SINCE 1984

Brilliant®

STUDY CENTRE, PALA

JEE MAIN 2026

SESSION-1
SHIFT-1 MORNING

SCAN ME

VIDEO SOLUTION
JANUARY 24, 2026
SATURDAY

MEMORY BASED QUESTIONS

QN A spring of stiffness k = 15 N/m is cut into a ratio of 3 : 1. Find the spring constant of smaller length spring thus formed.

1) 15N/m 2) 30N/m 3) 45N/m 4) 60N/m

QN EM waves and their source are given

Column I		Column II	
a)	X-rays	p)	Hot bodies and molecules
b)	Infrared Rays	q)	Oscillatory current in Atenas
c)	Microwaves	r)	Magnetron
d)	Radio waves	s)	Fast moving electrons striking a metal plate

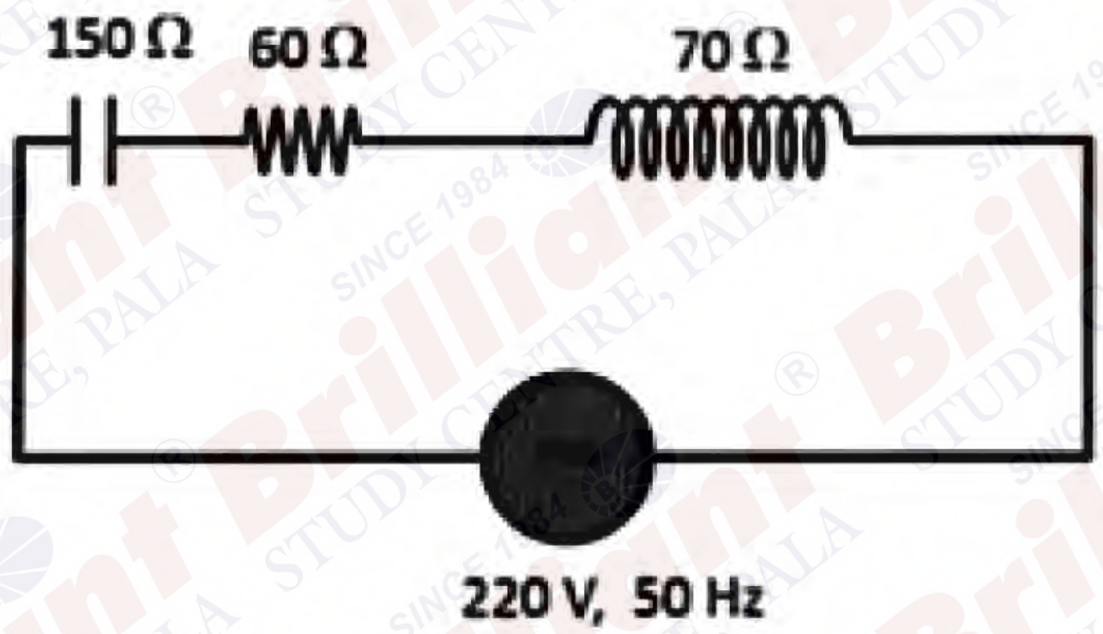
1) a-p, b-s, c-r, d-q 2) a-s, b-p, c-r, d-q

3) a-s, b-p, c-s, d-q 4) a-s, b-r, c-p, d-q

QN In H-like atom ratio of speed in two orbits is 3 : 2, then ratio of energy is

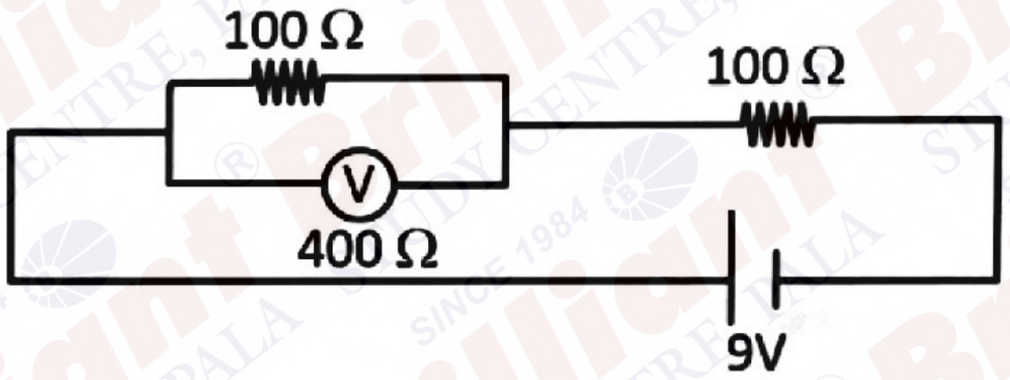
1) 2 : 3 2) 9 : 4 3) 2 : 1 4) 5 : 3

QN For the given ac circuit, find the power factor.



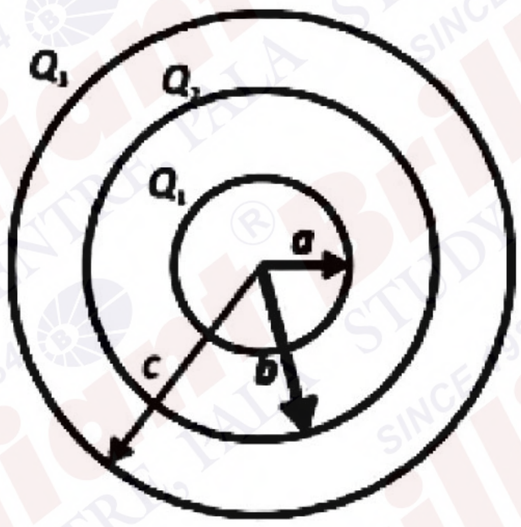
1) 4/5 2) 3/5 3) 3/4 4) 4/3

QN A voltmeter of 400W resistance is in parallel with 100 W resistor. And the combination is connected with 100W resistor and a battery of 9 volt in series as shown. Find the reading of voltmeter.



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

QN Three uniformly concentric charged shells are kept as shown. Find potential of each shell.



1) $V_A = \frac{kQ_1}{a} + \frac{kQ_2}{b} + \frac{kQ_3}{c}, V_B = \frac{k(Q_1+Q_2+Q_3)}{b}, V_C = \frac{k(Q_1+Q_2+Q_3)}{c}$

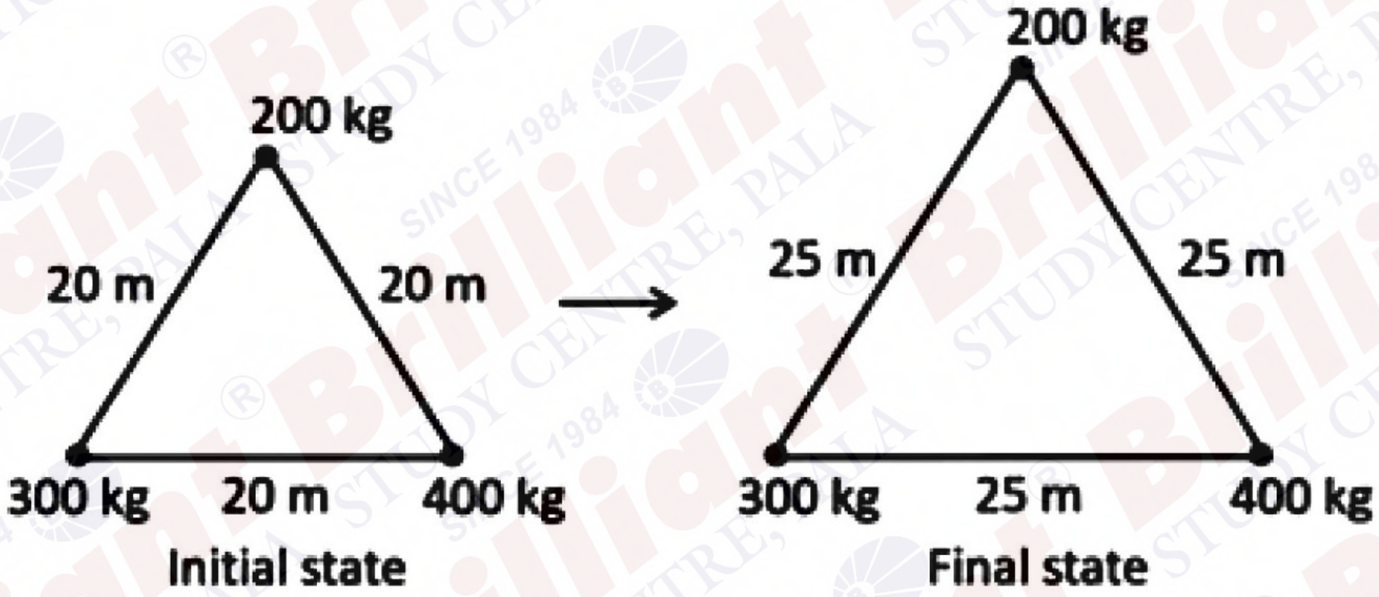
2) $V_A = \frac{kQ_1}{a} + \frac{kQ_2}{b} + \frac{kQ_3}{c}, V_B = \frac{k(Q_1+Q_2)}{b} + \frac{kQ_3}{c}, V_C = \frac{k(Q_1+Q_2+Q_3)}{c}$

3) $V_A = \frac{kQ_1}{a} + \frac{k(Q_2+Q_3)}{c}, V_B = \frac{k(Q_1+Q_2)}{b} + \frac{kQ_3}{c}, V_C = \frac{k(Q_1+Q_2+Q_3)}{c}$

4) $V_A = \frac{kQ_1}{a} + \frac{kQ_2}{b} + \frac{kQ_3}{c}, V_B = \frac{k(Q_1+Q_2)}{a} + \frac{kQ_2}{b}, V_C = \frac{k(Q_1+Q_2+Q_3)}{c}$

QN Find the work done.

(Given : $G = 6.67\times10^{-11}$ N-m^2/kg^2)



1) 1.7342×10^{-7}J 2) 1.6253×10^{-7} J 3) 2.5232×10^{-7} J 4) 6.6325×10^{-7} J

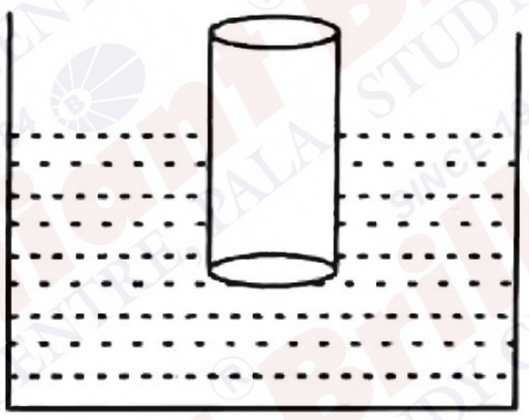
QN Match the two Lists given below.

List I		List II	
a)	Magnetic flux	1.	$M^1L^2T^{-2}A^{-2}$
b)	Magnetic permeability	2.	$M^1L^2T^{-2}A^{-1}$
c)	Magnetic induction	3.	$M^1L^1T^{-2}A^{-2}$
d)	Self induction	4.	$M^1L^0T^{-2}A^{-1}$

1) a-2, b-3, c-4, d-1 2) a-3, b-2, c-1, d-4 3) a-4, b-3, c-1, d-2 4) a-1, b-2, c-3, d-4

QN A cylinder of mass m, length l and area of cross section A is in equilibrium in liquid of density ρ.

Find time period of small vertical oscillations.

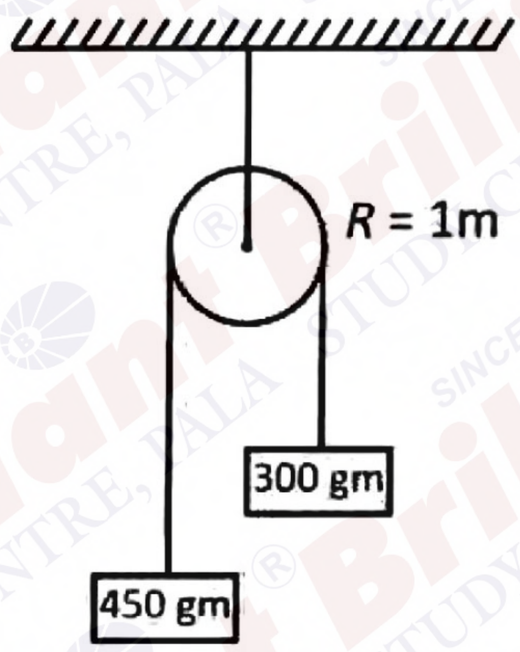


1) $2\pi\sqrt{\frac{mA}{\rho g}}$ 2) $2\pi\sqrt{\frac{mg}{\rho A}}$ 3) $2\pi\sqrt{\frac{m}{\rho A^2 g}}$ 4) $2\pi\sqrt{\frac{m}{\rho A g}}$

QN A dipole is placed in uniform magnetic field B = 800 gauss at an angle 30° then it experiences the torque of 16×10^{-3} N-m. Find the work done in slowly moving the dipole from stable equilibrium to unstable equilibrium.

1) 64×10^{-3} J 2) 5×10^{-3} J 3) 24.5×10^{-3} J 4) 7.6×10^{-3} J

QN When system is released from rest the heavier mass goes 81cm in sec, find rotational inertia. (g = 10 m/s^2)



1) 74.25 kg-m^2 2) 100.25 kg-m^2 3) 50.25 kg-m^2 4) 25.25 kg-m^2

QN Statement-1 : Binding energy per nucleon always increases with mass number.

Statement-2 : Binding energy per nucleon for smaller mass number always performs nucleon fusion.

1) Statement-1, true

Statement- 2, false

2) Statement-1, true

Statement- 2, true

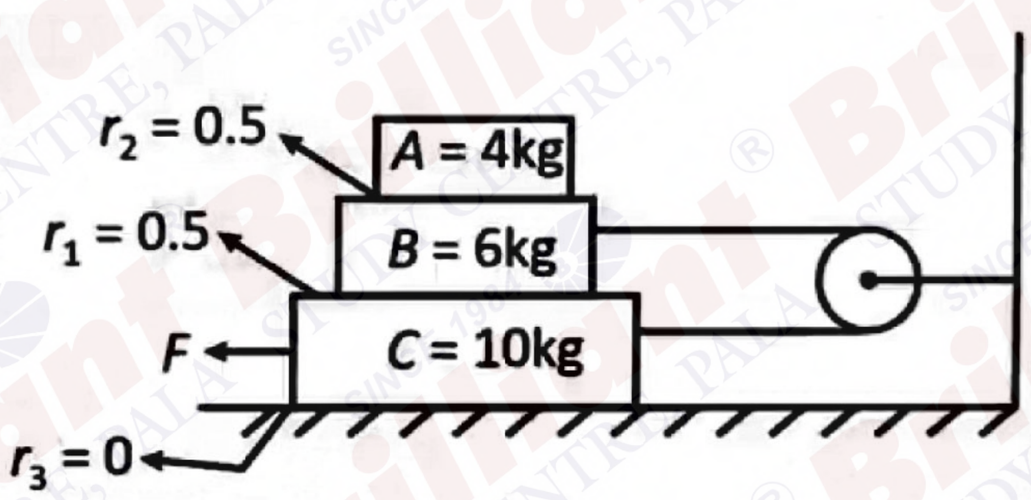
3) Statement-1, false

Statement- 2, true

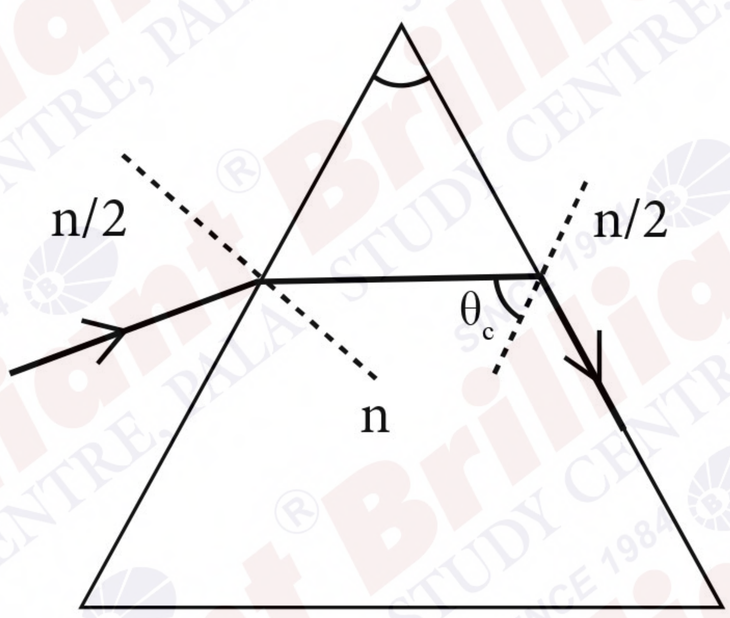
4) Statement-1, false

Statement- 2, false

QN For the given arrangement find the value of F(in Newton) so that body c moves with constant velocity.



QN A light ray incident on the prism such that deviation is minimum and angle of incidence on 2nd surface is critical angle. Find prism angle.



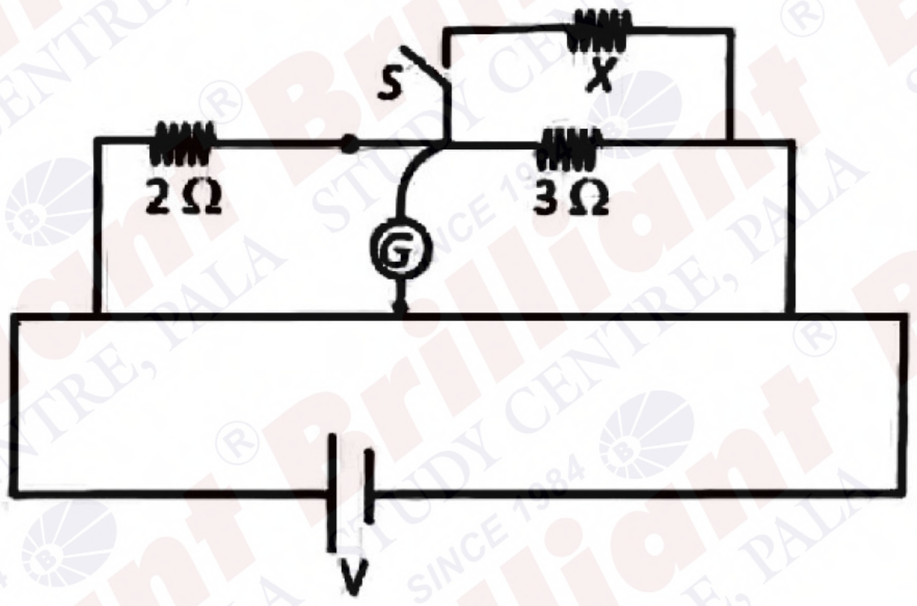
1) 90°

2) 60°

3) 105°

4) 74°

QN In meter bridge diagram given below, if S is closed, null point shifts by 25cm. Find value of resistance X. (in cm)



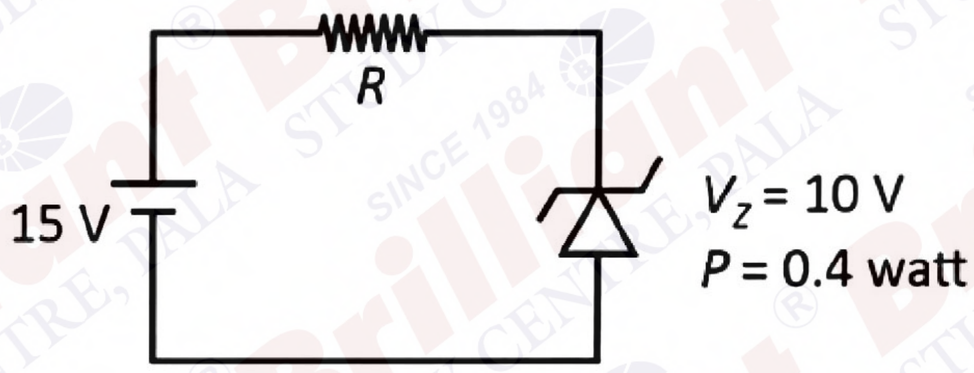
1) 4.1 2) 1.68 3) 6.28 4) 5.4

QN Velocity of electron in n^{th} shell of a hydrogen like atom is 3×10^5 m/s and velocity of electron in m^{th} shell of that atom is 2.5×10^5 m/s. Find ratio of radius of m^{th} shell to n^{th} shell.

1) 25/40 2) 25/36 3) 36/25 4) 36/35

QN For a microscope focal length of objective is 2cm and focal length of eyepiece is 4cm. Tube length is L= 10cm. Magnification for normal adjustment is 5x. Find the value of x.

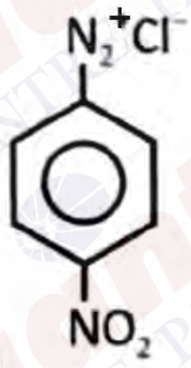
QN For the given the breakdown voltage of Zener diode is $V_z = 10$ volts and it can withstand the power dissipation of 0.4 watt. Find the value of resistance R (in Ω)



QN If potential varies as distance r as $v(r) = ar^3 + b$. Total magnitude of charge Q inclosed within a sphere of unit radius is $Q = \alpha(\pi a \varepsilon_0)$. Find the value of α.

QN Two solutes A and B of 0.3 g and 0.9 g respectively (molar mass of A and B are 30 g/mol and 90 g/mol respectively. Calculate of osmotic pressure at 300 K (in atm)

1) The correct order of stability of following diazonium ions is

a) 

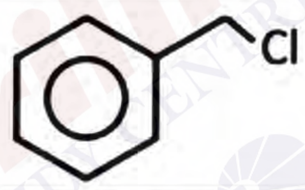
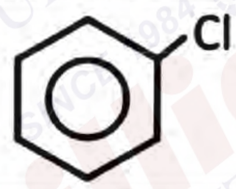
b) 

c) 

d) 

1) a < b < c < d 2) a < b < d < c 3) c < d < b < a 4) d < c < b < a

QN Match List-I with List-II.

	List-I		List-II
A.	Vinyl halide	(I)	
B.	Allyl halide	(II)	
C.	Benzyl halide	(III)	
D.	Aryl halide	(IV)	

Select the correct option.

1) A(II), B(I), C(III), D(IV)

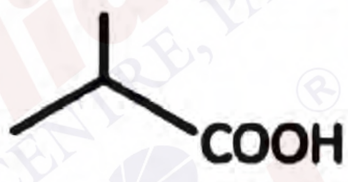
2) A(I), B(II), C(III), D(IV)

3) A(I), B(II), C(IV), D(III)

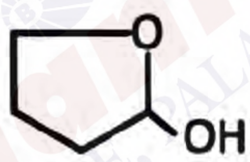
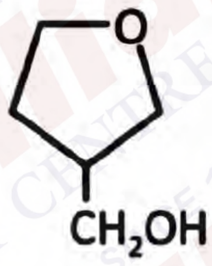
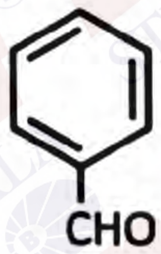
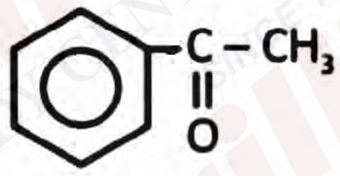
4) A(II), B(I), C(IV), D(III)

QN $A \xrightarrow[II.H_3O^+]{I.SnCl_2/HCl} B \xrightarrow[H^+]{KMnO_4} C \xrightarrow[H_2O]{Cl_2,P} C_3H_5O_2Cl$

Final product has one chiral centre. Structure of A is

1)  2)  3)  4) 

QN Which of the following compounds with give positive Tollen's reagent test?

A)  B)  C)  D) 

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

QN $K_2Cr_2O_7 + I^- + H^+ \rightarrow I_2$ (x = number of moles of e^- exchanged per mol I_2) $K_2Cr_2O_7 + S^{2-} \rightarrow S$ (y = number of moles of e^- exchanged for mole of S) x + y is

1) 12 2) 9 3) 4 4) 6

QN Match the column.

	Column-I		Column-II
(A)	IF_3	(I)	sp^3d^3, Pentagonal bipyramidal
(B)	IF_5	(II)	sp^3d^3, T-shaped
(C)	IF_7	(III)	sp^3, Tetrahedral
(D)	ClO_4^-	(IV)	sp^3d^2, Square pyramidal

1) (A)-(I); (B)-(II), (C)-(III); (D)-(IV)

2) (A)-(II); (B)-(I), (C)-(IV); (D)-(III)

3) (A)-(II); (B)-(IV), (C)-(I); (D)-(III)

4) (A)-(II); (B)-(III), (C)-(IV); (D)-(I)

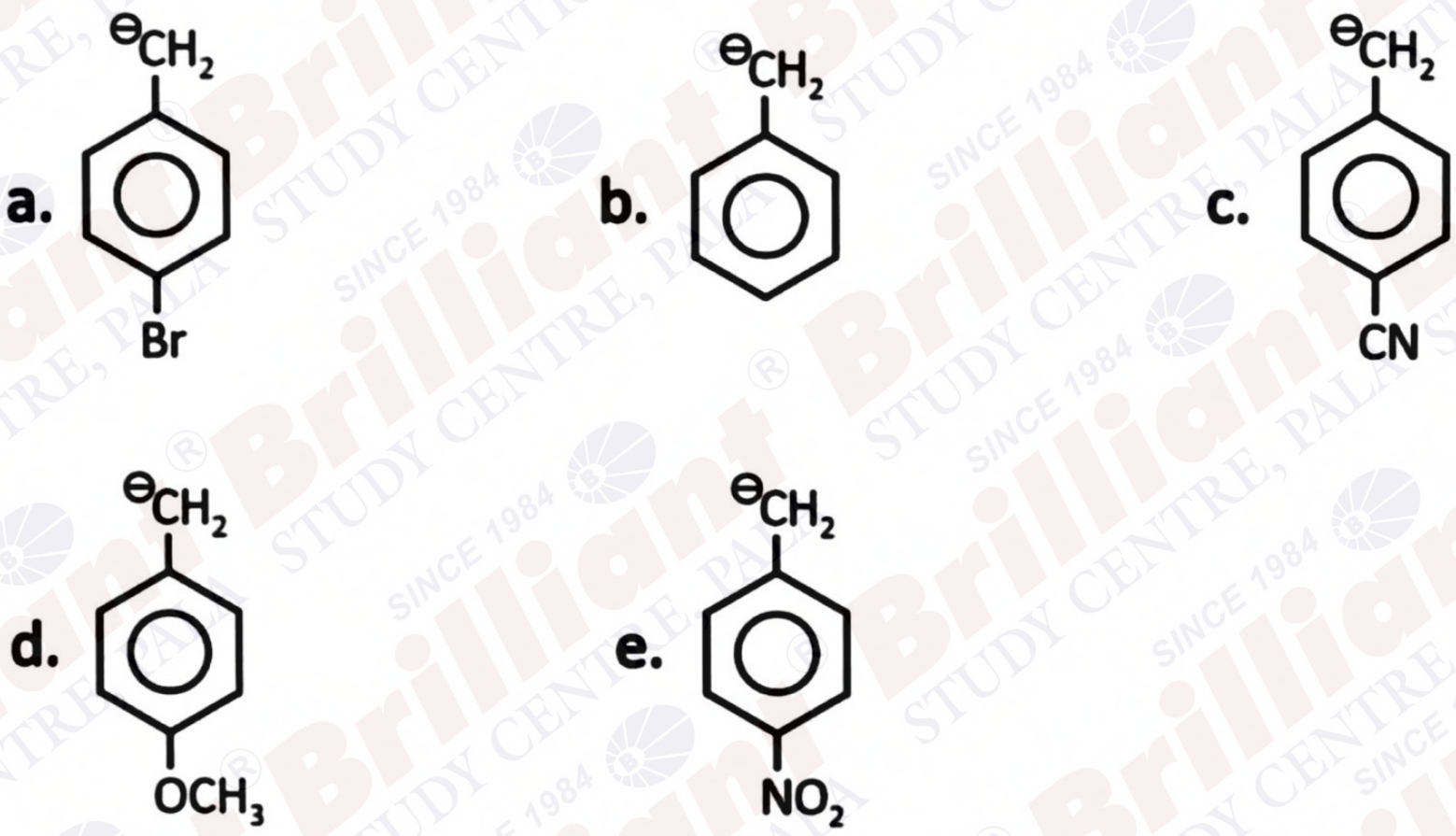
QN Consider the following alkene.

I II III IV

The correct stability order of alkenes is

1) II > I > III > IV 2) I > II > IV > III 3) I > II > III > IV 4) III > I > II > IV

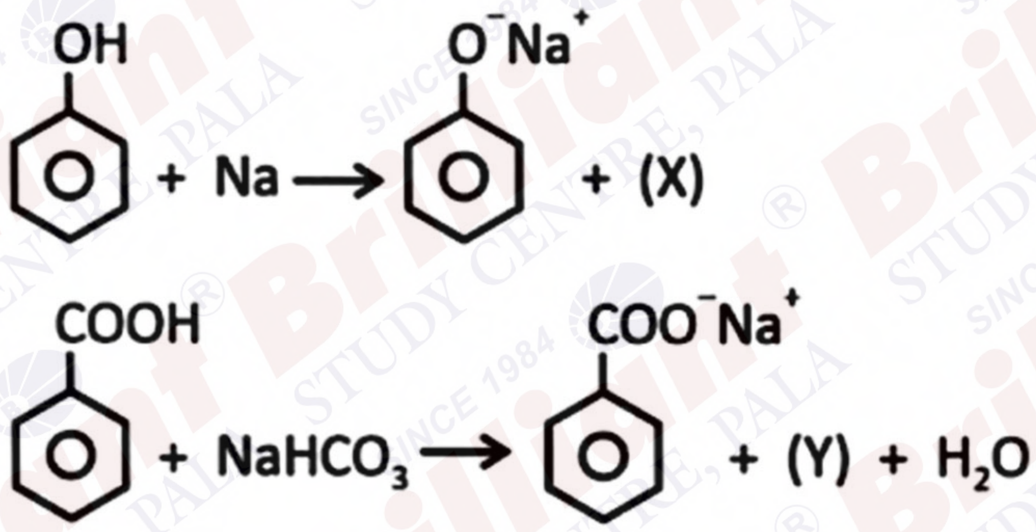
QN The correct order of stability of following species is



1) e > c > a > b > d 2) d > c > b > a > e

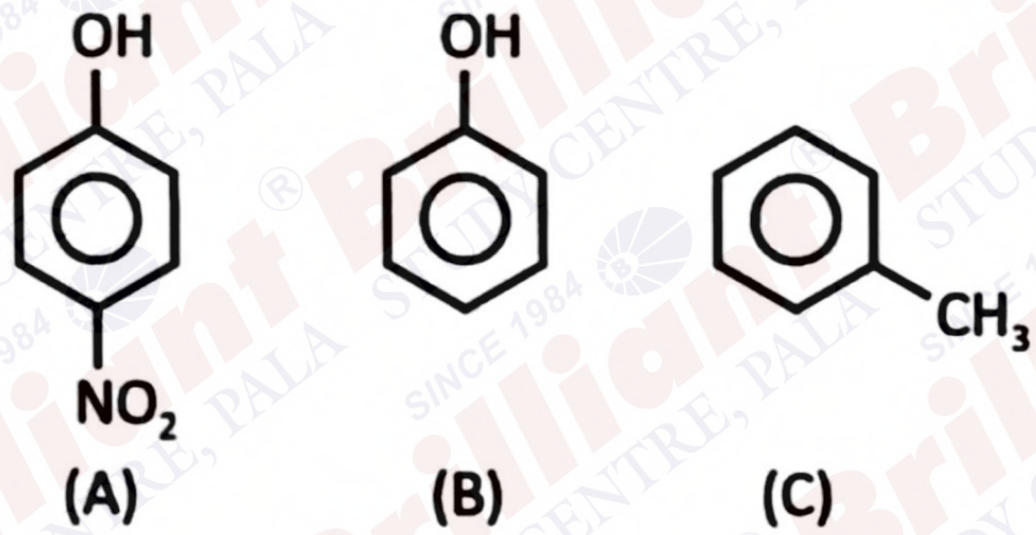
3) e > a > c > b > d 4) e > a > b > c > d

QN What is the sum of molar mass of X and Y formed in the given reaction?



1) 46 2) 44 3) 2 4) 42

QN Consider the following molecules.



The correct order of dipole moment is

1) A > B > C 2) A > C > B 3) B > A > C 4) C > A > B

QN Non-volatile solute A of mass 0.3 g (Molecular mass = 60), and non-volatile solute B of mass 0.9 g (Molecular mass = 180) in 100 mL H_2O at 27°C. If $K_b = 0.52$ K.Kg.mol^{-1}, then elevation of boiling point is

1) 0.52 K 2) 0.052 K 3) 0.026 K 4) 0.083 K

QN A solution contains two group-IV cations, X^{2+} and Y^{2+}, each at an initial concentration of 0.1 M. H_2S gas is passed through the solution to form a saturated solution. Given

K_{sp} of YS = 2×10^{-27} M^2

K_{sp} of XS = 1×10^{-27} M^2

What is the minimum concentration of sulphide in [S^{2-1}] required to begin precipitation of YS?

1) 2×10^{-26} 2) 10^{-26} 3) 3.2×10^{-14} 4) 0.1

QN What is the hybridisation and spin only magnetic moment of complex $[Co(CO)_6]Cl_3$?

1) d^2sp^3, 0 BM 2) sp^3d^2, 4.90 BM 3) d^2sp^3, 4.90 BM 4) sp^3d^2, 0 BM

QN Given below are two statements.

Statement I : Atomic radius is always more than ionic radius.

Statement II : The correct order of metallic character is K > Mg > Al > B

In the light of above statements, choose the correct option

1) Both Statement I and Statement II are correct

2) Both Statement I and Statement II are incorrect

3) Statement I is correct but Statement II is incorrect

4) Statement I is incorrect but Statement II is correct

QN Match the following

	Column-I		Column-II
A.	Free expansion	(I)	$W = -P_{ex}\Delta V$
B.	Reversible isothermal	(II)	$W = nC_v dT$
C.	Irreversible isothermal	(III)	$W = 0$
D.	Adiabatic reversible	(IV)	$W = -nRT \ln \frac{V_f}{V_i}$

1) A(I), B(IV), C(III), D(II)

2) A(III), B(IV), C(I), D(II)

3) A(IV), B(III), C(II), D(I)

4) A(II), B(I), C(III), D(IV)

QN Given below are two statements.

Statement I : Atomic radius is always more than ionic radius

Statement II : The correct order of metallic character is K > Mg > Al > B

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

1) Both Statement I and Statement II are correct

2) Both Statement I and Statement II are incorrect

3) Statement I is correct but Statement II is incorrect

4) Statement I is incorrect but Statement II is correct

QN Which of following compound contains 3 unpaired electrons?

1) V_2O_5 2) $[TiF_6]^{3-}$ 3) $[CoF_6]^{4-}$ 4) $[Fe(CN)_6]^{3-}$

QN Hydroxy compound (A) with molecular mass = 122 react with excess of acetic anhydride and gives compound (X) with molecular mass = 290, then find the number of hydroxy groups in given compound (A).

QN Salt (X) is soluble in water.

Salt (Y) is sparingly soluble in water.

Salt (Z) is soluble only in hot water.

X, Y, Z respectively are

1) $AgCl$, Hg_2Cl_2, $PbCl_2$

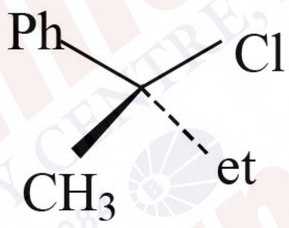
2) $AlCl_3$, $AgCl$, $PbCl_2$

3) $BaCl_2$, $PbCl_2$, Hg_2Cl_2

4) $MgCl_2$, Hg_2Cl_2, $CaCl_2$

QN 0.5 gm of an organic compound undergoes Duma's method for estimation of Nitrogen. N_2 gas collected over water at P-715 mm Kg occupies 70 ml at 27ºC. Calculate the % of N in original compound (aq. tension = 15 mm)

QN Statement I : $CH_2 = CH - Cl$ will have stronger C – Cl bond as compared to $CH_3 - CH_2 - Cl$.

Statement II : Product after solvolysis of will be 

optically active

1) Statement I Correct, Statement II incorrect

2) Statement I Correct, Statement II correct

3) Statement I incorrect, Statement II incorrect

4) Statement I incorrect, Statement II correct

QN Electrolysis of aqueous solution of $CuSO_4$ is carried out, where 300 mg copper is deposited (atomic mass of Cu = 63.54). After this 600 milliampere current is further passed for 28 minutes. Calculate total volume of O_2 required (in ml)

(Given 1 mole of gas occupy 22.4 litre)

(Given $Cu^{+2}(aq) + 2e^- \rightarrow Cu(s)$

$2H_2O(\ell) \rightarrow O_2(g) + 4H^+(aq) + 4e^-$

QN Find the value of $\log\left(\frac{K_{catalyst}}{K_{uncatalyst}}\right)$ at 300 K. If the charge in activation energy (ΔEa) is –10 kJ/mol.

$(R = 8\ jK^{-1}\ mol^{-1})$ $(\ln x = 2.31 \log)$

QN Minimum energy transition of Blamer series (energy line having minimum energy) of H-atom has energy of L eV. If the value of minimum energy of Lyman series (energy line having minimum energy) of H atom in terms of L is y, then the value of 10 y is .....

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24-01-2026 SHIFT 1-MORNING

MEMORY BASED QUESTIONS

MATHEMATICS

QN The number of real solution of $x|x-4|-1|x-1|-2=0$

1) 1 2) 2 3) 3 4) 4

QN The value of $\dfrac{\sqrt{3}\,\mathrm{cosec}\,20^0-\sec 20^0}{\cos 20^0\times\cos 40^0\times\cos 60^0\times\cos 80^0}$

1) 12 2) 16 3) 64 4) 32

QN Consider 10 data such that their mean is 10 and variance is 2. If one of the data α is removed and new data entry β is inserted . Now new man is 10.1 and new variance is 1.99 them $\alpha+\beta$ is equal to

1) 20 2)10 3) 1 4) 2

QN If the function $f(x)=\dfrac{e^x\left(e^{\tan x-x}-1\right)+\log(\sec x+\tan x)-x}{\tan x-x}$ is continuous at x =0, then the value of f(0) is equal to

1) $\frac{1}{2}$ 2) 2 3) $\frac{2}{3}$ 4) $\frac{3}{2}$

QN If $\cot x=\dfrac{5}{12}$ for some $x\in\left(\pi,\dfrac{3\pi}{2}\right)$ then $\sin 7x\left(\cos\dfrac{13x}{2}+\sin\dfrac{13x}{2}\right)+\cos 7x\left(\cos\dfrac{13x}{2}-\sin\dfrac{13x}{2}\right)$ is equal to

QN Consider an A.P $a_1,a_2....a_n;a_1>0$ $a_2-a_1=\dfrac{-3}{4},a_n=\dfrac{1}{4}a_1$ and $\sum_{i=1}^{n}a_i=\dfrac{525}{2}$ then $\sum_{i=1}^{17}a_i=$

QN If $F(t)=\int\dfrac{1-\sin(\log t)}{1-\cos(\log t)}dt$ and $F\left(e^{\pi/2}\right)=-e^{\pi/2}$ then $F\left(e^{\pi/4}\right)$ is

1) $\left(-1-\sqrt{2}\right)e^{\pi/4}$ 2) $\left(1-\sqrt{2}\right)e^{\pi/4}$ 3) $\left(1+\sqrt{2}\right)e^{\pi/4}$ 4) $\left(-2-\sqrt{2}\right)e^{\pi/4}$

QN If $A=\{1,2,3,4\}$ a relation R defined from A to A such that $(a,b)R(c,d)$ if $2a+3b=3c+4d$ then find the number of elements in R

QN If Z is a complex number satisfying $\left|\frac{z-6i}{z-2i}\right|=1$ and $\left|\frac{z-8+2i}{z+2i}\right|=\frac{3}{5}$ then find $\sum|z|^2$

QN Consider a sequence ..... Let P_n = product of first n terms of the given sequence and $\sum_{n=1}^{40}(P_n)^{\frac{1}{n}}=\frac{3^2-1}{2\times 3^{\beta}}$ then find $\alpha+\beta$

1) 73 2) 75 3) 76 4) 81

QN Number of matrices A of order 3×2 such that all of its elements are from the set $\{-2,-1,0,1,2\}$ such that trace of AAT is 5 is equal to .....

1) 120 2) 312 3) 192 4) 126

QN If $S=\frac{1}{25!}+\frac{1}{23!\times 3!}+\frac{1}{21!\times 4!}+....$ up to 13 terms. Then $13s=\frac{2^{\alpha}}{\beta_i}$, then $\alpha+\beta$ is

QN A line passing through point P(1,1,1) which is perpendicular to $\frac{x-17}{1}=\frac{y-71}{1}=\frac{z}{0}$ and $\frac{x-4}{4}=\frac{y-1}{1}=\frac{z-1}{1}$. Let the line intersect another plane at point R. Then the square of ara of parallelogram PQRS is

1) 11 2) 12 3) 13 4) 6

QN Let a circle passes through points $A\left(-\sqrt{2}\alpha,0\right)B\left(0,\sqrt{3}\beta\right)$ and 0(0,0) such that its radius is 4. Then the radius of locus of centroid of triangle OAB is

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

QN Out of 100 bulbs, 10 are defective and 90 are non-defective. If the probability of finding 7 defective bulbs out of 8 draws with replacement , is $\frac{k}{10^8}$, then the value of k is .....

1) 69 2) 72 3) 75 4) 96

QN Let A be the area enclosed by $y=x^2+2, y-\text{axis}$ and $x+y=8$ and let A_2 be the area enclosed by $y=x^2+2, y^2=x$ and $y=\text{axis}$, then the value of A_1-A_2 is .

1) $\frac{4+8\sqrt{2}}{3}$ 2) $\frac{2+4\sqrt{2}}{3}$ 3) $\frac{8+2\sqrt{2}}{3}$ 4) $\frac{8-2\sqrt{2}}{3}$

QN Let $\alpha,\beta\in R$ be such that the function $f(x)=\begin{cases}2\alpha\left(x^2-2\right)+2\beta x, x<1\\(\alpha+3)x+(\alpha-\beta), x\geq 1\end{cases}$ be differentiable at all $x\in R$, then $34(\alpha+\beta)$ is equal to

QN Let $A(1,0), B(2,-1)$ and $C\left(\frac{7}{3},\frac{4}{3}\right)$ be three points. If the equation of bisector of the angle ABC is $\alpha x+\beta y=5$. Then the value of $\alpha^2+\beta^2$ is

1) 8 2) 13 3) 10 4) 5

QN Find the number of numbers greater than 5000 and less than 9000 formed by using numbers 0,1,2,5,9 with repetition allowed and divisible by 3

1) 31 2) 48 3) 42 4) 52

QN $E_1:\frac{x^2}{a^2}+\frac{y^2}{b^2}=1, E_2=\frac{x^2}{A^2}+\frac{y^2}{B^2}=1$ let eccentricity of both E_1 and E_2 be $\frac{4}{5}, 2\ell_1^2=9\ell_2$ where ℓ_1 and ℓ_2 are the length of latus rectum of E_1 and E_2 respectively. Distance between the foci of E_1 be 8 then the distance between foci of ellipse E_2 is

1) $\frac{32}{5}$ 2) $\frac{16}{5}$ 3) $\frac{8}{5}$ 4) $\frac{4}{5}$

QN $\vec{a}=2\hat{i}+2\hat{j}-\hat{k}, \vec{b}=\hat{i}-\hat{j}, \vec{c}=\vec{a}\times\vec{b}\ \vec{d}$ makes angle $\frac{\pi}{4}$ with $\vec{c}$ and $\left|\vec{c}\times\vec{d}\right|=3\left|\vec{a}-\vec{d}\right|=\sqrt{11}$. find the value of $\vec{a}.\vec{d}$

QN $\int_0^{36} f\left(\frac{tx}{36}\right)dt=4\alpha f(x), y=f(x)$ is standard parabola passing through $(2,1)$ and $(-4,\beta)$. Then value of β^{α} is

QN Given $f(t)=\left|\frac{t+1}{t^2}\right|; t<0$ is strictly decreasing in the interval $(2\alpha,\alpha)$ then maximum value of $g(x)=2\log(x-2)+\alpha x^2+4x-\alpha$ is

QN Let the lines $L_1:\vec{r}=\left(\hat{i}+2\hat{j}+3\hat{k}\right)+\lambda\left(2\hat{i}+3\hat{j}+4\hat{k}\right), \lambda\in R$ and $L_2:\vec{r}=\left(4\hat{i}+\hat{j}\right)+\mu\left(5\hat{i}+2\hat{j}+\hat{k}\right), \mu\in R$ intersect at the point R. Let P and Q be the pints lying in the line L_1 and L_2 respectively such that $|PR|=\sqrt{29}$ and $|PQ|=\sqrt{\frac{47}{3}}$. If the point P lies in the first octant then $27(QR)^2$ is

1) 340 2) 360 3) 320 4) 348