SINCE 1984

Brilliant®

STUDY CENTRE, PALA

JEE MAIN 2025

SESSION-1

SHIFT-1 MORNING

SCAN ME

VIDEO SOLUTION

MEMORY BASED QUESTIONS

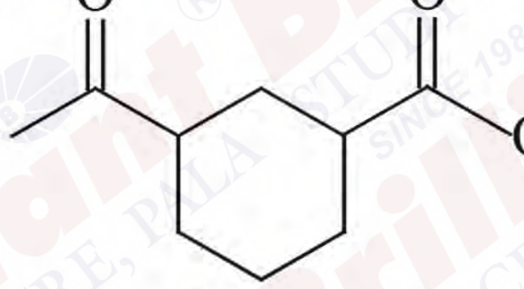
29-01-2025 SHIFT 1-MORNING

MEMORY BASED QUESTIONS

CHEMISTRY

QN Which of the following is animal starch?

1) Lactose 2) Glycogen 3) Amylose 4) Amylopectin

QN  $\xrightarrow{Zn\text{-}Hg/HCl}$ 'P' .Identify product

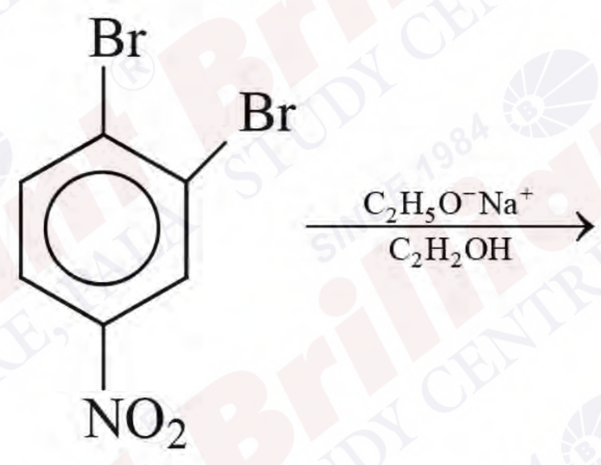
QN Match the column

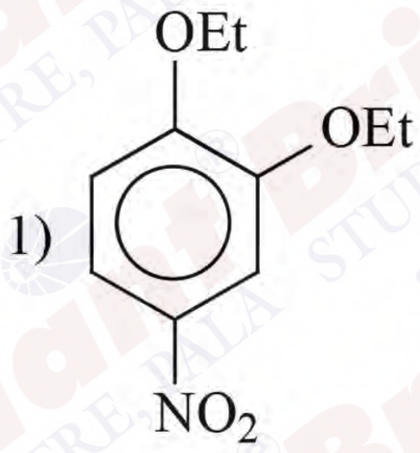
Column-I	Column-II
a) Cellulose	p) α-1, 4
b) Amylose	q) α-1, 4 & α-1, 6
c) Amylopectin	r) α-1, β-2
d) Sucrose	s) β-1, 4

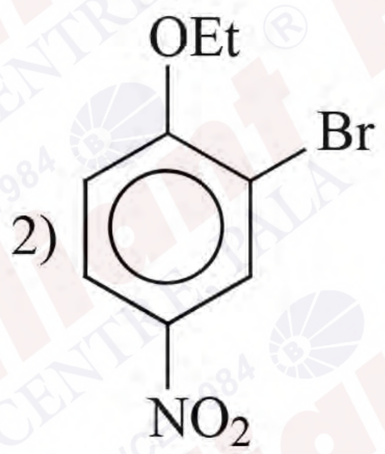
1) a→s; b→p; c→q; d→r 2) a→r; b→q; c→p; d→s

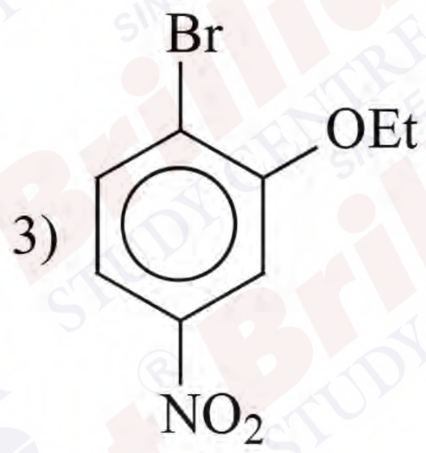
3) a→s; b→p; c→r; d→q 4) a→r; b→q; c→s; d→p

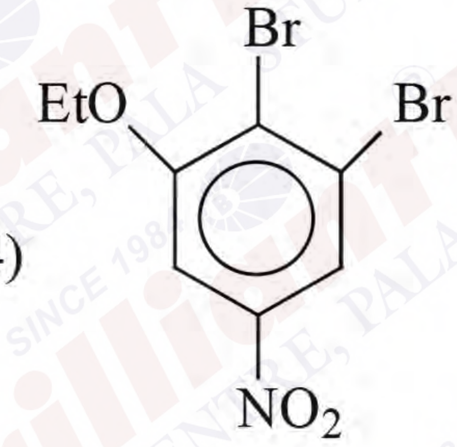
QN Hexa-1,3-dien-5-yne how many sigma and pi bonds in the given compound

QN 

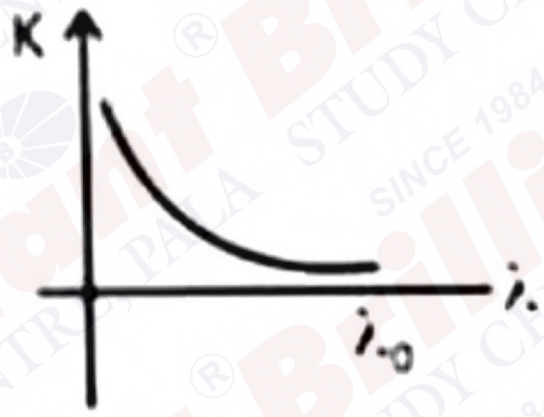
1) 

2) 

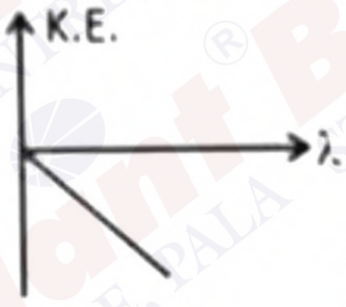
3) 

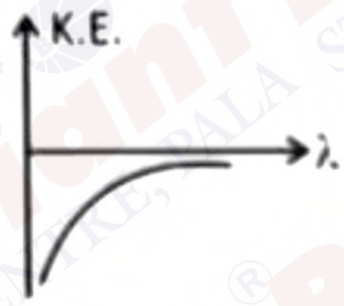
4) 

QN The graph between wavelength of incident light and kinetic energy of photoelectrons in photoelectric effect is

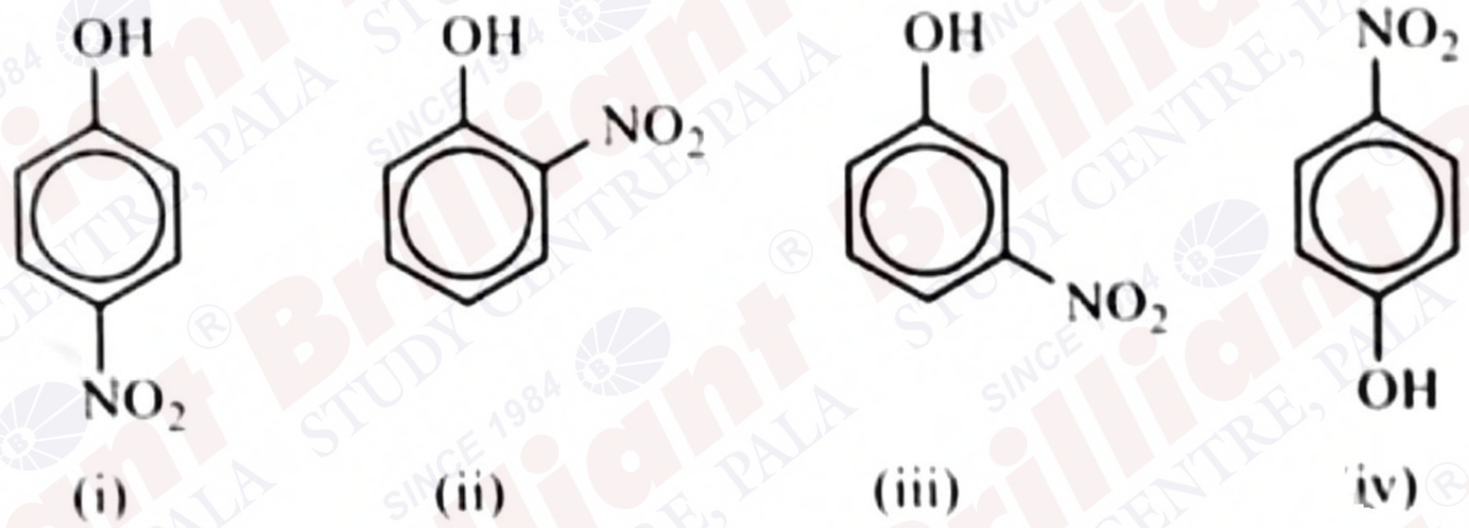
1) 

2) 

3) 

4) 

QN Which of the following is steam volatile?



(i) (ii) (iii) (iv)

QN Statement-I : Correct order of ionic radius for Mg^{2+}, Na^+, O^{2-} and F^- is $F > O^{2-} > Na^+ > Mg^{2+}$

Statement-II : Correct order of magnitude of gain enthalpy for 17th group follows order Cl > F > Br > I (Magnitude only)

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

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

3) Both statement-I & statement-II are incorrect

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

QN Chromite ore + Na_2CO_3 + O_2 →insoluble product containing Fe. Calculate the molar mass of insoluble product formed. (Given : Molar mass of Cr = 52g/mol, Na = 23 g/mol, Fe = 56 g/mol, O = 16 g/mol)

QN What is the value of van't Hoff factor for A_2B is 30% of A_2B is dissociated?

1) 1.60 2) 1.30 3) 1.50 4) 1.20

QN Match the following List-I with List-II

List-I	List-II
A) $[Co(OX)_3]^{3-}$	i) sp^3d^2
B) $[FeF_6]^{3-}$	ii) d^2sp^3
C) $[Ni(CO)_4]$	iii) dsp^2
D) $[PtCl_4]^{2-}$	iv) sp^3

1) A→i; B→ii; C→iii; D→iv

2) A→ii; B→i; C→iii; D→iv

3) A→i; B→ii; C→iv; D→iii

4) A→ii; B→i; C→iv; D→iii

QN Find the order of the reaction A+B→F.

If the mechanism of the reaction is given below

Step-I : A + B→D (Slow)

Step-2 : D →C + E (Fast)

Step-3 : C + E →F (fast)

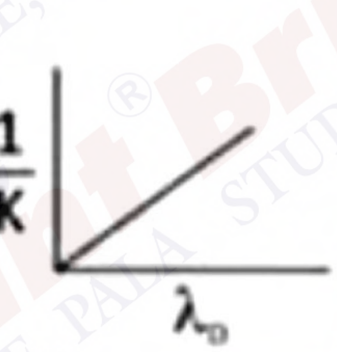
1) 1 2) 3 3) 2 4) 4

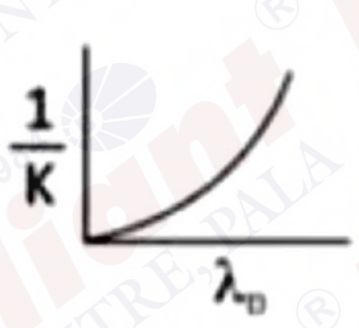
QN Given ionisation enthalpy of element $E_{(g)}$ is 300 kJmol and electron gain enthalpy of A, B, C and D gases atoms are –320 kJ/mol, –340 kJ/mol, –200 kJ/mol and –250 kJ/mol, then what will be the correct order of ionic nature of compounds?

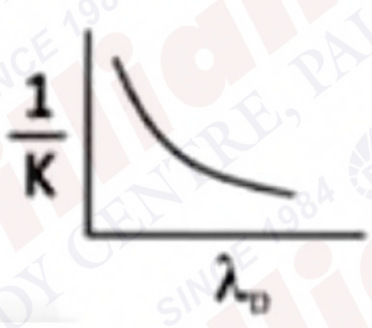
1) EB > EA > ED > EC 2) EB > EA > EC > ED

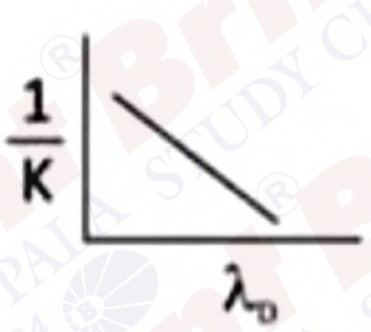
3) EC > ED > EA > EB 4) EC > ED > EB > EA

QN Graph between de-Broglie wavelength (λ_D) and kinetic energy (K) of an electron is

1) 

2) 

3) 

4) 

QN $\wedge_m$ is directly proportional to $\sqrt{c}$ for an electrolyte, then molar conductance for the same electrolyte at infinite dilution shows

1) Small increase 2) Small decrease 3) Sharp increase 4) Sharp decrease

QN The correct order of melting point of d-block element is

1) Fe > Mn 2) Tc > Ru 3) Os > Re 4) Ta > W

QN What is the correct Nernst equation representation for the following cell reaction

$Mg(s) \rightarrow Mg^{2+} + 2e^-$

$Ag^+ + e^- \rightarrow Ag(s)$

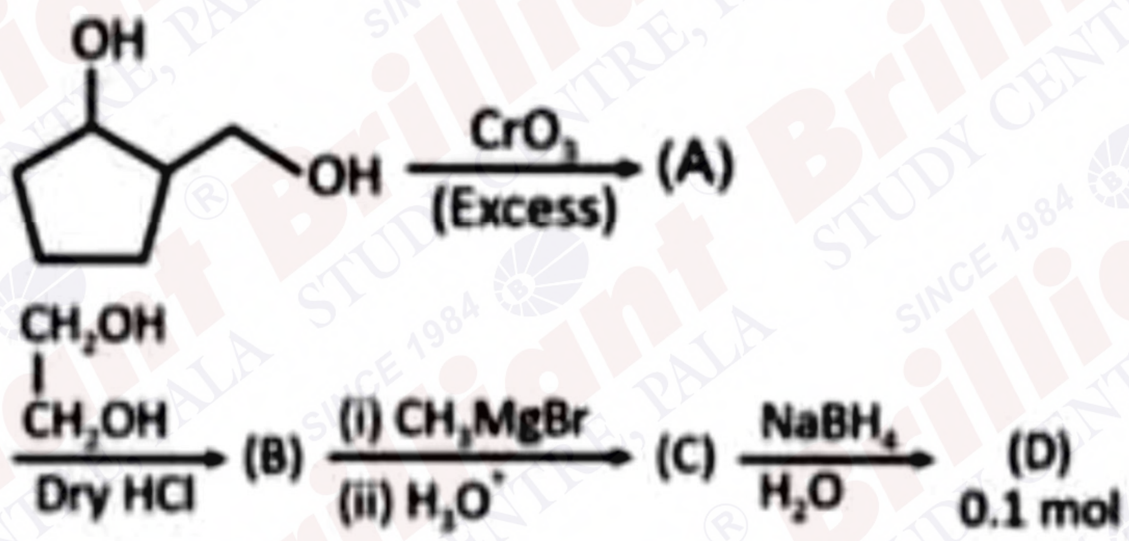
1) $E_{cell} = E^0_{cell} - \frac{RT}{nF} \ln \frac{[Mg^{2+}]}{[Ag^+]^2}$

2) $E_{cell} = E^0_{cell} - \frac{RT}{nF} \ln \frac{[Ag^+]^2}{[Mg^{2+}]}$

3) $E_{cell} = E^0_{cell} + \frac{RT}{nF} \ln \frac{[Mg^{2+}]}{[Ag^+]}$

4) $E_{cell} = E^0_{cell} + \frac{RT}{nF} \ln \frac{[Ag^+]^2}{[Mg^{2+}]}$

QN Consider the following reaction



Find the mass of final product (D) formed in gm(nearest integer)

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29-01-2025 SHIFT 1-MORNING

MEMORY BASED QUESTIONS

MATHEMATICS

QN The minimum value of n for which the number of integer terms in the binomial expansion of $\left(7^{\frac{1}{3}}+11^{\frac{1}{2}}\right)$ is 183 is

QN $80\int_0^{\frac{\pi}{2}}\frac{\sin x+\cos x}{9+16\sin 2x}dx$

QN $\vec{a}=2i-j+3k, \vec{b}=3i-5j+k$, if $\vec{a}\times\vec{c}=\vec{c}\times\vec{b}$ and $\left(\vec{a}+\vec{c}\right).\left(\vec{b}+\vec{c}\right)=168$ then $|c|^2=$

QN $L_1=\frac{x-1}{1}=\frac{y-2}{-1}=\frac{3-1}{2}, L_2=\frac{x+1}{-1}=\frac{y-2}{2}=\frac{3}{1}$ set the line L3 passes through the point (α,β,γ) perpendicular to L_1 and L_2 and L_3 intersect line L_1, then $|5\alpha-11\beta-8\gamma|$ is

QN $\lim_{n\to\infty} n\sum_{k=1}^{n}\frac{k^3+6k^2+11k+5}{(k+3)!}$ is equal to

QN Sum of 1st 3 terms of an AP with integral common difference is 54 and sum of first 20 terms lies between 1600 to 1800, find a_{11}

QN Area enclosed by $y\geq|x-1|, y+|x|\leq 3, x^2\leq 2y-3$ is A then 6A is

QN $|z_1-8-2i|\leq 1$ and $|z_2-6+8i\leq 2|$ then minimum value of $|z_1-z_2|$ is equal to

QN If R be a relation defined on $\left(0,\frac{\pi}{2}\right)$ such that $xRy\Rightarrow\sec^2 x-\tan^2 y=1$ then the relation is

QN Number of 7 digit numbers made with the digits 1,2,3 such that sum of the digits is 11 is equal to

QN If $\cos^{-1}x=\pi+\sin^{-1}x+\sin^{-1}(2x-1)$, then find the sum of all values of x

QN The minimum value of P such that $\lim_{x\to 0^+} x\left[\left(\frac{1}{x}\right)+\left(\frac{2}{x}\right)+.....+\left(\frac{P}{x}\right)\right]-$

$x^2\left[\left(\frac{1}{x^2}\right)+\left(\frac{2}{x^2}\right)+.....+\left(\frac{9}{x^2}\right)\right]\geq 1$ is equal to

QN If $\begin{vmatrix}\sin^2 x & 1+\cos^2 x & \sin 4x\\ 1+\sin^2 x & \cos^2 x & \sin 4x\\ \sin^2 x & \cos^2 x & 1+\sin 4x\end{vmatrix}=L$ and $L_{\min}=m$ and $L_{\max}=M$, then $|M^4-M^4|$ is

1) 79 2) 78 3) 80 4) 76

QN If α, β are real numbers such that $\sec^2(\tan^{-1}\alpha) + \operatorname{cosec}^2(\cot^{-1}\beta) = 36$ and $\alpha + \beta = 8$, where $\alpha > \beta$, then $\left(\alpha^3 + \beta^3\right)$ is equal to

QN How many 6 letter words can be formed using the word "MATHS" such that any letter can be used maximum two times?

1) 6400 2) 8100 3) 10000 4) 9824

QN A triangle is formed by three lines $2x + 3y - 5 = 0$, $x + y - 1 = 0$, $3x + 4y - 7 = 0$. Let (h,k) be the image of the centroid of ΔABC in the line $2x + 4y - 7 = 0$, then $h^2 + k^2 + hk$ is

1) $\frac{903}{225}$ 2) $\frac{223}{225}$ 3) $\frac{100}{23}$ 4) $\frac{10006}{225}$

QN Two parabolas having common focus at (4,3) intersect at points A and B. Find the value of $(AB)^2$, given that directrices of these parabolas are along X - axis and Y - axis respectively

QN Assertion: At the peak of mountain, time period of pendulum increases

Reason: Time period of pendulum increases with decrease in g.

1) Assertion is correct, Reason is correct

2) Assertion is incorrect, Reason is correct

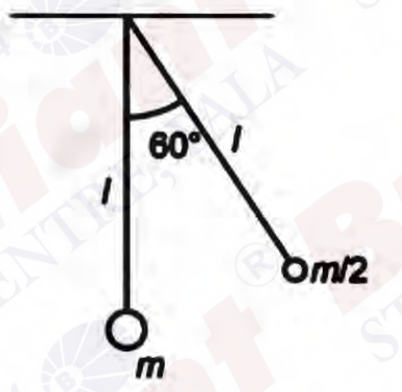
3) Assertion is incorrect, Reason is incorrect

4) Assertion is correct, Reason is correct

QN The velocity of a particle moving on a straight line varies with time as $v = v = At^2 + \frac{Bt}{C + t^2}$, where, A, B, C are constants. Find the dimension of ABC

1) L^2T^{-2} B) Lt^2T^{-1} C) L^2T^{-3} D) LT^{-3}

QN A pendulum of mass $\frac{m}{2}$ is released from given situation. Find speed of another pendulum after collision. (e =1)



1) $\sqrt{\frac{3}{2}gl}$ 2) $\frac{2}{3}\sqrt{gl}$ C) $\sqrt{\frac{gl}{3}}$ D) $\frac{1}{3}\sqrt{gl}$

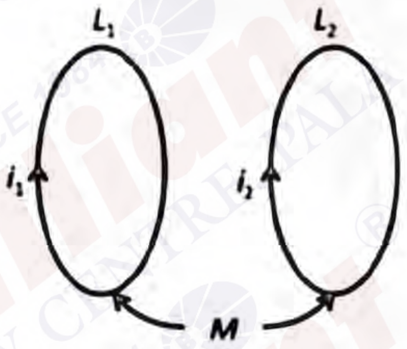
QN Two coils having self inductance L_1 and L_2 are placed closely such that they have a mutual inductance M. If the carry currents i_1 and i_2 as shown in the figure than the induced emf in coil 1 is

1) $-L_1\left(\frac{di_1}{dt}\right) + M\left(\frac{di_2}{dt}\right)$

2) $-L_1\left(\frac{di_1}{dt}\right) - M\left(\frac{di_2}{dt}\right)$

3) $-L_1\left(\frac{di_2}{dt}\right) + M\left(\frac{di_1}{dt}\right)$

4) $-L_1\left(\frac{di_2}{dt}\right) - M\left(\frac{di_1}{dt}\right)$



QN Two projectiles were launched from same position simultaneously only same speed on of the projectile was launched at angle $(45 - \alpha)^\circ$ and the other at an angle of $\left(45 + \alpha^\circ\right)$. Find the ratio of maximum height of the projectile.

1) $\frac{1 - \sin\alpha}{1 + \sin\alpha}$ 2) $\frac{1 - \sin 2\alpha}{1 + \sin 2\alpha}$ 3) $\frac{1 - \tan\alpha}{1 + \tan\alpha}$ 4) $\frac{1 - \cos\alpha}{1 + \cos\alpha}$

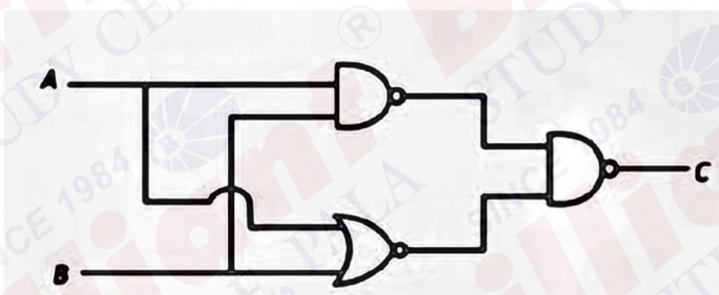
QN A river is flowing with speed 9km/h. Boat is going down stream - speed of boat in still water is 27km/h. A person in boat throws a ball upwards with speed 10m/s. Find range of the ball as seen by an observer at bank of river.

1) 10m 2) 20m 3) 25m 4) $20\sqrt{3}$m

QN Which of the two physical quantities have same dimensions?\

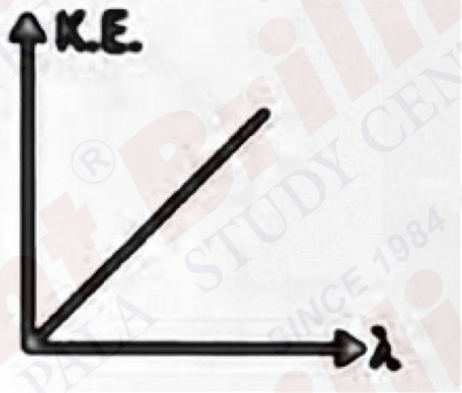
1) Angular momentum and Planck's constant
2) Torque and moment of inertia
3) Impulse and surface tension
4) Momentum and work done

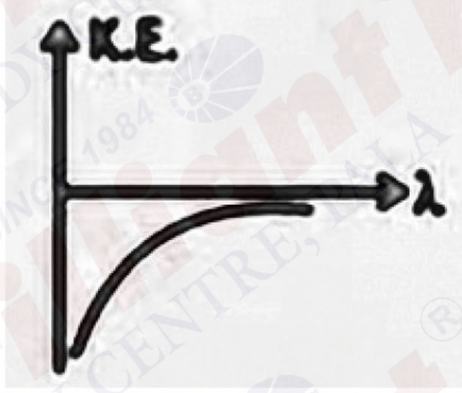
QN Identify the logic gate represented by the circuit shown below.

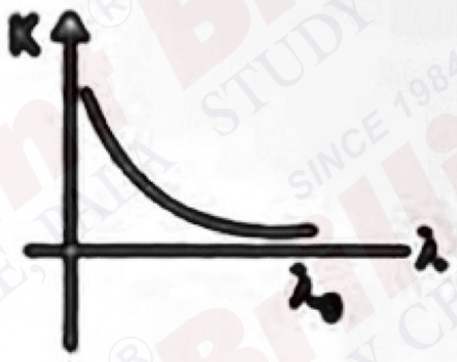


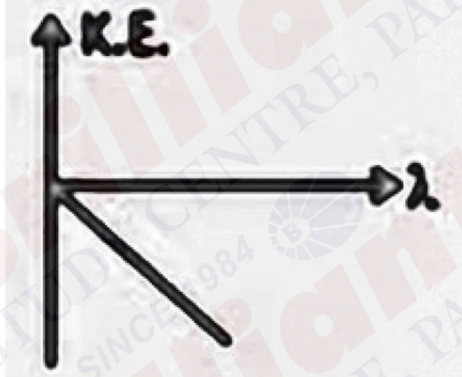
1) OR gate 2) NAND gate 3) AND gate 4) NOR gate

QN The graph between wavelengths (λ) of incident light and kinetic energy (K. E) of photoelectrons in photoelectric effect is

1) 

2) 

3) 

4) 

QN Statement 1: Electromagnetic wave have both energy and momentum

Statement 2: Rest mass of photon is zeo

1) Statement 1 is correct, Statement 2 is correct
2) Statement 1 is correct, Statement 2 is incorrect
3) Statement 1 is incorrect, Statement 2 is correct
4) Statement 1 is incorrect, Statement 2 is incorrect

QN If the radius of first Bohr's orbits of H-atom is a_0 Then find the radius of 2nd Bohr's orbit of H- atom

1) $8a_0$ 2) $4a_0$ 3) $2a_0$ 4) $6\pi a_0$

QN Assertion : A negative potential is required to stop the photoelectron

Reason: Speed of electron decreases when a negative potential is applied in a photo cell

1) Assertion is correct but Reason is false

2) Assertion is correct and Reason is also correct

3) Assertion is false but Reason is correct

4) Assetion is false and Reason is also false

QN Heat given to 0.5 moles of a monoatomic gas at constant pressure is 500J. Initial temperature of gas was 27°C. Find value of ΔV and ΔT.

1) $300J, 48°C$ 2) $150J, 24°C$ 3) $180J, 16°C$ 4) $210J, 18°C$

QN An infinite solid cylindrical wire of radius R carries a current I uniformly distributed along its area. The distance from the centre where the magnetic field is equal to $\frac{\mu_0 I}{4\pi R}$ is

1) R/2 2) R 3) 4R 4) Zero

QN When ball is kept under sea at depth 2.5km. Find the percentage change in it's volume. If bulk modulus of water is $2 \times 10^9 Pa$.

1) 2% 2)15% 3) 1.25% 4) 2.75%