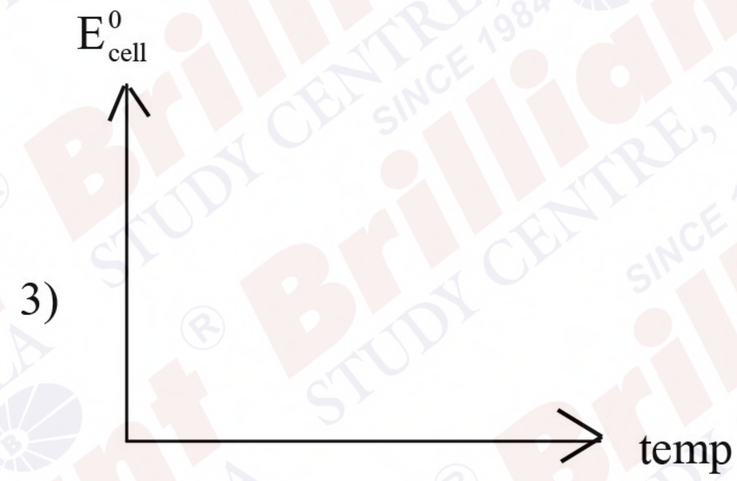
2)



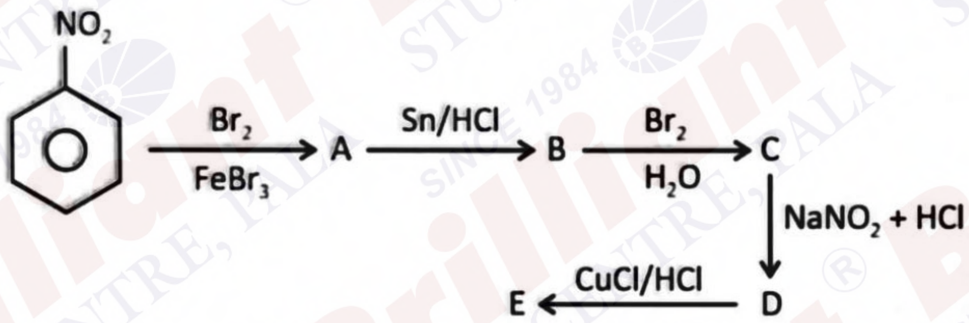
3)



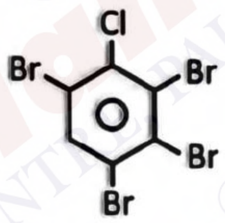
3)

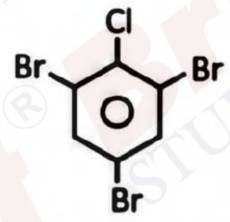


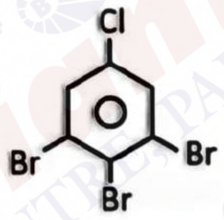
QN **Observe the following reaction sequence.**

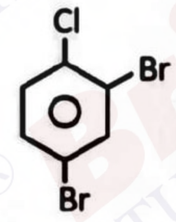


The final product 'E' is

1) 

2) 

3) 

4) 

QN **For first order kinetics reaction,**

$A \rightarrow B + C$

If initial pressure of A is 1 bar and at time 100 s, the total pressure is 1.5 bar, then find the rate constant of the reaction.

1) $6.93 \times 10^{-3}\ s^{-1}$

2) $6.93 \times 10^{-2}\ s^{-1}$

3) 0.693

4) 6.9

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MATHEMATICS

QN The largest $n \in N$ for which 7^n divides 101! is

QN Let $f(x) = x^3 + x^2 f'(1) + 2x f''(2) + f'''(3), x \in R$ then the value of $f'(s)$?

QN If three vectors are given as in the figure. If angle between $\vec{p}$ and $\vec{q}$ is θ where $\cos\theta = \frac{1}{\sqrt{3}}$ and $|\vec{p}| = 2\sqrt{3}, |\vec{q}| = 2$. Then the value of $|\vec{p} \times (\vec{q} - 3\vec{r})|^2 - 3|\vec{r}|^2$ is equal to

QN Let Z be the complex number sastisfying $|z\text{-}s| \leq 3$ and having maximum positive argument, then $34\left|\frac{5z-12}{5iz+16}\right|^2$ is equal to

QN Le the line L pass throguh the point (–3, 5, 2) and make equal angle with the positive coordinate axes. If the distance of L from the point (–2, r, 1) is $\sqrt{\frac{14}{3}}$, then the sum of all possible value of x is

A) 16 B) 10 C) 12 D) 6

QN Let A = {2, 3, 4, 5,9} and relation R = {(x,y) : 2 x $\leq$ 3y, x, y $\in$ A}. If m is the number of elements in R and 'n' is the number of to be added in R to make it symmetric , then m + n is

QN $\frac{dy}{dx} \sec x - 2y = 2 + 3 \sin x$, $y(0) = \frac{-7}{4}$ then $y\left(\frac{\pi}{6}\right)$ is

QN Let α and β be the roots of the equation $x^2 + 2ax + (3a+10) = 0$ such that $\alpha < 11 < \beta$. Then the set of all possibl values of a si

QN For matrices $A = \begin{bmatrix} 2 & -4 \\ 1 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} -29 & 49 \\ -13 & 18 \end{bmatrix}$, if $\left(A^{15} + B\right) - \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$ then find x, y ?

QN Maximum of $\left[\left(\cos^{-1} x\right)^2 + \left(\sin^{-1} x\right)^2\right] = \frac{m}{n}\pi^2$, $x \in \left[\frac{-\sqrt{3}}{2}, \frac{1}{\sqrt{2}}\right]$ then m + n is

QN Let a a_n a_n .....a_{10} be G.P ——— $\frac{a}{2}, \frac{a}{2^2}$ $\frac{}{2^9}$ of common ratio $\frac{1}{\sqrt{2}}$. If $a_1 + a_2 + a_3 + ...a_{10}$ = then a_1 is equal to

QN $\int_0^1 4\cot^{-1}\left(1 - 2x + 4x^2\right)dx = a\tan^{-1}(2) - b\log s$ then 2a + b =

QN Let O be the vertex of the parabola $\log^2 = 16x$. The locus of centroild of ΔOPA where p lies on parabola and A lies on x - axis and $\angle OPA = 90^0$