JEE MAINS 2026

PAPER SOLUTION

05 APR, SHIFT 2

•LIVE

PHYSICS

Q) Escape velocity on earth is $v_e = \sqrt{2gR}$. A planet of half the radius of earth will density equal to that of earth, the escape speed shall be $\frac{v_e}{N}$ then N is

$V_e = \sqrt{2gR}$

$g = \frac{GM}{R^2}$

$V_e = \sqrt{2\left(\frac{GM}{R^2}\right)R}$

$V_e = \sqrt{\frac{2GM}{R}}$

$M = \rho V$

$M = \rho\left(\frac{4}{3}\pi R^3\right)$

$V_e = \sqrt{\frac{2G\left(\rho \times \frac{4}{3}\pi R^3\right)}{R}}$

$V_e = \sqrt{CR^2}$

$V_e \propto R$

$V_e' = \frac{V_e}{2}$

$N = 2$

Q) Find dimensions of $\sqrt{\frac{Gh}{c^5}}$

(A) $[M^0 L^0 T^{-1}]$
(B) $[M^0 L T^{-1}]$
(C) $[ML^2 T^{-1}]$
(D) $[M^0 L^0 T^1]$

$$F = \frac{G m_1 m_2}{r^2}$$

$$G = \frac{F \times r^2}{m^2}$$

$$G = \frac{[M^1 L^1 T^{-2}][L^2]}{[M^2]}$$

$$\sqrt{\frac{[M^{-1} L^3 T^{-2}][M^1 L^2 T^{-1}]}{[L^1 T^{-1}]}} \equiv \sqrt{[L^4 T^{-4}]}$$

$$\sqrt{T^2} = T$$

$$E = h\nu$$

$$h = \frac{E}{\nu} = \frac{[M^1 L^2 T^{-2}]}{[T^{-1}]}$$

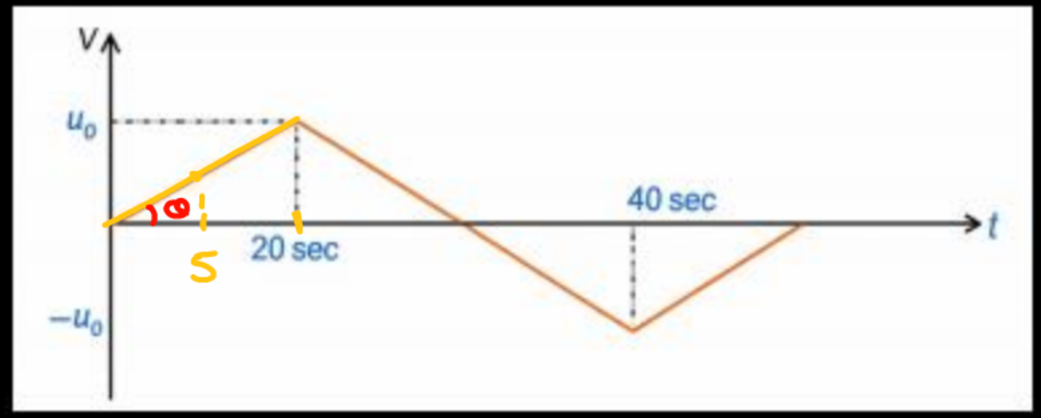
$$h = [M^1 L^2 T^{-1}]$$

Ans. (D)

Q) Find magnitude of acceleration of the particle at t = 5 sec

(A) $u_0/4$ **(B) $u_0/10$**

(C) $u_0/5$ **(D) $u_0/20$**



$$\tan\theta = \frac{u_0}{20} = a$$

Ans. (D)

Q) 8 Hg drops coalesce to form a new drop. Ratio of final surface energy of new drop to total surface energy of 8 drops is

(A) 1 **(B) 1/2**

(C) 1/4 **(D) 1/8**

$$8 \times \frac{4}{3}\pi r^3 = \frac{4}{3}\pi R^3$$

$$2r = R$$

$$\left(\frac{R}{r}\right)^2 = (2)^2 = 4$$

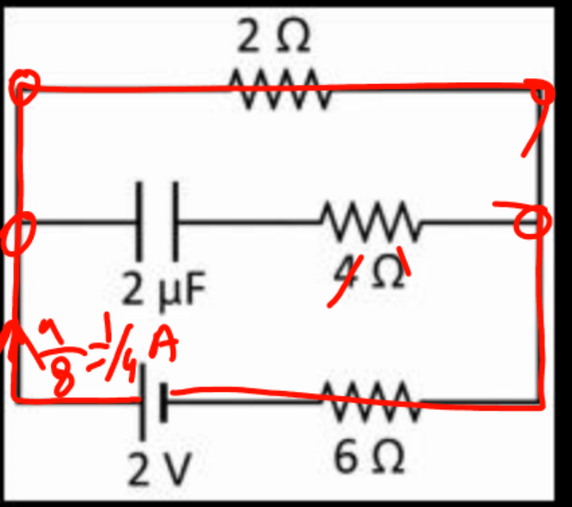
$$= \frac{8 \times 4\pi R^2}{8\left(8 \times 4\pi r^2\right)} = \frac{4}{8} = 1/2$$

Ans. (B)

Q) In circuit below, find voltage across capacitor in steady state

(A) 0.5 V (B) 1 V

(C) 4 V (D) 3/2 V



Ans. (A)

Q) A wheel initially at rest is subjected to a unform angular acceleration about its axis. In the first 2 seconds it rotates through an angle θ_1 and in the next 2 seconds it rotates an angle θ_2. Find the ratio θ_2/θ_1.

(A) 3 (B) 1/3 (C) 4 (D) 6

1 3 : 5 : 7

$\theta_1 = 0 + \frac{1}{2}\alpha(2)^2$

$\theta_2 = \frac{1}{2}\alpha(4)^2 - \frac{1}{2}\alpha(2)^2$

$\frac{\theta_2}{\theta_1} = 3$

Ans. (A)

CHEMISTRY

Q) Given below are two statements:

Statement I: Glucose is found to exist in two different anomeric form α and β.

Statement II: In open chain structure C_3, C_4, C_5 of glucose & fructose both have same orientation at chiral carbon.

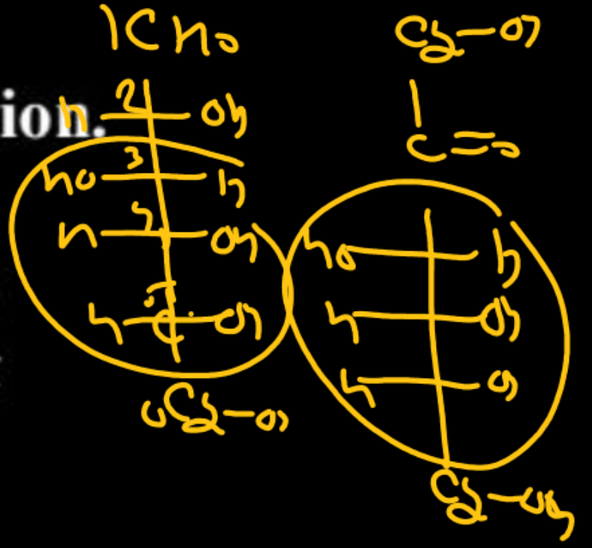
In the light of above statements choose the correct option.

(A) Both statement I and statement II are correct

(B) Statement I is correct but statement II is incorrect

(C) Statement I is incorrect but statement II is correct

(D) Both statement I and statement II are incorrect



Ans. (A)

MATH

Q) The coefficient of x^2 in the binomial expansion of $\left(2x^2 + \frac{1}{x}\right)^{10}$ is:

(A) 3360 (B) 3260 (C) 1760 (D) 1890

$T_{r+1} = {}^{10}C_r (2x^2)^{(10-r)} (x^{-1})^r$

$= {}^{10}C_r \cdot 2^{10-r} \cdot x^{20-3r}$ $\quad 20-3r = 2 \Rightarrow r = 6.$

Regd Coeff $= {}^{10}C_6 \cdot 2^4 = 210(16)$

$= 3360$

Ans. (A)

TPT

Q) If it is given that probability of A, becoming captain of the team is 0.8 and B becomes captain is 0.4. If A becomes captain then chances of winning the match by the team is 0.6 and when B becomes captain then chances of team winning the match is 0.7. Then the probability that team wins the match is:

(A) 0.74 (B) 0.78 (C) 0.76 (D) 0.84

$P(A) = \frac{48}{100} + \frac{28}{100}$

$= \frac{76}{100}$

$= 0.76.$

A: Team wins

E_1: A is captain ; $P(E_1) = \frac{8}{10}$; $P\left(\frac{A}{E_1}\right) = \frac{6}{10}$

E_2: B is —11— ; $P(E_2) = \frac{4}{10}$; $P\left(\frac{A}{E_2}\right) = \frac{7}{10}$

Ans. (C)

Que $\sum_{n=1}^{10} \frac{n}{1+4n^4}$

$\sum_{n=1}^{10} \frac{n}{(2n^2+1)^2-4n^2}$

$\frac{n}{(2n^2+1+2n)(2n^2+1-2n)}$

$\frac{1}{4}\left(\frac{(2n^2+1+2n)-(2n^2+1-2n)}{(\quad)(\quad)}\right)$

$\frac{1}{4}\sum_{n=1}^{10}\left(\frac{1}{2n^2+1-2n} - \frac{1}{2n^2+1+2n}\right)$

$\frac{1}{4}\left(\frac{1}{1} - \cancel{\frac{1}{5}} + \cancel{\frac{1}{5}} - \cancel{\quad} - \cancel{\quad} - + \cancel{\left(1-\left(\frac{1}{221}\right)\right)}\right)$

$\frac{1}{4}\left(\frac{220}{221}\right)$

$= \frac{55}{221}$

Q) Let A = {2, 3} and B = {5, 6}. Then, the number of relations from A × B to B × A are

(A) 2^{12} ☑(B) 2^{16} (C) 2^{10} (D) 2^{15}

$A \times B = \{(2,5), (2,6), (3,5), (3,6)\}$

$n(A \times B) = n(B \times A) = n(A)\, n(B) = 4$

no. of Relation $= 2^{4 \times 4} = 2^{16}$

$n(A) = p$

$n(B) = q$

$n(A \times B) = pq$

no. of Relation $= 2^{pq}$

Ans. (B)

Q) A bag contains 4 red balls, 6 yellow balls and 5 blue balls. In how many ways we can select 8 balls such that we get at least two balls of each colour, is

R	Y	B	
2	2	4	$= {}^4C_2 \times {}^6C_2 \times {}^5C_4$
2	3	3	$= {}^4C_2 \times {}^6C_3 \times {}^5C_3$
2	4	2	
3	2	3	
3	3	2	
4	2	2	

$= 4100$

Ans. (4100)

Q) If distance of point (a, 2, 5) from image of point (1, 2, 7) in line $\frac{x}{1} = \frac{y-1}{1} = \frac{z-2}{2}$ is 4, then sum of all possible values of a is :

Q

$(a-3)^2 + 2^2 + 0^2 = 4^2$

$a^2 - 6a - 3 = 0$

P(1,2,7)

R (α, α+1, 2α+2)

<2, 3, 6>

P'

<3, 4, 5>

$[(\alpha-1)\hat{i} + (\alpha-1)\hat{j} + (2\alpha-5)\hat{k}] \cdot [\hat{i}+\hat{j}+2\hat{k}] = 0$

$\alpha - 1 + \alpha - 1 + 2(2\alpha - 5) = 0$

$6\alpha = 12 \Rightarrow \alpha = 2$

Ans. (6)

Q) If $z^2 + 4z - (1+12i) = 0$ has roots z_1 and z_2 then find $|z_1|^2 + |z_2|^2$ (where $z_1, z_2 \in C$)

$(z+2)^2 - 4 - 1 - 12i = 0 \Rightarrow (z+2)^2 = 5+12i$

$z+2 = \pm\sqrt{5+12i}$

$\sqrt{5+12i} = x+iy$

$5+12i = x^2 - y^2 + 2xyi$

$xy = 6, \quad x^2 - y^2 = 5$

$x^2 + y^2 = \sqrt{(x^2-y^2)^2 + 4x^2y^2}$

$= \sqrt{25 + 4 \times 36}$

$= 13$

$2x^2 = 18 \Rightarrow x^2 = y \Rightarrow x = \pm 3$

$\pm(3+2i)$

$z+2 = \pm(3+2i)$

$z_2 = -5-2i$

$z_1 = 1+2i$

Ans. (34)

let $\alpha, \alpha r, \alpha r^2, \alpha r^3$

Q) Let $\alpha, \beta, \gamma, \delta$ are in G.P. If α, β are roots of $x^2 - x + p = 0$ and γ, δ are roots of $x^2 - 4x + q = 0$. If $p, q, \in I$ then find $|p + q|$

$\beta = \alpha^2 r$

$q = \alpha^2 r^5$

$\alpha + \alpha r = 1$

$\alpha(1 + r) = 1$

$\alpha r^2 (1 + r) = 4$

$r^2 = 4$

$r = 2, -2$ ✓

$3\alpha = 1$

$\alpha = \frac{1}{3}$ ✗

$-\alpha = 1$

$\alpha = -1$

$p = (1)(-2)$

$q = -32$

$|p + q| = 34$

Ans. (34)

Q) Let $A_1, A_2, A_3 \ldots\ldots A_{39}$ be 39 arithmetic mean between the numbers of 59 and 159. Then the mean of $A_{25}, A_{28}, A_{31}, A_{36}$ is:

(A) 122 (B) 143 (C) 134 (D) 140

$59+d, 59+2d \ldots\ldots 59+39d$

$59, A_1, A_2 \ldots\ldots\ldots A_{39}, 159 \Rightarrow$ 41 terms

$a =$ $\quad r =$

$159 = 59 + 40d$

$\frac{100}{40} = d = 2.5$

$\therefore \frac{(a+24d)+(a+28d)+(a+31d)+(a+36d)}{4}$

$= a + 30d$

$= 59 + 75 = 134$

Ans. (C)

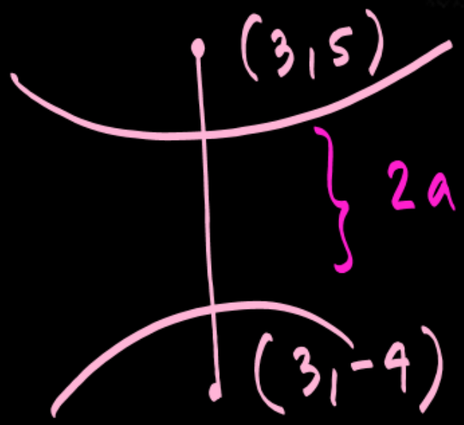
Q) Foci of Hyperbola are (3, 5) and (3, -4). Eccentricity of Hyperbola satisfies $3e^2 - 11e + 6 = 0$, then find LR of Hyperbola.

$e > 1$

$3e^2 - 9e - 2e + 6 = 0$

$3e(e-3) - 2(e-3) = 0$

$e = 3, \frac{2}{3}$ ✓ ✗



$2ae = 9$

$e^2 = 9 = 1 + \frac{b^2}{a^2}$

$9 = \frac{a^2 + b^2}{a^2}$

$a^2 e^2 = \frac{81}{4}$

$a^2\left(1 + \frac{b^2}{a^2}\right) = \frac{81}{4}$

$a^2 = \frac{9}{4}$

$a = 3/2$

$b^2 = \frac{72}{4}$

$\therefore LR = 2\frac{b^2}{a}$

$= 24$

Ans. (24) ✓

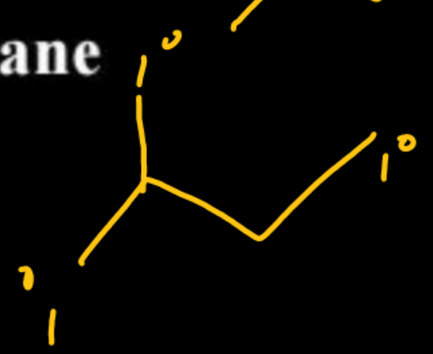
Q) In which of the following compound 1° carbon atoms are three, compound having molecular weight 72.

(A) 2,3-dimethyl butane

(B) 2,2-dimethyl propane

(C) 2-methyl butane

(D) n-pentane



$C_nH_{2n+2} = 72$

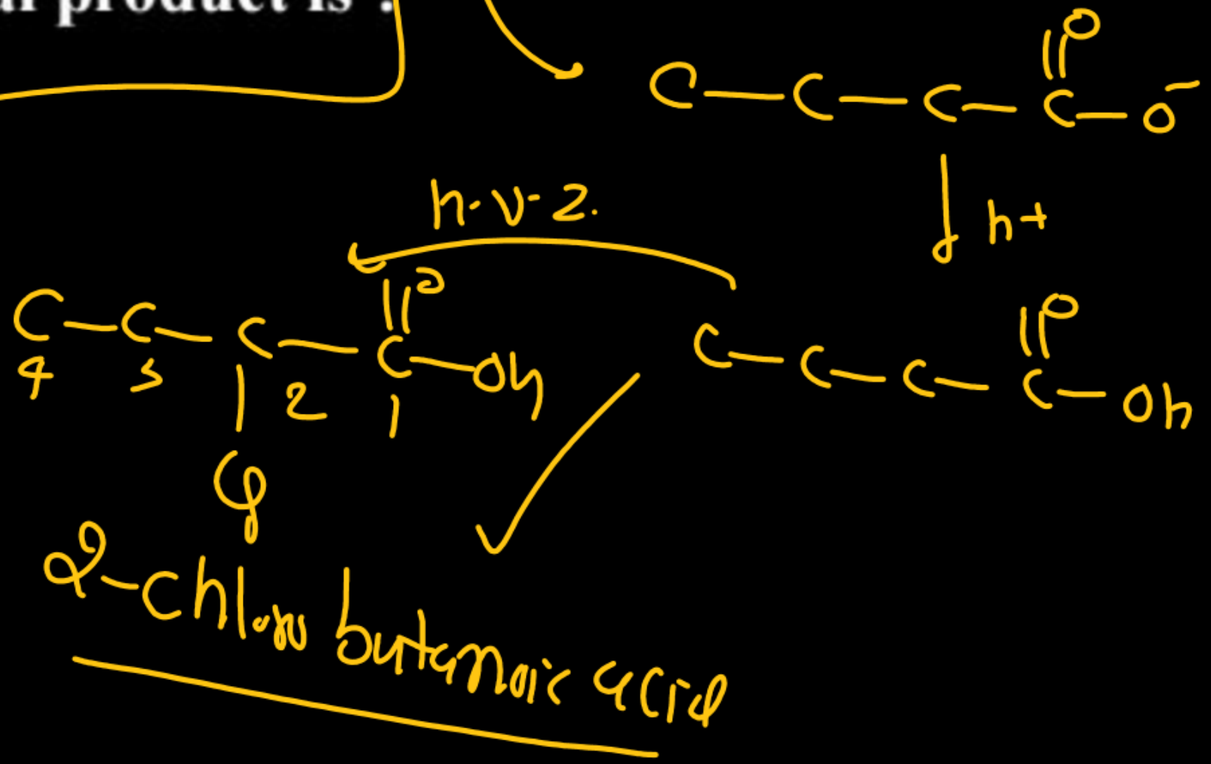
$12n + 2n + 2 = 72$

$n = 5 \longrightarrow C_5H_{12}$

Ans. (C)

Q) $CH_3 - CH_2 - CH_2 - CN$ —(i) OH^-/H_2O, (ii) H^+, (iii) Cl_2/Red P, (iv) H_2O→ product

Final product is ?



Q) Match List I to list II

List-I	List-II
(A) Fractional distillation	(P) technique used to separate liquid mixtures into component having almost same boiling points.
(B) Steam distillation	(Q) used to separate steam volatile compounds.
(C) Simple distillation	(R) technique used to separate liquid mixtures into component having a large difference in their boiling points.
(D) Distillation under reduce pressure	(S) to purify liquids with very high boiling points or those that decompose at or below their normal boiling point

Q) Given below are two statements:

Statement I: The shape of ICl_3 is square planar

Statement II: The shape of $ClBr_2^-$ is pyramidal

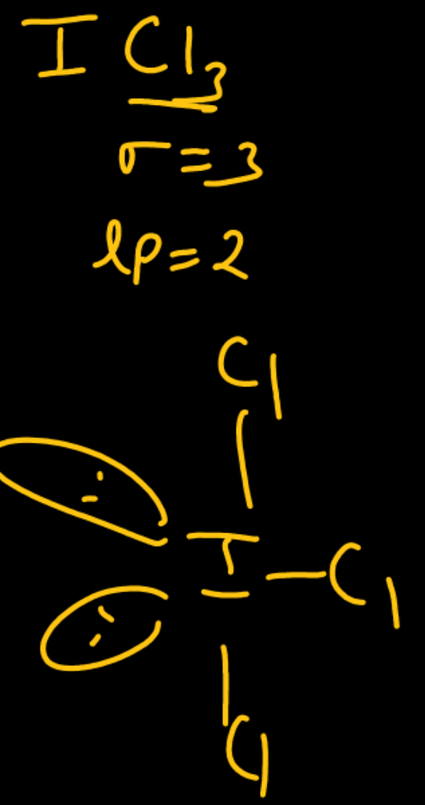
In the light of above statements choose the correct option.

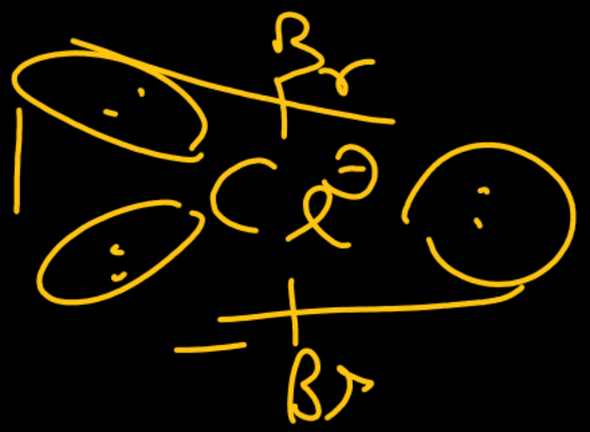
(A) Both statement I and statement II are incorrect

(B) Statement I is incorrect but statement II is correct

(C) Statement I is correct but statement II is incorrect

(D) Both statement I and statement II are correct





Ans. (A)

Q) Consider the following equilibrium –

$$2AB_{(g)} \rightleftharpoons A_{2(g)} + B_{2(g)}$$

If equilibrium pressure is P and degree of dissociation is α, then K_p is

(A) $\frac{\rho \cdot \alpha^2}{4(1-\alpha)}$ **(B)** $\frac{\rho \cdot \alpha}{(1-\alpha)}$ **(C)** $\frac{\alpha^2}{4(1-\alpha)^2}$ **(D)** $\frac{\rho \cdot \alpha}{4(1-\alpha)}$

$$2AB_{(g)} \rightleftharpoons A_{2(g)} + B_{2(g)}$$

	1		
t=0	1	–	–
t=eq	1−α	α/2	α/2

$$K_p = \frac{P_{A_2} \times P_{B_2}}{(P_{AB})^2} = \frac{\left(\frac{\alpha}{2} \times P\right)\left(\frac{\alpha}{2} \times P\right)}{\left(\frac{1-\alpha}{1} \times P\right)^2} = \frac{\alpha^2}{4(1-\alpha)^2}$$

Ans. (C)

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