JEE MAINS 2026

PAPER SOLUTION

05 APR, SHIFT 1

•LIVE

PHYSICS

Q) As shown in figure, the ratio of T_1 and T_2 is

(A) 1/3 **(B) 4/3**

(C) 10/3 **(D) 5/3**

$60 - T_2 = 6a$

$40 + T_2 - T_1 = 4a$

$T_1 - 40 = 4a$

$60 = 14a$

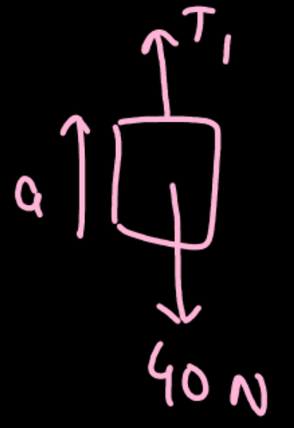
$a = \frac{30}{7}\ m/s^2$

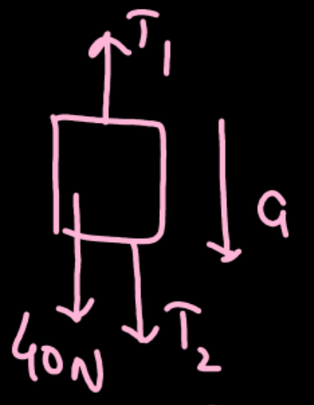
$T_1 = 40 + \frac{120}{7}$

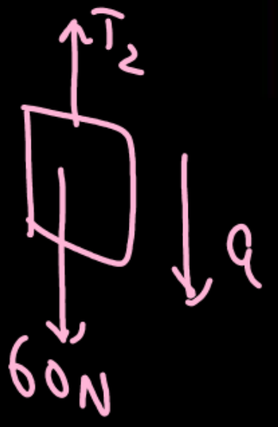
$T_1 = \frac{400}{7}$

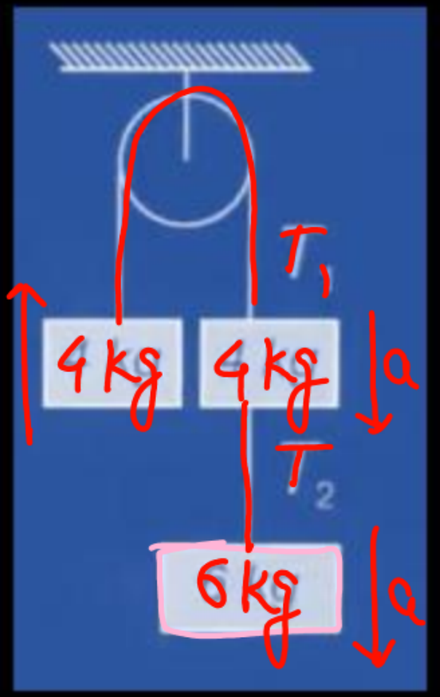
$T_2 = 60 - 6 \times \frac{30}{7} = \frac{420 - 180}{7}$

$T_2 = \frac{240}{7}$









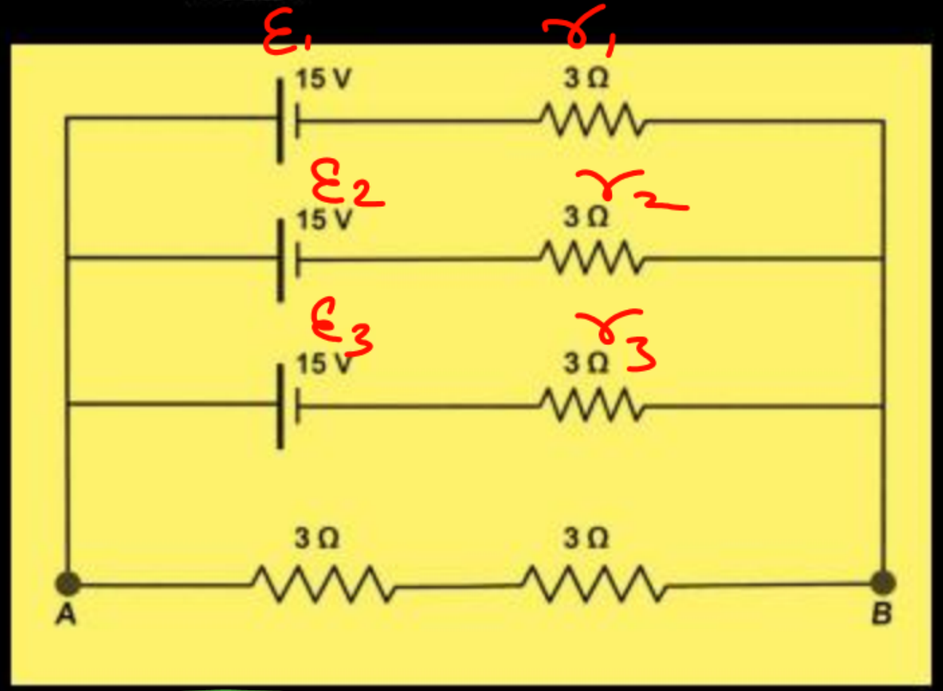
$\frac{4a}{24} = \frac{5}{3}$

Ans. (D)

Q) For the circuit shown below, find current across AB(I_{AB}).

(A) 10/7 A (B) 13/7 A

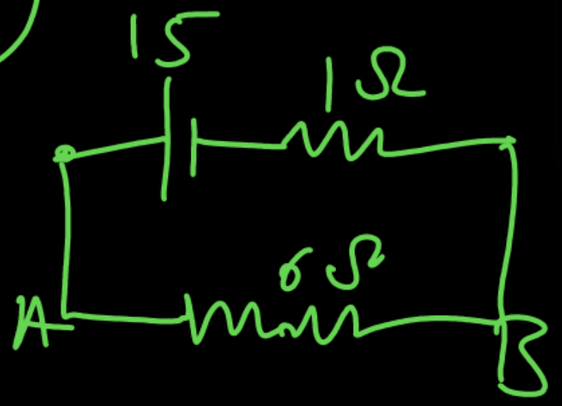
(C) 15/7 A (D) 11/7 A



$$\varepsilon_{eq} = \frac{\frac{15}{3} + \frac{15}{3} + \frac{15}{3}}{\frac{1}{3} + \frac{1}{3} + \frac{1}{3}} = \frac{45}{3} = 15$$

$$\frac{1}{r_{eq}} = \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$$

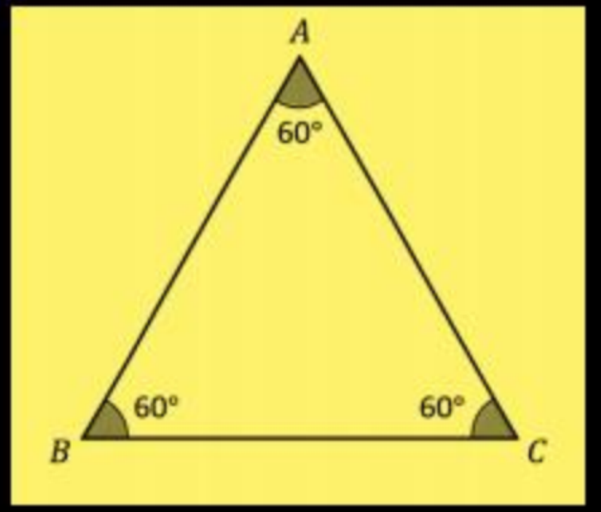
$$r_{eq} = 1$$



$$i = \frac{15}{7}\ A$$

Ans. (C)

Q) Speed of light in the prism = 2×10^8 m/s. Then find minimum deviation through the prism.



(A) $2\sin^{-1}\left(\frac{3}{4}\right) - 60^\circ$

(B) $2\sin^{-1}\left(\frac{3}{4}\right) + 30^\circ$

(C) $2\sin^{-1}\left(\frac{3}{4}\right) - 30^\circ$

(D) $2\sin^{-1}\left(\frac{3}{4}\right) + 60^\circ$

$\mu = \frac{c}{v} = \frac{3\times10^8}{2\times10^8} = \frac{3}{2}$

$\delta = i + e - A$

$i = e$

$r_1 = r_2 = \frac{A}{2} = \frac{60}{2} = 30^\circ$

$1\sin i = \frac{3}{2}\sin 30^\circ$

$\sin i = \frac{3}{4}$

$i = \sin^{-1}\left(\frac{3}{4}\right) = e$

Ans. (A)

Q) Select the quantity with matching dimensions of $[ML^2 T^{-4} A^{-2}]$.

(A) $\frac{1}{R}\sqrt{\frac{L}{C}}$

(B) $\frac{R}{LC}$

(C) $\frac{R}{\sqrt{LC}}$

(D) $\frac{C}{\sqrt{LR}}$

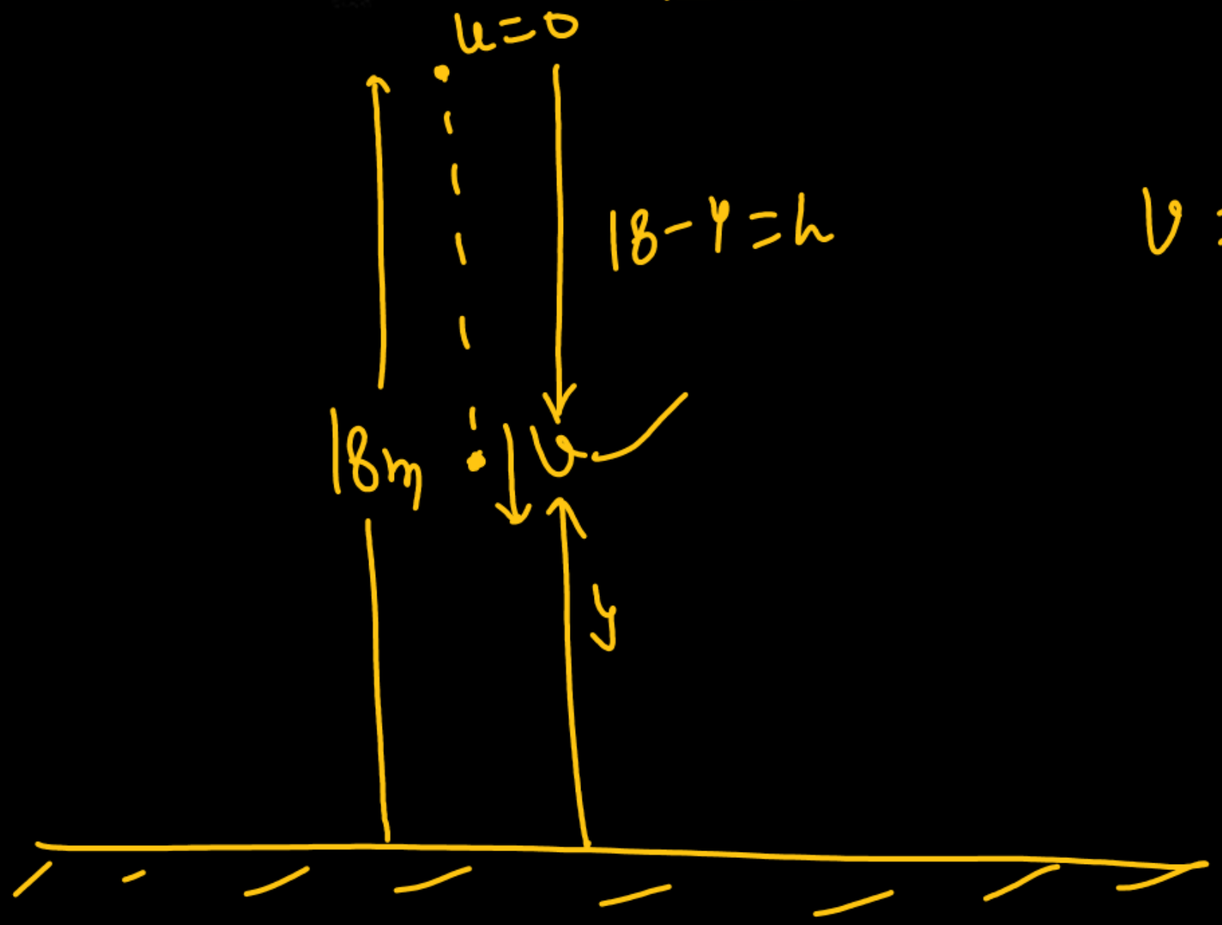
$$[\omega] = \left[\frac{1}{\sqrt{LC}}\right] = [T^{-1}]$$

$$R = \frac{V}{I} = \left[\frac{U}{qI}\right] = \frac{ML^2T^{-2}}{A^2T}$$

$$\frac{R}{\sqrt{LC}} = ML^2T^{-3}A^{-2} = ML^2T^{-3}A^{-2}$$

Ans. (C)

Q) A particle is drop from a height 18m from rest, find the height from ground when magnitude of acceleration and velocity are same.



$$v = \sqrt{2g(18-y)} = g$$

$$2g(18-y) = g^2$$

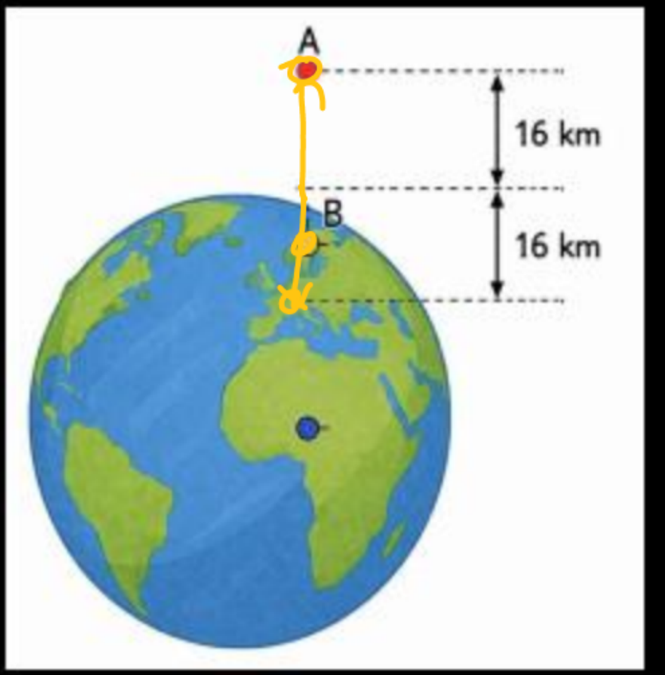
$$18-y = 5 \Rightarrow y = 13\,m$$

Q) Two points, A and B are 16 km from surface of earth. Acceleration due to gravity at A and B is g_A and g_B, then g_A/g_B =

(A) 149/200 **(B) 441/442**

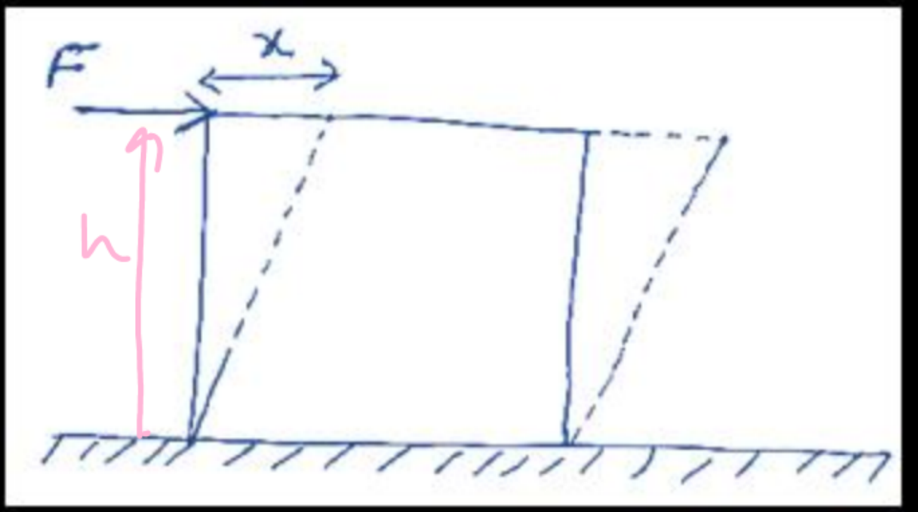
(C) 1/2 **(D) 398/399**

$$\frac{g_A = g_0\left(1 - \frac{2\times 16}{6400}\right)}{g_B = g_0\left(1 - \frac{16}{6400}\right)}$$



Ans. (D)

Q) Side of cube is 5 cm, $\eta = 2 \times 10^{+8}$ N/m², F = 10 N.
Find x?



$$\eta = \frac{F_{\parallel}/A}{x/h}$$

$$\frac{x}{h} = \frac{F_{\parallel} h}{A\eta} = \frac{10 \times 8 \times 10^{-2}}{25 \times 10^{-4} \times 2 \times 10^{+8}} \cdot m$$

$$x = 10^{-6}\ m = 1\ \mu m$$

Q) Young's modulus of wire is Y. Keeping material same, if radius of wire is doubled while length is halved. Then new value of Young's modulus is

(A) Y
(B) 2Y
(C) Y/2
(D) 4Y

Ans. (A)

CHEMISTRY

Q) 0.2 g of organic compound is subjected to estimation of 'S' by Carius method, giving 0.6g $BaSO_4$. Find % of S. (Nearest integer)

$$\%\text{ of } S = \frac{32}{233} \times \frac{w}{m} \times 100$$

$$= \frac{32}{233} \times \frac{0.6}{0.2} \times 100$$

$$= 41.20\%$$

Ans. (41.20%)

Q) Compare the energy of orbitals for multielectron species.

(A) A > B > C > D

(B) C > D > B > A

(C) C > B > D > A

(D) A > B > D > C

n+l

	n	l	m
(A)	3	0	0
(B)	3	1	−1
(C)	4	2	0
(D)	3	2	1

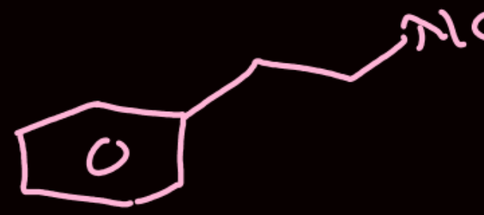
A 3

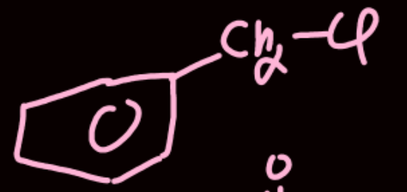
B 4

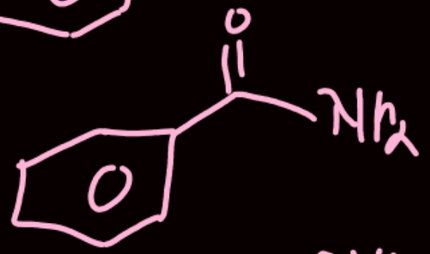
C 4

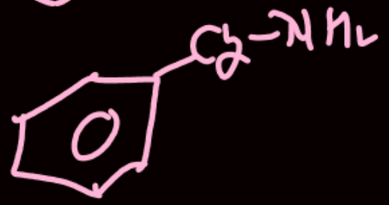
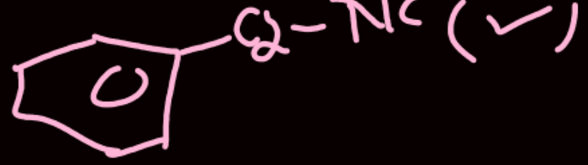
D 5

✓11 $Ph-CH_2-Br \xrightarrow{AgCN} Ph-CH_2-NC$ ✓

d✗  $\xrightarrow{AgCN}$  ✗

31✗  $\xrightarrow{KCN}$  ✗

41✗  $\xrightarrow{CH^- + Br_2}$ 

✓51  $\xrightarrow{CHCl_3 + KOH}$  (✓)

Q) Half life for a first order reaction is 6.93 min. What is the time required (in min) to complete 90% of reaction? (Nearest integer)

23

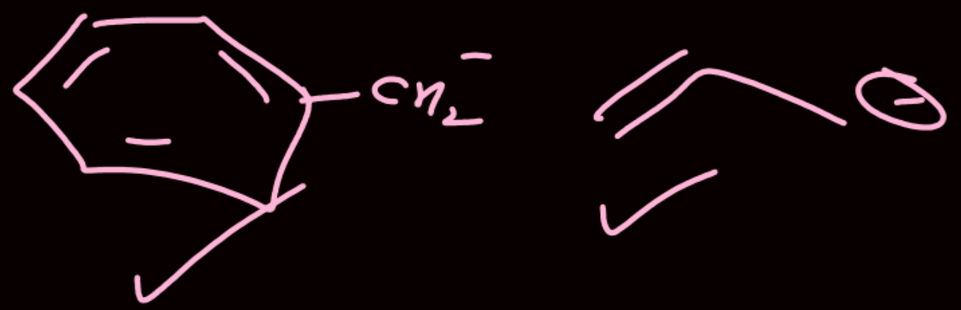
$$\frac{t_{90\%}}{t_{50\%}} = \frac{\frac{1}{k}\ln\frac{100}{10}}{\frac{\ln 2}{k}} = \frac{\ln 10}{\ln 2} = \frac{\log 10}{\log 2}$$

$$t_{90\%} = \frac{1}{0.30} \times 6.93 = 23.1 \text{ min}$$

Statement → CH_3^- > $CH_3-CH_2^-$ > $CH_3-\overset{-}{C}H-CH_3$ > $(CH_3)_3\overset{\ominus}{C}$

✓ This stability order is due to I-effect

Statement II → Benzyl, allyl $C^{\ominus}$ is are more then Normal alkyl $C^{\ominus}$ due to Resonance effect



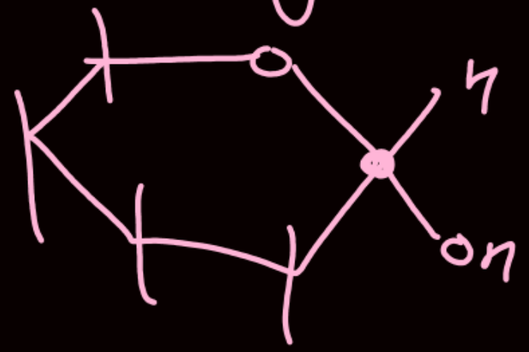
✓

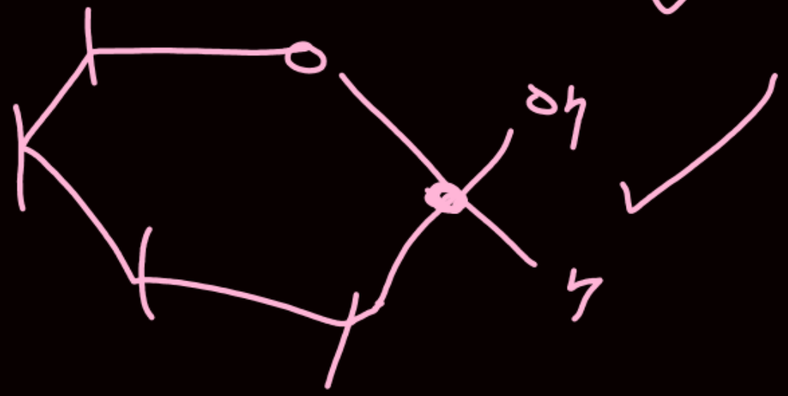
Q S-1 → glucose exist In 2-anomeric form ✓ T

S-2 α-glucose has more M.P then β-glucose ✗ F

S-3 α-glucose has optical Rotation → α = +19°
and β-glucose has optical Rotation α (+112°) ✓ T

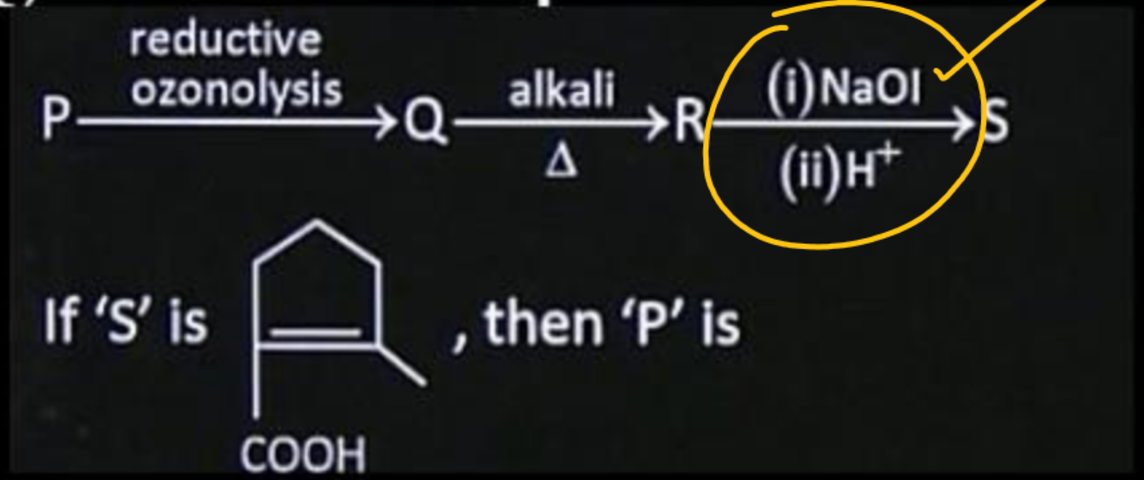
S-4

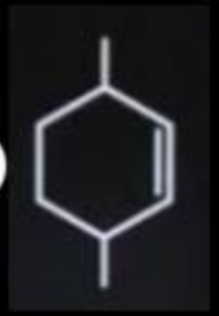


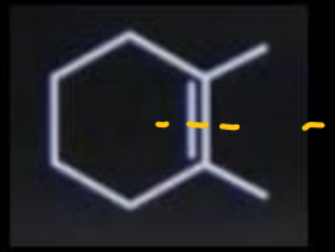


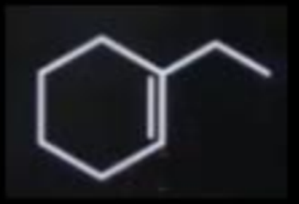
a, b, c
b, c, d

Q) Consider the sequence :

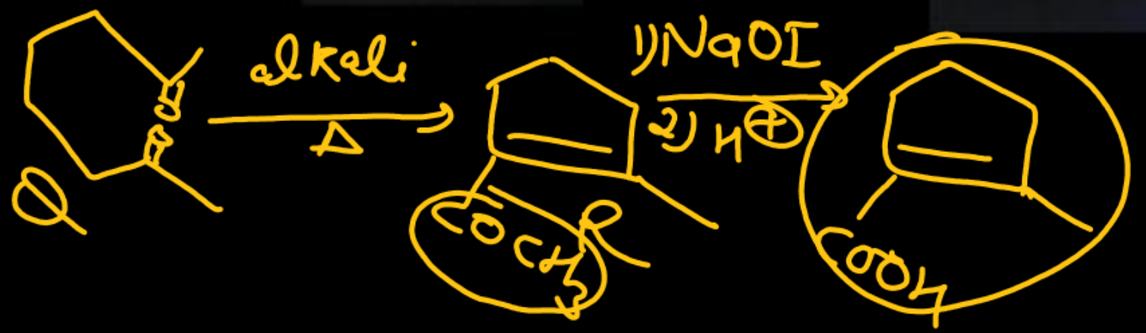


(A) 

(B) 

(C) 

(D) 

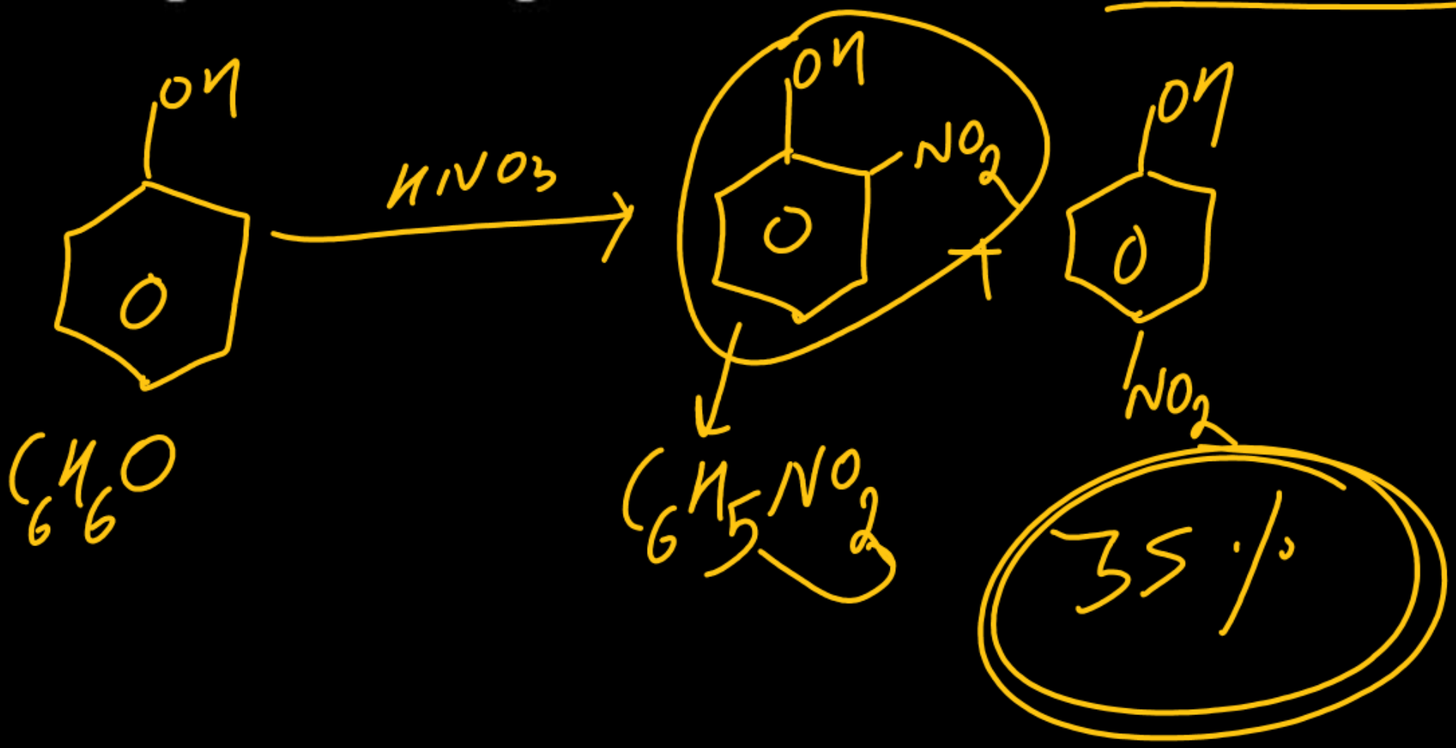


Ans. (B)

Q) Consider the following reaction :

$$\text{Phenol} \xrightarrow{HNO_3} \text{Product} \xrightarrow[\text{Distillation}]{\text{Steam}} \text{Filtrate}$$

Change in % of oxygen from phenol and product in filtrate is x%. Find the value of 2x.



Step 1: % Oxygen in Phenol (C_6H_6O)

Molar mass = $6 \times 12 + 6 \times 1 + 16 = 94$

$$\%O = \frac{16}{94} \times 100 \approx 17.02\%$$

Step 2: % Oxygen in p-Nitrophenol ($C_6H_5NO_3$)

Molar mass = $6 \times 12 + 5 \times 1 + 14 + 3 \times 16 = 139$

$$\%O = \frac{48}{139} \times 100 \approx 34.53\%$$

Step 3: Change in % Oxygen

$$x = 34.53 - 17.02 = 17.51\% \approx 17.5\%$$

Step 4: Find $2x$

$$2x \approx 2 \times 17.5 = \boxed{35}$$

Q) How many compounds among the following having sp^3d hybridisation of central atom BrF_5, XeF_5^-, ICl_2^-, ICl_4^-, SF_4, NH_4^+, ClF_3, XeF_2, XeF_4

BrF_5: $\sigma = 5$, $lp = 1$
XeF_5^-: $\sigma = 5$, $lp = 2$
ICl_2^-: $\sigma = 2$, $lp = 3$
ICl_4^-: $\sigma = 4$, $lp = 2$
SF_4: $\sigma = 4$, $lp = 1$
NH_4^+: $\sigma = 4$, $lp = 0$
ClF_3: $\sigma = 3$, $lp = 2$
XeF_2: $\sigma = 2$, $lp = 3$
XeF_4: $\sigma = 4$, $lp = 2$

5

S.N. = 5

$\sigma + l.p.$

4

Q) Given below are two statements:

Statement I: $K_2Cr_2O_7$ can be used as a primary standard

Statement II: Phenolphthalein is a weak base indicator

in the light of above statements choose the correct option.

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

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

(C) Both statement I and statement II are correct

(D) Both statement I and statement II are incorrect

Ans. (A)

Q) What amount of residual will be produced on heating 2.76 gram of Ag_2CO_3?

(A) 1.08g (B) 2.16g (C) 4.32 g (D) 3.2g

$Ag_2CO_3 \longrightarrow Ag$

POAC on Ag atom :-

$2 \times n_{Ag_2CO_3} = 1 \times n_{Ag}$

$2 \times \frac{2.76}{276} = n_{Ag}$

$n_{Ag} = 0.02$

$W_{Ag} = 0.02 \times 108$

$= 2.16$ gm

Ans. (B)

Q) Ionic eq.

(7) more

SB

100%

10^{-7} M KOH

pH ?

$[OH^-] = 10^{-7}$ M

$[OH^-]_{Total} = [OH^-]_{KOH} + [OH^-]_{water}$

$= 10^{-7} + 10^{-7}$

$= 2 \times 10^{-7}$

$p^{OH} = 7 - 0.3$

$= 6.7$

$pH = 7.3$

water $[OH^-] \approx 10^{-7}$ M

MATH

Q) The sum of value $\sum_{n=1}^{10} \frac{528}{n(n+1)(n+2)}$ is equal to:

(A) 220 (B) 130 (C) 65 (D) 260

$= 264\left[\frac{1}{2} - \frac{1}{11.12}\right]$.

$= \frac{264}{264}\left[\frac{66-1}{11.12}\right]$

$= 2 \times 65 = 130$.

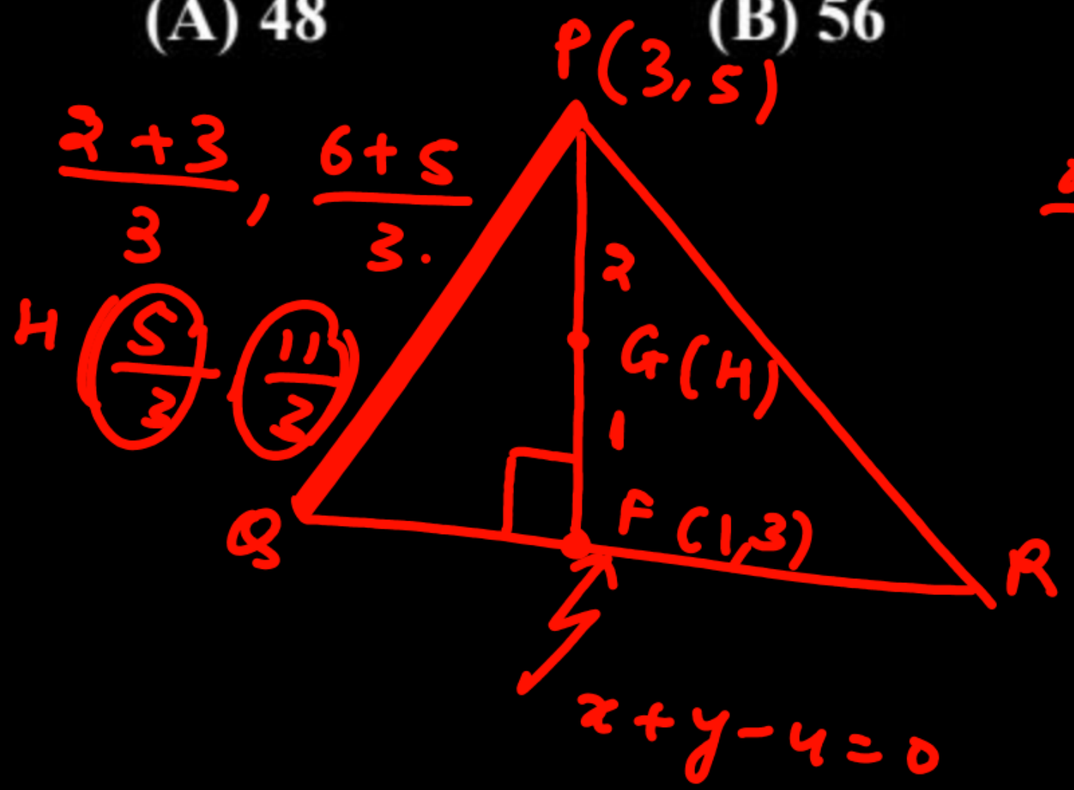
$= \frac{528}{2} \sum_{n=1}^{10} \left(\frac{1}{n(n+1)} - \frac{1}{(n+1)(n+2)}\right)$

$= 264\left[\frac{1}{1.2} - \frac{1}{2.3} + \frac{1}{2.3} - \frac{1}{3.4} \quad \cdots \quad \frac{1}{10.11} - \frac{1}{11.12}\right]$

Ans. (B)

Q) Consider an equilateral triangle PQR where P(3, 5) and QR is $x + y = 4$. It the orthocentre of ΔPQR is (α, β), then $9(\alpha + \beta)$ is equal to:

(A) 48 (B) 56 (C) 64 (D) 36



$\frac{x-3}{1} = \frac{y-5}{1} = -\left(\frac{3+5-4}{1+1}\right) = -2.$

F(1, 3)

$9(\alpha+\beta) = 9 \times \frac{16}{3}$

$= 48$

Ans. (A)

Q) A Teacher wrote either of words "KANPUR" or "ANANTPUR" on board but due to malfunction of marker words is not properly written and only two consecutive letters "AN" are visible then the chance that the written word is "KANPUR" is:

(A) $\frac{7}{17}$ (B) $\frac{5}{17}$ (C) $\frac{9}{17}$ (D) $\frac{11}{17}$

$$\text{prob} = \frac{\frac{1}{2} \times \frac{1}{5}}{\frac{1}{2} \times \frac{1}{5} + \frac{1}{2} \times \frac{2}{7}} = \frac{7}{17}$$

Ans. (A)

Q) If $S_n = 3n^2 + 5n$ find then sum of square of first 10 terms of series is

(A) 16320 (B) 15220 (C) 17220 (D) 18320

$$T_n = S_n - S_{n-1} = 3n^2 + 5n - (3(n-1)^2 + 5(n-1))$$

$$T_n = 6n + 2$$

$$S_n = \sum_{n=1}^{10} T_n^2 = \sum_{n=1}^{10} (36n^2 + 24n + 4)$$

$$= 36 \frac{10(11)(21)}{6} + 24 \frac{10 \cdot 11}{2} + 4(10)$$

$$= 15220$$

Ans. (B)

Q) The value of $\int_0^\infty \frac{\ln x}{x^2+4}dx$ is equal to

(A) $\frac{\pi \ln 4}{3}$ (B) $\frac{\pi \ln 2}{2}$

(C) $\pi \ln 2$ (D) $\frac{\pi \ln 2}{4}$

Ans. (D)

$\int \frac{\ln x}{ax^2+bx+a}$

$x=2t \Rightarrow dx=2dt$

$I=\int_0^\infty \frac{(\ln 2+\ln t)}{4(t^2+1)}dt = \frac{1}{4}\int_0^\infty \frac{\ln 2\,dt}{t^2+1} + \frac{1}{2}\int_0^\infty \frac{\ln t\,dt}{t^2+1}$ (I')

$I=\frac{1}{2}\int_0^\infty \frac{\ln 2\,dt}{t^2+1} = \frac{\ln 2}{2}\left[\tan^{-1}t\right]_0^\infty$

$t=\frac{1}{y}$, $dt=-\frac{1}{y^2}dy$

$I'=\frac{1}{2}\int_\infty^0 \frac{-\ln y}{\left(\frac{1}{y^2}+1\right)}\left(\frac{-1}{y^2}\right)dy$

$x=2\tan\theta$, $dx=2\sec^2\theta\,d\theta$

$\int_0^{\pi/2} \frac{\ln 2+\ln\tan\theta}{4\sec^2\theta}(2\sec^2\theta\,d\theta)$

$\frac{1}{2}\left(\ln 2\left(\frac{\pi}{2}\right) + \int_0^{\pi/2}\ln\tan\theta\,d\theta\right)$

$+\int_0^{\pi/2}\ln\cot\theta\,d\theta$

$+\int_{\pi/2}^{\pi}\ln\tan(\pi-\theta)\,d\theta$

Q) The area of the region $\{(x, y) : xy \leq 27, 1 \leq y \leq x^2\}$ is

(A) $54\ln 3 - \frac{26}{3}$

(B) $54\ln 3 + \frac{26}{3}$

(C) $54\ln 3 + \frac{52}{3}$

(D) $54\ln 3 - \frac{52}{3}$

$\frac{27}{x} = x^2$

$x^3 = 27$

$$\int_1^3 (x^2 - 1)\,dx + \int_3^{27} \left(\frac{27}{x} - 1\right)dx$$

$$= 54\ln 3 - \frac{54}{3}$$

Ans. (D)

Q) Consider a set A = {1, 2, 3, 4, 5, 6}. The number of one-one functions f: A → A such that f(1) ≥ 3, f(3) ≤ 4 and f(2) + f(3) = 5 is equal to:

(A) 72 **(B) 144** **(C) 36** **(D) 24**

f(2) + f(3) = 5		f(1)	
1	4	3,5,6	3 . $\lfloor 3$ = 18
2	3	4,5,6	3 . $\lfloor 3$ = 18
3	2	4,5,6	3 . $\lfloor 3$ = 18
4	1	3,5,6	3 . $\lfloor 3$ = 18

72

Ans. (A)

Q) The square of distance of point P(5, 6, 7) from the line $\frac{x-2}{2}=\frac{y-5}{3}=\frac{z-2}{4}$ is equal to.

$(PQ)^2 = (1+4+1)$

$= 6$

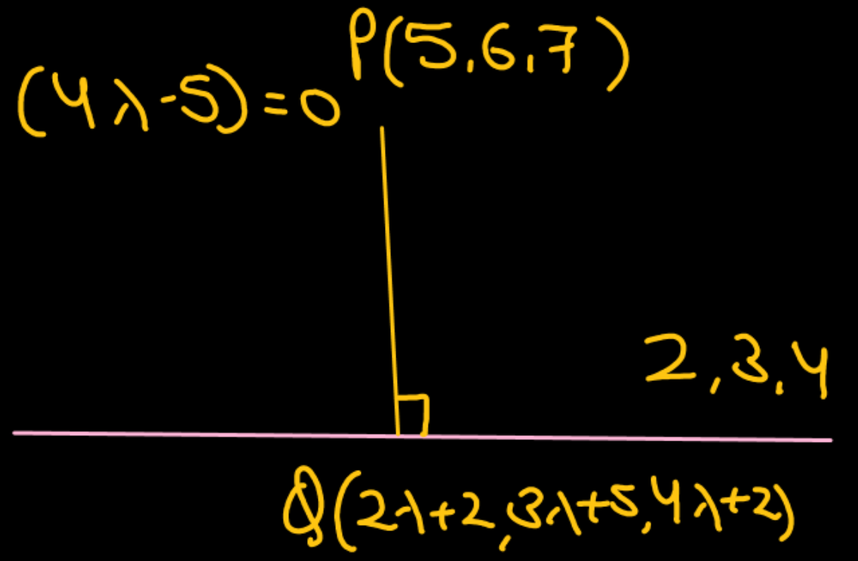
d's of PQ: $2\lambda-3, 3\lambda-1, 4\lambda-5$

$2(2\lambda-3)+3(3\lambda-1)+4(4\lambda-5)=0$

$29\lambda = 29$

$\lambda = 1$

$Q(4, 8, 6)$



Ans. (6)

Q) If roots of $x^2 - 2x - 5 = 0$ are tan A and tan B where A, B $\in \left(\frac{-\pi}{2}, \frac{\pi}{2}\right)$ then evaluate $20 \sin^2\left(\frac{A+B}{2}\right)$

(A) $5 + 3\sqrt{5}$ (B) $5 - 3\sqrt{5}$

(C) $10 - 3\sqrt{10}$ (D) $10 + 3\sqrt{10}$

$\sec^2(A+B) = 1 + \frac{1}{9} = \frac{10}{9}$

$\cos(A+B) = \frac{3}{\sqrt{10}}$

$\sin^2\left(\frac{A+B}{2}\right) = \frac{1 - \frac{3}{\sqrt{10}}}{2}$

$= \frac{\sqrt{10} - 3}{2\sqrt{10}}$

Ans. (C)

$t_A + t_B = 2$

$t_A \, t_B = -5$

$\tan(2\theta) \rightarrow \tan\theta$

$\sin(\theta)$

or $A > B$

$\tan(A+B) = \frac{2}{1-(-5)}$

$\tan(A+B) = \frac{1}{3}$ (I)

$\sin\left(\frac{A+B}{2}\right)$

Q) If $x^2 + ax + b = 0$ has roots α and β, $a, b \in C$. If $\beta - \alpha = \sqrt{11}$ and $\beta^2 - \alpha^2 = 3\sqrt{11}\,i$ then evaluate $(\beta^3 - \alpha^3)^2$

(A) 160 (B) 167

(C) 170 (D) 176

$\alpha + \beta = -a = 3i$

$a = -3i$

$\alpha\beta = b = -5$

$(\beta + \alpha)(\beta - \alpha) = 3\sqrt{11}\,i$

$\beta + \alpha = 3i$

$(\beta + \alpha)^2 = 9i^2 = -9$

$\frac{\sqrt{D}}{1} = \sqrt{11}$

$D = 11$

$a^2 - 4b = 11$

Ans. (D) $b = -5$

$(\beta - \alpha)(\beta^2 + \alpha^2 + \alpha\beta)$

$\sqrt{11} \cdot \left((\alpha + \beta)^2 - (-5)\right)$

-9

$(4\sqrt{11})^2$

$= 16 \times 11 = 176$

π/2 King ?

$\frac{1}{c^4} = \sec^4 x$

Q) The value of $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \left(\frac{4-\operatorname{cosec}^2 x}{\cos^4 x}\right) dx$ **is equal to**

(A) 32 **(B)** $\frac{16\sqrt{3}}{9}$ **(C)** $\frac{32\sqrt{3}}{9}$ **(D)** $\frac{16}{\sqrt{3}}$

$\int (4-(1+\cot^2 x))(\sec^2 x)(1+\tan^2 x)\,dx$

$\int (3-\cot^2 x)(1+t^2)(dt)$

$\int \left(3-\frac{1}{t^2}\right)(1+t^2)\,dt$

$\int_{\pi/6}^{\pi/3} \left(2-\frac{1}{t^2}+3+t^2\right)$

$\left(2\tan x + \frac{1}{\tan x} + \tan^3 x\right)\Big|_{\pi/6}^{\pi/3}$

Ans. (C)

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