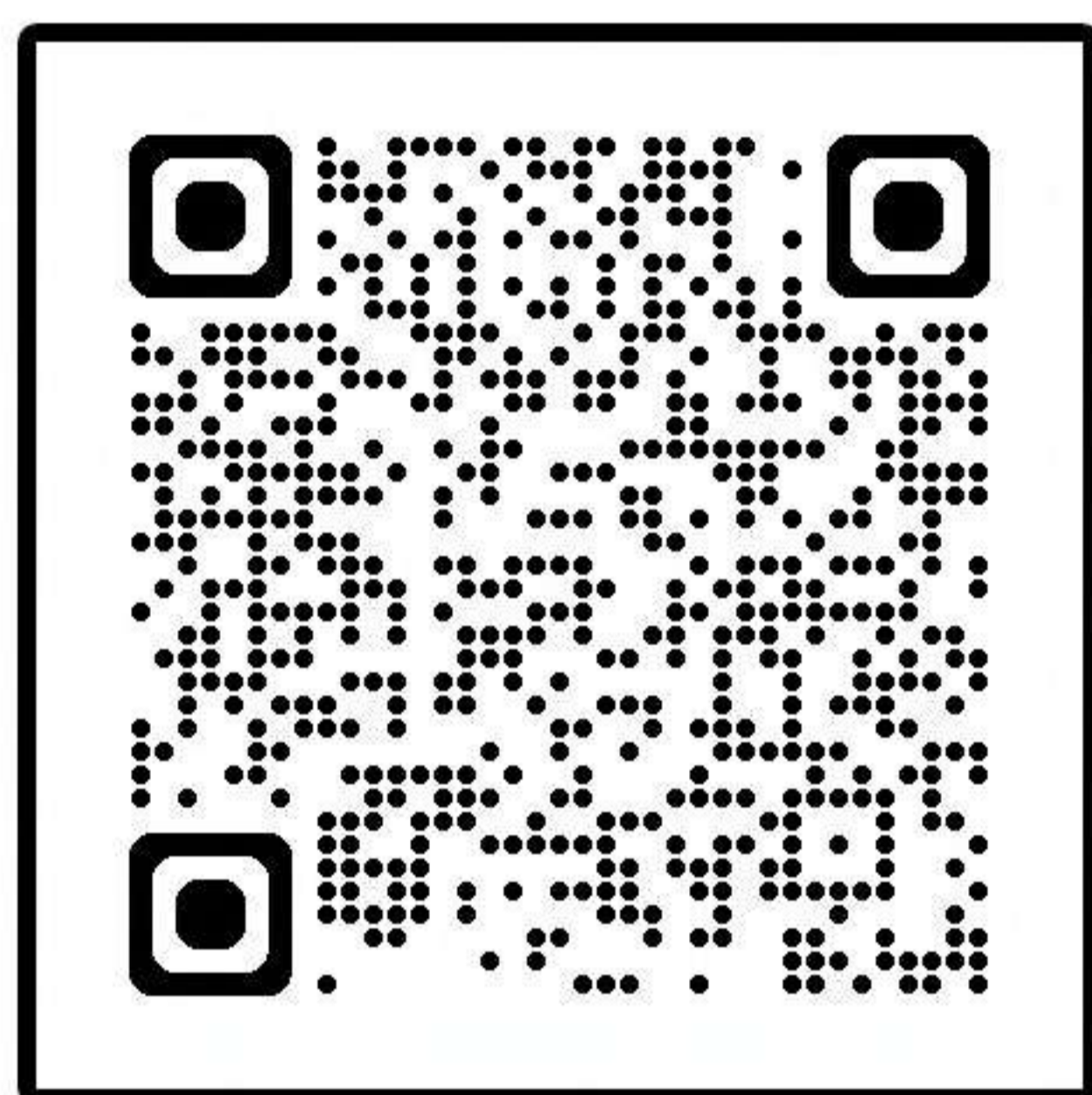


JEE MAIN 2025

SESSION-1

DAY-1

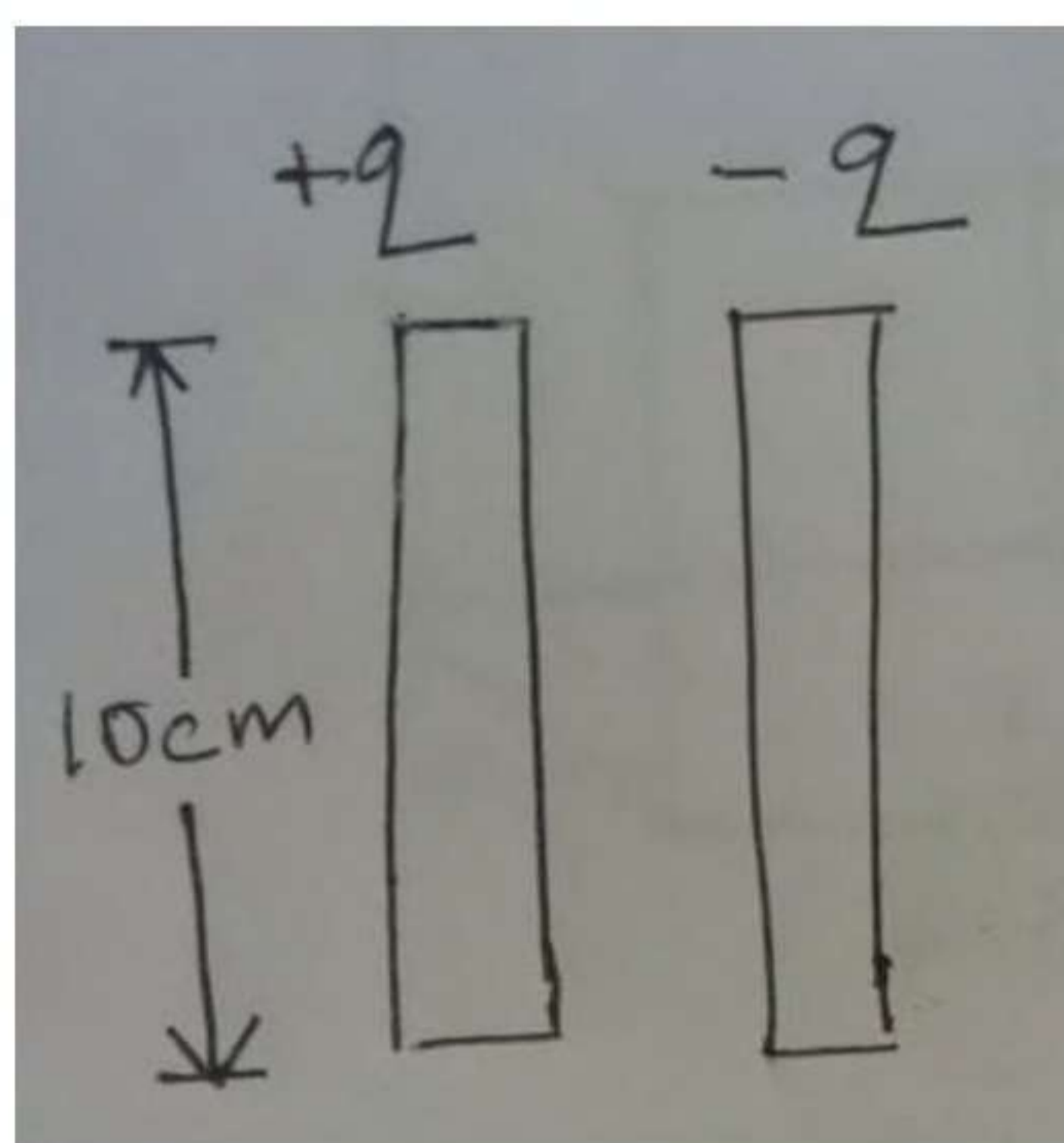


SCAN ME

VIDEO SOLUTION

MEMORY BASED QUESTIONS

Que. An electron is made to enter symmetrically between two parallel plate and equal oppositely charged metal plates, each of 10cm length. The electron emerges out of the electric field region with a horizontal component of velocity 10^6 m/s . If the magnitude of the electric field between the plates is 9.1 V/cm , then the vertical component of velocity of electron is (mass of electron $9.1 \times 10^{-31} \text{ kg}$ and charge of electron = $1.6 \times 10^{-19} \text{ C}$)

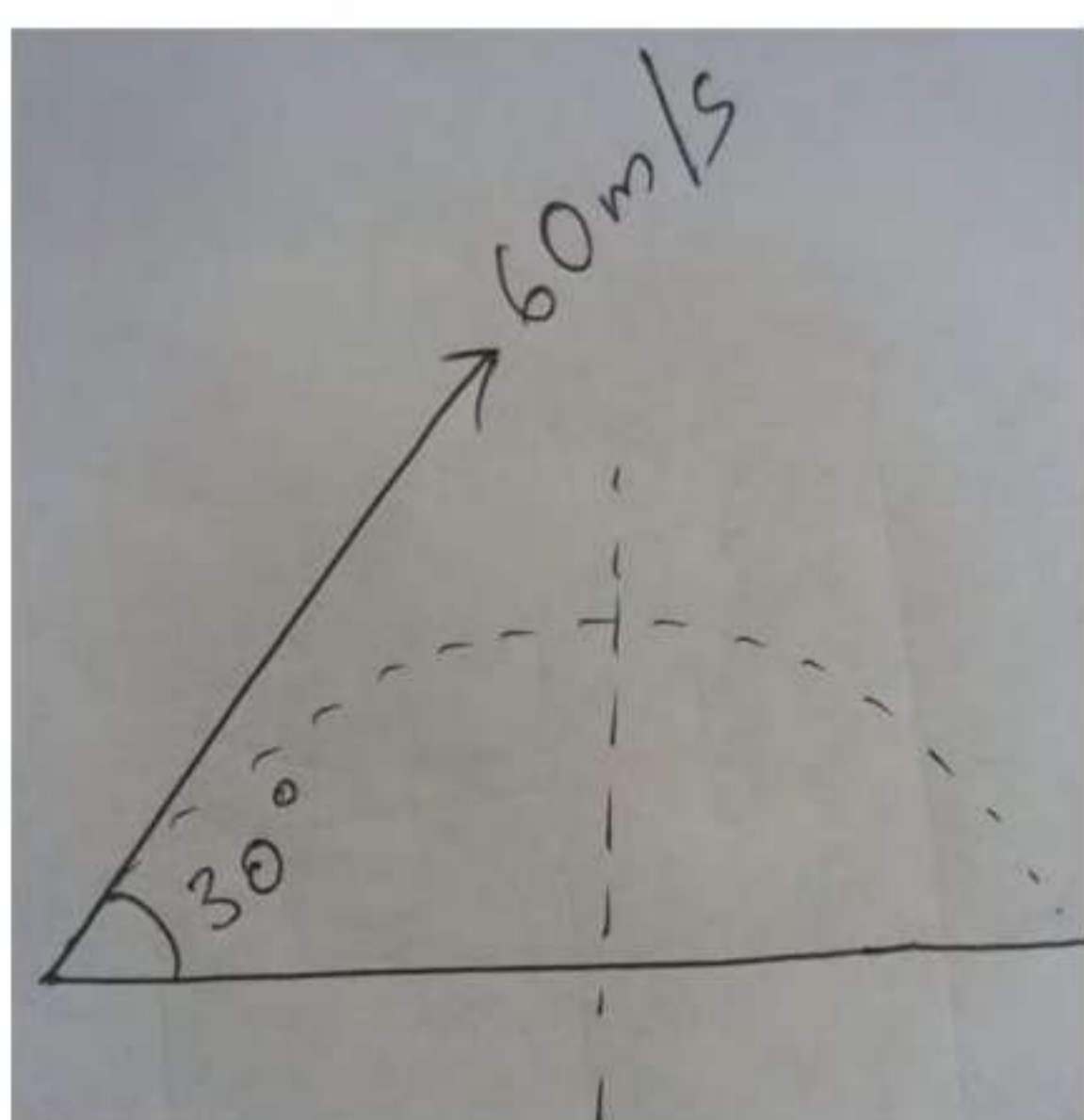


- A) 0 B) $16 \times 10^6 \text{ m/s}$ C) $16 \times 10^4 \text{ m/s}$ D) $1 \times 10^6 \text{ m/s}$

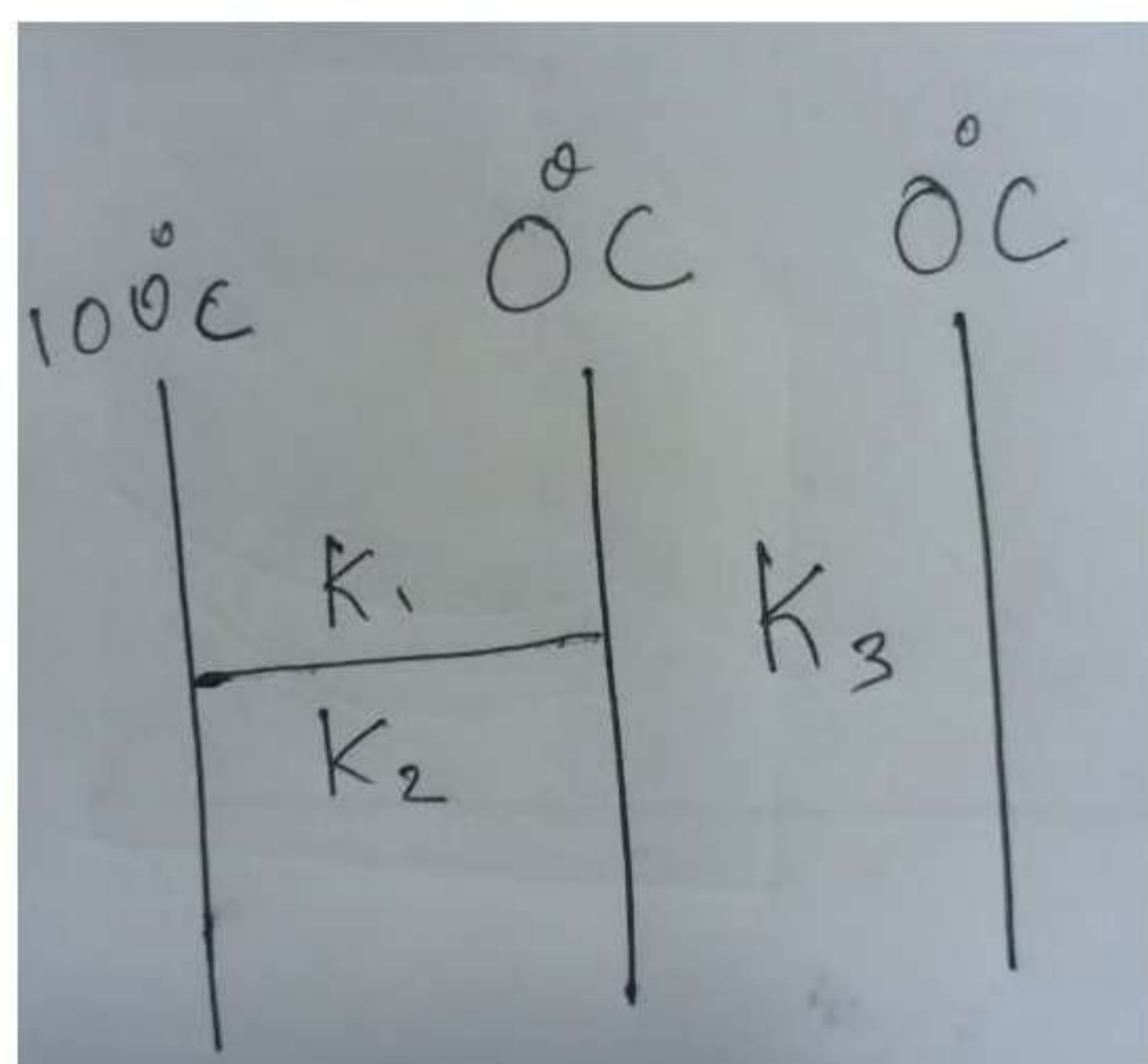
Que. A closed organ pipe in 9th harmonic resonates with 4th harmonic of open organ pipe ($l_{\text{closed}} = 10 \text{ cm}$). Find length of open organ pipe

- 1) $L_o = 15 \text{ cm}$ 2) $L_o = \frac{100}{9} \text{ cm}$ 3) $L_o = \frac{110}{7} \text{ cm}$ 4) $L_o = \frac{80}{9} \text{ cm}$

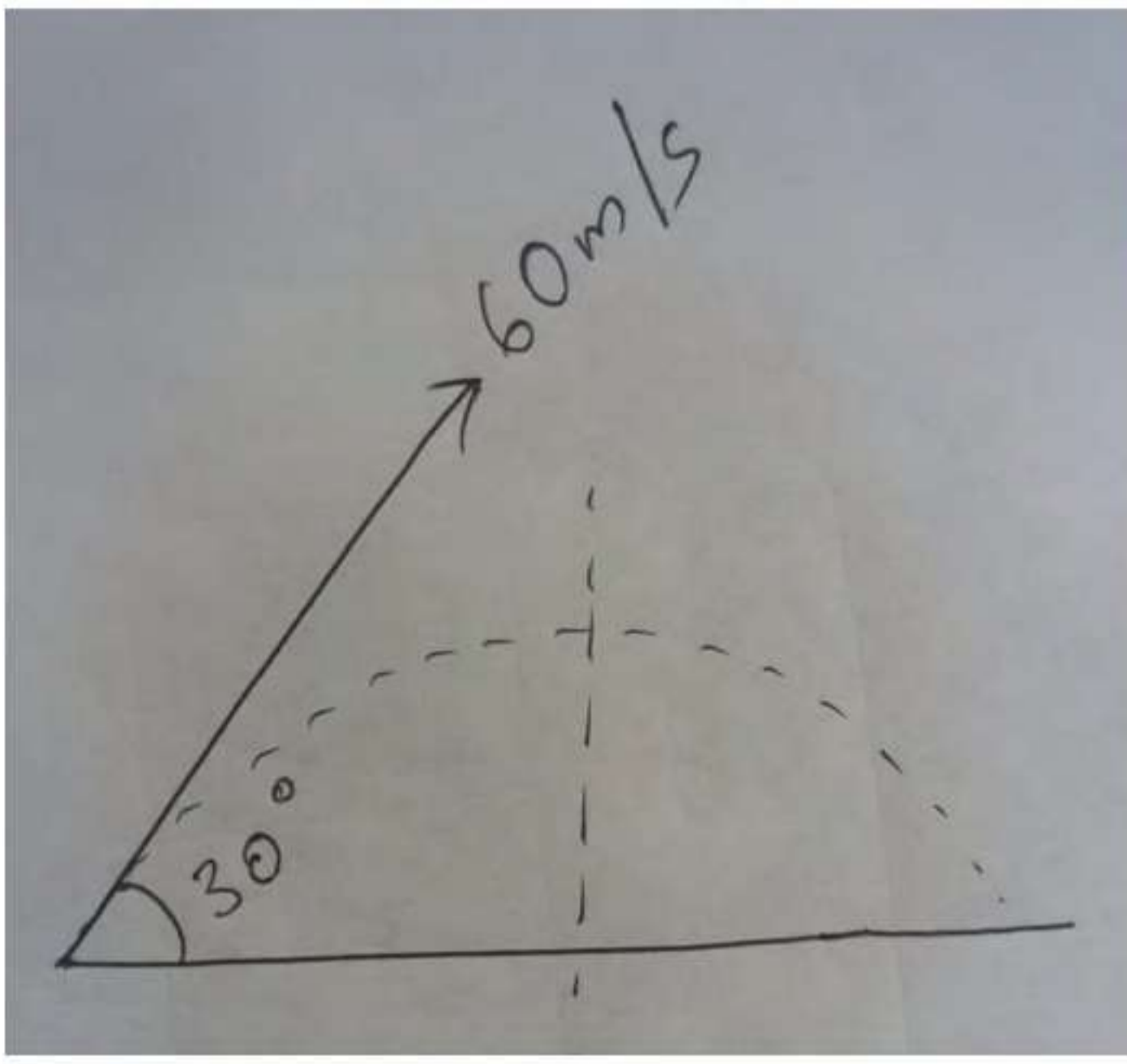
Que. Find the ratio of heights in first and last second of upward journey



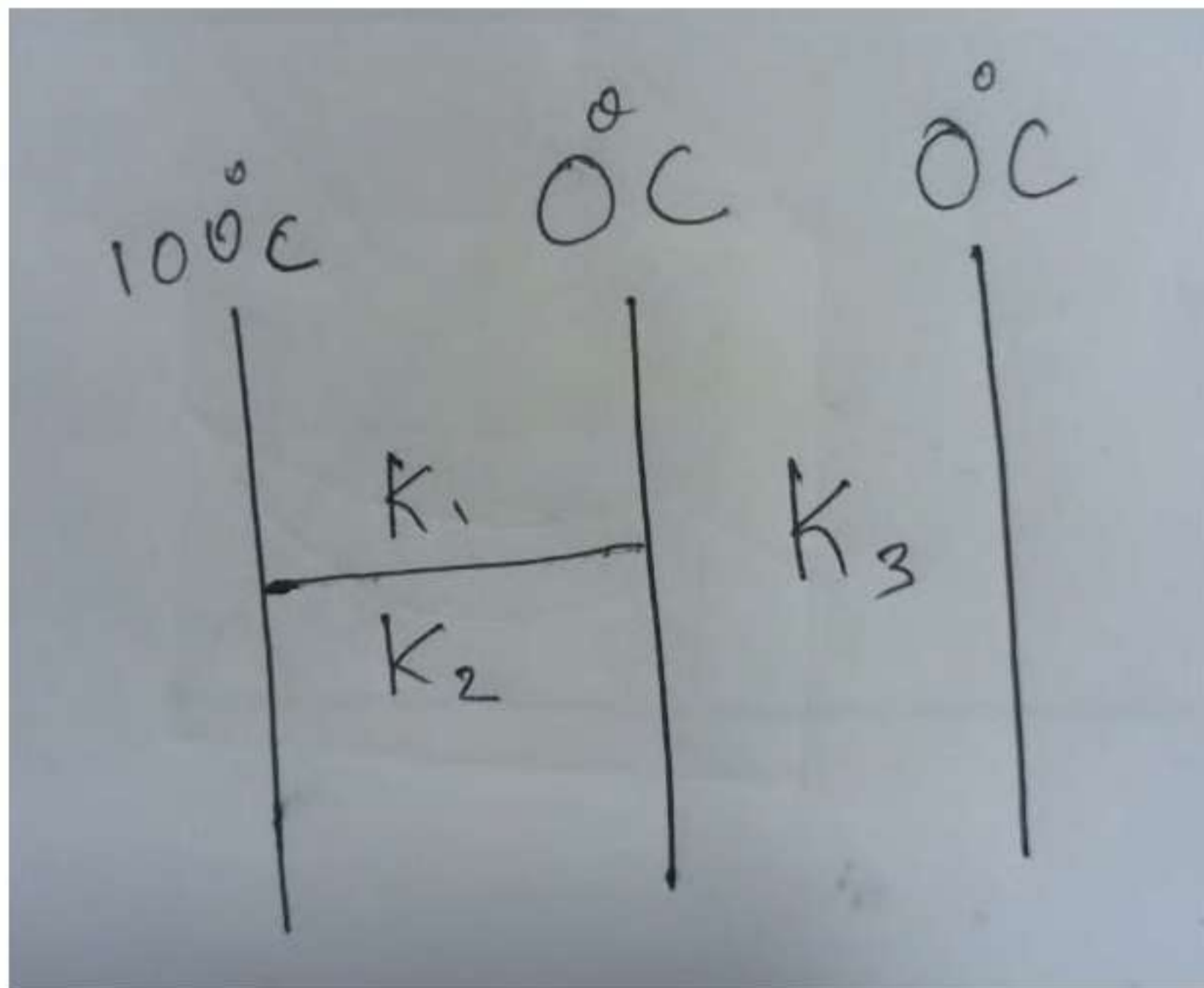
Que. Find out the temperature ' θ ' shown in diagram, $K_1 = 60$, $K_2 = 120$ and $K_3 = 135$



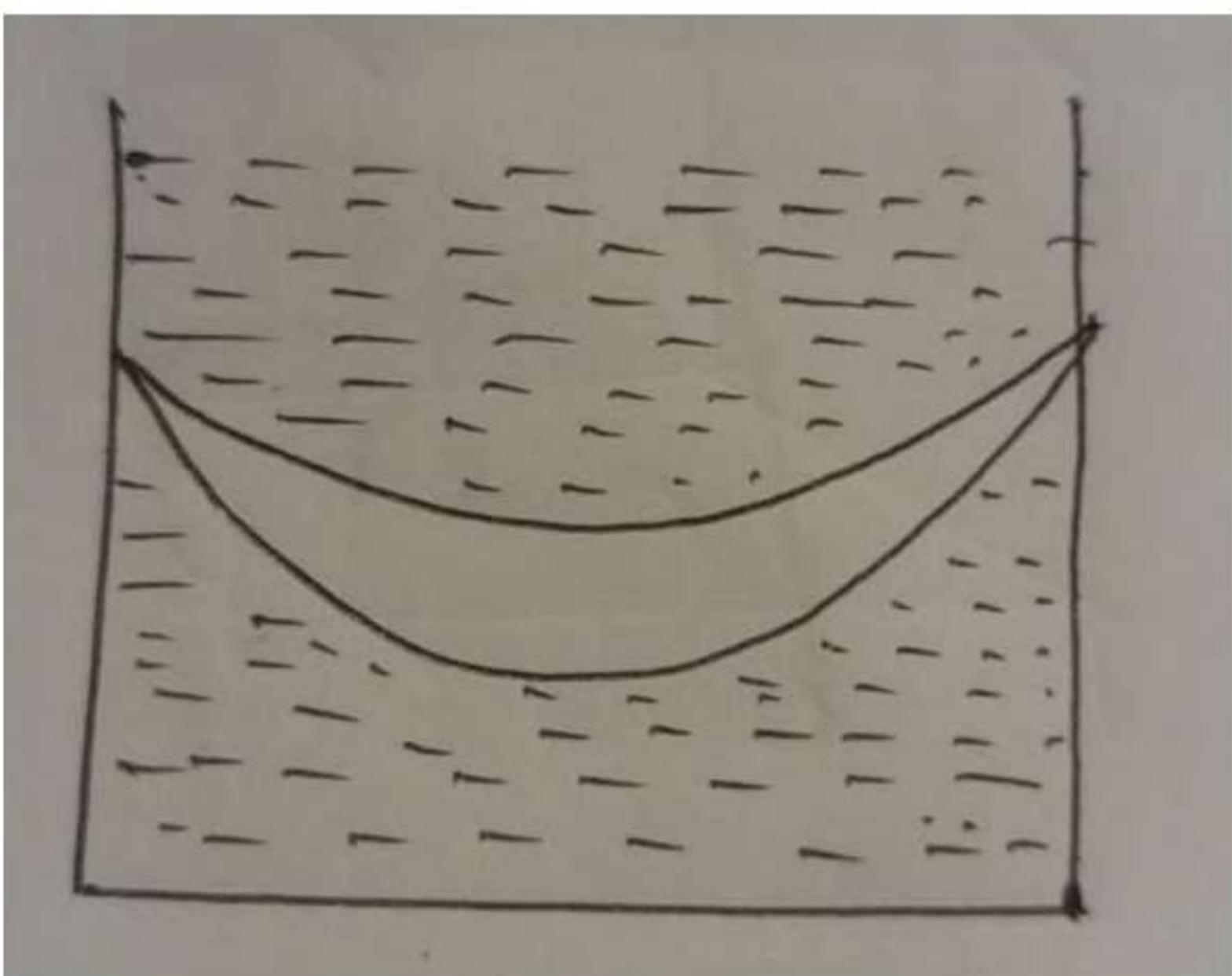
Que. Find the ratio of heights in first and last second of upward journey



Que. Find out the temperature ' θ ' shown in diagram, $K_1 = 60$, $K_2 = 120$ and $K_3 = 135$

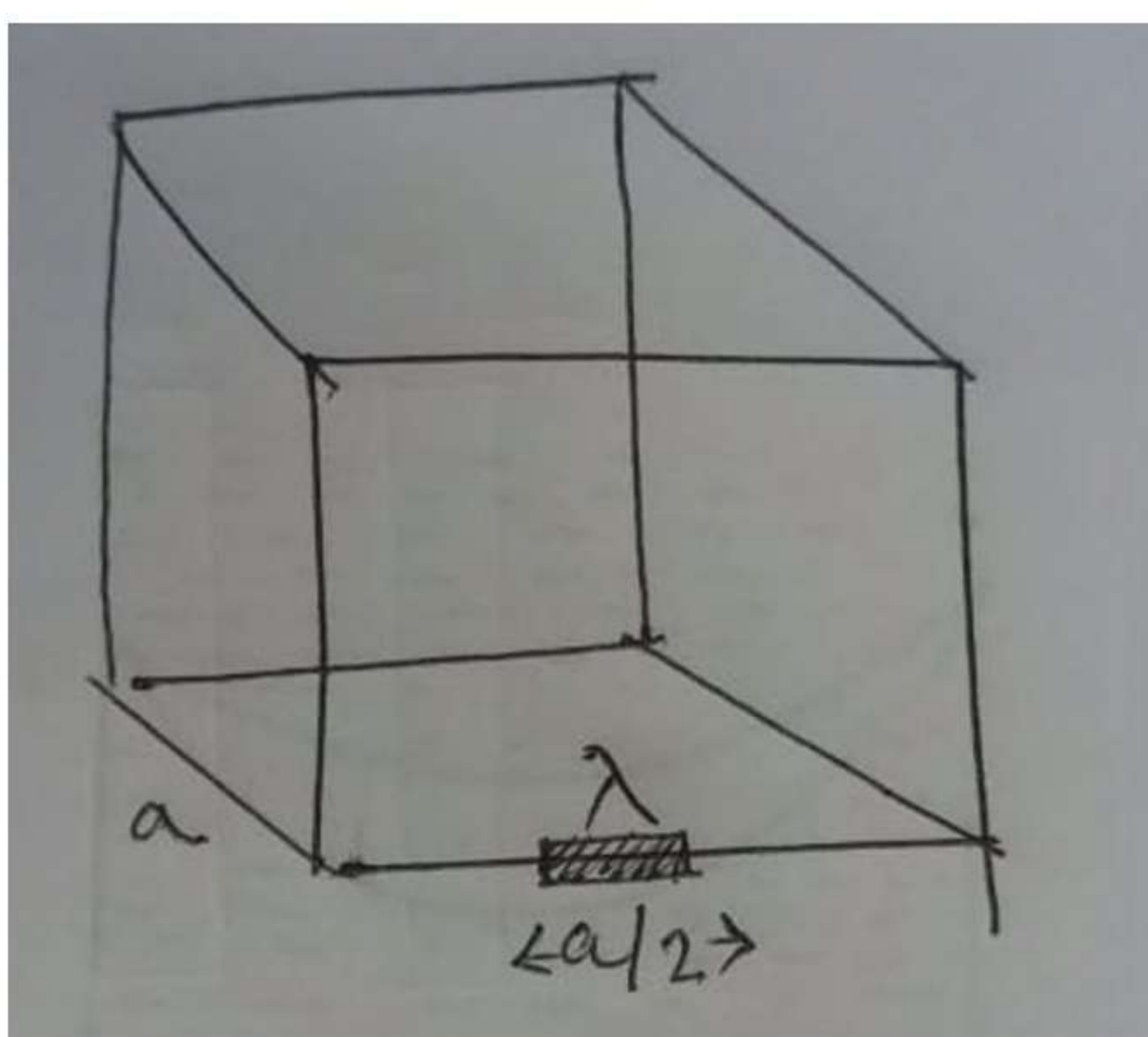


Que. A concavo - convex lens of refractive index $\frac{3}{2}$ is placed in water ($\mu = \frac{4}{3}$). If the radius of curvature of inner and outer surface are R_1 and R_2 . Find the power of combination



Que. A light of wavelength 525 nm is incident on cesium ($\phi = 1.9 \text{ eV}$) and lithium ($\phi = 2.5 \text{ eV}$). Then the electron is emitted from which element?

A line charge of length $a/2$ and charge density λ is placed along the edge of the cube. Find the flux through cube



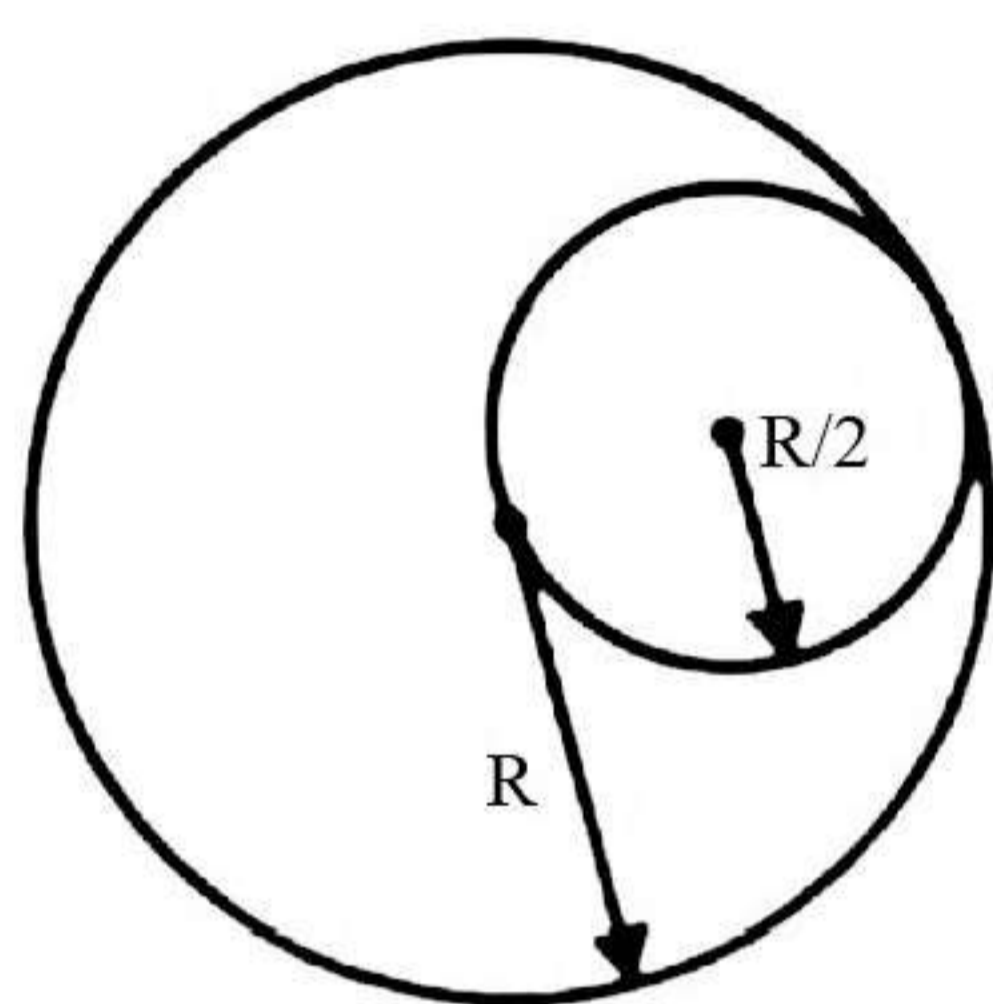
Que. A body of mass M at rest explodes into three pieces, in the ratio of masses $1 : 1 : 2$. Two smaller pieces fly off perpendicular to each other with velocities of 30 ms^{-1} and 40 ms^{-1} respectively. The velocity of the third piece will be:

Que. A parallel plate capacitor of capacitance $40 \mu\text{F}$ is connected to a 100 V power supply now the intermediate space between the plates is filled with a dielectric material of dielectric constant $k=2$ due to the introduction dielectric the extra charge and the change in electrostatic energy in the capacitor respectively or

- 1) 2 mc and 0.4 J 2) 2 mc and 0.2 J 3) 4 mc and 0.2 J 4) 8 mc and 2 J

Que. A uniform circular disc of radius ' R ' and mass ' m ' is rotating about an axis perpendicular to it's plane and passing through it's center. A small circular part of radius $\frac{R}{2}$ is removed from the

original disc as shown in the figure. Find this moment of inertia of the remaining part of the original disc about the axis as given above.



- 1) $\frac{17}{32} mR^2$ 2) $\frac{15}{32} mR^2$ 3) $\frac{7}{32} mR^2$ 4) $\frac{13}{32} mR^2$

Que. An electron in the ground state of the hydrogen atom has the orbit, radius of $5.3 \times 10^{-11} \text{ m}$ while that for the electron in third excited state is $8.48 \times 10^{-10} \text{ m}$. The ratio of the de-Broglie wavelength is of electron in the ground state to that in the excited state is

- 1) 9 2) 3 3) 4 4) 16

Que. Find the dimensions of $\frac{B}{\mu_0}$

- 1) $[AL]$ 2) $[AL^{-1}]$ 3) $3[MAL]$ 4) $[MALT^{-1}]$

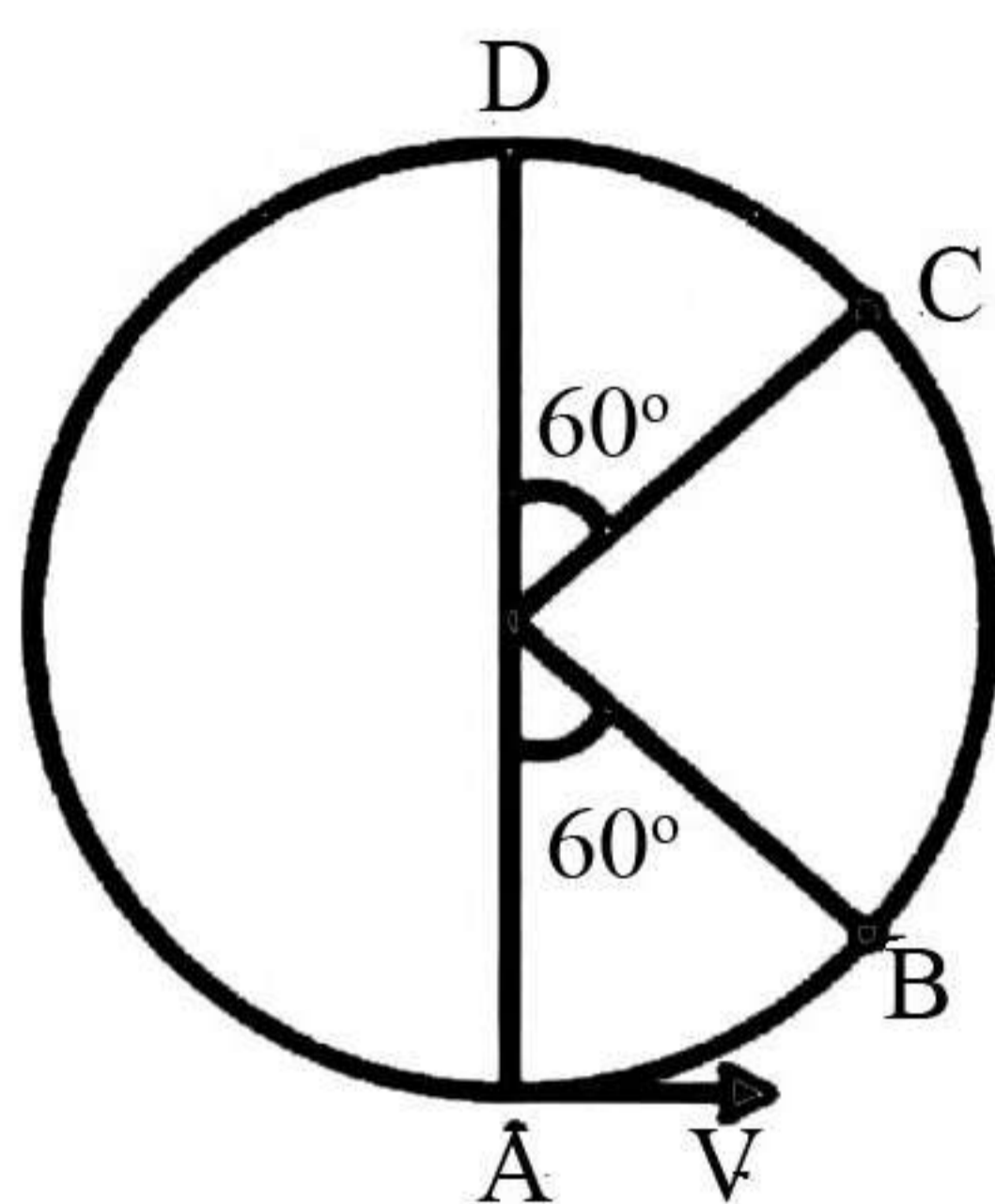
Que. Solid sphere of mass M , radius R exerts force F on a point mass. Now a concentric spherical mass $\frac{M}{7}$ is removed. What is new force

- 1) $\frac{F}{7}$ 2) $\frac{6}{7}F$ 3) $\frac{5F}{7}$ 4) $\frac{3F}{7}$

Que. Statement I : In a vernier callipers, one vernier scale division is smaller than one main scale division.

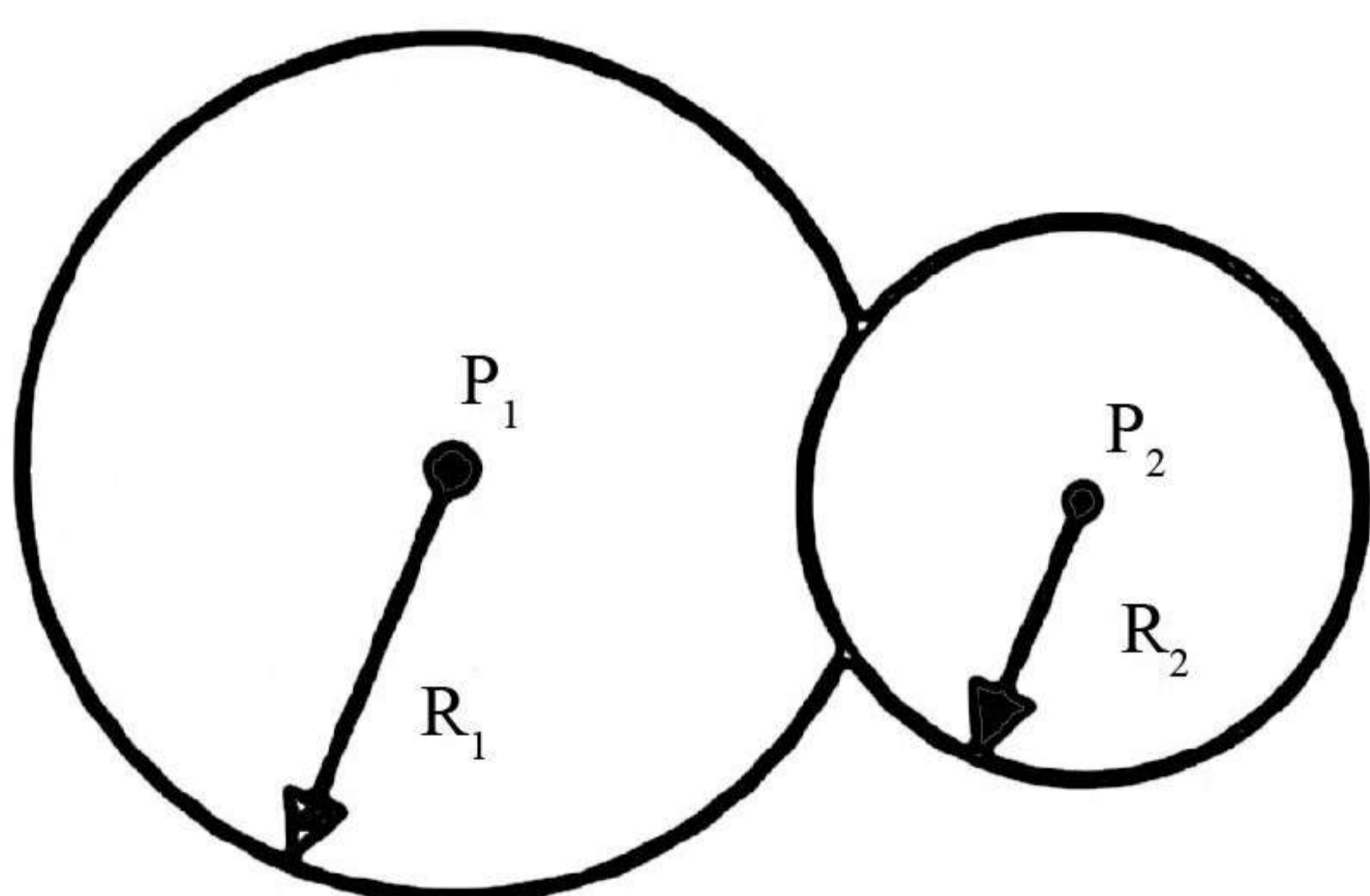
Statement II : The vernier constant is given by one main scale division multiplied by the number of vernier scale divisions.

Que. A bob of mass m is suspended at a point 'O' by a light string of length ' ℓ ' and left to perform vertical motion (circular) as shown in figure. Initially by applying horizontal velocity V_0 at the point 'A', the string becomes slack when the bob reaches at the point 'D'. The ratio of the KE of the bob at the points B and C is



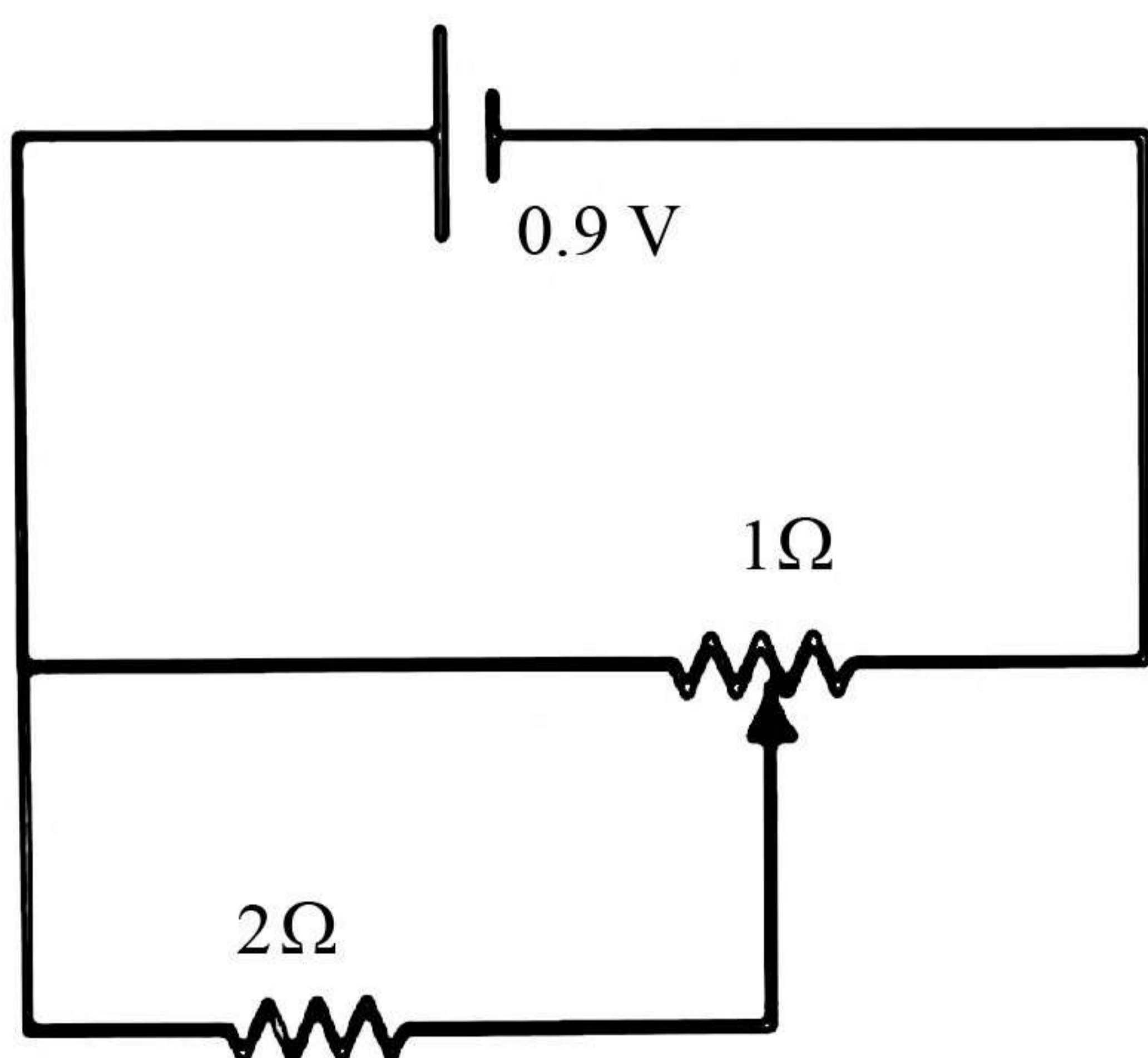
- 1) 2 2) 4 3) 1 4) 3

Que. Find the radius of curvature of the common surface of two bubbles ($R_1 > R_2$)



- 1) $R = \frac{R_1 R_2}{R_1 + R_2}$ 2) $R = \frac{2R_1 R_2}{R_1 - R_2}$ 3) $R = \frac{R_1 R_2}{R_1 - R_2}$ 4) $R = \frac{R_1 R_2}{R_1 + R_2}$

Que. Find current in the circuit. Jockey is at middle point on 1Ω .



Que. Solid sphere of mass M , radius R exerts force F on a point mass. Now a concentric spherical mass $\frac{M}{7}$ is removed. What is new force

Que. The shortest distance between the lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-1}{4}$ and $\frac{x+2}{7} = \frac{y-2}{8} = \frac{z+1}{2}$ is

In a bag there are 6 white and 4 black balls two balls are drawn at random, then the probability that both ball are white are

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

Que. If A be a 3×3 square matrix such that $\det(A) = -2$. If $\det(3 \operatorname{adj}(-6 \operatorname{adj}(3A))) = 2^n \times 3^m$, where $m \geq n$,

If $a_1, a_2, a_3, \dots, a_n$ are in geometric progression such that $a_2 a_5 = 28, a_2 + a_4 = 29$, then the value of a_6 is

Let $A = \{1, 2, 3\}$. Then number of non-empty equivalence relations from A to A

If $f(x) = 16(\sec^{-1} x)^2 + (\operatorname{cosec}^{-1} x)^2$. Then the maximum and minimum value of $f(x)$ is

- 1) $\frac{1001\pi^2}{33}$ and $\frac{2\pi^2}{9}$ 2) $\frac{1105\pi^2}{68}$ and $\frac{4\pi^2}{17}$ 3) $\frac{1117\pi^2}{58}$ 4) $\frac{1117\pi^2}{58}$

Que. If $8 = 3 + \frac{1}{4}(3+p) + \frac{1}{4^2}(3+p^2) + \dots + \infty$, then the value of p is

If $\frac{dx}{dy} + \frac{x}{y^2} = \frac{1}{y^3}$ and $x(1) = 1$. Then $x\left(\frac{1}{2}\right)$ is equal to

- 1) 2-e 2) 3-e 3) 5-e 4) 7-e

Let $T_r = \frac{(2r-1)(2r+1)(2r+3)(2r+5)}{64}$, then $\lim_{n \rightarrow \infty} \sum_{r=1}^n \frac{1}{T_r}$ is equal to

- 1) $\frac{22}{45}$ 2) $\frac{32}{35}$ 3) $\frac{27}{45}$ 4) $\frac{32}{45}$

Que. Coefficient of x^{2012} in the expansion of $(1-x)^{2008} (1-x+x^2)^{2007}$

- 1) 0 2) 1 3) 2 4) 3

Que. If the mirror images of the points A(1,3), B(3,1) and C(2,4) in the line $x + 2y = 4$ are D,E and F respectively, then the centroid of the triangle DEF is

Que. If $A = \{1, 2, 3, \dots, 10\}$ and $B = \left\{ \frac{m}{n} : m, n \in A, m < n \text{ and } \gcd(m, n) = 1 \right\}$ Then number of elements in set B is

- 1) 30 2) 31 3) 28 4) 29

Que. How many ways are there to select 5 letters from English alphabets such that M is in the middle of the letters if repetition is not allowed

- 1) ${}^{26}C_5$ 2) ${}^{25}C_4$ 3) ${}^{26}C_4$ 4) ${}^{25}C_5$

Que. Let $g(x) = 3f\left(\frac{x}{3}\right) + f(3-x) \forall x \in (0, 3)$ and $f''(x) > 0 \forall x \in (0, 3)$, then $g(x)$ decreases in interval $(0, \alpha)$, then α is

Que. Let a coin is tossed thrice. Let the random variable X is tail follows a head and the mean of X is μ and variance is σ^2 respectively. Then $64(\mu + \sigma^2)$ is

- 1) 48 2) 64 3) 32 4) 128

Que. Let $|z_i| = 1 \forall i = 1, 2, 3$ satisfying $|\bar{z}_1 z_2 + \bar{z}_2 z_3 + \bar{z}_3 z_1|^2 = a + b\sqrt{2}$, where a, b are rational numbers such that $\arg(z_1) = \frac{\pi}{4}$, $\arg(z_2) = 0$

Que. Let $\vec{b} = \lambda \hat{i} + 4\hat{k}, \lambda > 0$ and the projection vector of \vec{b} on $\vec{a} = 2\hat{i} + 2\hat{j} - \hat{k}$ is \vec{c} . If $|\vec{a} + \vec{c}| = 7$, then the area of the parallelogram formed vectors \vec{b} and \vec{c} is (in square units)

Que. If $f(x) = \begin{cases} -3ax^2 - 2 & x < 1 \\ a^2 + bx & x \geq 1 \end{cases}$ given $f(x)$ is continuous and differentiable Area enclosed by $f(x)$ and line $y = -20$ is $\alpha + \beta\sqrt{3}$ then find $\alpha + \beta$

Que. If $A = \{1, 2, 3, \dots, 10\}$ and $B = \left\{ \frac{m}{n} : m \in A, m < n \text{ and } \gcd(m, n) = 1 \right\}$. Then number of

Que. elements in set B is
Let the triangle PQR be the image of the triangle with vertices (1,3), (3,1), (2,4) in the line $x + 2y = 2$. If the centroid ΔPQR is the point (α, β) then $15(\alpha - \beta)$ is equation

Que. $e^{5(\ln x)^2 + 3} = x^8$ product of all real values of x

Que. $\sum_{n=0}^5 \frac{{}^{11}C_{2r+1}}{2r+2} = \frac{m}{n}$, $\gcd(m, n) = 1$, $m - n = ?$

The Foci of hyperbola are (1,14) and (1,-12) and passes through the point (1,6) then its latus rectum is

Que. If $f(0) = 1$, $f(x + y) = f(x).f(y) + f(x) + f(y)$ then $100 \sum_{n=1}^{100} \log f(n)$

Que. Two balls are selected at random one by one without replacement from the bag containing 4 white and 6 black balls. If the probability that the first selected ball is black given that the second selected is also black, is $\frac{m}{n}$ when $\gcd(m, n) = 1$, then mm ?

Que. Electrolysis of which compound gives $H_2S_2O_8$

- 1) Electrolysis of conc. H_2SO_4
- 2) Electrolysis of dil. H_2SO_4
- 3) Electrolysis of conc. NaCl
- 4) Electrolysis of dil. Na_2SO_4

Que. 180 g of organic compound on reaction with $AgNO_3$, 143.5 mg of white precipitate is obtained. Calculate % of Cl in organic compound. (Atomic wt. of Cl = 35.5 gm/mol, Atomic wt. of Ag = 108 gm/mol)

- 1) 19.72
- 2) 30.92
- 3) 15.14
- 4) 25.74

Que. $CO_2(g) + C(s) \rightleftharpoons 2CO(g)$. Starting with partial pressure of CO_2 0.6 atm. After equilibrium total pressure is 0.8 atm. Then, find K_p

- 1) 0.4
- 2) 0.2
- 3) 0.6
- 4) 0.8

Que. Radius of electron in ground state for hydrogen is a_0 , then radius of electron in He^+ ion in 3rd excited state is a. Then $\frac{a_0}{a}$ is

- 1) 1/2
- 2) 1/4
- 3) 1/16
- 4) 1/8

Que. Statement-I : $CH_3 - O - CH_2 - Cl$ will show nucleophilic substitution by S_N1 mechanism in protic medium

Statement-II : $CH_3 - \overset{\overset{CH_3}{|}}{C} - CH_3 - Cl$ will not undergo nucleophilic substitution via S_N2 mechanism easily

- 1) Statement-I and Statement-II both are correct
- 2) Statement-I and Statement-II both are incorrect
- 3) Statement-I is correct but Statement-II is incorrect
- 4) Statement-I is incorrect but Statement-II is correct

Que. Light of wavelength 550 nm is incident on surfaces of cerium and lithium. Work function are respectively 1.9 eV and 2.5 eV. Then electron will be ejected from

- 1) Cerium only 2) Lithium only 3) From both of them 4) None of them

Que. CO₂ gas is taken at 1 atm, 273 K. Now it is allowed to pass through 0.1 M Ca(OH)₂ aq. solution. Excess amount of Ca(OH)₂ is neutralised with 40 mL of 0.1 M HCl. Then find volume of Ca(OH)₂ initial taken if half of the amount of Ca(OH)₂ is reacted with CO₂

- 1) 40 mL 2) 20 mL 3) 80 mL 4) 50 mL

Que. Match the column and choose the correct option

Column-I (Properties) Column-II (Order)

- A) Electronegativity 1) B < C < N < O
 B) Cationic size 2) Li > Mg > Be
 C) Metallic character 3) K > Mg > Al
 D) Electron affinity 4) Cl < F < Br < I

Que. For [NiCl₄]²⁻ what is the change on metal and shape of complex respectively

- 1) +2, tetrahedral 2) +2, square planar
 3) +4, tetrahedral 4) +4, square planar

Boiling point of given solutions

- I) 10⁻⁴ NaCl II) 10⁻³ NaCl III) 10⁻² NaCl IV) 10⁻⁴ urea
 1) I > II > III > IV 2) III > II > I > IV 3) II > I > III > IV 4) III > I > II > IV

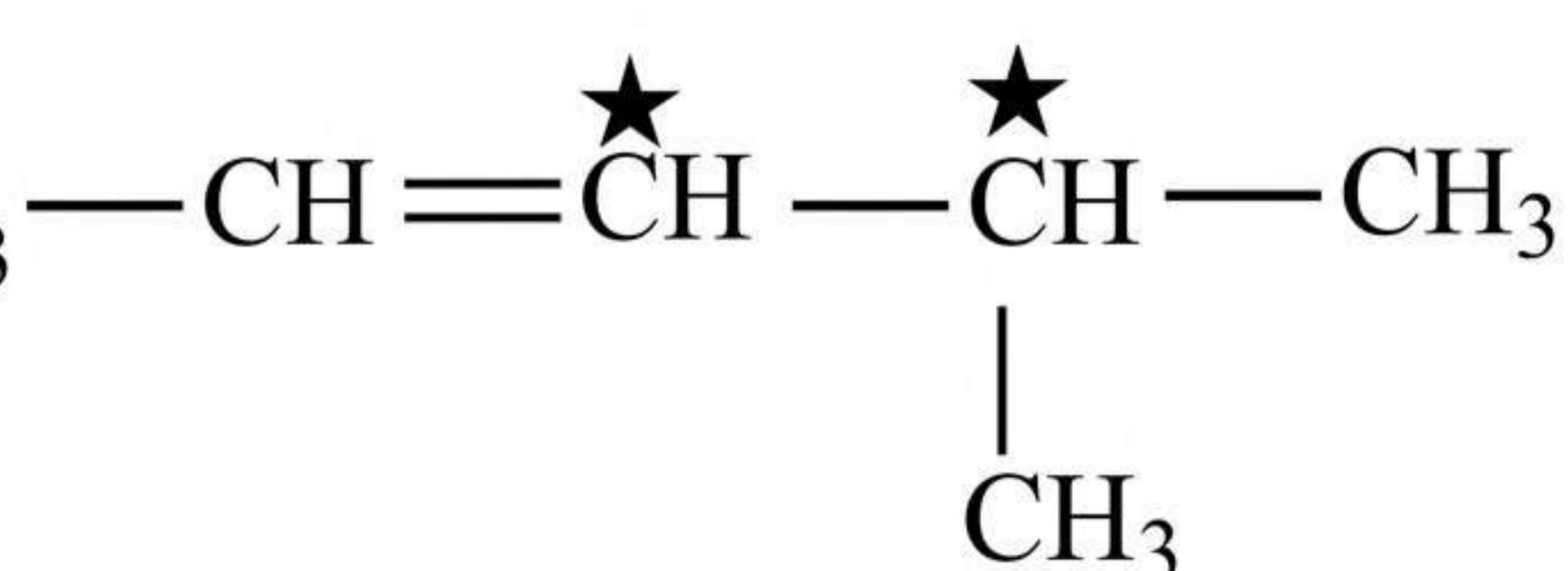
Que. Correct decreasing order of electronegativity

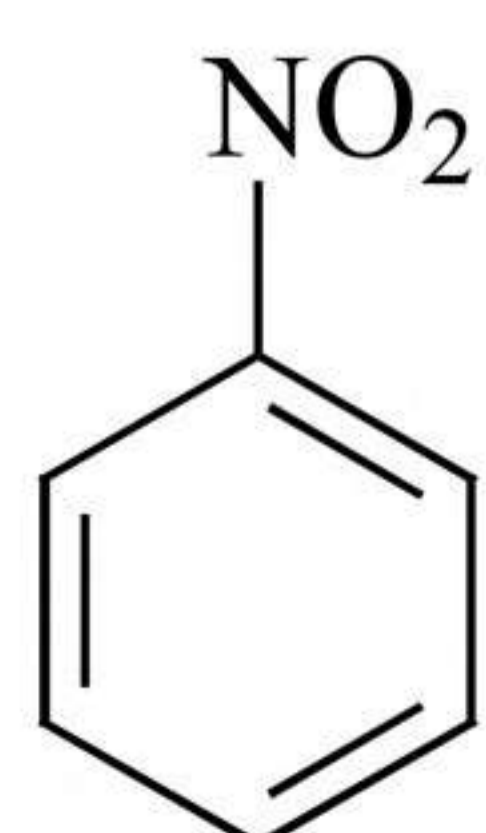
- 1) F > Cl > I > Br 2) Cl > F > Br > I 3) F > Cl > Br > I 4) Br > F > I > Cl

Which of the following has maximum size out of Al³⁺, Mg²⁺, F⁻, Na⁺

- 1) Al³⁺ 2) Mg²⁺ 3) F⁻ 4) Na⁺

Que. How many compounds have linear shape SO₂, BeCl₂, N₃⁻, I₃⁻, NO₂⁺, NO₂?

Calculate the number of stereoisomers of CH₃—CH=CH—CH—CH₃




$\xrightarrow[\text{4) Na/Ether}]{\begin{matrix} \text{1) Sn/HCl} \\ \text{2) NaNO}_3/\text{HCl} \\ \text{3) CuCl} \end{matrix}}$ → A . Find the molecular weight of A

VIDEO SOLUTION

