

JEE MAIN 2026

SESSION-1

SHIFT-1 MORNING

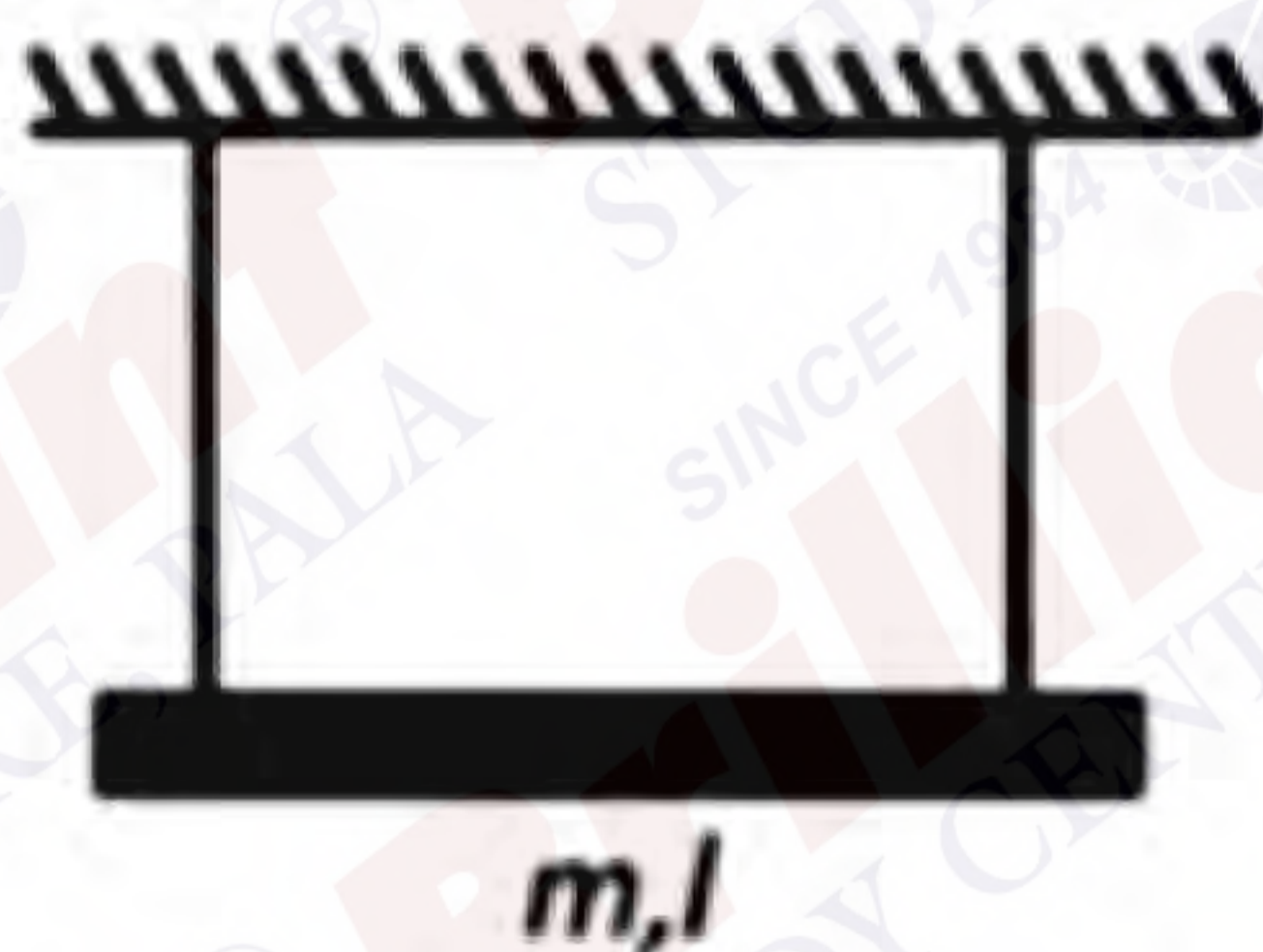


SCAN ME

VIDEO SOLUTION

MEMORY BASED QUESTIONS

QN A rod of mass m and length ℓ is attached to two ideal strings. Find tension in left string just after right string is cut.



- 1) $\frac{mg}{2}$ 2) $\frac{mg}{4}$ 3) $\frac{2}{3}mg$ 4) $\frac{mg}{5}$

QN Which logic gate is given in the figure?

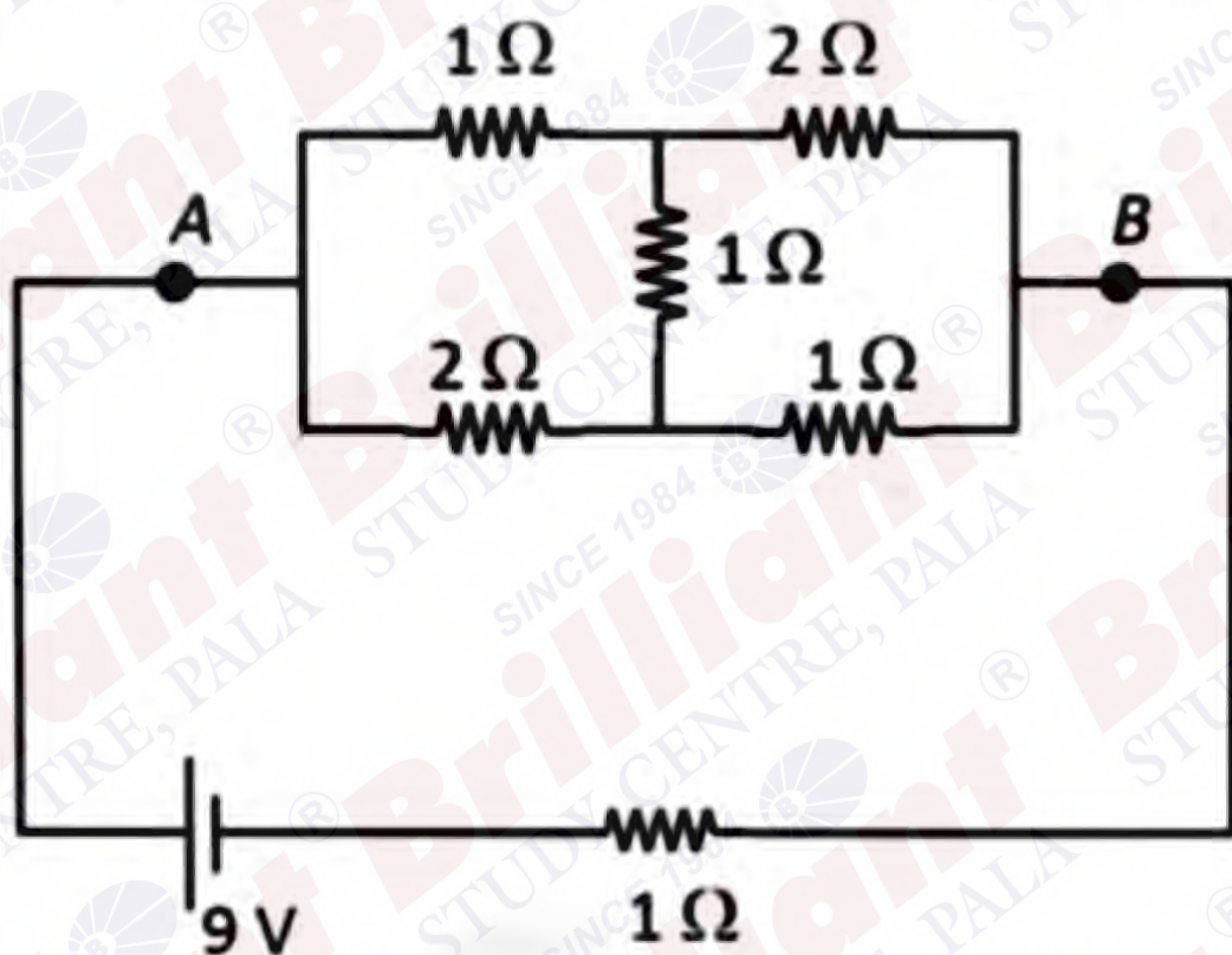


- 1) XOR 2) NOR 3) NAND 4) OR

QN Find dimensions of $\frac{A}{B}$ if $\left(P + \frac{At^2}{B}\right) + \frac{1}{2}\rho V^2 = \text{constant}$, where $P \rightarrow$ pressure, $\rho \rightarrow$ density, $V \rightarrow$ speed

- 1) ML^1T^{-4} 2) $ML^{-1}T^{-4}$ 3) ML^2T^{-4} 4) $ML^{-1}T^{-2}$

QN Find the heat produced in external circuit (AB) in one second.



- 1) 1181.25 J 2) 1311.25 J 3) 1207.50 J 4) 1410.50 J

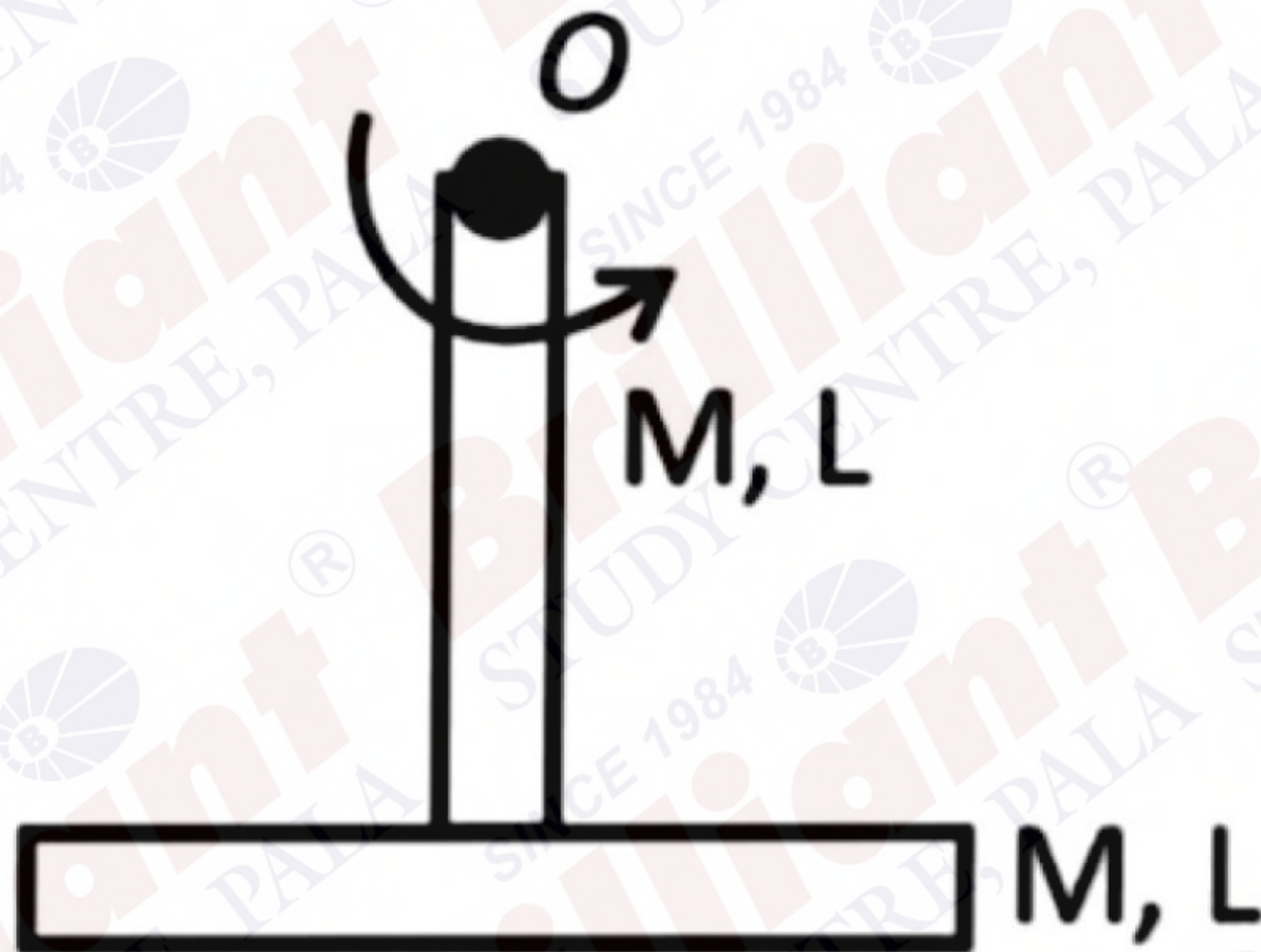
QN An α -particle having kinetic energy 7.7 MeV is approaching fixed gold nucleus (atomic number is 79). Find distance of closest approach.

- 1) 1.72 nm 2) 6.2 nm 3) 16.8 nm 4) 0.2 nm

QN An air filled capacitor of capacitance C filled with dielectric ($k = 3$) of width $\frac{d}{3}$, where d is separation between plates. The new capacitance is

- 1) $\frac{9}{5}C$ 2) $\frac{5}{4}C$ 3) $\frac{4}{3}C$ 4) $\frac{9}{7}C$

QN Find the moment of inertia of system formed using two identical rods about the given axis of rotation as shown

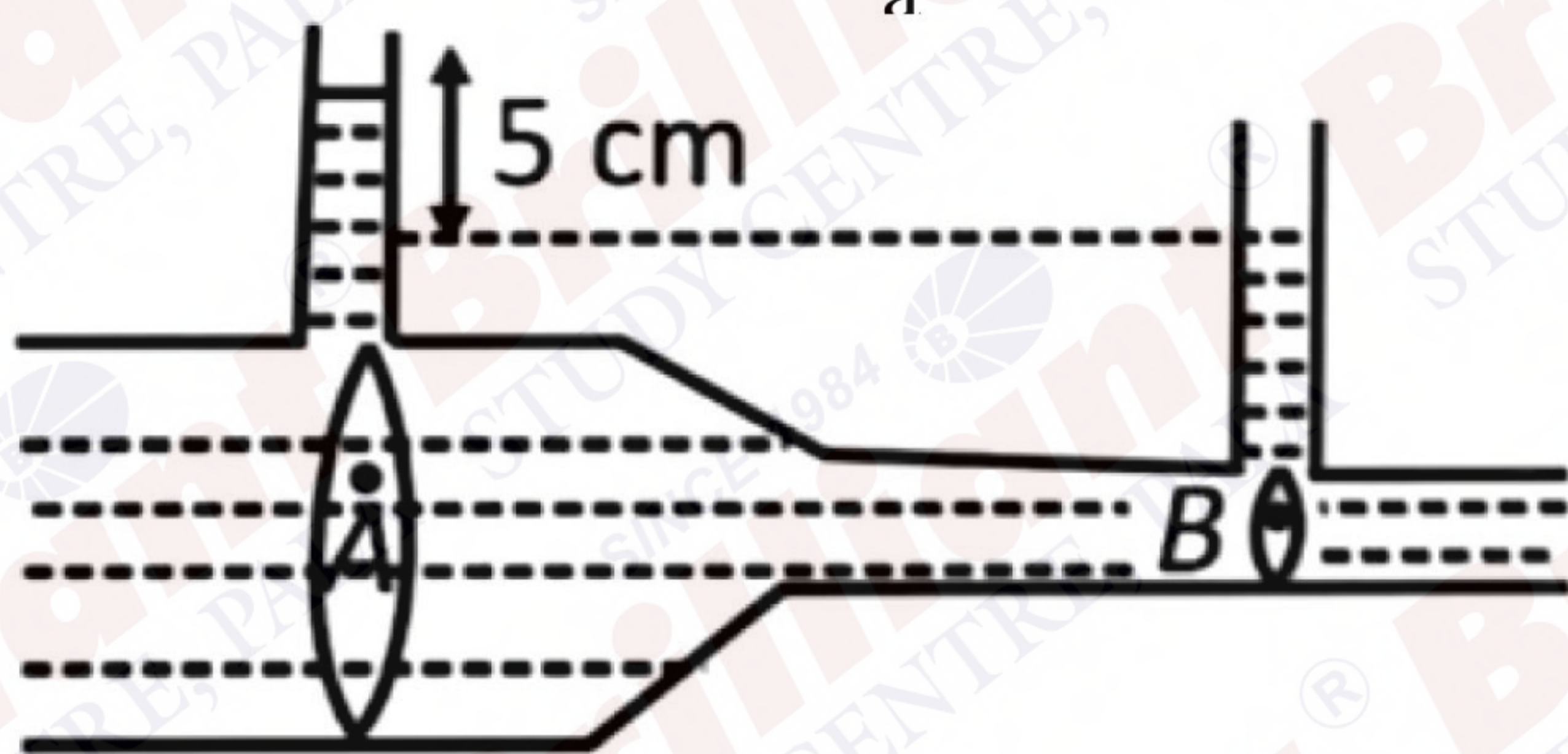


- 1) $\frac{17}{12}ML^2$ 2) $\frac{13}{12}ML^2$ 3) $\frac{2}{3}ML^2$ 4) $\frac{3}{4}ML^2$

QN If electric field of EM wave is given by $60 [\sin(3 \times 10^{14}t) + \sin(12 \times 10^{14}t)]$ at $x = 0$ falls on a photo sensitive material having work function 2.8 eV . Find the maximum kinetic energy (M eV) of ejected electrons.

- 1) 2.52 eV 2) 2.16 eV 3) 2.00 eV 4) 2.34 eV

QN Find volume flow rate in the venturi meter given below in which water is flowing. [Cross-section area t A & B is A and a, $\frac{A}{a} = 2$. $A = \sqrt{3} \text{ m}^2$. $P = 1000 \text{ kg/m}^3$]



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

QN An ideal solenoid is kept with its axis vertical. Current I_0 is flowing in the solenoid. A charge Q is thrown downward inside the solenoid it acceleration of the charge particle is a then

- 1) 2.52 eV 2) 2.16 eV 3) 2.00 eV 4) 2.34 eV

QN Wave propagates whose electric field is given by $\vec{E} = 69 \sin(\omega t - kx) \hat{j}$, find the direction of magnetic field.

- 1) \hat{k} 2) $-\hat{k}$ 3) $\frac{\hat{i} + \hat{j}}{\sqrt{2}}$ 4) $\frac{\hat{i} - \hat{j}}{\sqrt{2}}$

QN Two rods of equal length of 60 cm each are joined together end to end. Coefficient of linear expansions of the rods are $24 \times 10^{-6} \text{C}^{-1}$ and $1.2 \times 10^{-5} \text{C}^{-1}$. Their temperatures are same and equal and 30°C which is increased to 100°C . Find final length of the combination (in cm)

- 1) 120.1321 2) 120.1123 3) 120.1512 4) 120.1084

QN Find change in internal energy of gas if its temperature changes by 10 K. Number of moles of gas is 10, C_p (specific heat at constant pressure of the gas is 7 cal/K/mol) and R (gas constant) = 2 cal/K

- 1) 500 cal 2) 1000 cal 3) 250 cal 4) 100 cal

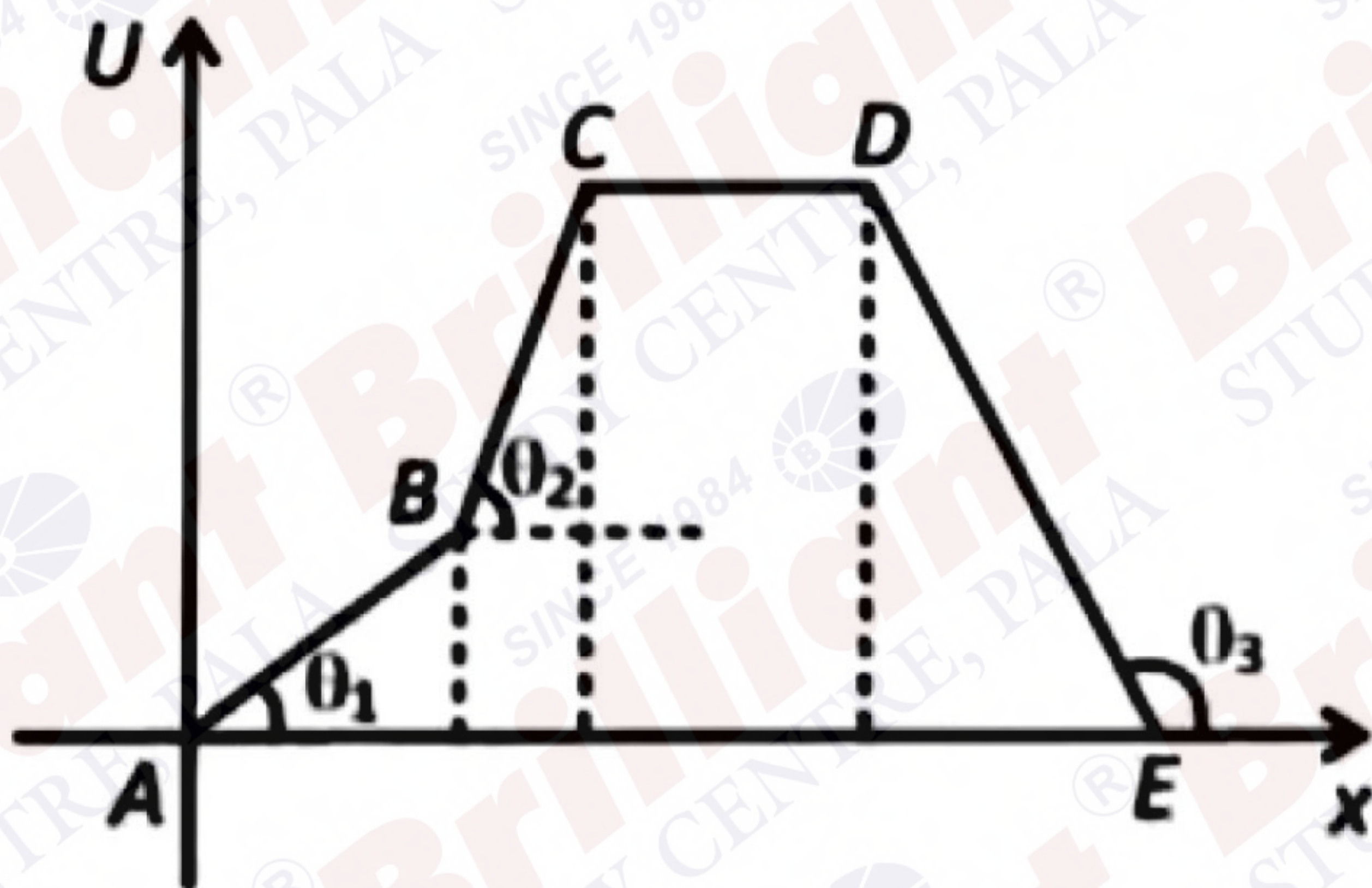
QN Two mechanical wave on strings of equal length (L) tension (T) having linear mass density $\frac{\mu_1}{\mu_2} = \frac{1}{2}$

. Find the ratio of time taken for a wave pulse to travel from one end to the other in both strings. (ignore gravity)

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

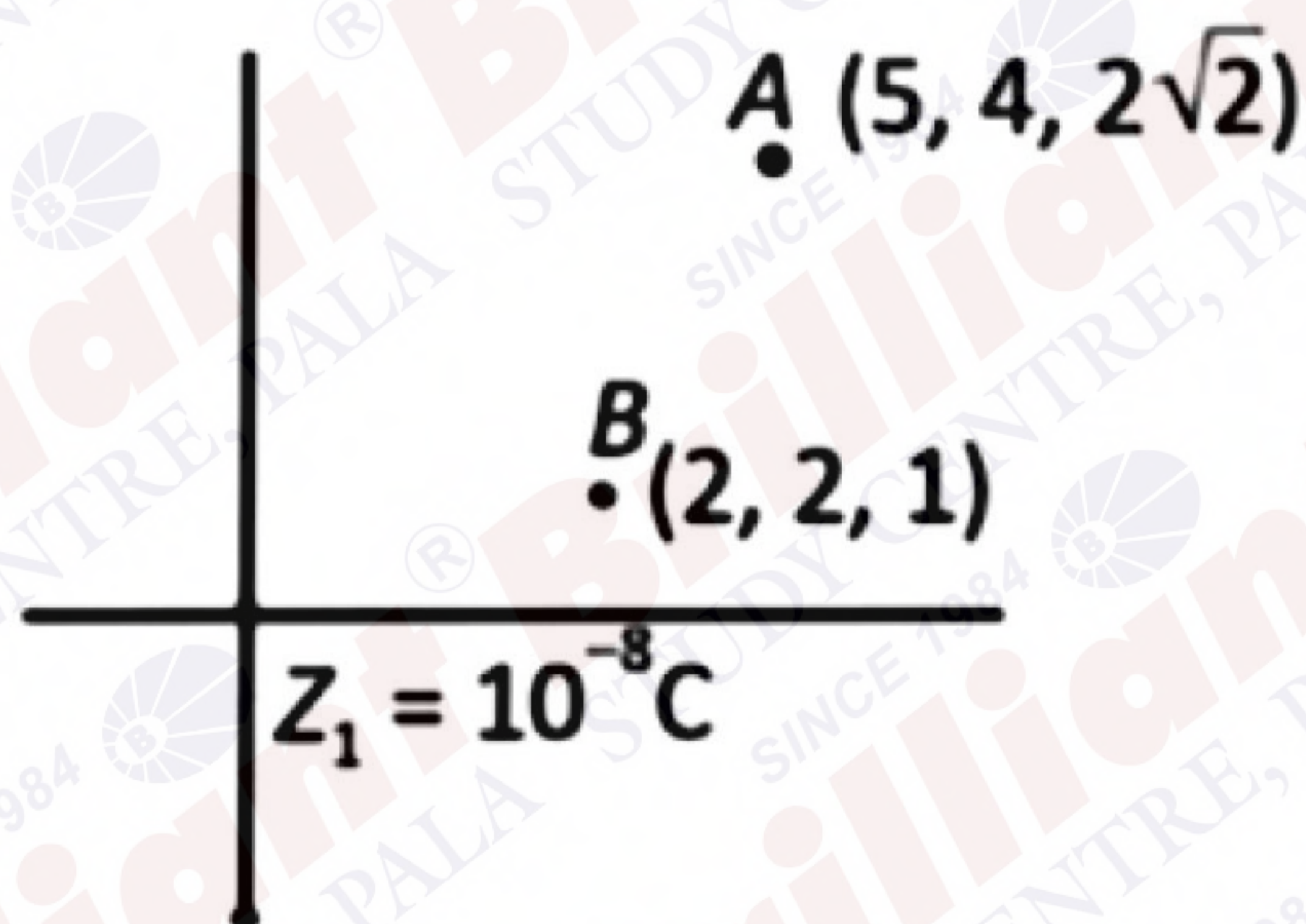
QN A curve is given between potential energy of a particle and its position on x-axis. Given: $\tan \theta_1 = 1, \tan \theta_2 = 3, \tan \theta_3 = -\frac{1}{2}$. If F_{AB} be force acting on the particle during A to B similarly F_{BC} ,

F_{CD} and F_{DE} are the forces during B to C, C to D and D to E respectively. Arrange magnitudes of these forces in decreasing order.



- 1) $F_{BC} > F_{AB} > F_{CD} > F_{DE}$ 2) $F_{BC} > F_{AB} > F_{DE} > F_{CD}$
 3) $F_{AB} > F_{BC} > F_{DE} > F_{CD}$ 4) $F_{BC} > F_{DE} > F_{AB} > F_{CD}$

QN Find out work done in moving a $2\mu\text{C}$. Choose from A to B



- 1) $6\mu\text{J}$ 2) 120 mJ 3) $34.3 \mu\text{J}$ 4) $24.2 \mu\text{J}$

QN A satellite is revolving around a planet in orbit radius of $1.5 R$. Additional minimum energy required to transfer the satellite to new orbit radius of $3R$ is (m and M are mass of satellite and planet) $\frac{GMm}{\lambda R}$ then λ is

QN There are two springs of spring constants $k_1 = (20 \pm 0.2) \text{ N/m}$ and $k_2 = (30 \pm 0.3) \text{ N/m}$. If they are connected in parallel then percentage error in equivalent spring constant of combination is%

QN In a YDSE set up, a slab of width t is inserted in front of one slit. The interference pattern shifts by 0.2 cm on the screen. If the refractive index of slab is 1.5 than t is $N \mu\text{m}$ (screen distance 50 cm and slits separation 1 mm) then N is

QN Focal length of objective lens and eyepiece lens are 1.25 cm and 5 cm and tube length is 26 cm . Find magnification of compound microscope in normal adjustment.

QN $k_1 = (10 \pm 0.2)$ and $k_2 = (20 \pm 0.3)$. The maximum error in calculating value of equivalent spring constant if the above springs are connected in series is

- 1) $\frac{11}{90}$ 2) $\frac{7}{50}$ 3) $\frac{2}{23}$ 4) $\frac{7}{90}$

QN A mass of 2 kg at rest is subjected to a force $\vec{F} = 4t^3 \hat{i} - 3t \hat{j}$ (in N). The velocity of particle at $t = 2 \text{ s}$ in magnitude is m/s

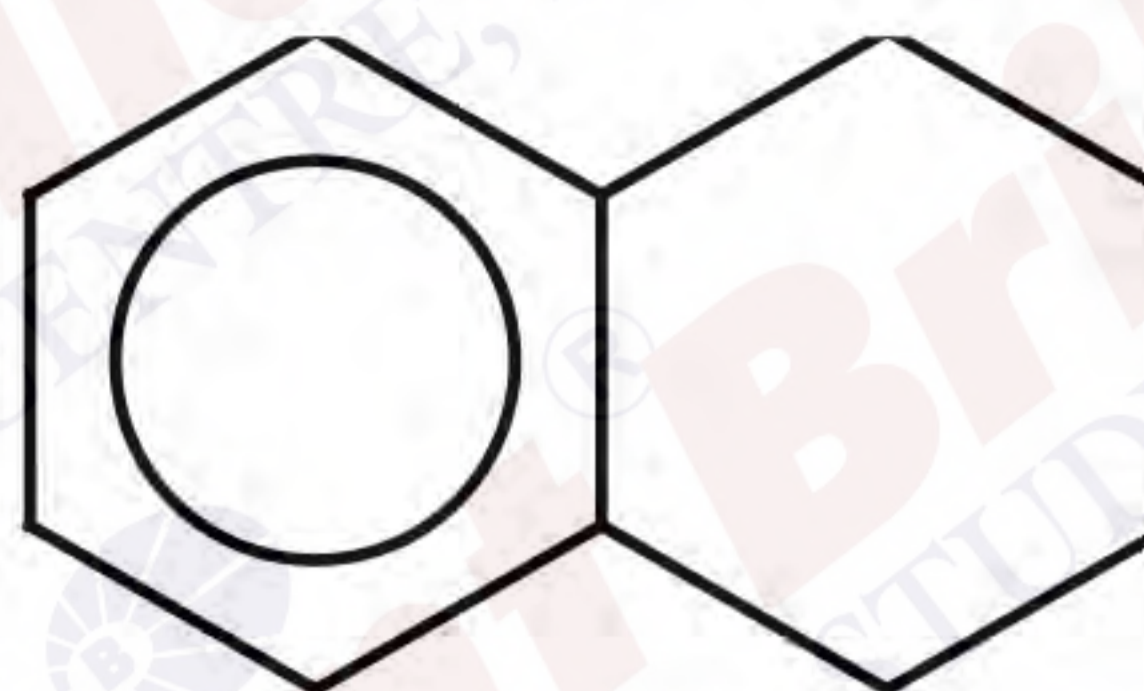
QN A charge 10^{-8} C is held fixed at origin and a charge $2 \times 10^{-6} \text{ C}$ is moved from $(4, 4, 2)$ to $(2, 1, 2)$ slowly. The work done in doing so is

- 1) $10 \mu\text{J}$ 2) $20 \mu\text{J}$ 3) $30 \mu\text{J}$ 4) $40 \mu\text{J}$

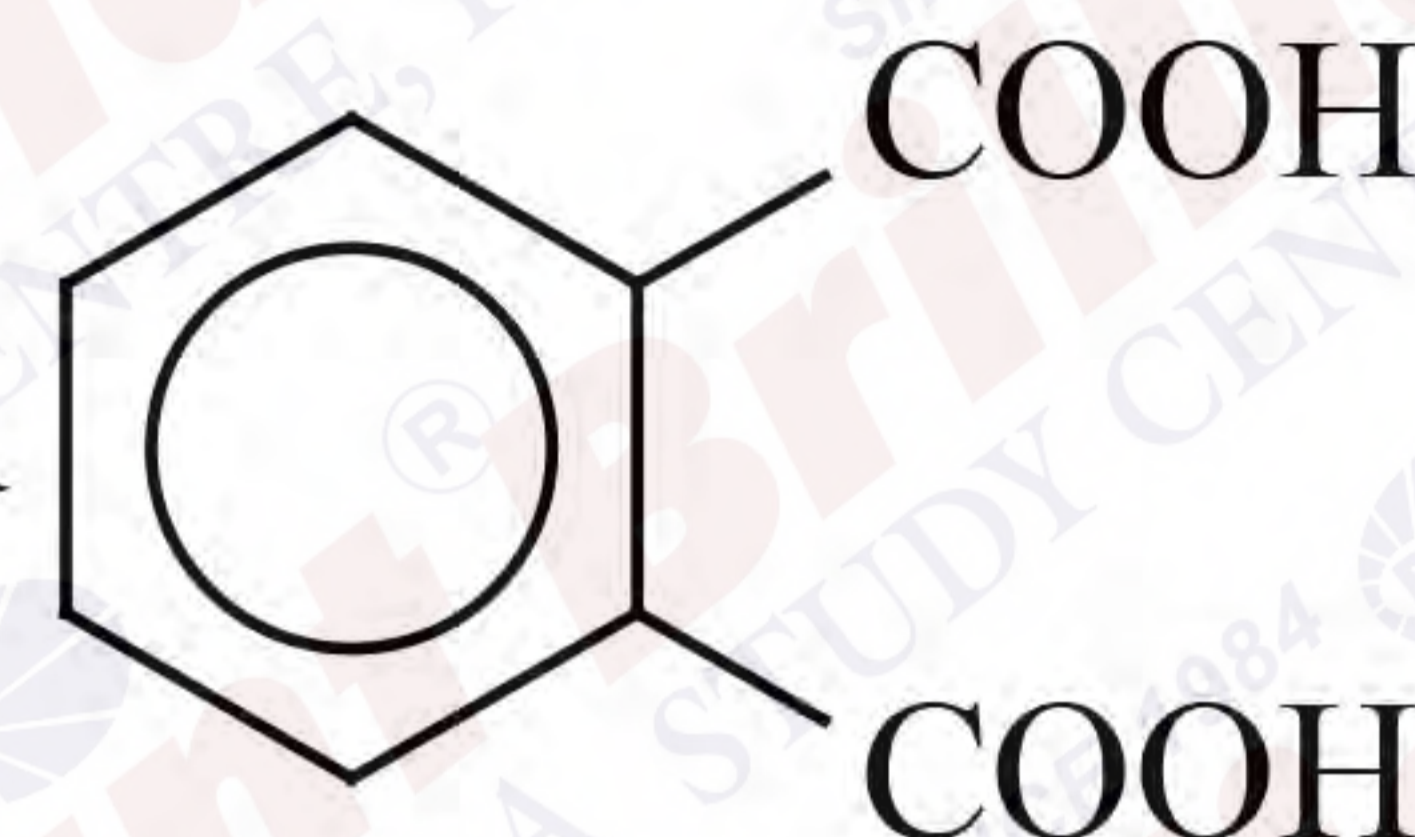
QN

A

H_2/Pt

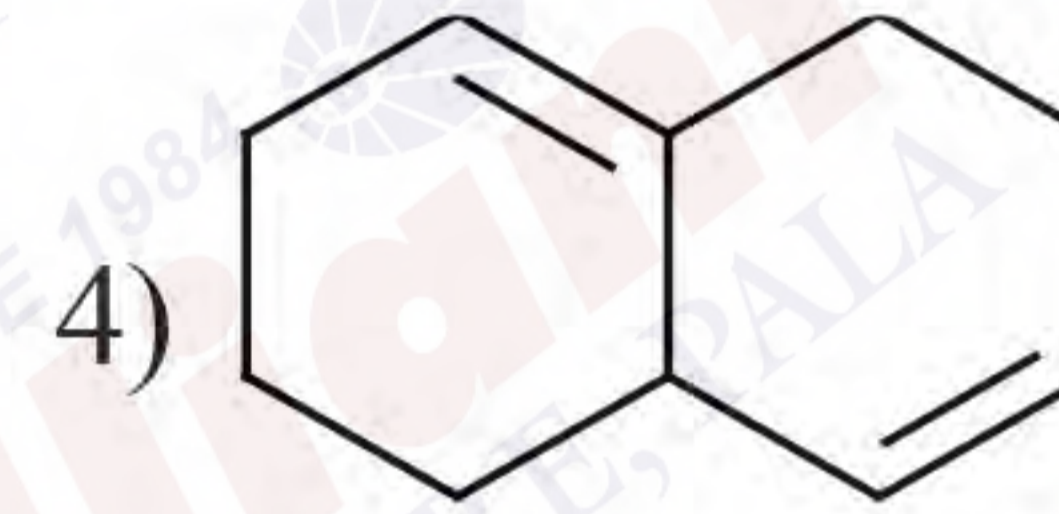
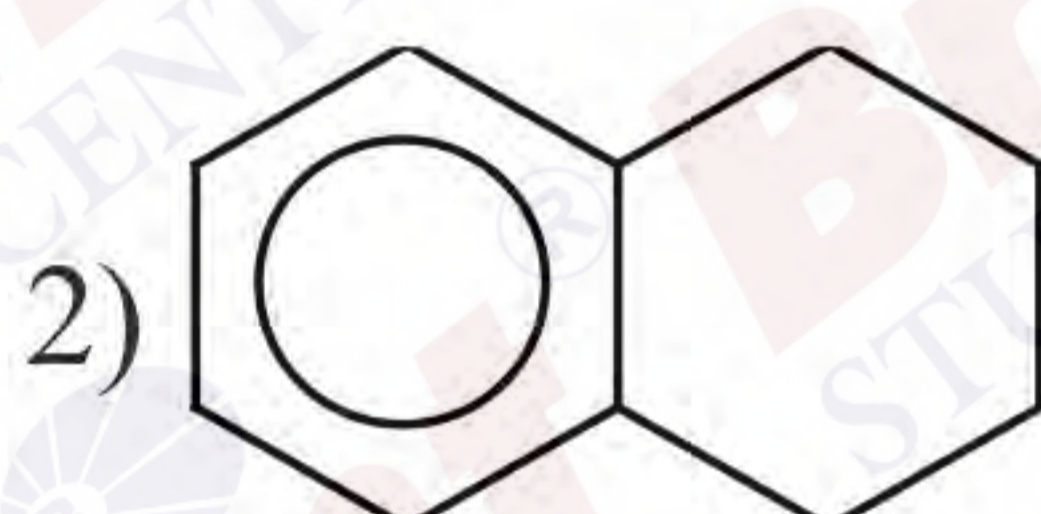
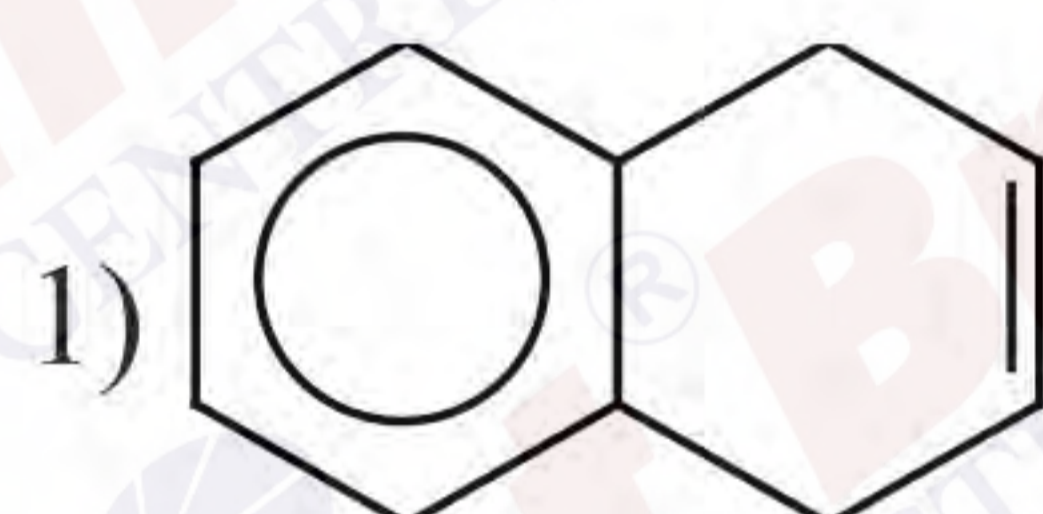


i) Hot.alk.KMnO₄



ii) H^+ , H₂O

Which of the following is A?



QN

Which of the following is the correct order with respect to the property indicated?

1) $Cl > F$ (ionisation energy)

2) $K_2O > Na_2O > Al_2O_3$ (Basic nature)

3) $K > Na > Al > Mg$ (Metallic character)

4) None of these

QN

For two chemical reactions A and B, if the difference between their activation energy is 20 kJ at 300 K ($R = 8.3 \text{ JK}^{-1}$). Determine $\ln \frac{k_2}{k_1}$

QN

Statement-I : Arginine and Tryptophan are essential amino acids

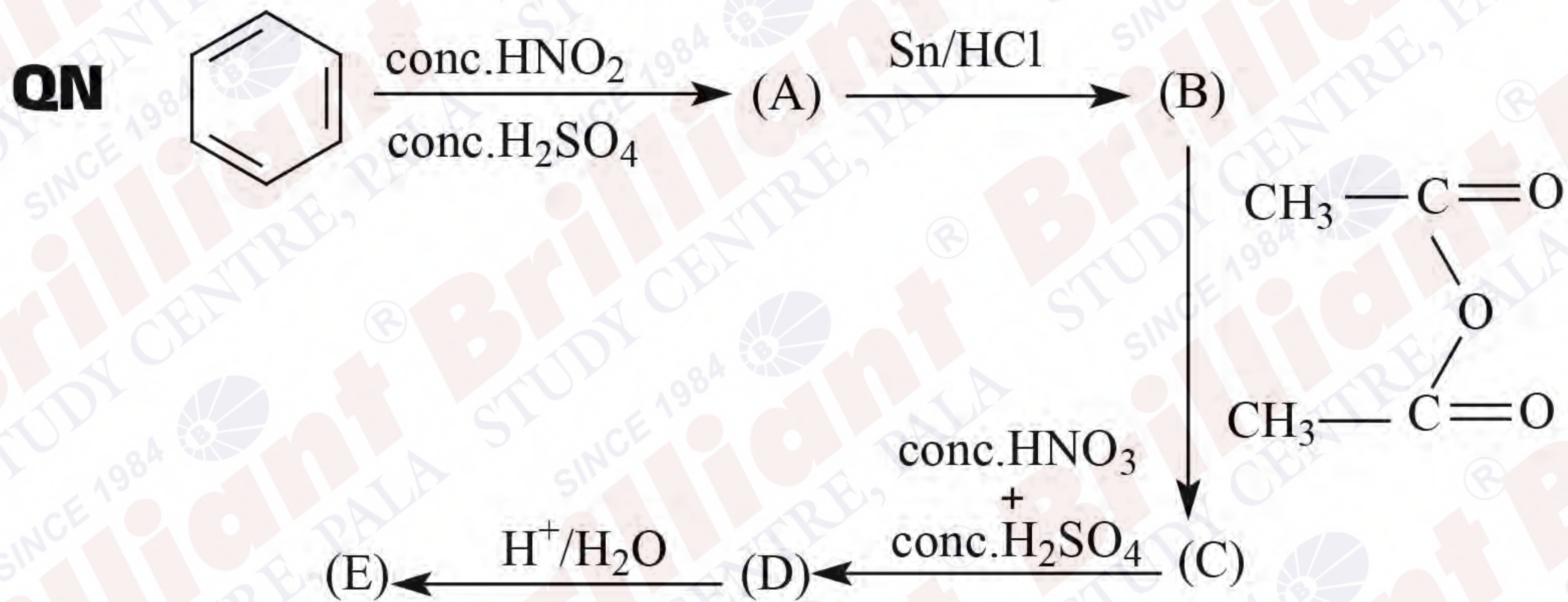
Statement-II : Glycine does not have any chiral carbon

1) Both statement-I and statement-II are correct

2) Both statement-I and statement-II are incorrect

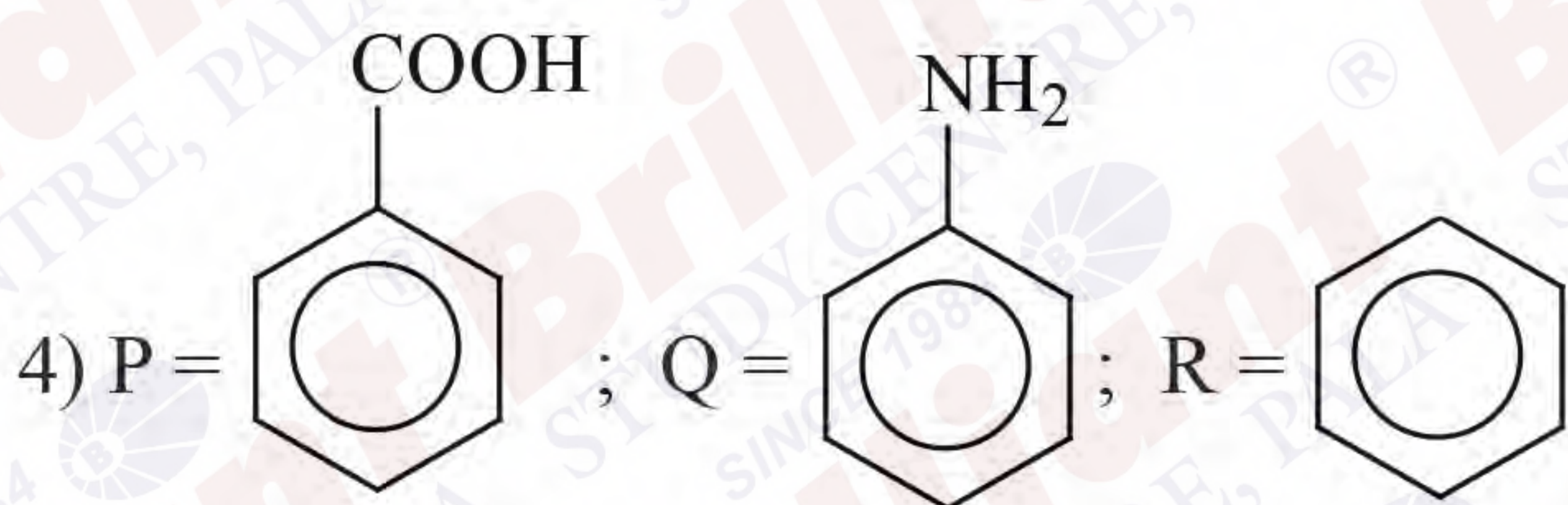
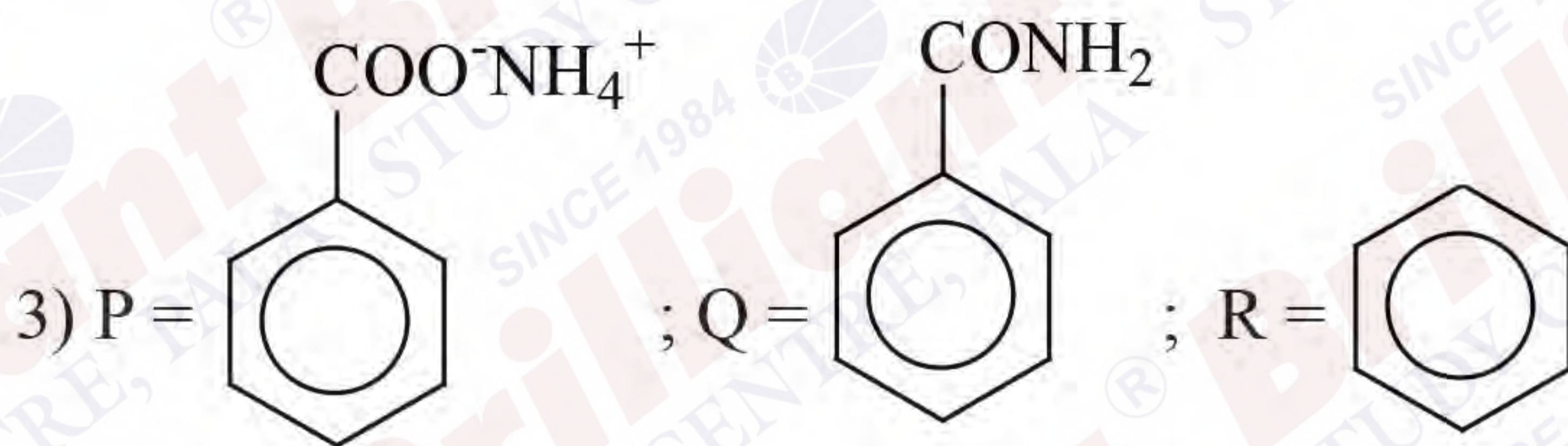
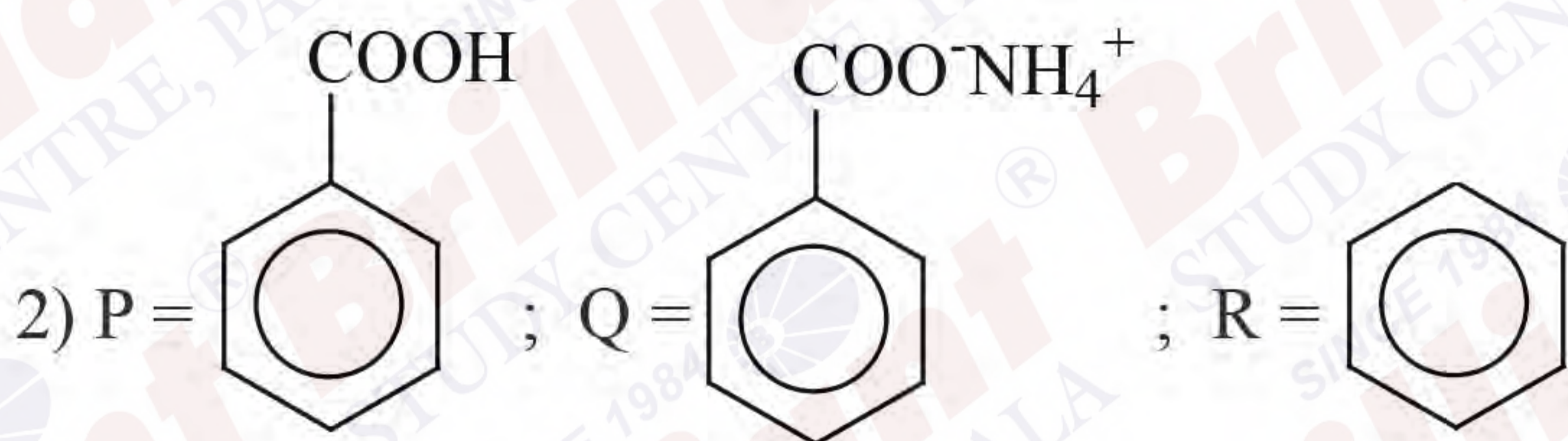
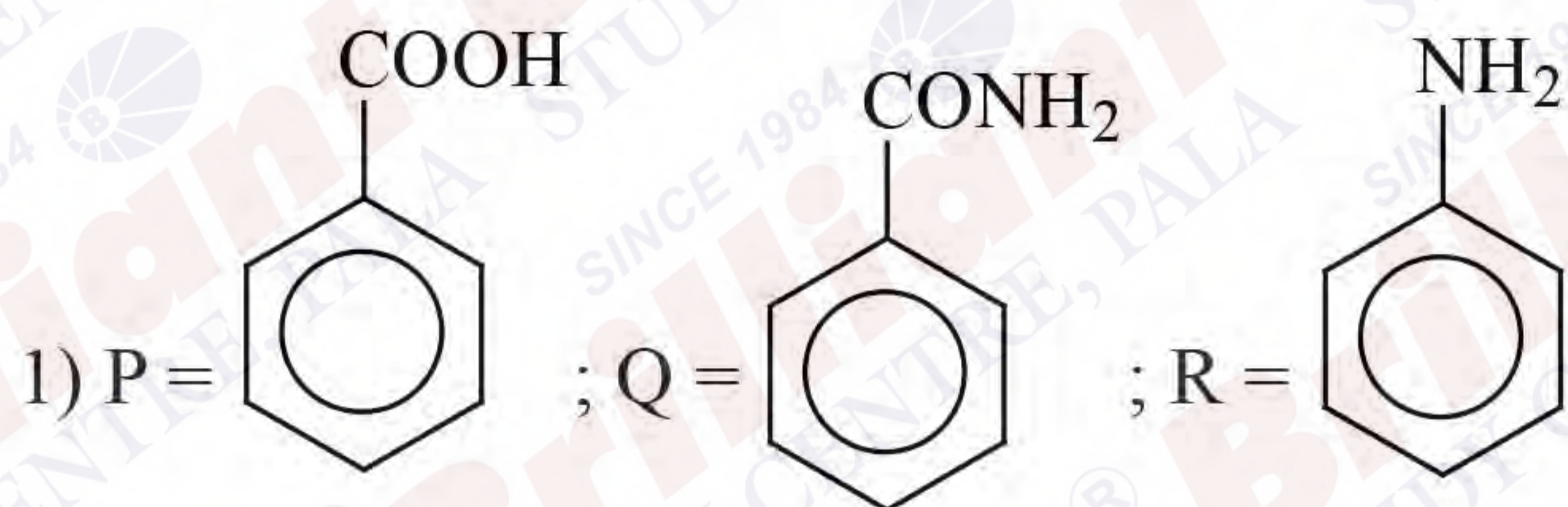
3) Statement-I is correct and statement-II is incorrect

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



% of N in E = ?

QN Observe the following reaction sequence: $\text{P} \xrightarrow[\Delta]{\text{NH}_3} \text{Q} \xrightarrow{\text{Br}_2/\text{KOH}} \text{R}$. Which of the following is the correct structure for P, Q and R?



QN In the following reaction, $\text{MnO}_4^{2-} \xrightarrow{\text{H}^+}$ Manganate ion undergoes disproportionation to form

- 1) $\text{MnO}_2, \text{MnO}_4^-$ 2) MnO, MnO_2 3) MnO_2, MnO 4) $\text{MnO}_4^-, \text{MnO}$

QN 80 mL of organic compound is mixed with 264 mL O_2 and ignited. It gives 224 mL of gaseous mixture at NTP. After passing KOH 64 L of gas remains. The organic compound is

- 1) C_2H_4 2) C_2H_2 3) C_4H_{10} 4) C_3H_6

QN Consider the following reaction $\text{Ca} + 2\text{HCl} \longrightarrow \text{CaCl}_2 + \text{H}_2$

We have 14g Ca reacts with excess of HCl. Choose the incorrect option

- 1) Mass produced of CaCl_2 is 38.85 g
2) Mole of H_2 produced in 0.35 mol
3) Volume of H_2 produced at STP is 7.84 L
4) Mass of CaCl_2 produced is 3.885 g

QN 1g of AB_2 is dissolved in 50g of solvent such that $\Delta T_f = 0.689$. When 1g AB is dissolved in 50g of same solvent, ΔT_f is 1.176. Find molar mass of AB_2 . $K_f = 5 \text{ K kg/mol}$
(Report to nearest integer) AB_2 and AB are non electrolyte

QN Out of the following, how many compounds have tetrahedral geometry?



QN Find change in internal energy of gas if its temperature changes by 10 K. Number of moles of gas is 10, C_p (specific heat at constant pressure of the gas) is 7 cal/K/mol and R (gas constant) = 2 cal/K

- 1) 500 cal 2) 1000 cal 3) 250 cal 4) 100 cal

QN 14.0 g of calcium metal is allowed to react with excess HCl 1.0 atm pressure and 273 K. Which of the following statement is incorrect?

- 1) 0.35 mol of H_2 gas is evolved
2) The limiting reagent is calcium metal
3) 33.3 g of CaCl_2 is produced
4) 7.84 L of H_2 gas is evolved

QN In Carius method, 0.75 g of an organic compound gave 1.2 g of barium sulphate. Find percentage of sulphur (molar mass 32g mol⁻¹). Molar mass of barium sulphate is 233 mol⁻¹

- 1) 16.48% 2) 4.55% 3) 21.97% 4) 10.30%

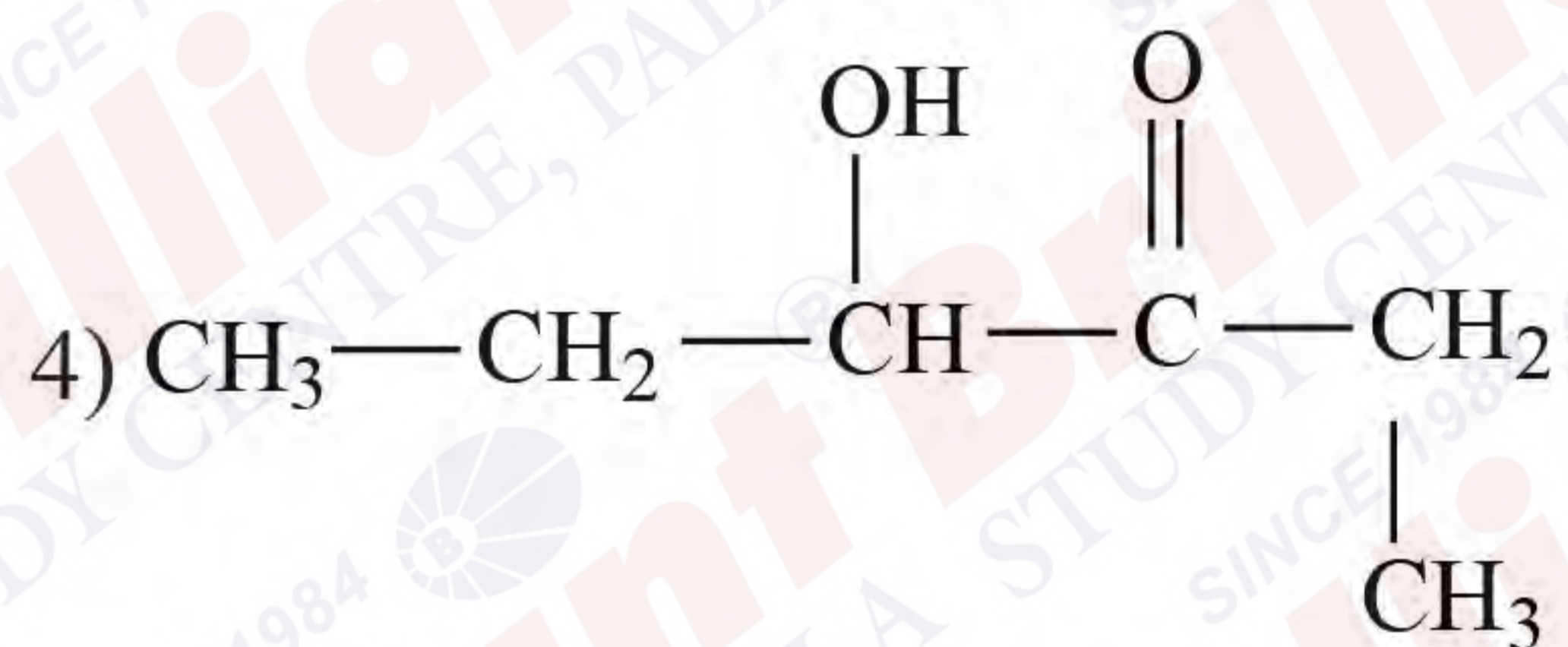
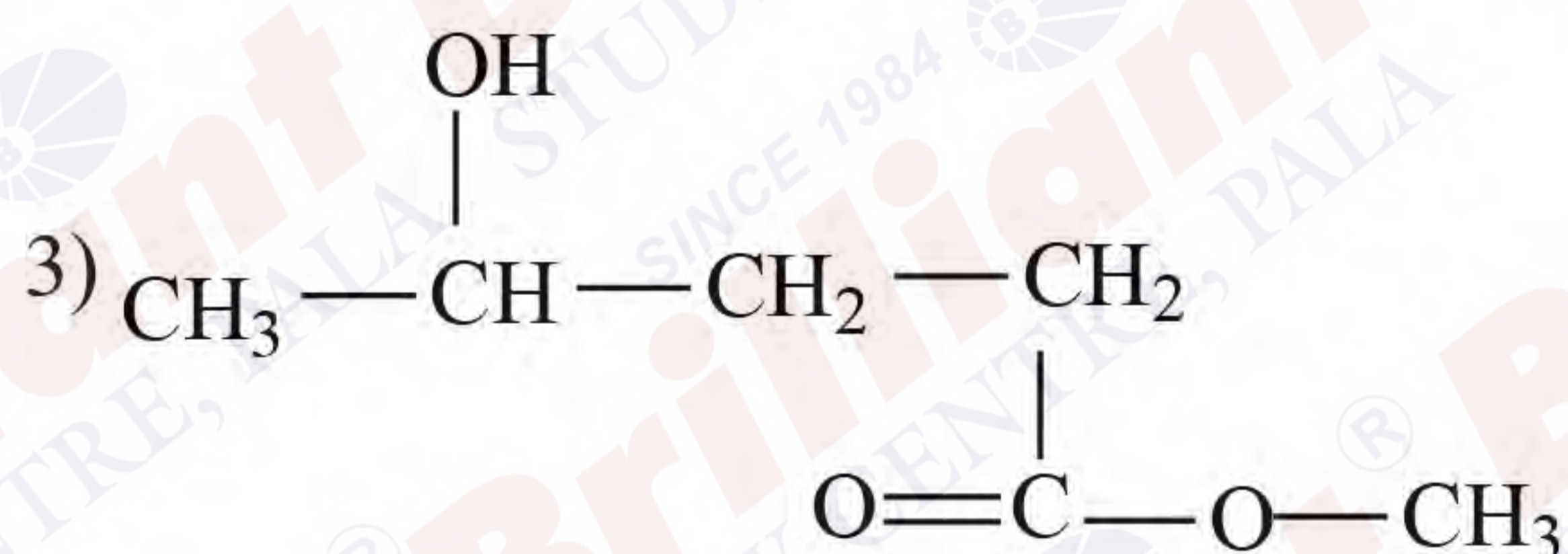
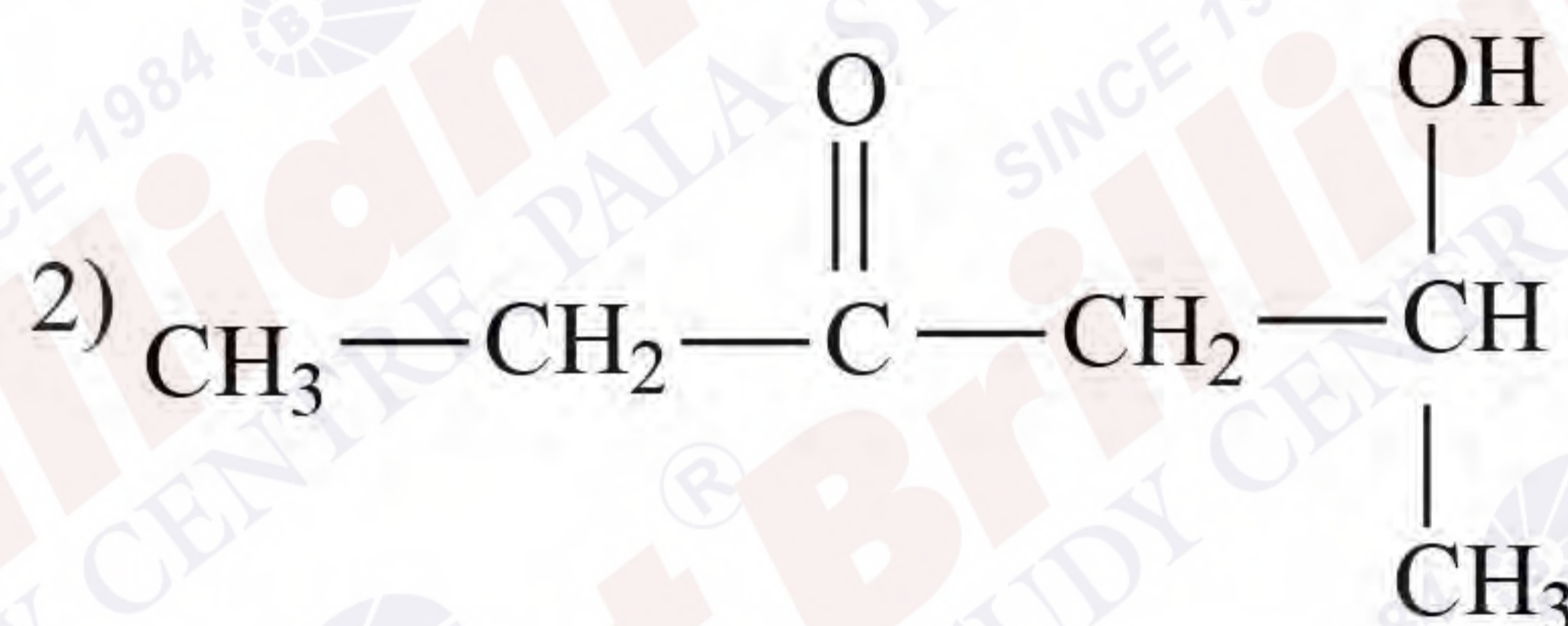
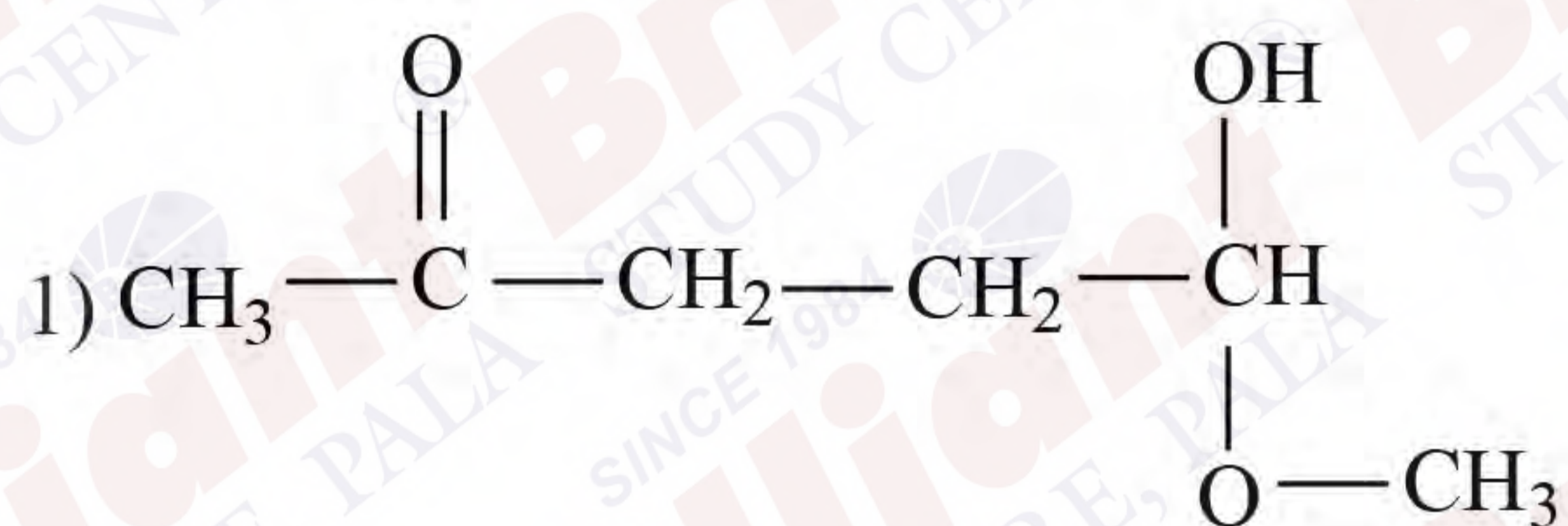
QN Which of the following is incorrect order with respect of the property indication?

- 1) $F > P > S > B$ (First ionisation energy)
- 2) $Cl > F > S > P$ (Electron affinity)
- 3) $K > Al > Me > B$ (Metallic character)
- 4) $K_2O > Na_2O > MgO > Al_2O_3$ (Basic character)

QN Which of the following is correct?

- 1) Propanal and propanone \rightarrow functional
- 2) Ethoxyethane and Methoxypropane \rightarrow Metamer
- 3) But-2-ene show optical isomer
- 4) Pentane and 2,2-dimethylbutane chain

QN $C_6H_{12}O_3$ gives positive iodoform test on hydrolysis with dil. acid product formed gives Tollen and iodoform test both. Find structure of $C_6H_{12}O_3$



QN Two solution of PQ and PQ_2 respectively (Non-volatile, non-ionisable) containing 1 gm solute in 50 gm solvent ($K_b = 5 \text{ K}\cdot\text{kg/mol}$) elevation in b.p of solutions are 1.176°C and 0.689°C respectively. Calculate molar masses of P and Q?

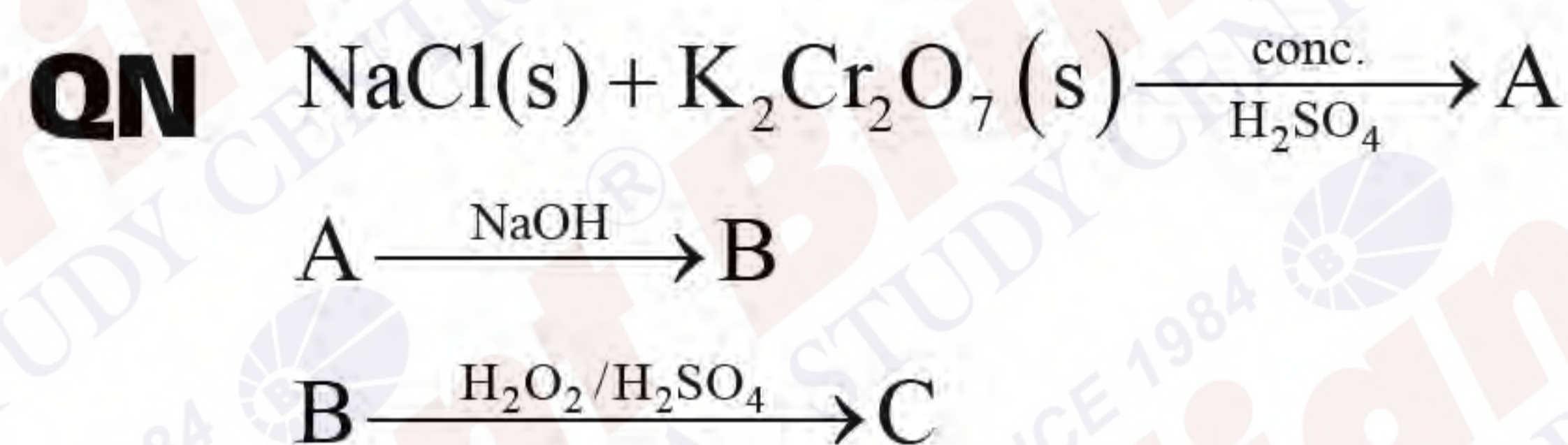
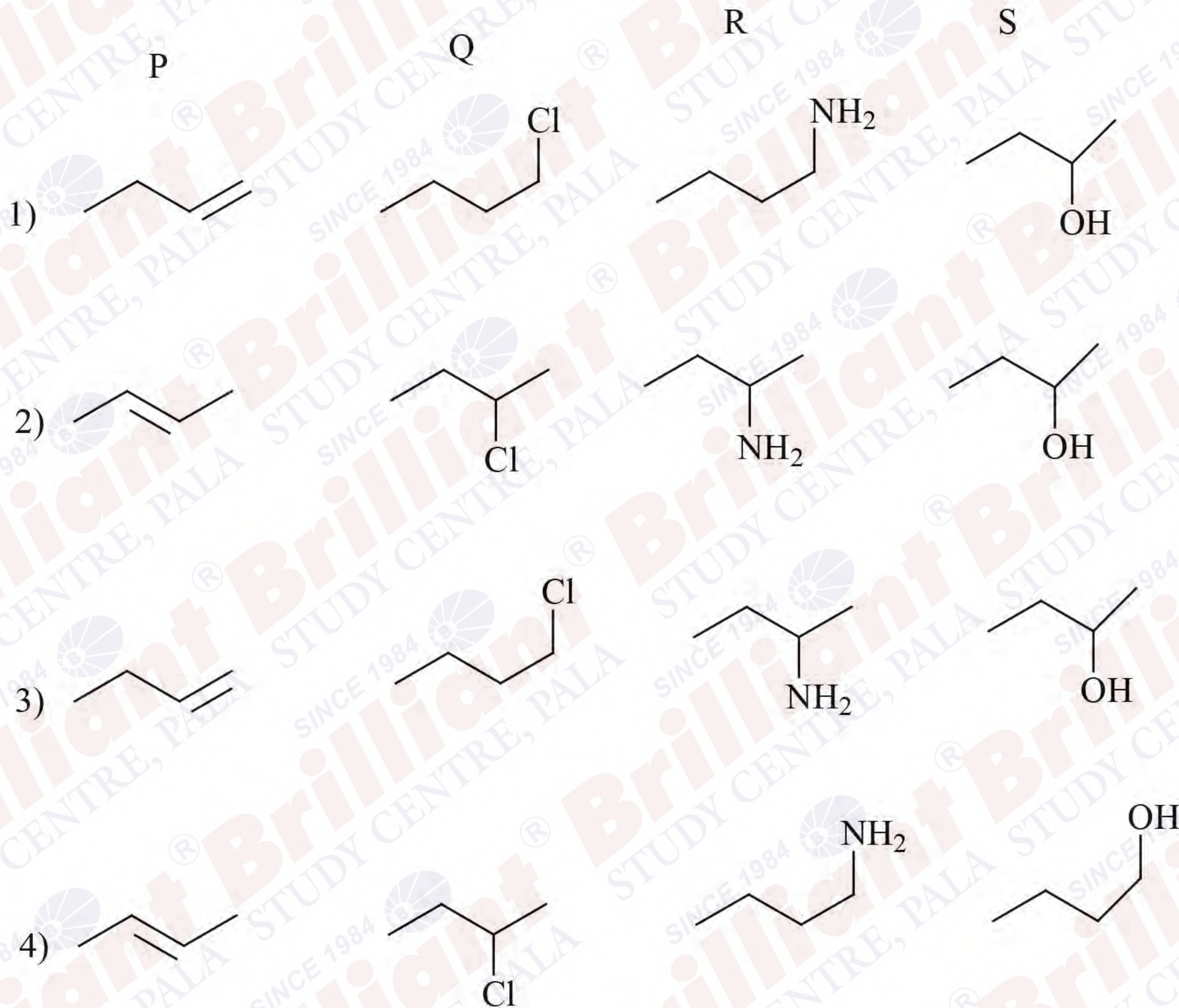
- 1) 75, 25 2) 60, 25 3) 25, 60 4) 25, 75

QN pH of conductance of a solution HA are 5 and $4 \times 10^{-5} \text{ S}$, respectively. The standard solution is present in cell having length 15cm and area = 1cm^2 (Assume degree of dissociation of HA $< < 1$)

QN Compound P when pass on from ammonia and heating gives a compound Q which is further treated with $KOH + Br_2$ gives compound R. Which formula C_6H_7N . Then find the correct structure of P, Q, R respectively

- 1) Benzoic acid, benzamide, aniline
- 2) Benzoic acid, ammonium benzoate, benzene
- 3) Ammonium benzoate, benzamide, benzene
- 4) Benzoic acid, aniline, benzene

QN An alkaline $P(C_4H_8)$, gives optically active product Q which further react with ammonia and gives R. R react with $NaNO_2 + HCl$ followed by hydrolysis gives S. P, Q,R,S are respectively



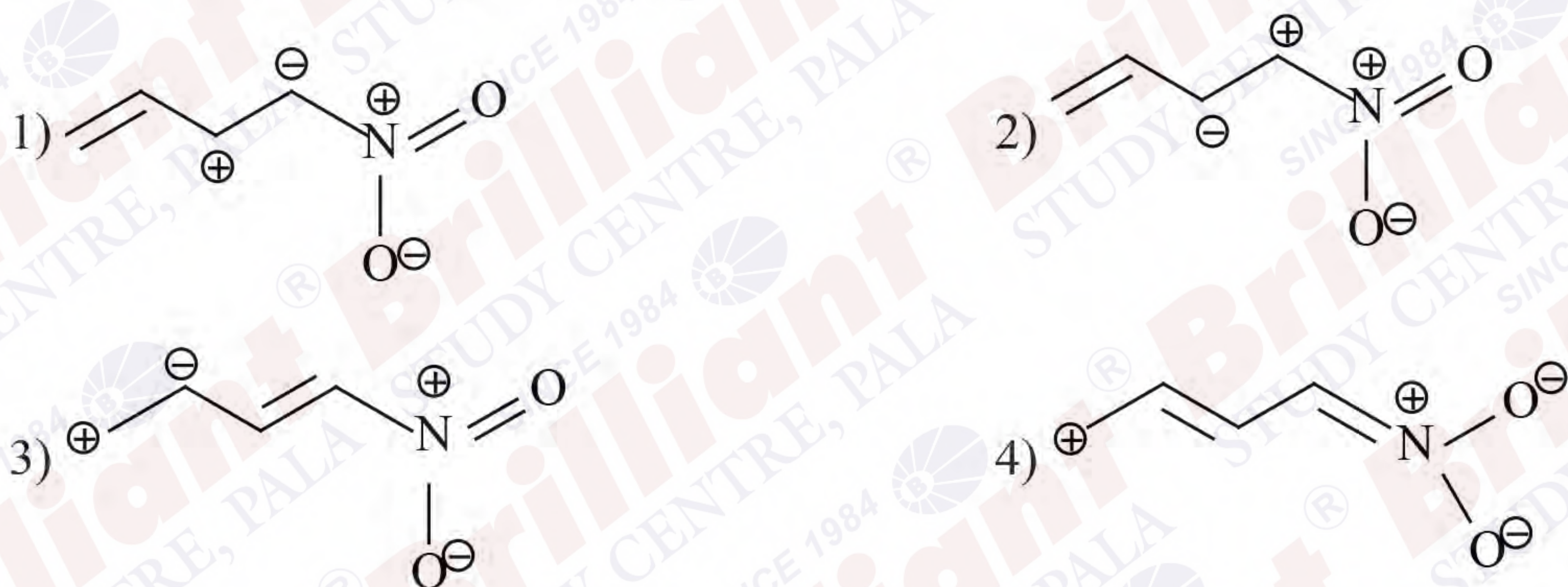
If number of O^{-1} ion in C = X

If number of O atom in C = Y

If oxidation state of Cr in C = Z

Then (X + Y + Z) is.....

QN Least stable resonating structure?



QN 80 ml of hydrocarbon is mix with 264 ml O₂ and ignited. It gives 224 ml of gas mixture at NTP. After passing 64 ml of gas remain the organic compound is ?

Statement-A : Tryptophan, arginine are essential amino acid

Statement-B : Glycine has no chiral centre

Statement-C : Proline has 6-membered ring

Statement-D : Cysteine is amino acid having sulphur atom

Identify correct statement

1) A, B

2) A, B, D

3) A, C, D

4) A, B, C

QN Find the value of $\operatorname{cosec}10^\circ - \sqrt{3} \sec10^\circ$

QN If x satisfies the equation $x^2 + x + 1 = 0$, then find the value

$$\left(x + \frac{1}{x}\right)^4 + \left(x^2 + \frac{1}{x^2}\right)^4 + \dots + \dots + \left(x^{25} + \frac{1}{x^{25}}\right)^4$$

QN If $A = \begin{bmatrix} \alpha & 2 \\ 1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 1 \\ \beta & 1 \end{bmatrix}$ and $A^2 - 4A + 2I = 0$, $B^2 - 2BI = 0$, then $|\operatorname{adj}(A^3 - B^3)|$ is equal to

QN The value of $\int_0^{\frac{\pi}{2}} |\sin x + \sin 3x + \sin 2x| dx$

QN If $y = y(x)$ and $(1+x^2)dy + (1-\tan^{-1}y)dx = 0$ and $y(0)=1$ then $y(1)$ is

QN The sum of roots of the equation

$$(|x-1|^2 - 5|x-1| + 5 = 0)$$

QN Let $A = \{a, b, c, d\}$ then find total number of reflexive and symmetric relations

QN The locus of point of intersection of tangent drawn to the circle $(x-2)^2 + (y-3)^2 = 16$ which subtends an angle of 120°

QN If a_1, a_2, a_3, \dots are increasing G.P such that $a_1 + a_3 + a_5 = 21$, $a_2 a_3 a_5 = 64$ then $a_1 + a_2 + a_3$ is

QN $f(i) \neq i$ if $f(x)$ is strictly \uparrow function $f: A \rightarrow B$ where $A = \{1, 2, 3, 4, 5, 6\}$ $B = \{1, 2, \dots, 9\}$ then the number of function $A \rightarrow B$ is equal to

- 1) 25 2) 27 3) 28 4) 29

QN If tangents are drawn from P to the circle $x^2 + y^2 - 4x - 6y - 3 = 0$ touching circle at A and B such that $\angle AOB = 60^\circ$ (O is the centre of circle) then locus of P is=?

QN Value of $\operatorname{cosec}10^\circ - \sqrt{3}$

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

QN α and β are the roots of the equation $x^2 + x + 1 = 0$ the value of

$$(\alpha + \beta)^4 + (\alpha^2 + \beta^2)^4 + (\alpha^3 + \beta^3)^4 + \dots + (\alpha^{25} + \beta^{25})^4$$

- A) 145 B) 140 C) 415 D) 541

QN Tangents are drawn from P to the circle $x^2 - 4x - 6y - 3 = 0$ touching circles of A and B such $\angle AOB = 60^\circ$ (O is the centre of circle) then locus of

QN Area enclosed by $x^2 + 4y^2 \leq 4, y \leq |x| - 1, y \geq |z|$ is

QN If the mean and variance of observations $x, y, 12, 14, 4, 10, 2$, is 8 and 16 respectively where $x > y$. Then the value of $3x - y$ is

QN The value of $\int_{-\frac{\pi}{6}}^{\frac{\pi}{6}} \frac{\pi + 4x^{11}}{1 - \sin\left(\left|n\right| + \frac{\pi}{6}\right)} dx$

QN L_1 and L_2 are two lines and ∇ABC is an equilateral triangle, such that A and B lie on L_1 and L_2 respectively, vertex C is at a distance of 6 and 3 unit from L_1 and L_2 respectively, then area of ΔABC is

- 1) $\frac{280\sqrt{3}}{3}$ 2) $280\sqrt{3}$ 3) $\frac{23\sqrt{3}}{3}$ 4) $23\sqrt{3}$

QN Consider the expansion $(ax^2 + bx + c)(1 - 2x)^2$. If the coefficient of x^2 and x^3 are zero and coefficient of x is -56 then $(a+b+c)$ is

QN Foci of the ellipse $\frac{x^2}{36} + \frac{y^2}{16} = 1$ coincide with hyperbola. If the eccentricity of the hyperbola is 5, then find the length of latus rectum of the hyperbola

QN If the domain of the function $\cos^{-1}\left(\frac{2x-5}{11x-7}\right) + \sin^{-1}(2x^2 - 3x + 1)$ is $[0, a] \cup \left[\frac{12}{13}, b\right]$ then $\frac{1}{ab}$ is

QN If $f(3) = 18, f'(3) = 0$ and $f''(3) = 4$, Then the value of $\lim_{x \rightarrow 3} \log \left(\frac{f(x+2)}{f(3)} \right)^{\frac{18}{(x-3)^2}}$

QN If $a_1 = 1$ and $\forall n \geq 1, a_{n+1} = \frac{1}{2}a_n + \frac{n^2 - 2n - 1}{n^2(n+1)^2}$ then $\left| \sum_{n=1}^{\infty} \left(a_n - \frac{2}{n^2} \right) \right| =$

QN If O is the vertex of the parabola $x^2 = 4y$, Q is the point on parabola. If C is the locus of point which divides OQ in the ratio 2:3. The equation of chord of C which bisected at point (1,2)

QN Let (α, β, γ) be coordinates of foot of perpendicular drawn from point $(5, 4, 2)$ on line

$$\vec{r} = (\hat{i} + 3\hat{j} + \hat{k}) + \lambda(2\hat{i} + 3\hat{j} - \hat{k}) \quad \text{Find length of projection of vector } \alpha\hat{i} + \beta\hat{j} + \gamma\hat{k} \text{ on vector } 6\hat{i} + 2\hat{j} + 3\hat{k}$$

QN $f(0) = 1$ and $f(x+y) = f(x) + f'(y)$ such that $f(x)$ be a real differential functions such that $x, y \in \mathbb{R}$

then $\sum_{n=1}^{1000} \log_e f(n)$