SINCE 1984

Brilliant®

STUDY CENTRE, PALA

JEE MAIN 2026

SESSION-1
SHIFT-1 MORNING

VIDEO SOLUTION
JANUARY 28, 2026
THURSDAY

SCAN ME

MEMORY BASED QUESTIONS

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SHIFT 1-MORNING

MEMORY BASED QUESTIONS

CHEMISTRY

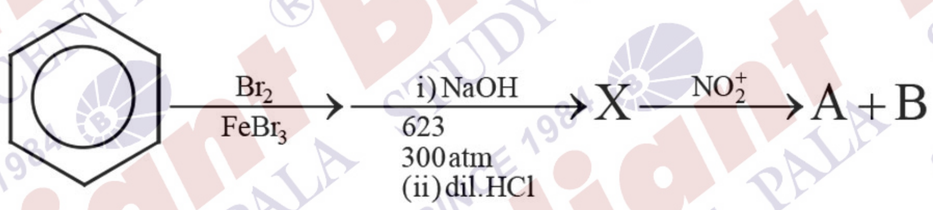
QN In carius method of estimation of 'Br', 1.53 g of an organic compound gave 1 g AgBr. The % of Br in organic compound is, (Atomic mass of Ag, Br = 108, 80 u respectively)

1) 35.23 2) 43.53 3) 27.81 4) 22.71

QN In period 4 of the periodic table which elements have the highest and lowest atomic radii respectively

1) K and Br 2) Na and Cl 3) K and Se 4) Rb and Br

QN Consider the following reaction sequence:



The organic product 'A' and 'B' can be separated by

1) Steam distillation

2) Fractional distillation

3) Distillation under reduced pressure

4) Azeotropic distillation

QN The wave number of three spectral lines of H-atom are given. Identify the correct set of spectral lines belonging to Balmer series

1) $\frac{5R}{36}, \frac{3R}{16}, \frac{21R}{100}$

2) $\frac{3R}{4}, \frac{3R}{16}, \frac{7R}{144}$

3) $\frac{7R}{144}, \frac{3R}{16}, \frac{16R}{255}$

4) $\frac{5R}{36}, \frac{3R}{16}, \frac{21R}{24}$

QN For equivalence point X ml of 0.02 M HCl is treated with 5 mL of 0.02 M of a weak base. The pK_b of weak base is 5.69 and the pH of the resulting solution is Y at half of the equivalence point. The value of (X + Y) is:

1) 5 2) 8.81

3) 13.31 4) 3.81

QN Given below are two statements

Statement I : Among XeF_4, BF_4^- and SF_4 the species having equal M-X bond lengths are XeF_4 (M = central atom).

Statement II : Among O_2^{2-}, O_2^-, F_2 and O_2^+ the highest bond order is for F_2 and O_2^{2-}

In the light of the above statements, choose the most appropriate 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 is correct option

A) $[Ni(CN)_4]^{2-}$ is paramagnetic while $[NiCl_4]^{2-}$ and $[Ni(CO)_4]$ are diamagnetic

B) $[Ni(CN)_4]^{2-}$ and $[Ni(CO)_4]$ are diamagnetic while $[NiCl_4]^{2-}$ is paramagnetic

C) $[NiCl_4]^{2-}$ and $[Ni(CO)_4]$ are paramagnetic while $[Ni(CN)_4]^{2-}$ is diamagnetic

D) $[NiCl_4]^{2-}$ and $[Ni(CN)_4]^{2-}$ are paramagnetic while $[Ni(CO)_4]$ is diamagnetic

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

QN For a first order reaction, $X \rightarrow Y + Z$, time required for decomposition of $\frac{1}{8}$th and $\frac{1}{10}$th of its in conc, is $t_{1/8}$ and $t_{1/10}$

The value of $\left(\frac{t_{1/8}}{t_{10}}\right) \times 10 =$

Take : log 8 = 0.90, log7 = 0.84, log9 = 0.95

1) 9 2) 10 3) 12 4) 8

QN Choose the correct statements in respect of hydrides of Group-15

A) Reducing power increasing down the group

B) Basic nature increases down the group

C) Stability decreases down the group

D) Boiling point decreases regularly down the group

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

QN At T(K), 2 moles of liquid A and 3 moles of liquid B are mixed. The vapour pressure of ideal solution SO formed is 320 mm Hg. At this stage one mole of A are mixed further, the vapour pressure is found to be 340 mm Hg. The vapour pressure of pure A and B are respectively

1) 200 mm Hg, 400 mm Hg
2) 440 mm Hg, 240 mm Hg
3) 300 mm Hg, 400 mm Hg
4) 240 mm Hg, 440 mm Hg

QN $X \xrightarrow[H_3O^+]{(i)CO_2,500\,atm} Y$

X react with $FeCl_3$

X contain C = 76.57 %, H = 6.43 %, O = 17%

V.D of X = 47

Incorrect statement among following

1) X react with $NaHCO_3$
2) X is more acidic than Y
3) Y is salicylic acid
4) Y is product of Kolbe's reaction

QN Among the following coloured ion is/are

1) Ti^{3+} and V^{3+}
2) Ti^{3+} and Sc^{3+}
3) Ti^{4+} and V^{3+}
4) V^{2+} and Sc^{3+}

QN Consider following ions

$CH_3-\overset{\ominus}{C}H_2$ (I) $CH_2=\overset{\ominus}{C}H$ (II) $HC\equiv\overset{\ominus}{C}$ (III)

Stability of ions is in order

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

QN Observe the following reaction:

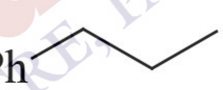
$C_3H_6Cl_2 \xrightarrow[NaNH_2]{excess} (X) \xrightarrow[H_2O]{Hg^{2+},H^+} (Y)$

The product (Y) gives which of the following test?

1) Tollen's test
2) Lucas test
3) Iodoform test
4) Fehling's test

QN $Ph-CH=CH_2 \xrightarrow[(PhCOO)_2]{HBr} Product$

Correct statement(s) regarding product:

a)  is minor product

b) Benzene is also formed as by product

c) Reaction follow free radical mechanism

d) In absence of peroxide carbocation mechanism is followed

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

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CHEMISTRY

QN Calculate pH of 10 mM weak acid (HA) dissociated in water. Assume α to be negligible.

Given $pK_b = 4$

QN Spherical node shown in fig. 1 is best represented by which point in fig.2?

Fig. 1

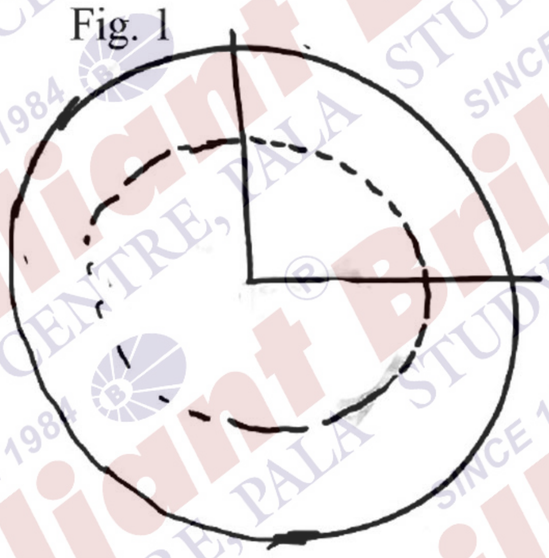
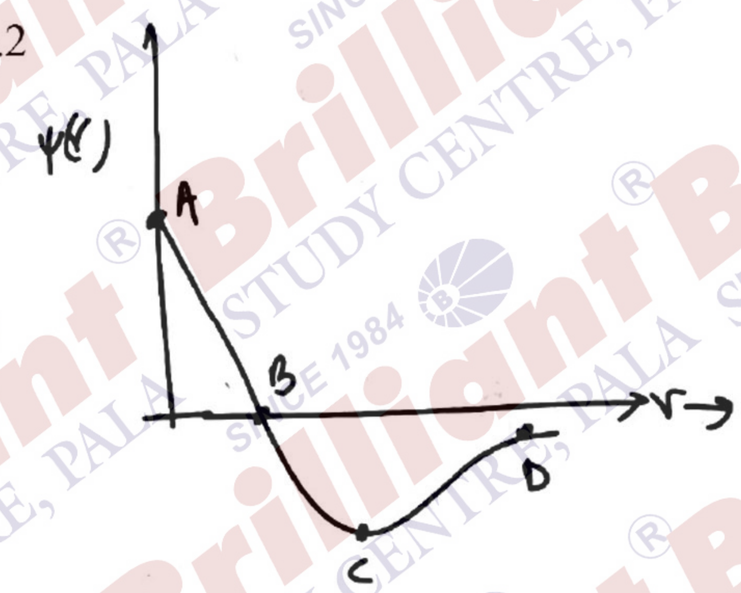


Fig.2



QN 1 gm of an organic compound gives 1.32 gm CO_2, 0.53 g of same compound gives 0.75 gm AgBr. If molecular formula of compound is $C_xH_yBr_z$; Calculate % of H in the compound

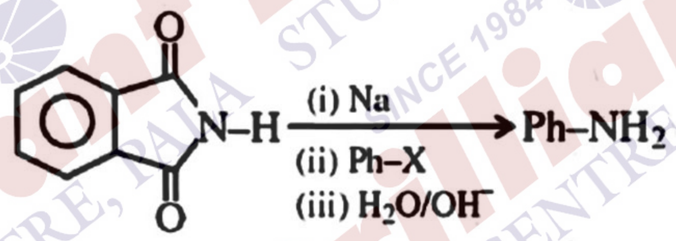
QN Determine the values of X, Y and Z for the following complexes and calculate the sum X + Y + Z.

X = number of geometrical isomers of $[Pt(NH_3)(Cl)(Br)(Py)]$

Y = Number of optically inactive isomers of $[Cr(en)_2Cl_2]^{+1}$

Z = Number of stereoisomers of $[Co(NH_3)_3(NO_3)_3]$

QN Which of the following reaction is correctly matched with their product?

1) 

2) $CH_3CH_2-\underset{\underset{O}{\|}}{C}-NH_2 + Br_2 + 4KOH\ (alc.) \rightarrow CH_3CH_2-NH_2 + 2KBr + K_2CO_3$

3) $Ph-CH_2-NH_2 + CHCl_3 + KOH\ (alc.) \xrightarrow{\Delta} Ph-CH_2-N\overset{\oplus}{\equiv}\overset{\ominus}{C} \xrightarrow{(i)\ Sn+HCl} PhCH_2NH_2$

4) $Ph-\underset{\underset{O}{\|}}{C}-NH_2 \xrightarrow{LiAlH_4} Ph-NH_2$

QN Statement I : Test for nitrite; sulphanilic acid and 1-napthylamine are used.

Statement II : Acidified nitrite is di-azotized with sulphanilic acid and coupled with 1-napthylamine.

Select the correct statement

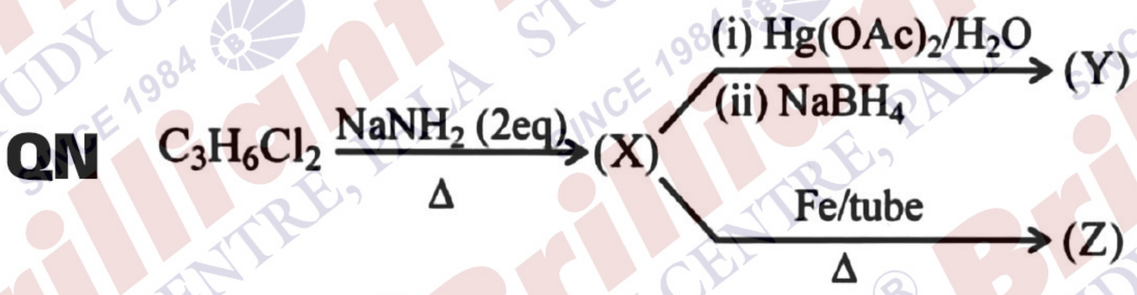
1) Both statements are correct

2) Both statements are incorrect

3) Statement I is correct but statement II is incorrect

4) Statement I is incorrect but statement II is correct

QN



Statement I : Y gives yellow ppt. with $NaOH/I_2$.

Statement II : Two (2) types of H-atoms in Z and 1 in aromatic ring & other one is aliphatic side chain & their ratio is 1 : 3

1) Statement -I is correct and statement -II is incorrect

2) Statement -I is incorrect and statement-II is correct

3) Both statements are correct

4) Both statements are incorrect

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MATHEMATICS

QN Consider 10 observations 2,3,5,10,11,13,15,21, a and b such that mean of observation is 9 and variance is 34.2. Then the mean deviation about median is

1) 3 2) 5 3) 6 4) 7

QN If α,β are roots of the equation $(\alpha<\beta)\lambda x^2-(\lambda+3)x+3=0$ such that $\frac{1}{\alpha}-\frac{1}{\beta}=\frac{1}{3}$, then the sum of all possible value of λ is

1) 8 2) 4 3) 2 4) 6

QN Let $f(x)$ be a polynomial function such that $f(x^2+1)=x^4+5x^2+3$, then $\int_0^3 f(x)=$

QN If 3 balls are taken from the box without replacement and found to be all black . If all configuration of red balls and black balls are equally likely then the probability that box contained 1 red and black ball is $\frac{p}{q}$ for some co prime in numbers p and q, then p + q is

1) 59 2) 69 3) 57 4) 79

QN If unit vectors $\vec{a},\vec{b},\vec{c}$ then $|\vec{a}-\vec{b}|^2+|\vec{b}-\vec{c}|^2+|\vec{c}-\vec{a}|^2=9, |2\vec{a}+k\vec{b}+k\vec{c}|=3$ then find the positive value of k

QN If $g(x)=3x^2+2x-3, f(0)=-3$, $4g(f(x))=3x^2-32x+72$. Then $f(g(2))$

1) $\frac{-25}{6}$ 2) $\frac{25}{6}$ 3) $\frac{-7}{2}$ 4) $\frac{7}{2}$

QN Let $k=\left(\tan\frac{\pi}{4}+\frac{1}{2}\cos^{-1}\frac{2}{3}\right)+\tan^{-1}\left(\frac{1}{2}\sin^{-1}\frac{2}{3}\right)$. Then number of solution of the equation $\sin^{-1}(kx-1)=\sin^{-1}x-\cos^{-1}x$

QN Find the value of $\sum_{k=1}^{\alpha}\frac{(-1)^{k+1}\times k(k+1)}{k!}$

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

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MATHEMATICS

QN $\lim\limits_{x\to 0} \log \dfrac{\left[\sec(ex)\sec(e^2x)\times\sec(e^3x)\times....\times\sec(e^{10}x)\right]}{e^2-e^{2\cos x}}$

1) $\dfrac{e^{16}-1}{e^2-1}$ 2) $\dfrac{e^{18}-1}{e^2-1}$ 3) $\dfrac{e^{20}-1}{e^2-1}$ 4) $\dfrac{e^{22}-1}{e^2-1}$

QN Consider a circle C_1 passing through origin and lying in region $x\geq 0$ only, with diameter 10.

Consider a chord PQ of C_1 with equation $x = y$ and another circle C_2 which has PQ as diameter. A chord is drawn to C_2 passing through (2,3) such that distance of chord from centre of C_2 is maximum has equation $x+ay+b=0$ then (b-a) is equal to

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

QN Product of first three terms of G.P is 27 then the range of sum of these terms is $R-(a,b)$, then a^2+b^2 is

QN If $y=f(x)$ satisfies the differential equation $x\dfrac{dy}{dx}-\sin 2y=x^3\cos^2 y$ and $y(1)=\dfrac{\pi}{4}$ then $y\left(\dfrac{\pi}{3}\right)$ is

1) 1 2) $\tan^{-1}\dfrac{\pi}{4}$ 3) $\tan^{-1}\dfrac{\pi^3}{27}$ 4) 0

QN Let $S=\left\{x^3+ax^2+bx+c, a,b,c\in N \text{ and } a,b,c\leq 20\right\}$ be a set of polynomials. Then the number of polynomials in S, which are divisible by x^2+2 is

1) 20 2) 10 3) 6 4) 120

QN The area of region $R=\left\{(x,y): xy\leq 8, 1\leq y<x^2, x>0\right\}$ is

QN Let Z be a complex number lying in the first quadrant such that $|z-6|=5$ and $|z-3i+5|=7$, then $z^3+7z^2+25z+16$ is equal to

1) 45 2) 55 3) 35 4) 25

QN The common difference of AP, $a_1,a_2,a_3...a_n$ is 13 times the common difference of Ap $b_1,b_2,b_3....b_n$, also $a_{78}=327, b_{43}=-385, b_{31}=-277$, then a_1 is

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QN 17. Let $A=\begin{bmatrix}12 & -5\\ 10 & 6\end{bmatrix}, B\begin{bmatrix}x_1\\ x_2\end{bmatrix}=\begin{bmatrix}12\\ -6\end{bmatrix}$ such that $B=(I+A)^{-1}$, then x_1-x_2 is equal to

1) 27 2) 108 3) 21 4) 54

QN Let a line $L: x+2\sqrt{2}y-4=0$ cuts x-axis and y-axis at A and B respectively consider an equilateral triangle ABC such that (0,0) is the orthocentre of ΔABC. If $c\in(\alpha,\beta)$ then $\left|\alpha+\sqrt{2}\beta\right|$ is

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

QN Let $\int\frac{1-s\cos^2 x}{\sin^2 x\times\cos^2 x}dx=f(x)+c$ then find $f\left(\frac{\pi}{4}\right)-f\left(\frac{\pi}{6}\right)$ is

1) $4\sqrt{2}-\frac{32}{\sqrt{3}}$ 2) $4\sqrt{3}-\frac{32}{\sqrt{3}}$ 3) $4\sqrt{3}-\frac{32}{\sqrt{2}}$ 4) $4\sqrt{2}-\frac{32}{\sqrt{2}}$

QN Given conic $x^2-y^2\sec^2\theta=8$ whose eccentricity is e_1 and length of latus rectum ℓ_1 and for conic $x^2+y^2\sec^2\theta=6$, eccentricity e_2 and length of latus rectum ℓ_2. If $e_1^2=e_2^2(1+\sec^2\theta)$ then value of $\frac{e_1\ell_1}{e_2\ell_2}\times\tan\theta$ is

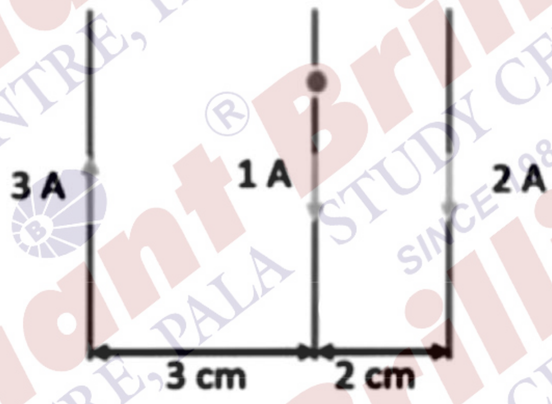
QN The value of $s=\sum_{x-1}^{20}\sqrt{\pi\int_0^r x\left|\sin\pi x\right|d}$ is

1) 102 2) 210 3) 201 4) 120

QN In ΔABC if $\frac{\tan(A-B)}{\tan A}+\frac{\sin^2 C}{\sin^2 A}=1$ where $A,B,C\in\left(0,\frac{\pi}{2}\right)$ then

1) tanA,tanB, tan C are in A.P
2) tan A, tan C, tan B are in A.P
3) tan A,tan B, tan C are in G.P
4) tan A,tan C, tan B are in G.P

QN There are three long parallel wires in a plane as shown. Find force on 15 cm of length of middle wire



1) 5 μN 2) 7μN 3) 6μN 4) 1μN

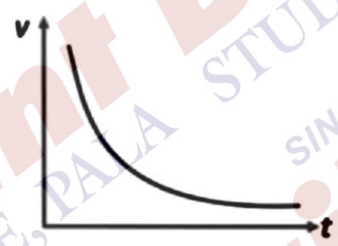
QN Equation of an EMW in a medium is given by $E=2\sin(2\times10^{15}t-10^{7}x)$. Find refractive index of the medium

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

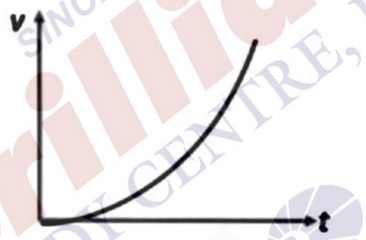
QN For a circular coil of radius R, center is $B_0=16$ μT. What will be the magnetic field on axis at a distance $x=\sqrt{3}R$ from center ?

1) $\frac{1}{4}\mu T$ 2) $\frac{1}{2}\mu T$ 3) 4μT 4) 2μT

QN An object is being dropped from height h above the ground. Apart from force of gravity additional drag force, F=–kv acts on the object. Find the graph of v versus t.

1) 

2) 

3) 

4) 

QN Electric current in a circuit is given by $i=i_0\left(\frac{t}{T}\right)$, find rms current for period t = 0, t= T.

1) $\frac{i_0}{\sqrt{5}}$ 2) $\frac{i_0}{\sqrt{2}}$ 3) $\frac{i_0}{2}$ 4) $\frac{i_0}{\sqrt{3}}$

QN Position of a particle is given by $x=A\sin(\omega t)$ potential energy is minimum at $t=\frac{T}{2\beta}$, where T is time period. Find minimum value of positive β.

1) 1/2 2) 1 3) 1/3 4) 1/6

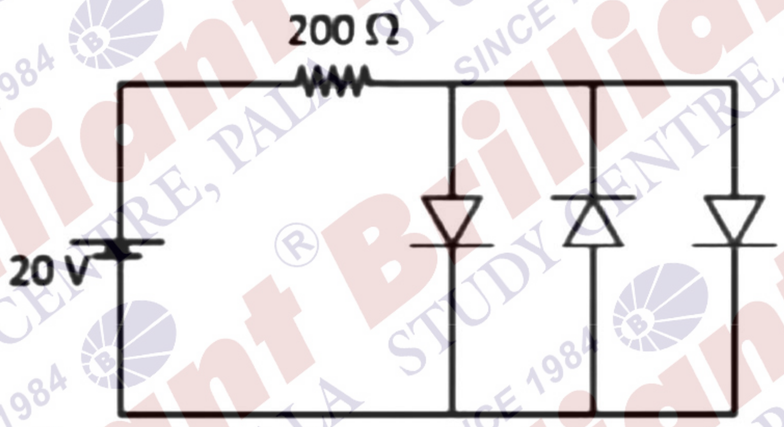
QN A tap is at a height of 5m from ground. Water drops are falling from it at regular interval. When 1st drop hits the ground 6th droplet is just about to fall. Find the height of 4th droplet from ground when 1st droplet hits the ground.

1) 4.2 m 2) 3.2 m 3) 4 m 4) 3 m

QN If 10 kg of ice at –10°C is mixed with 100 kg of water at 25°C, then resultant temperature in equilibrium for mixture shall be ($S_i = \frac{1}{2}$ cal / gm – °C , S_w = 1cal/gm-°C, L_f = 80 cal/gm)

1) 0°C 2) 15°C 3) 12.5°C 4) 5°C

QN The threshold voltage for the diodes is 0.7 volt. Then current through diodes (from left to right) in given circuit is



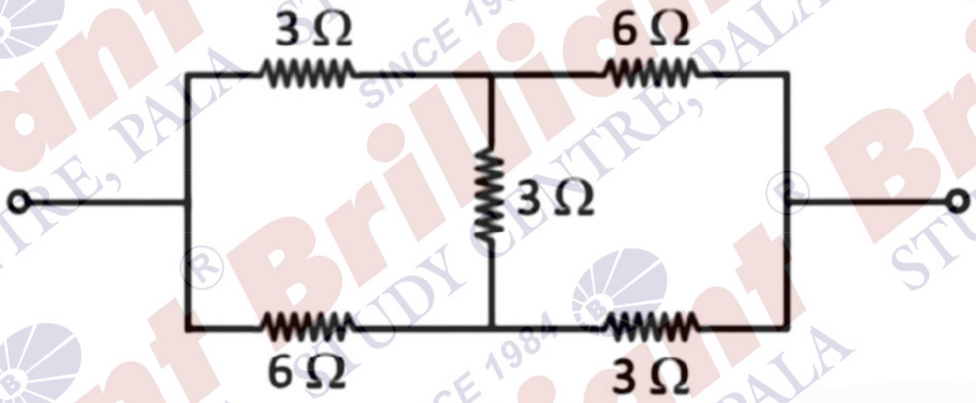
1) Zero, Zero, Zero 2) 32.23 mA, 32.23 mA, 32.23 mA

3) 48.25 mA, Zero, 48.25 mA 4) 50 mA, Zero, 50 mA

QN The wave number of three spectral lines of H-atom are given. Identify the correct set of spectral lines belonging to Balmer series

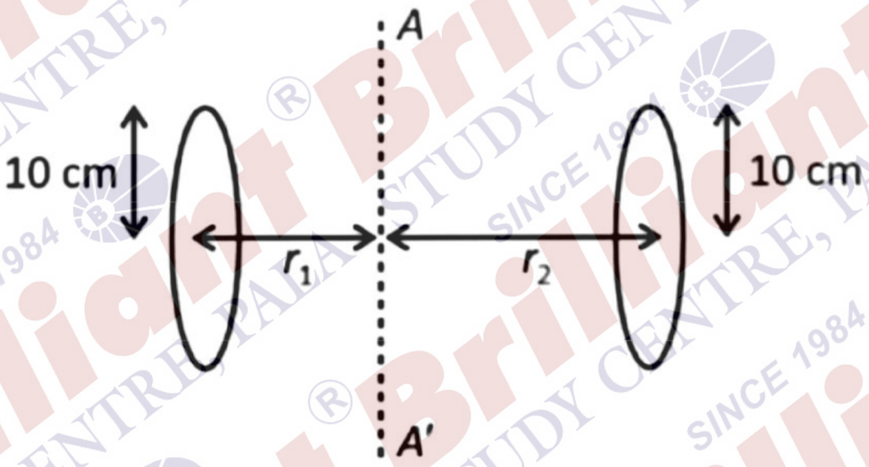
1) $\frac{5R}{36}, \frac{3R}{16}, \frac{21R}{100}$ 2) $\frac{3R}{4}, \frac{3R}{16}, \frac{7R}{144}$ 3) $\frac{7R}{144}, \frac{3R}{16}, \frac{16R}{255}$ 4) $\frac{5R}{36}, \frac{3R}{16}, \frac{21R}{24}$

QN Find equivalent resistance of the given circuit.



1) 6.4 Ω 2) 4.2 Ω 3) 7 Ω 4) 5 Ω

QN For the given situation shown in figure two disks each of mass m = 600 grams are rotating about a fixed axis AA'. Radius of each disk is r_0 = 10 cm and they are at distance r_1 = 10 cm and r_2 = 20 cm from the axis AA'. Torque acting about the axis is 45×10^2 dyne-cm. Find angular acceleration in rad/sec^2.



1) $\frac{170}{11}$ rad / sec^2 2) $\frac{140}{9}$ rad / sec^2 3) $\frac{150}{11}$ rad / sec^2 4) $\frac{160}{9}$ rad / sec^2

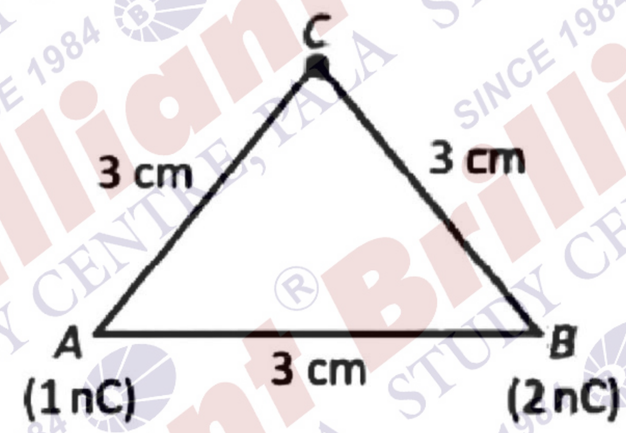
QN A bi-convex lens of refractive index 1.5 and planoconcave lens of refractive index 1.7 have same magnitude of power. If 2nd radius of curvature of convex lens is equal to radius of curvature of planoconcave lens. Find ratio of 1st radius of curvature to 2nd radius of curvature of bi-convex lens.

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

QN 14. Find the ratio of de-Broglie wavelength associated with deuteron with kinetic energy of K and α- particle with kinetic energy of 2K.

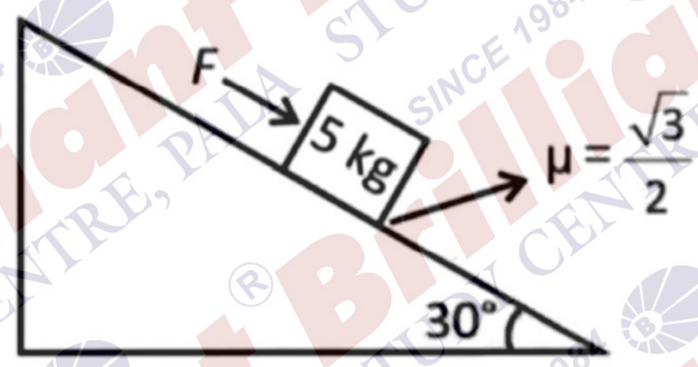
1) 2 : 1 2) $2\sqrt{2}:1$ 3) $1:\sqrt{2}$ 4) $\sqrt{2}:1$

QN 15. Find the work done by external agent in moving a 3 nC charge from a large separation to point C.



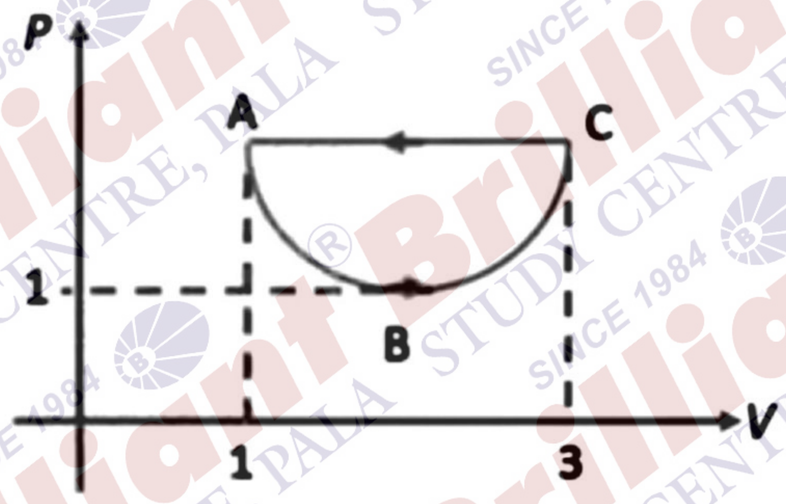
1) 8.1 μJ 2) 12 μJ 3) 2.7 μJ 4) 9 μJ

QN A block of mass 5 kg is placed on wedge of inclination 30°. Find force applied to move the block downwards with constant speed.



1) $\left(\sqrt{3}-1\right)\frac{25}{2}$ 2) 12.5 N 3) zero 4) 25 N

QN Process ABC represents a parabolic section given by $(V-2)^2 = 4(P-1)$ in given cyclic process then work done by gas in process is



1) $-\frac{1}{3}$ units 2) $-\frac{1}{6}$ units 3) $-\frac{1}{2}$ units 4) $-\frac{2}{3}$ units

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PHYSICS

QN Statement I : When a planar wavefront passes through a prism then its wavefront doesn't change, but when planer wavefront passes through a smaller slit wavefront becomes cylindrical.

Statement II : If distance slits is decreased and screen distance is increased then fringe width increases

1) S-I & S-II are both correct

2) S-I & S-II are both incorrect

3) S-I is correct & S-II is incorrect

4) S-I is incorrect & S-II is correct