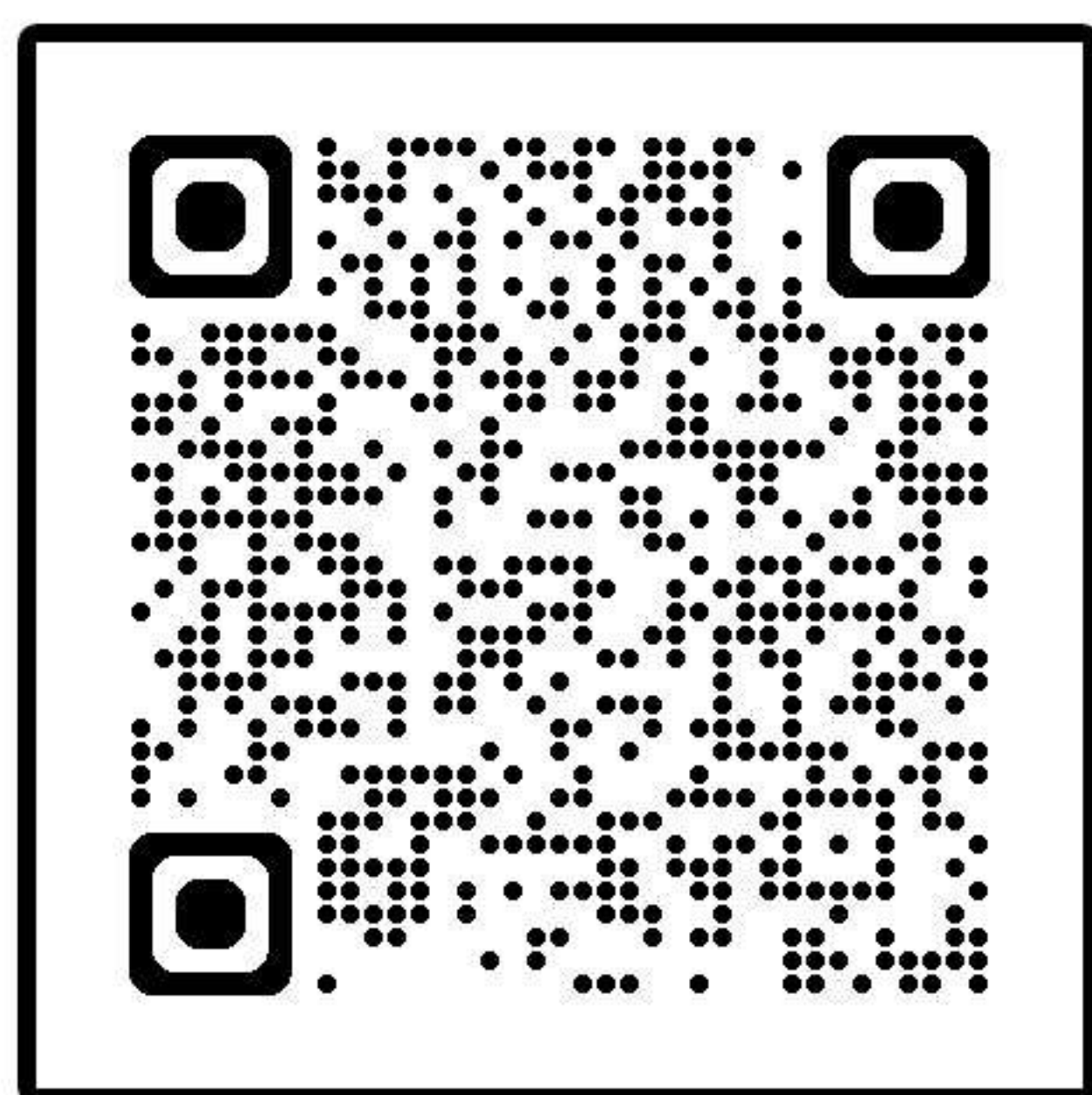


JEE MAIN 2025

SESSION-1

DAY-1



SCAN ME

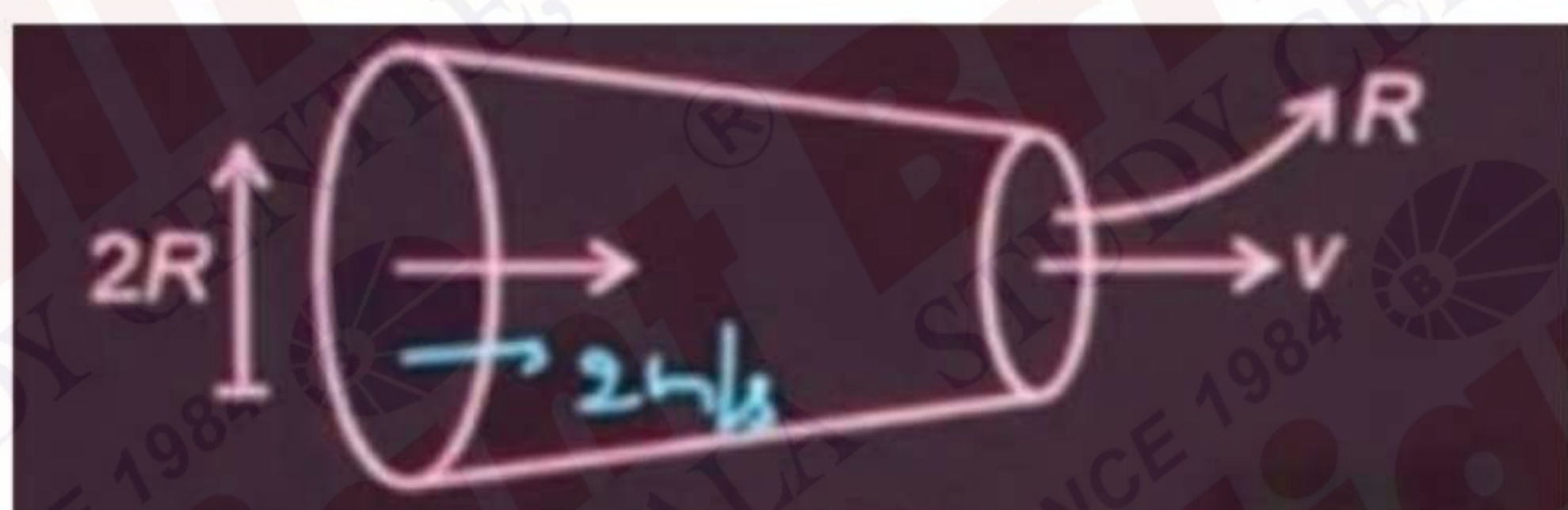
VIDEO SOLUTION

MEMORY BASED QUESTIONS

1. Assertion: Simple pendulum is taken on a planet of mass 4 times of earth and radius 2 time of earth then the time period is remains constant

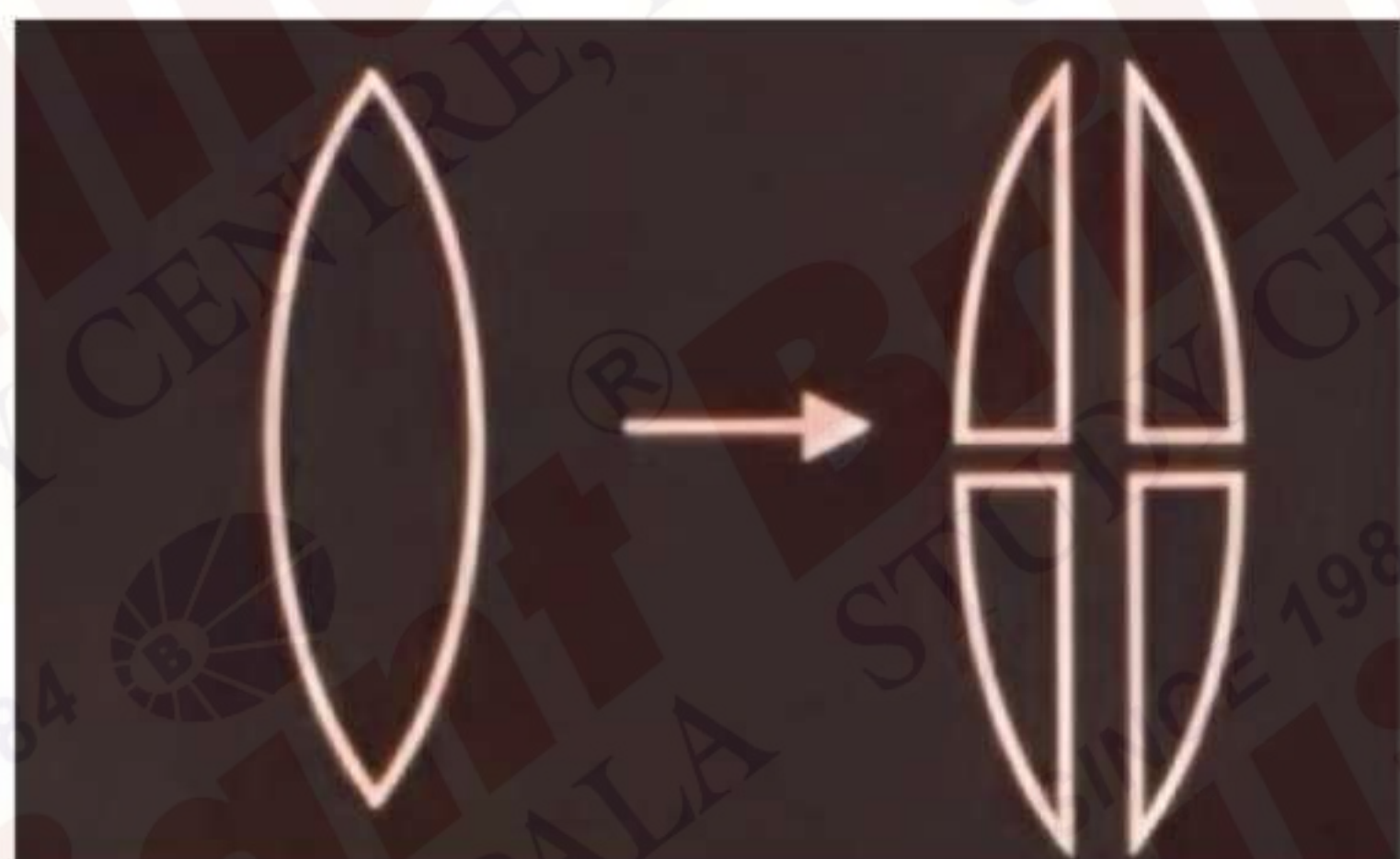
Reason: Mass of pendulum remains same

- A) Statement: I is correct and Statement II is incorrect
B) Statement : II is correct and Statement I is incorrect
C) Statement : I is correct and Statement II is correct explanation of statement I
D) Statement I is correct but Statement II is not correct explanation of statement I
2. Radius of a tube decreases from $2R$ in which ideal is flowing at same level

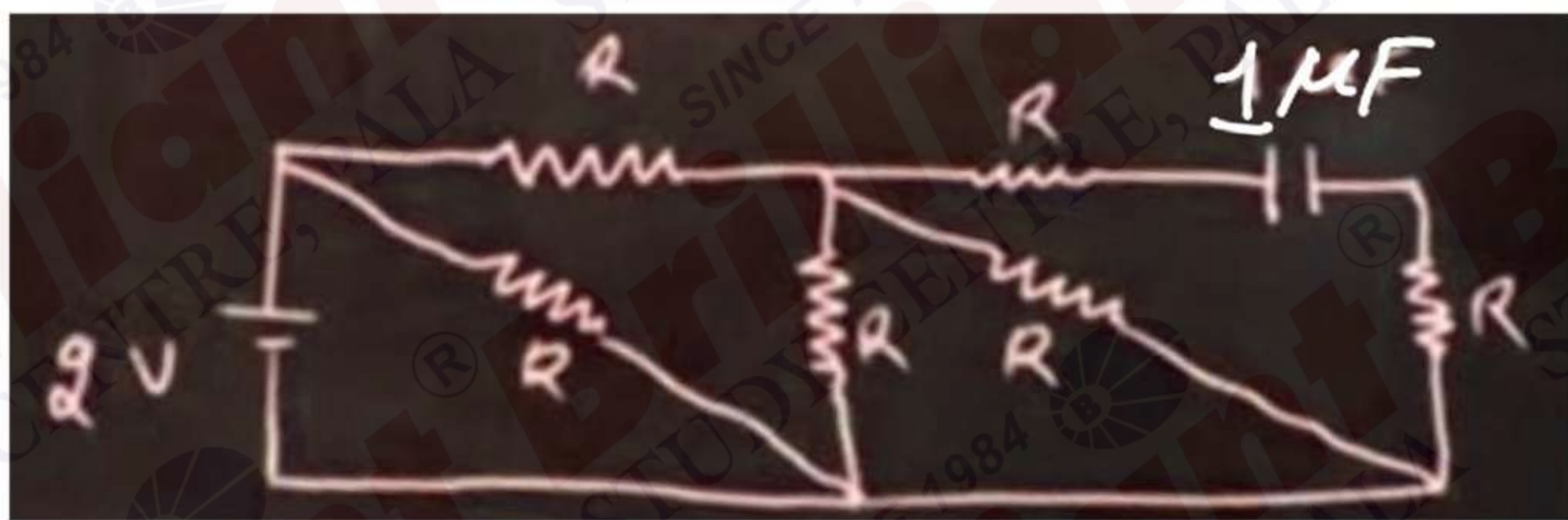


Speed at one end is 2m/s as shown, find speed v at other end

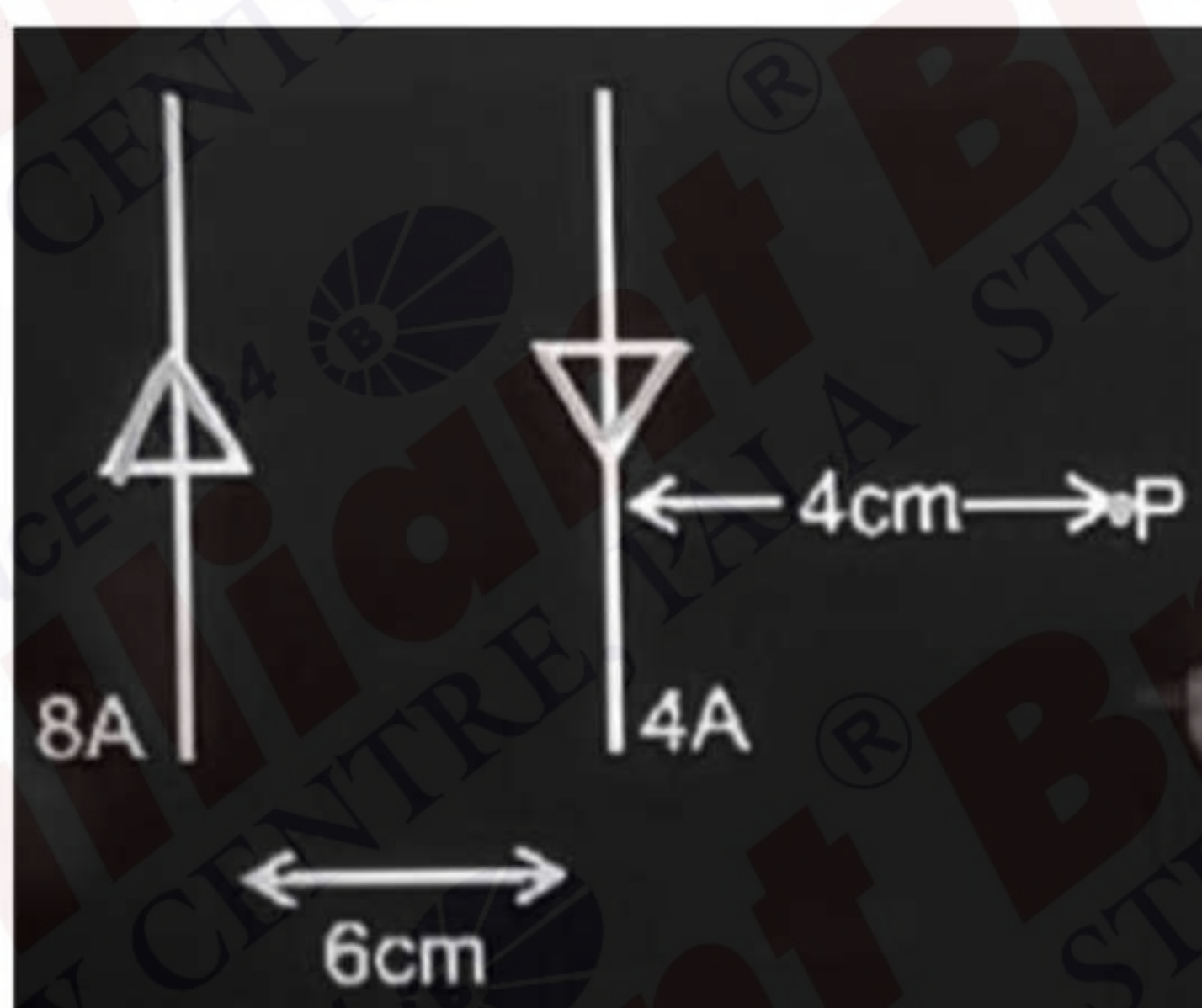
3. An equiconvex lens of focal length f , is cut into four parts as shown in the diagram. The power of lens is $4D$. Power if each part?



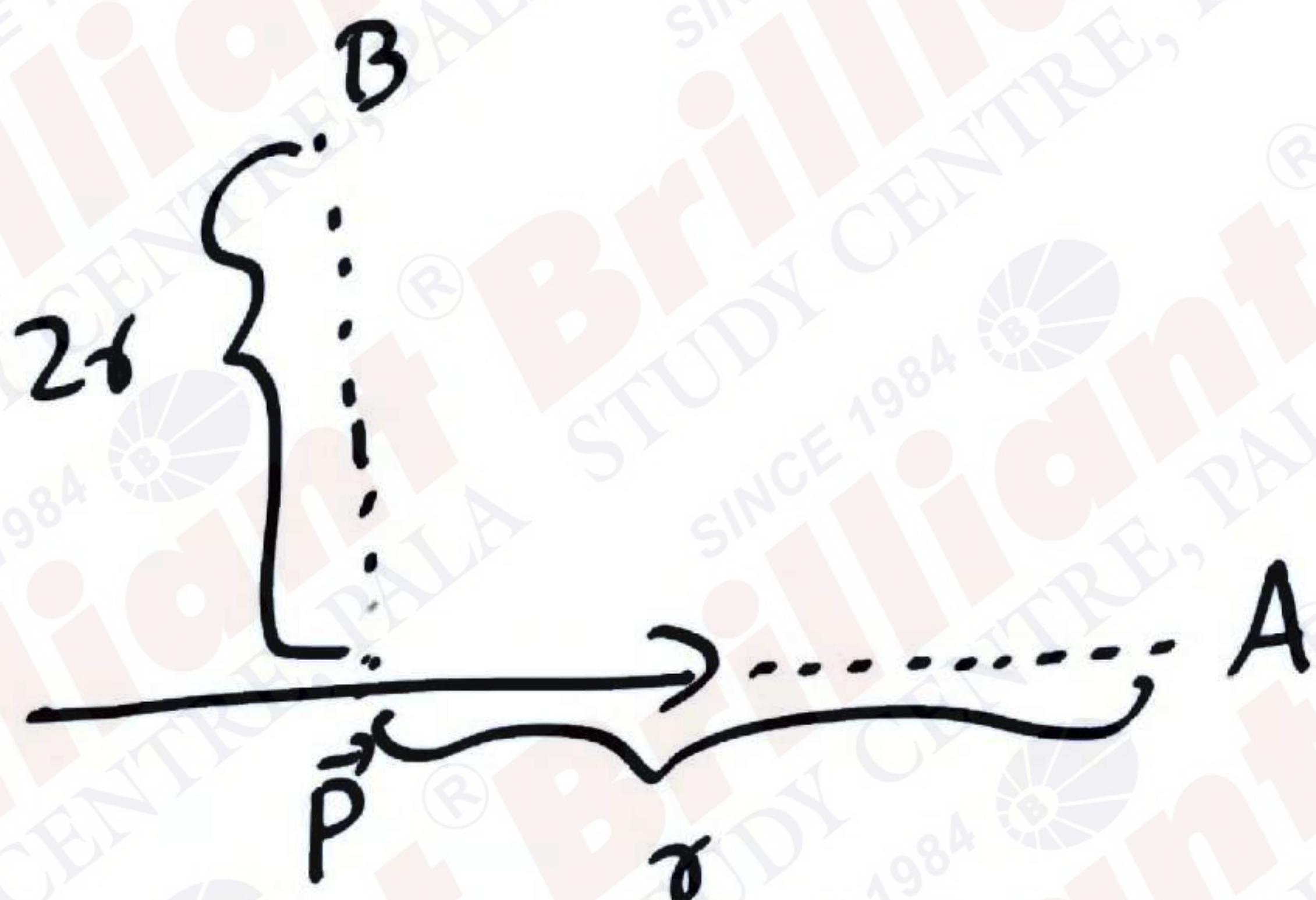
4. Find current in the circuit at steady state, given $R = 2\Omega$



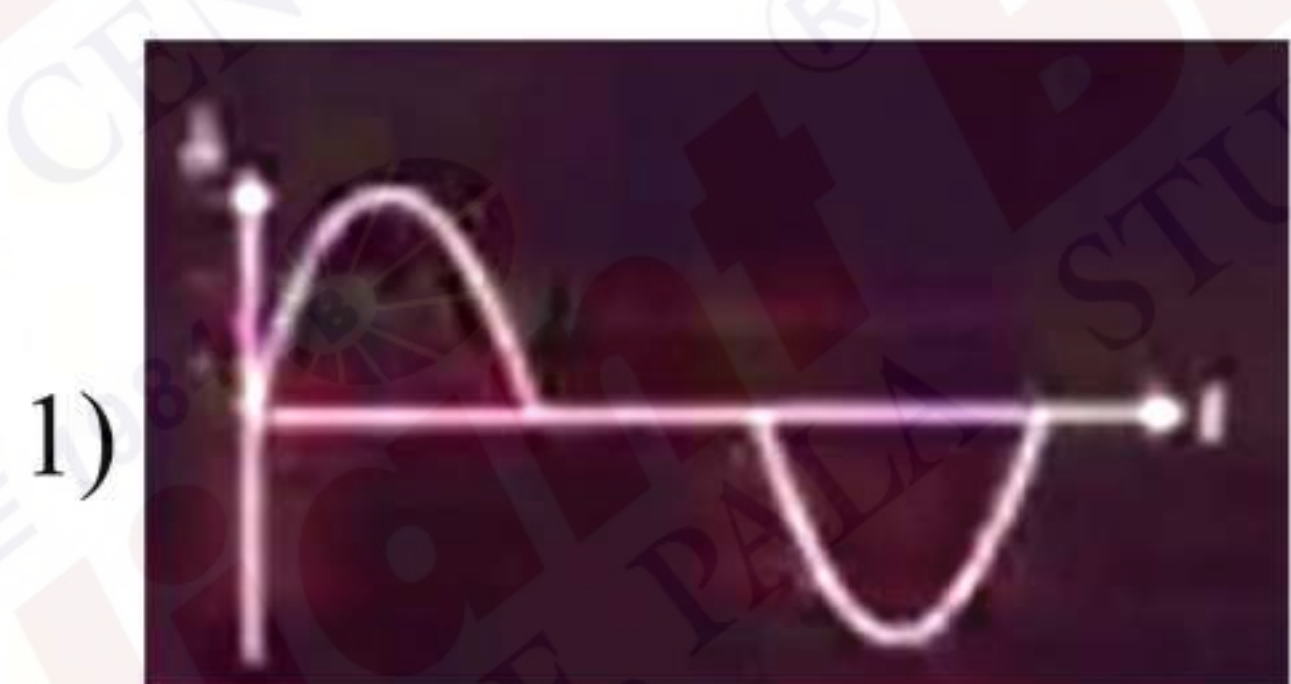
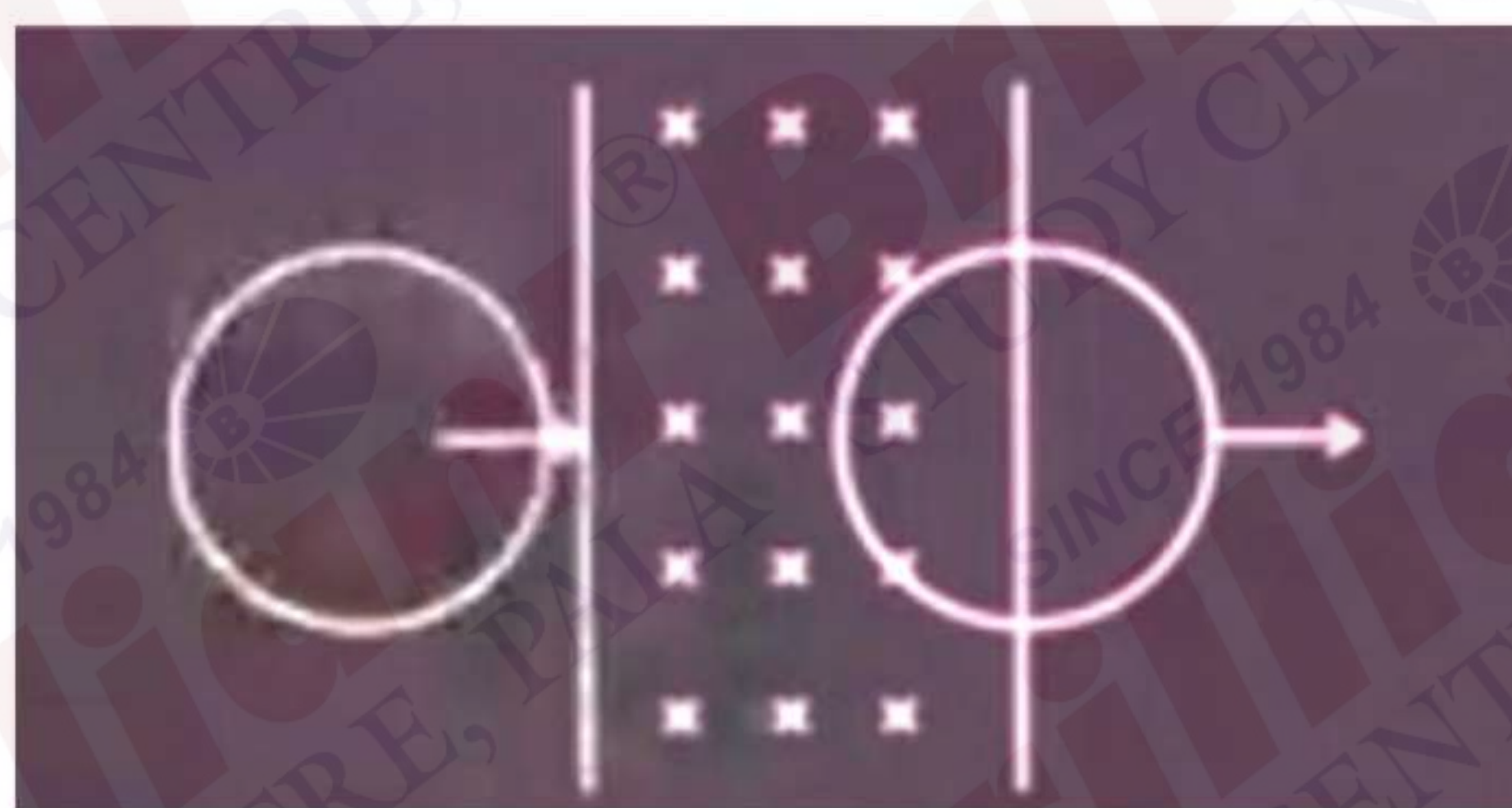
5. Find (B_{net}) at point P?



6. Find the correct dimensional formula for the capacitance in terms of M.L.T and C where they stand for unit of mass, length, time and charge.
7. A proton is moving with uniform velocity of 2×10^8 m/s in uniform magnetic and electric fields which are perpendicular to each other. If electric field is switched off then proton moves in circular path of radius 1.6×10^{-5} m. Then electric field :
8. The point A is situated on the axis of dipole at a distance 'r' from the dipole with E_0 and V_0 the electric field and electric potential at A. Find the electric field and potential at point B at distance '2r' from dipole on its perpendicular bisector in terms of E_0 and V_0 .



9. A force $\vec{F} = 2\hat{i} + \hat{j} + 2\hat{k}$ acting at a point (1, 1, 1). Find torque of this force about the origin.
10. The maximum percentage error in the measurement of density of a wire is
 $m = (0.60 \pm 0.003)$ g
 $r = (0.50 \pm 0.01)$ cm
 $\ell = (10.00 \pm 0.05)$ cm
11. A projectile is thrown with a velocity 20 m/s at an angle of projection 60° from ground. Find Knetic energy difference between point of projection and highest point, if mass of the particle is m
12. Calculate the radius of first excited state of He^+ ion (in \AA)
13. The displacement of a particle moving under the action of a force $F = 2\hat{i} + b\hat{j} + \hat{k}$ is $\vec{d} = \hat{i} + \hat{j} + \hat{k}$. Find the value of b if the work done by the force is zero
14. A conducting circular ring is moving with a constant velocity in a uniform magnetic field as shown identify the correct graph between induced emf vs time



15. In a series LCR circuit the maximum amplitude of current is I_0 when the resistance is R. What is the maximum amplitude of current if the resistor is replaced by a resistor of resistance R/2.
 1) I_0 2) $2I_0$ 3) $\frac{I_0}{2}$ 4) $\frac{2I_0}{3}$
16. Statement I: Fringe width of red light is more than fringe width of violet light.
 Statement II : Fringe width is directly proportional to the wavelength of light used. Choose the correct option
 1. Statement - I is correct and Statement II is incorrect
 2. Both statement - I and Statement - II are correct
 3. Statement - I is incorrect and Statement - II is correct
 4. Both Statement - I and Statement - II are incorrect

Q If $\theta \in [0, 2\pi]$ satisfying the system of equations $2 \sin^2 \theta = \cos 2\theta$ and $2 \cos^2 \theta = 3 \sin \theta$. Then the sum of all real values of θ is

- 1) $\frac{3\pi}{2}$ 2) π 3) $\frac{\pi}{2}$ 4) $\frac{5\pi}{6}$

Q Let $A = \{1, 2, 3, 4\}$ and $B = \{1, 4, 9, 16\}$. If: $A \rightarrow B$, then number of many - one functions from A to B are

- 1) 24 2) 232 3) 256 4) 252

Q 4 boys and 3 girls are to be seated in a row such that all girls seat together and two particular boy B_1 and B_2 are not adjacent to each other. Then the number of ways in which this arrangement can be done

- 1) 432 2) 430 3) 516 4) 1002

Q If $2x^2 + (\cos \theta)x - 1 = 0, \theta \in [0, 2\pi]$ has roots α and β . Then the sum of maximum and minimum value of $\alpha^4 + \beta^4$ is

- 1) $\frac{25}{16}$ 2) $\frac{9}{16}$ 3) $\frac{41}{16}$ 4) $\frac{8}{17}$

Q If the sum $\sum_{r=0}^{30} \frac{r^2 \binom{30}{r}}{\binom{30}{r-1}} = \alpha \cdot 2^{29}$, then α is equal to

- 1) 225 2) 465 3) 345 4) 425

Q Set \vec{a} and \vec{b} be two unit vectors such that angle between \vec{a} and \vec{b} is $\frac{\pi}{3}$. If $r\vec{a} + 3\vec{b}$ and $2\vec{a} + r\vec{b}$ are perpendicular to each other, then the product of all possible values of r is

Q Consider a function $f(x) = \int_0^x \frac{t^2 - 8t + 15}{e^{ht}} dt$. The number of points of extrema are

- 1) 3 2) 5 3) 7 4) 9

Q Let A and B are two events such that $P(A \cap B) = \frac{1}{10}$ and P(A/B) and P(B/A) are the roots of

the equation $12x^2 - 7x + 1 = 0$ then $\frac{P(A^c \cup B^c)}{P(A^c \cap B^c)}$ is equal

- 1) $\frac{4}{9}$ 2) $\frac{9}{4}$ 3) $\frac{3}{2}$ 4) $\frac{2}{3}$

Q Number of terms in an arithmetic progression is 2n. sum of terms occurring at even places is 40 and sum of terms occurring at odd places is 55. If the first term exceeds the last term by 27, then 'n' equals to

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

Q If A is the 3 x 3 matrix of order 3 x 3, such that $\det(A) = 1/2$, $\text{tr}(A) = 10$ and B be another matrix of order 3 x 3 and defined as $B = \text{adj}(\text{adj}(2A))$, then $\det(B) + \text{tr}(B)$ is equal to (where $\text{tr}(A)$ denotes trace of matrix A)

Q In the expansion of $\left(x + \sqrt{x^3 - 1}\right) + \left(x - \sqrt{x^3 - 1}\right)^5$, where α, β, γ and δ are the coefficients of x, x^3, x^5 and x^7 respectively. If $\alpha u - \beta v = 18$ and $\gamma u + \delta v = 20$ then $u + v$ is equal to

- a) $\frac{-14}{15}$ b) $\frac{-13}{15}$ c) $\frac{-3}{5}$ d) $\frac{-2}{5}$

Q The perpendicular distance of point $(3, 4, 5)$ from the line $2\hat{i} - \hat{j} + \hat{k} + \alpha(4\hat{i} - \hat{j} + 5\hat{k})$ is

- a) $\sqrt{\frac{19}{42}}$ b) $\sqrt{\frac{19}{21}}$ c) $\sqrt{\frac{42}{19}}$ d) $\sqrt{\frac{21}{19}}$

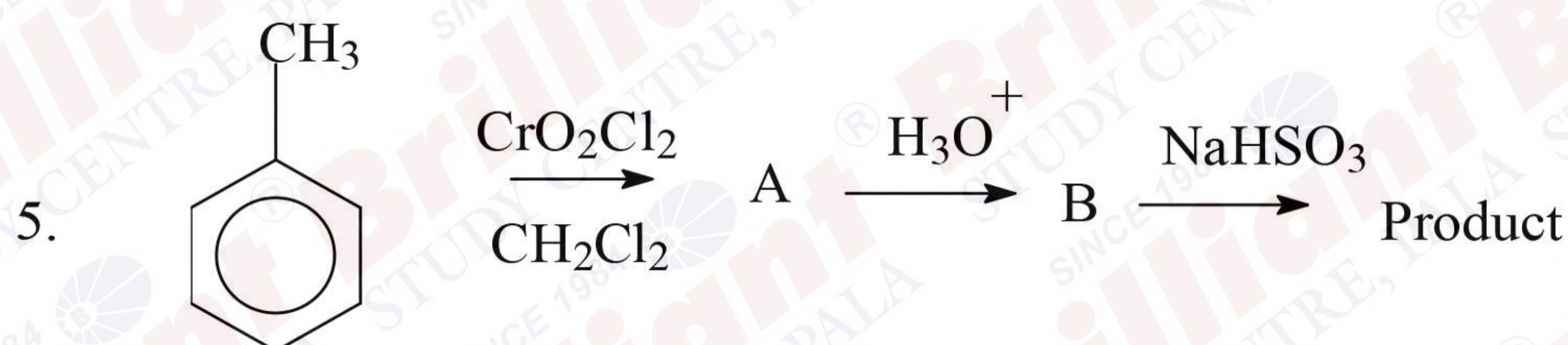
Q A relation R is defined on set A , $A = \{1, 2, 3\}$ and $R = \{(1, 2), (2, 3)\}$. Elements are added such that R becomes reflexive and transitive but not symmetric. Find the number of such relations.

- A) 3 B) 4 C) 2 D) 9

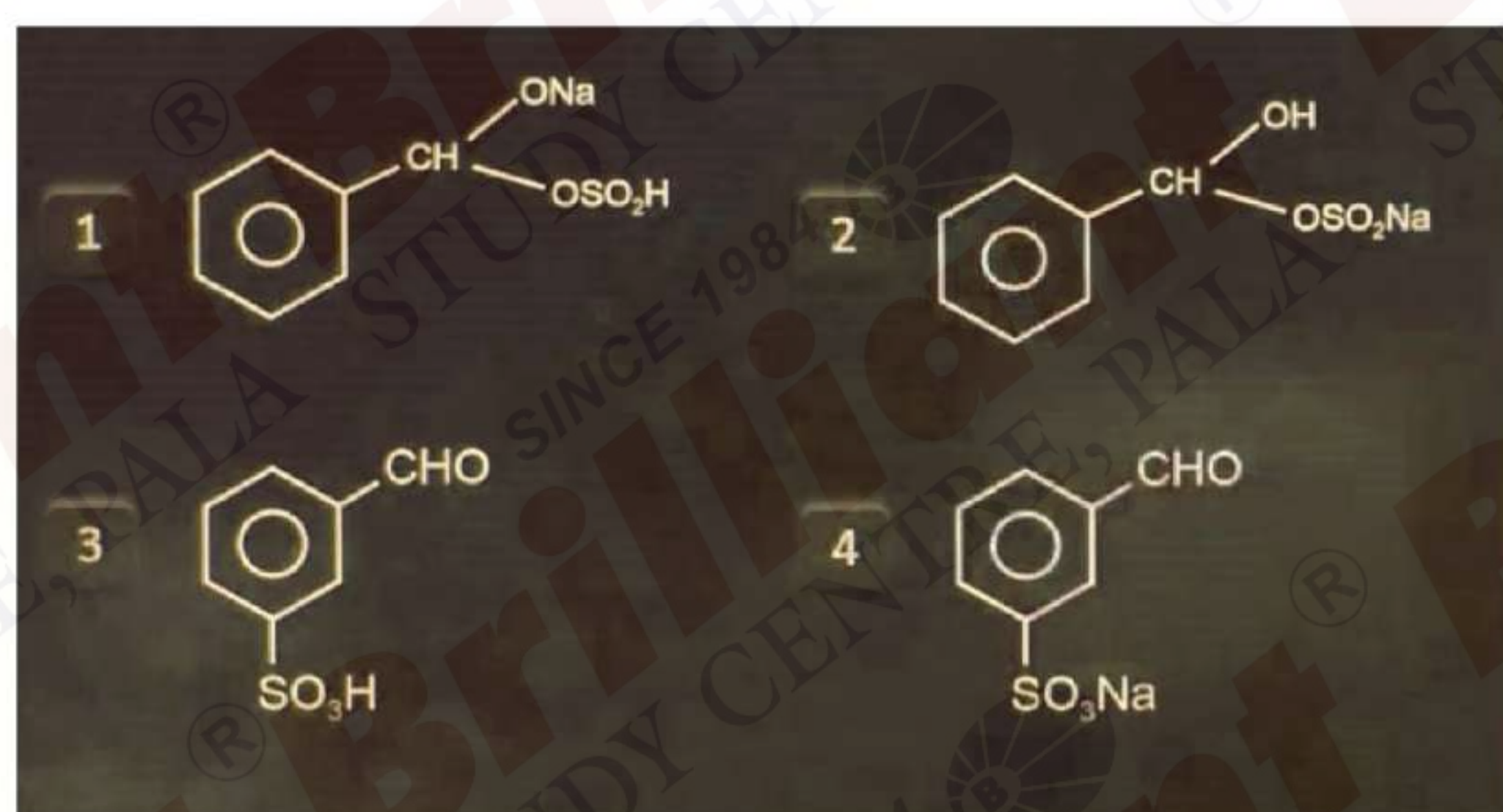
JEE MAIN PHASE-I QUESTIONS

PHYSICS

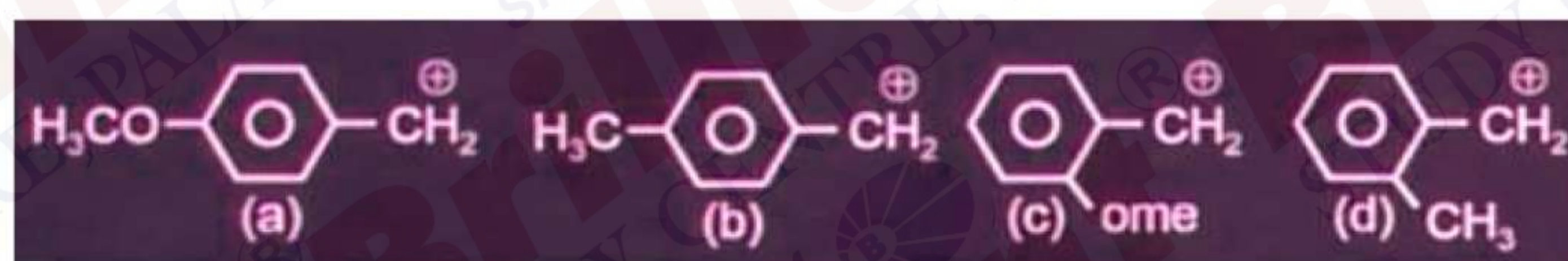
- Density of 3M NaOH is 1.25g/ml. Molality of solution is
- Which of the following has “two secondary hydrogens”
 - 2,2,3,3–Dimethyl pentane
 - 2,2,4,4 - Dimethyl Heptane
 - 4 - Ethyl - 2,2 Di methyl hexane
 - None of these
- Which of the following doesn't show disproportionation rxn
 - 1) ClO^-
 - 2) ClO_2^-
 - 3) ClO_3^-
 - 4) ClO_4^-
- Arrange according to CFSE
 - $[\text{Co}(\text{NH}_3)_4]^{2+}$
 - $[\text{Co}(\text{NH}_3)_6]^{3+}$
 - $[\text{Co}(\text{NH}_3)_6]^{2+}$
 - $[\text{Co}(\text{en})_3]^{3+}$
 - (iv) > (ii) > (iii) > (i)
 - (iv) > (iii) > (ii) > (i)
 - (i) > (iii) > (ii) > (iv)
 - (i) > (ii) > (iii) > (iv)



The product is



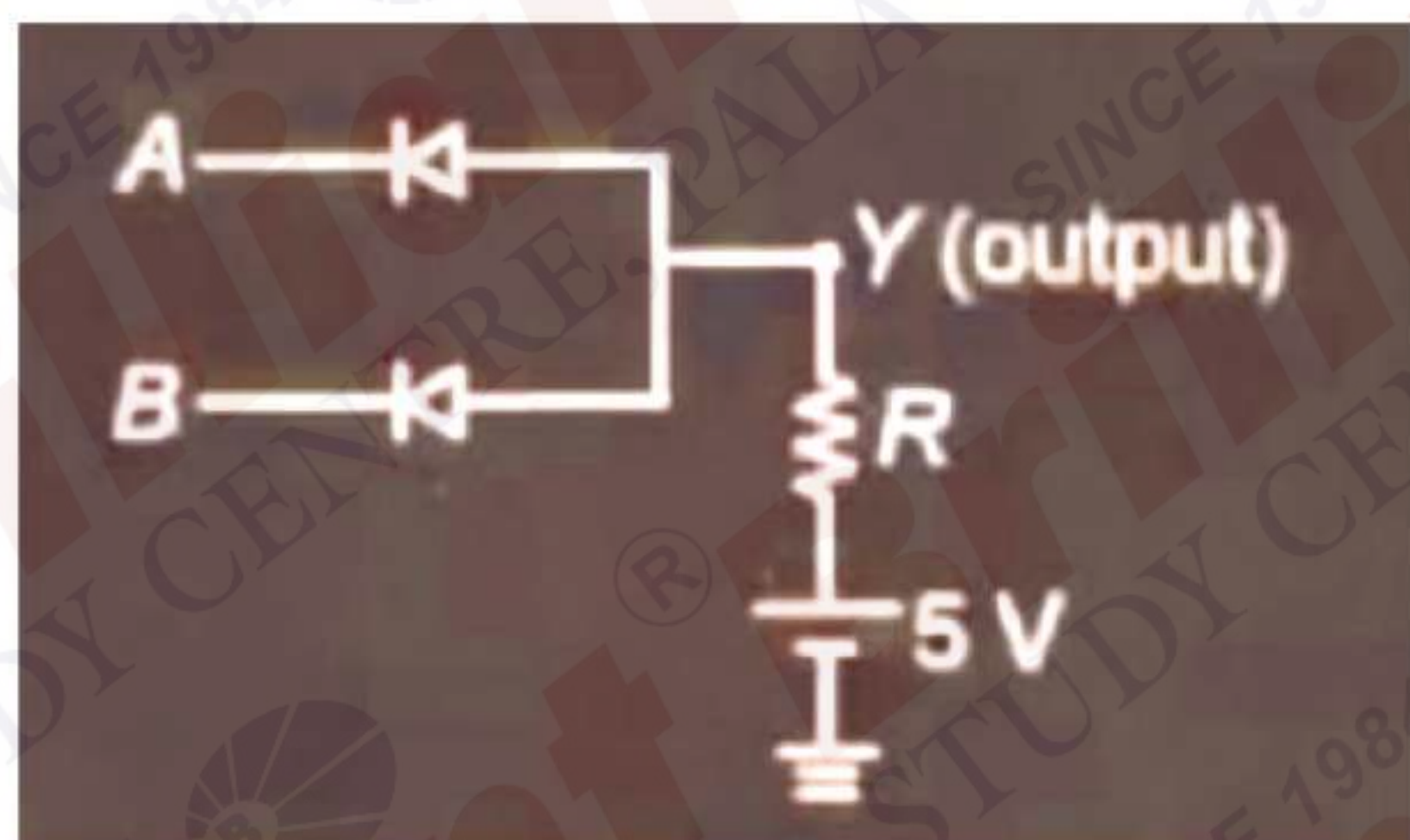
- What is correct order of stability of carbocation



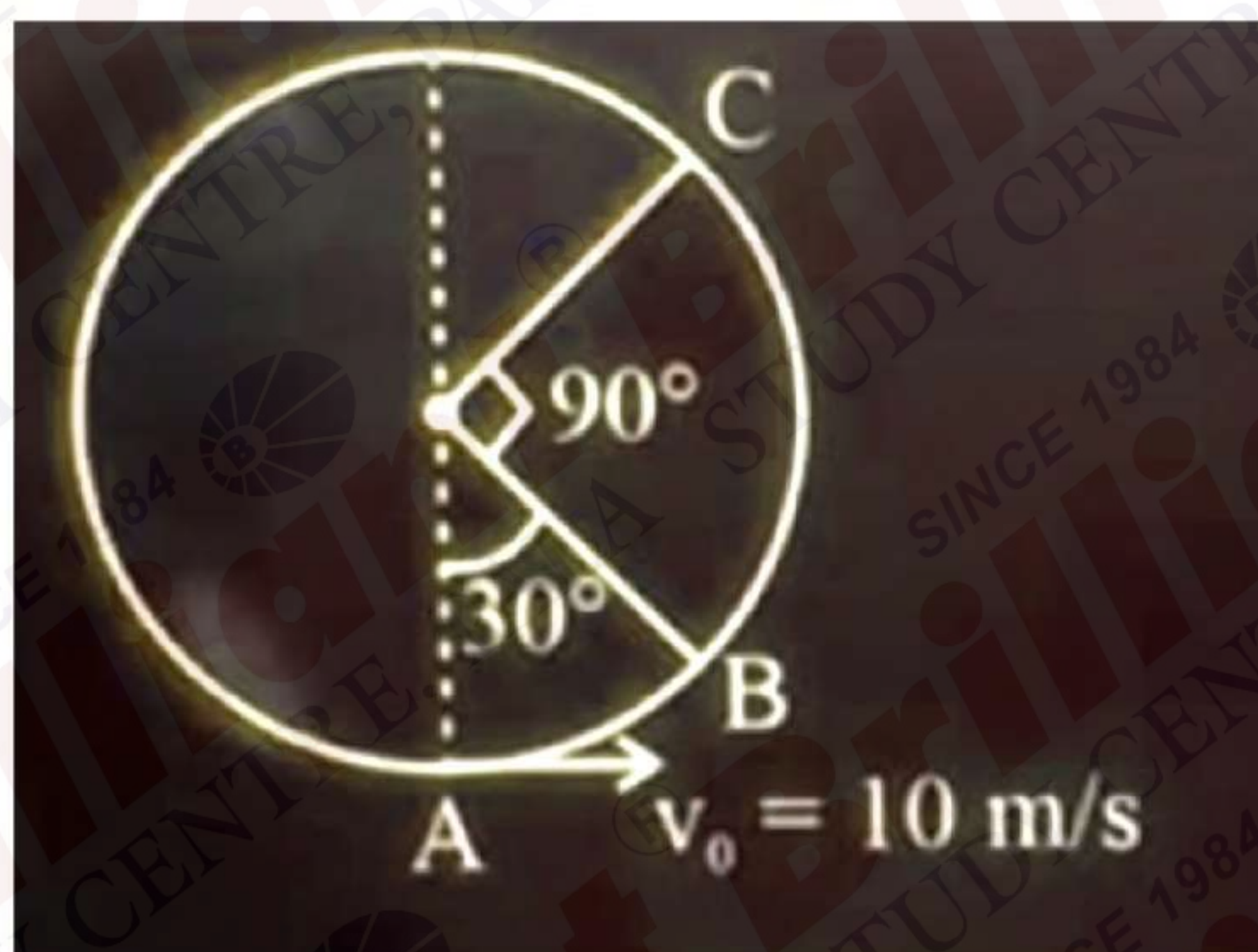
- Compare dipole moment of
 - NF_3
 - CHCl_3
 - H_2S
 - HBr
 - I > II > III > IV
 - II > III > I > IV
 - II > III > IV > I
 - III > I > IV > II

8. Calculate the radius of first excited state of He^+ ion (in \AA)
9. Given below are two statements
 S-I: Lassaigne test is used for detection of Nitrogen, phosphorous, sulphur and Halogens
 S- II: Lassaigne extract is made with magnesium metal
 1) Both S - I and S- II are correct 2) Both S - I and S- II are incorrect
 3) S- I is correct but S - II is incorrect 4) S -I is incorrect but S - II is correct
10. 40ml of 2M NaOH and 60ml of 4M of NaOH are mixed then. Find the Molarity of mixture
11. Nickel di methyl glyoxime complex has how many hydrogen atoms
12. Statement - I: In corrosion of metal, the metal acts as cathode
 Statement - 2: Alkaline medium increases rate of corrosion\
13. The compound with molecular formula C_6H_6 gives one bromo derivative in presence of light and requires four moles of hydrogen for hydrogenation
14. Assertion: Element from left of the periodic table are acidic in nature
 Reason: Element oxide from right of the periodic table on hydrolysis gives acid
 1) Both A and R are correct and R is the correct explanation of A
 2) Both A and R are correct, but R is not the correct explanation of A
 3) A is correct but, R is incorrect
 4) R is correct but, A is incorrect
15. In Ru and Nb, if in Ru, 4d electrons are x and in Nb, 4d electrons are y then find the sum of x and y

17. Name the logic gate

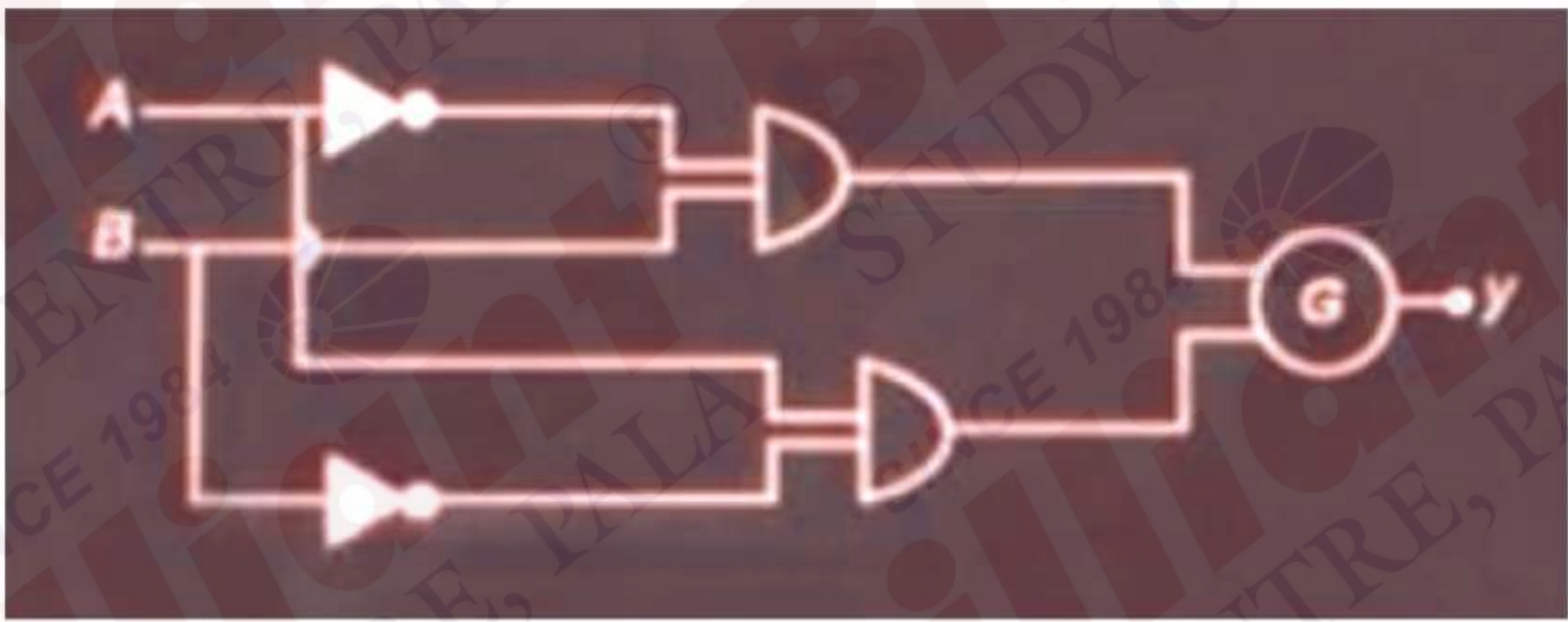


- 1) OR 2) AND 3) NOT 4) NAND
18. For a Diatomic gas if $Y_1 = C_p/C_v$ for rigid molecules and $Y_2 = C_p/C_v$ for another diatomic molecule having vibrational modes then
 1) $Y_2 < Y_1$ B) $Y_2 > Y_1$ C) $Y_2 = Y_1$ D) $Y_2 = 2Y_1$
 19. Find the ratio of kinetic energy at point B and poiunt C in vertical circular motion



20. A surface is incident with a photon of wavelength λ then kinetic energy of electron is 2eV, if wavelength of photon is $\lambda/2$. Then maximum kinetic energy of ejected electron is: (Given work function of metal surface = 1eV)
21. Displacement current in capacitor of area 16cm^2 is 6A at an instant. Find displacement current across area 3.2cm^2
 1) 1.2A 2) 1.6A 3) 2.1A 4) 0.5A

22.

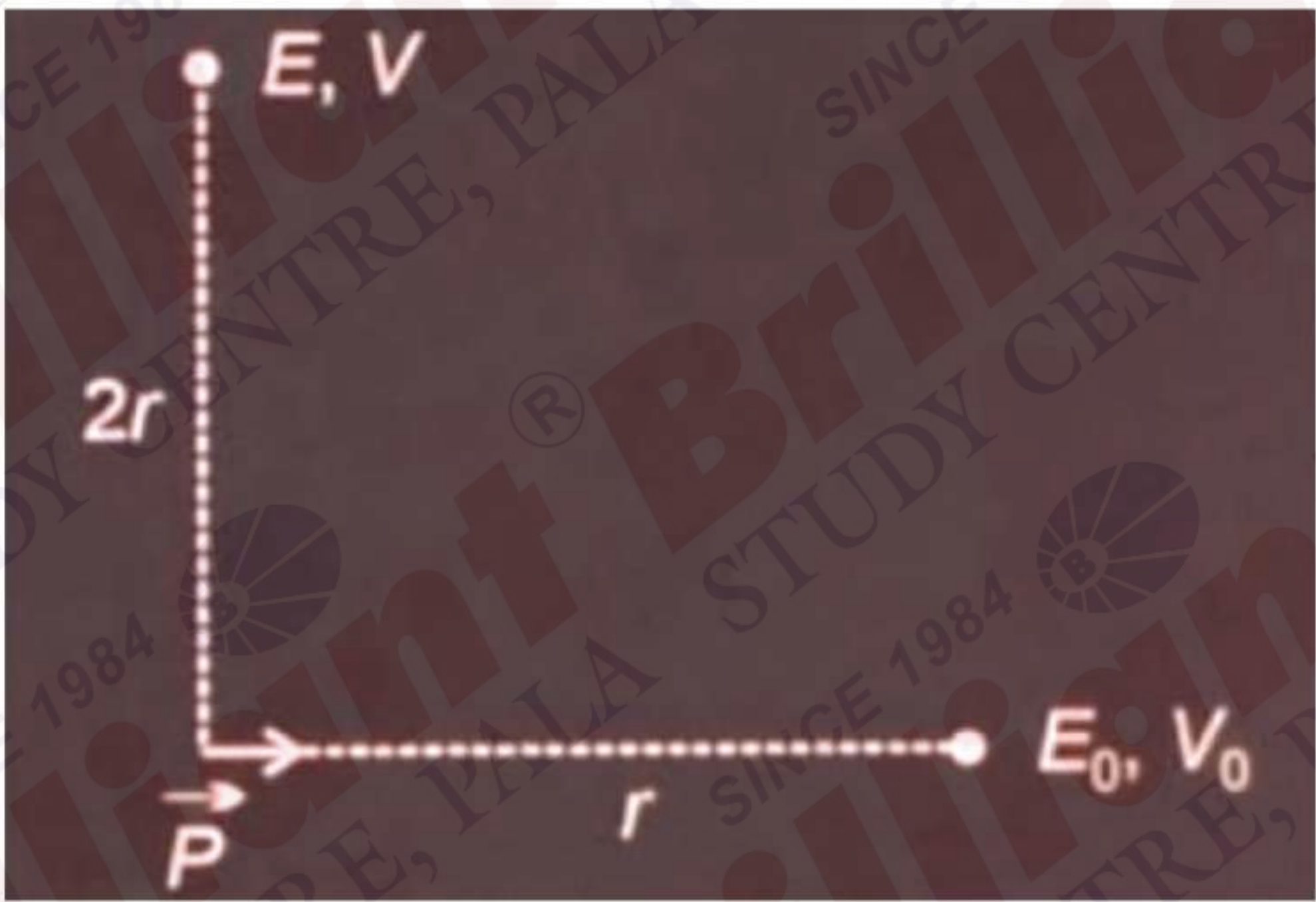


For a given logic circuit truth table is given identify the gate G

A	B	y
0	0	1
1	0	0
0	1	0
1	1	1

- 1) AND 2) NOR 3) NAND 4) OR

23. For the electric shown in the figure, the electric field and the electric potential are E_0 , V_0 at a distance r on the axis. Then what is the electric field and the electric potential at a point on the equatorial plane at a distance $2r$.



- 1) $\frac{E_0}{16}, 0$ 2) $\frac{E_0}{4}, 0$ 3) E_0, V_0 4) $\frac{E_0}{8}, 0$