



# Problems related with Container

Course on States of Matter for Class XI



Open

$$\underline{n_1 T_1 = n_2 T_2}$$

① Container contains a gas at 300K is heated to a higher temp. find final temp if

②  $\frac{1}{3}$ rd moles of gas present

initially

escaped

⑤

$\frac{1}{3}$ rd mol

of gas

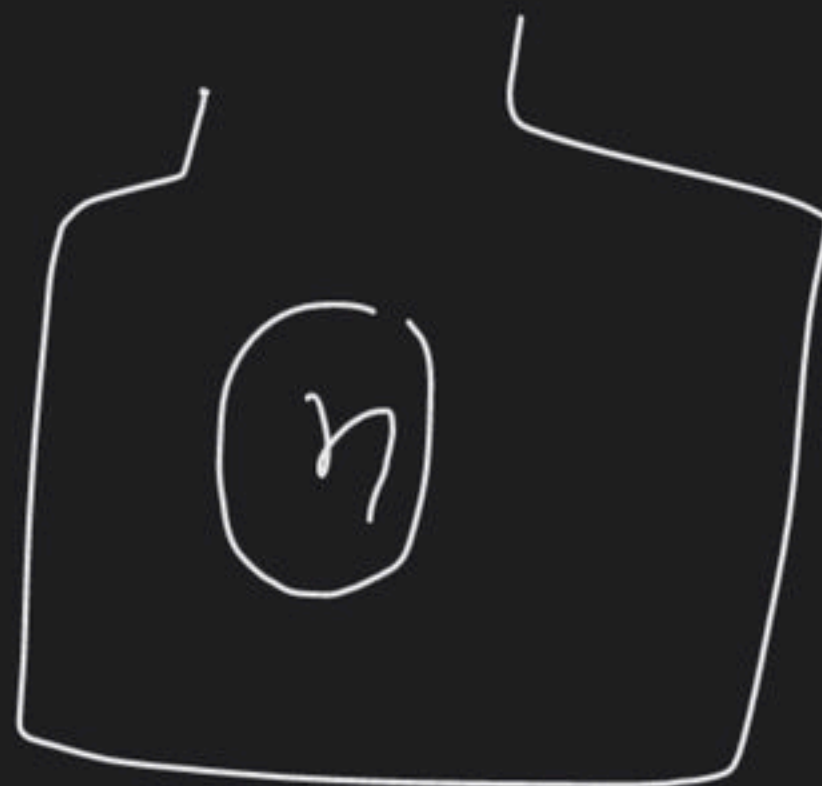
present finally  
escaped

(A) 450 K

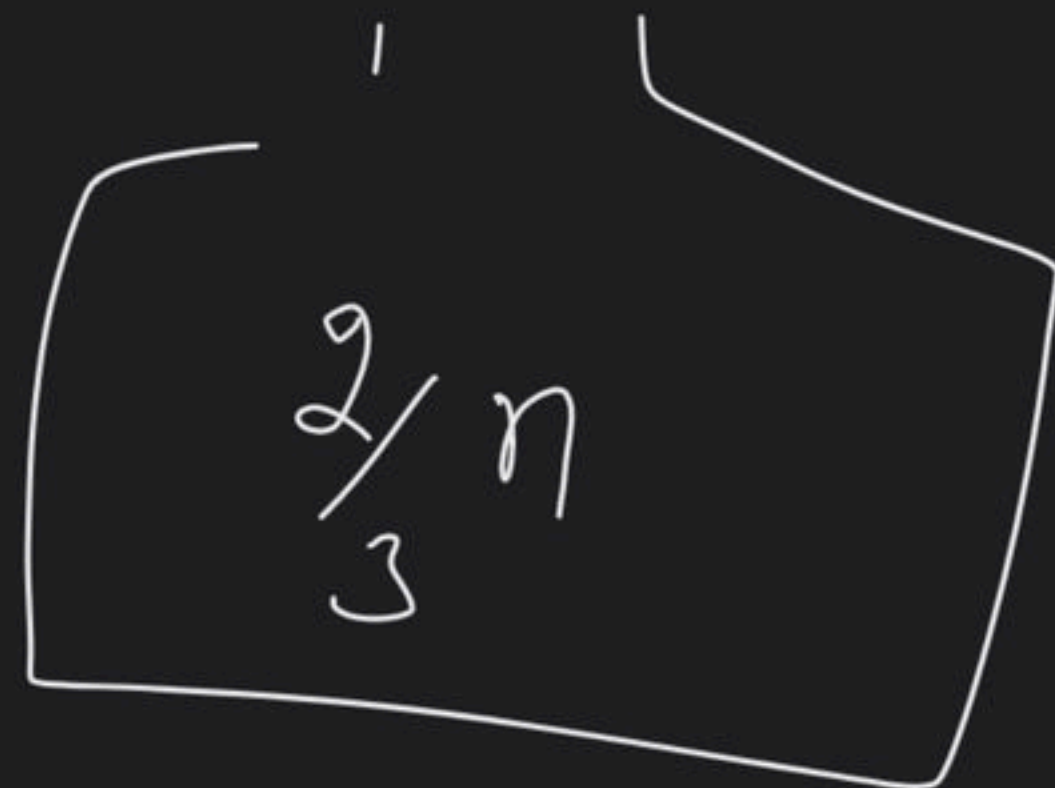
(B) 600 K

☒ (C) 400 K

(D) 900 K

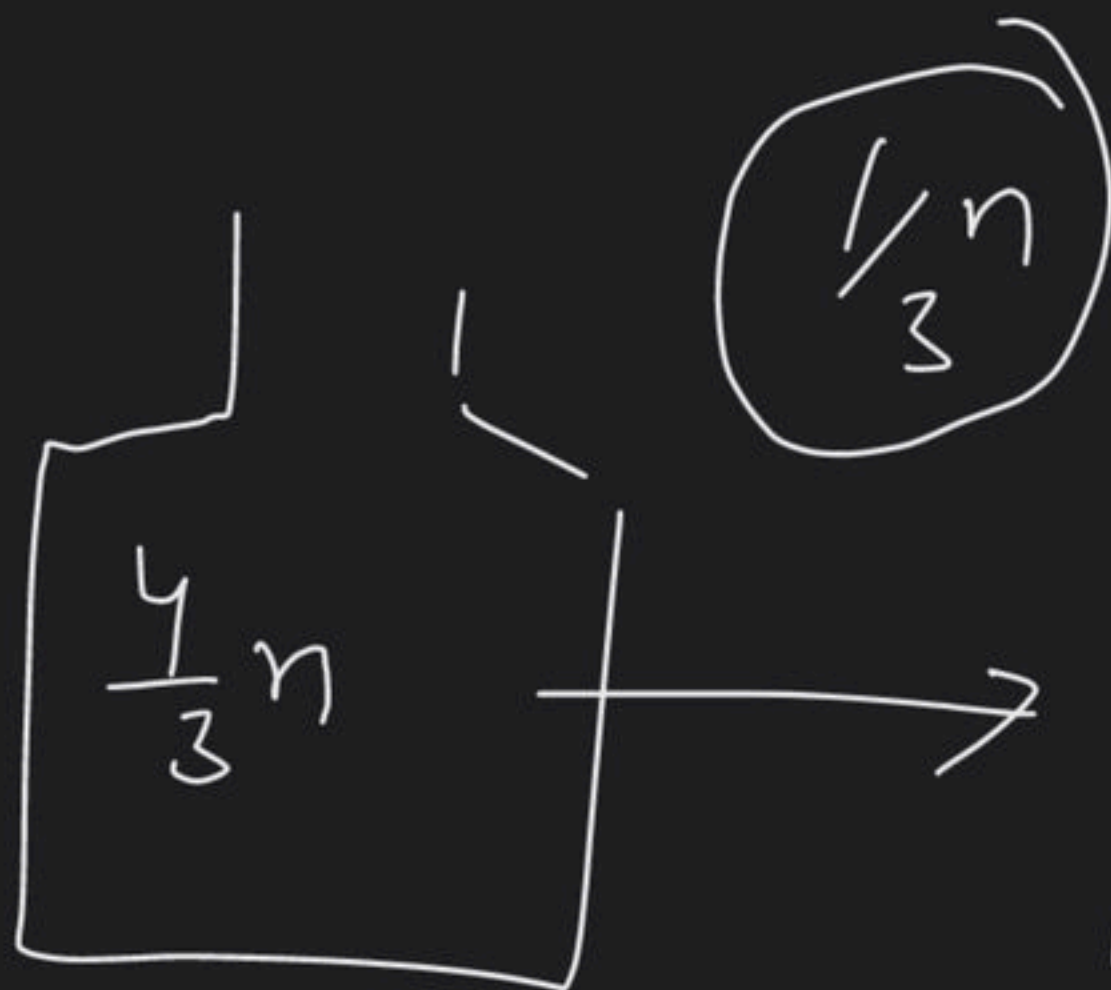


300 K



T

$$\frac{1}{3} \eta \times 300 = \eta \gamma T$$



$\frac{1}{3} \eta$



$$\eta \times 300 = \frac{2}{3} \eta \times T_2$$

$$T_2 = 450$$

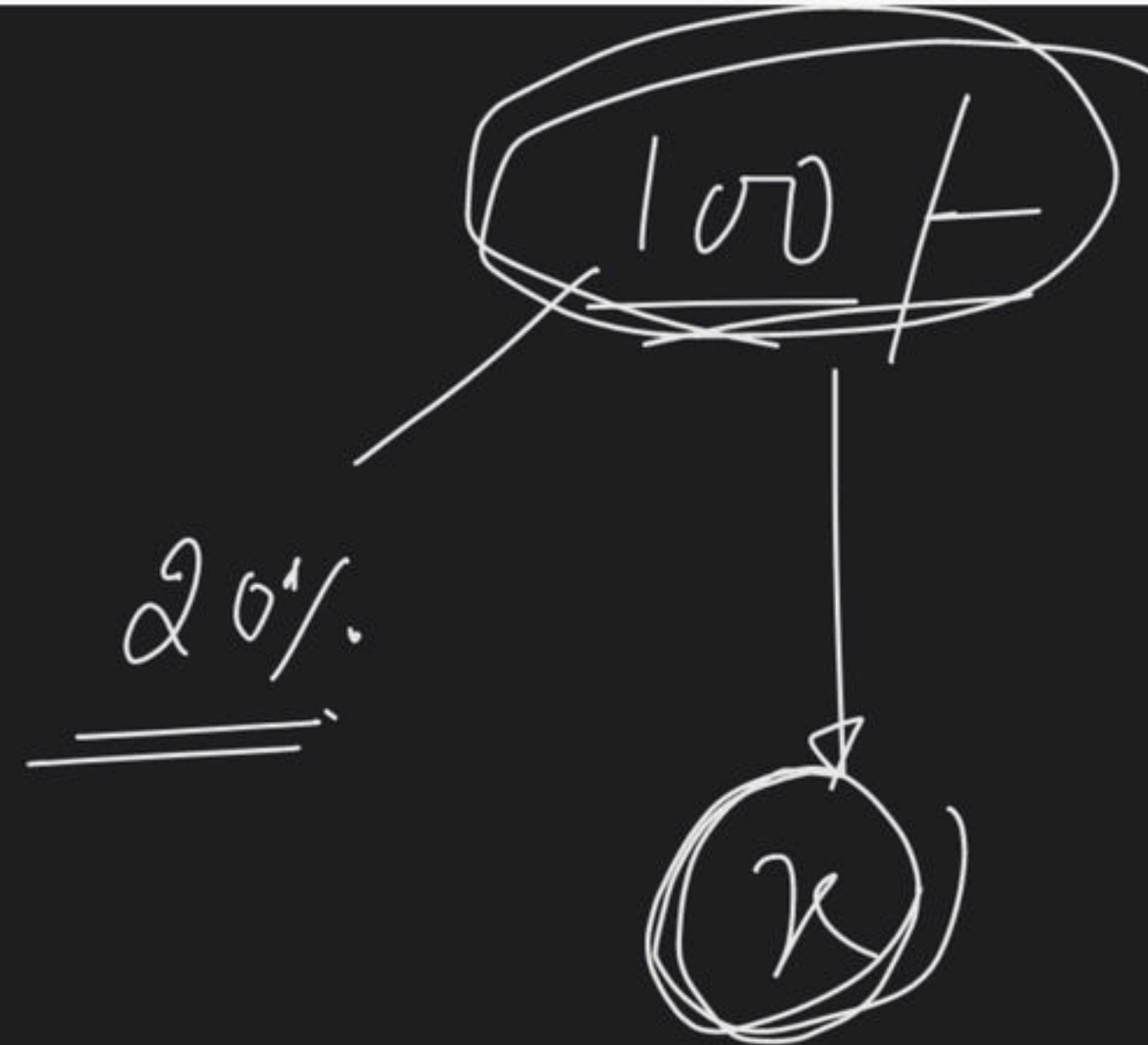




$$n_i - n_f = \text{moles escaped.}$$

$$\textcircled{1} \frac{\cancel{PV}}{R \cdot 300} - \frac{\cancel{PV}}{R \cdot T} = \frac{1}{3} \times \frac{\cancel{PV}}{R \times 300} \Rightarrow \frac{1}{300} - \frac{1}{T} = \frac{1}{3} \times \frac{1}{300}$$

$$\textcircled{2} \left( \text{ " " " } \right) = \frac{1}{3} \times \frac{\cancel{PV}}{R \cdot T}$$



$$100 - x$$

An open container is heated from  $27^{\circ}\text{C}$  to  $227^{\circ}\text{C}$ . Expelled gas was collected and its volume was measured at different temperature. find volume of container if

- (1) vol. of expelled air was  $200\text{ ml}$  at  $227^{\circ}\text{C}$
- (2) " " " " " " at  $27^{\circ}\text{C}$
- (3) " " " " " " at  $127^{\circ}\text{C}$



A) 350

B) 400

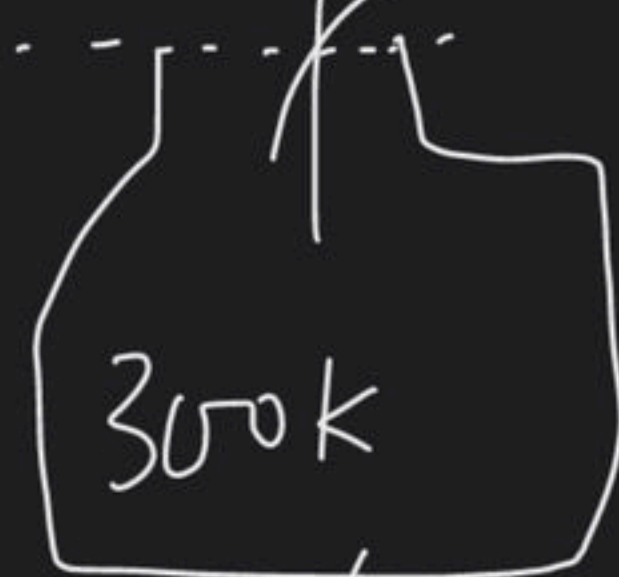
C) 450

D) 350

$$\frac{PV}{R \times 300}$$

(20)

(40)



$$\frac{PV}{R \times 500}$$



$$\frac{P \times (200)}{R \times 500}$$

$$= \frac{P \times 200}{R \times 300}$$

=



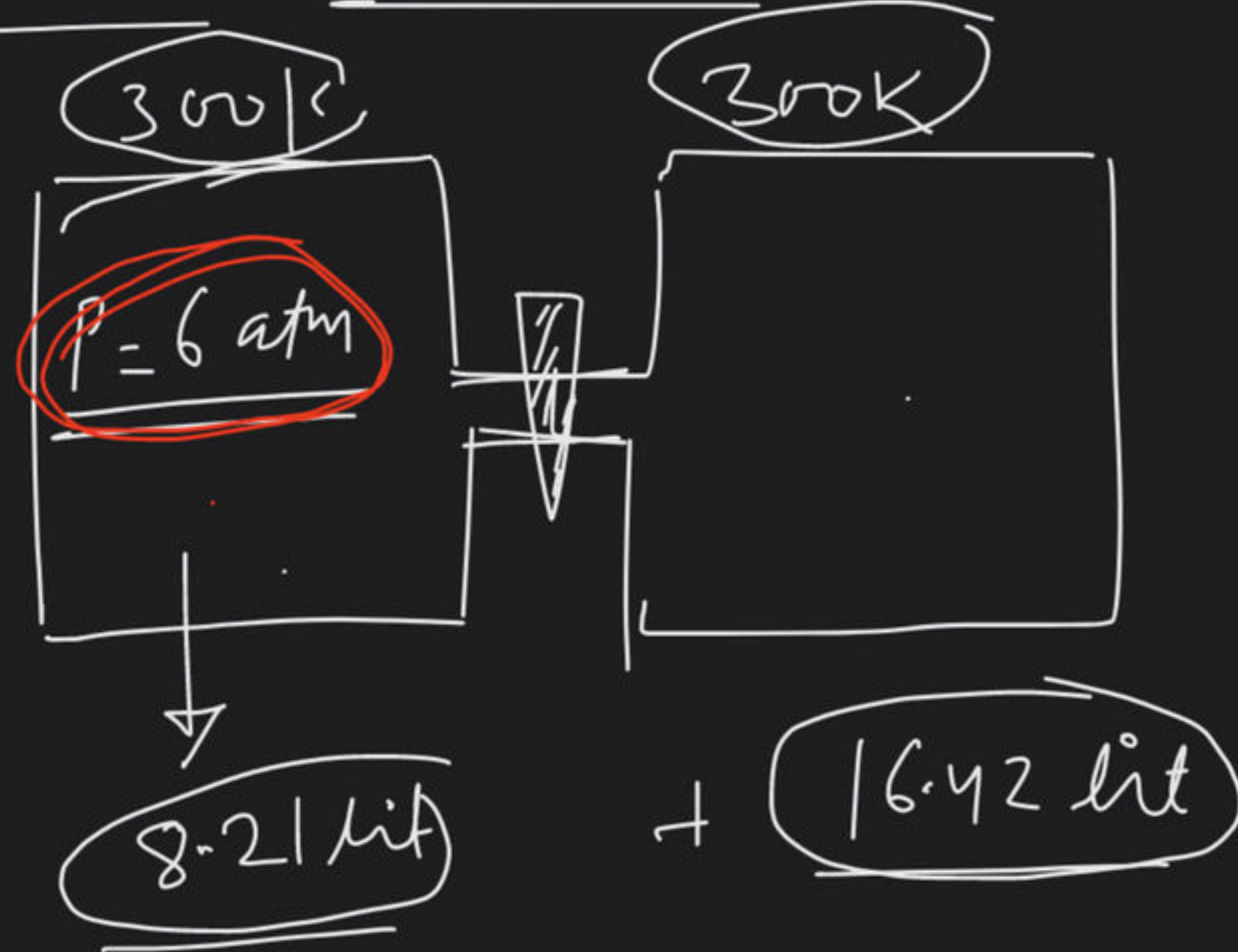
Volume

300ml

500ml

375ml

# Problems related with connected containers $\rightarrow$



$$\textcircled{1} P_1 V_1 = P_2 V_2$$

$$6 \times 8.21 = P \times (3 \times 8.21)$$

$$\underline{\underline{2 \text{ atm} = P}}$$

$$\textcircled{2} \frac{6 \times 8.21}{\cancel{R \times T}} = \frac{P \times 8.21}{\cancel{R \times T}} + \frac{P \times 16.42}{\cancel{R \times T}}$$

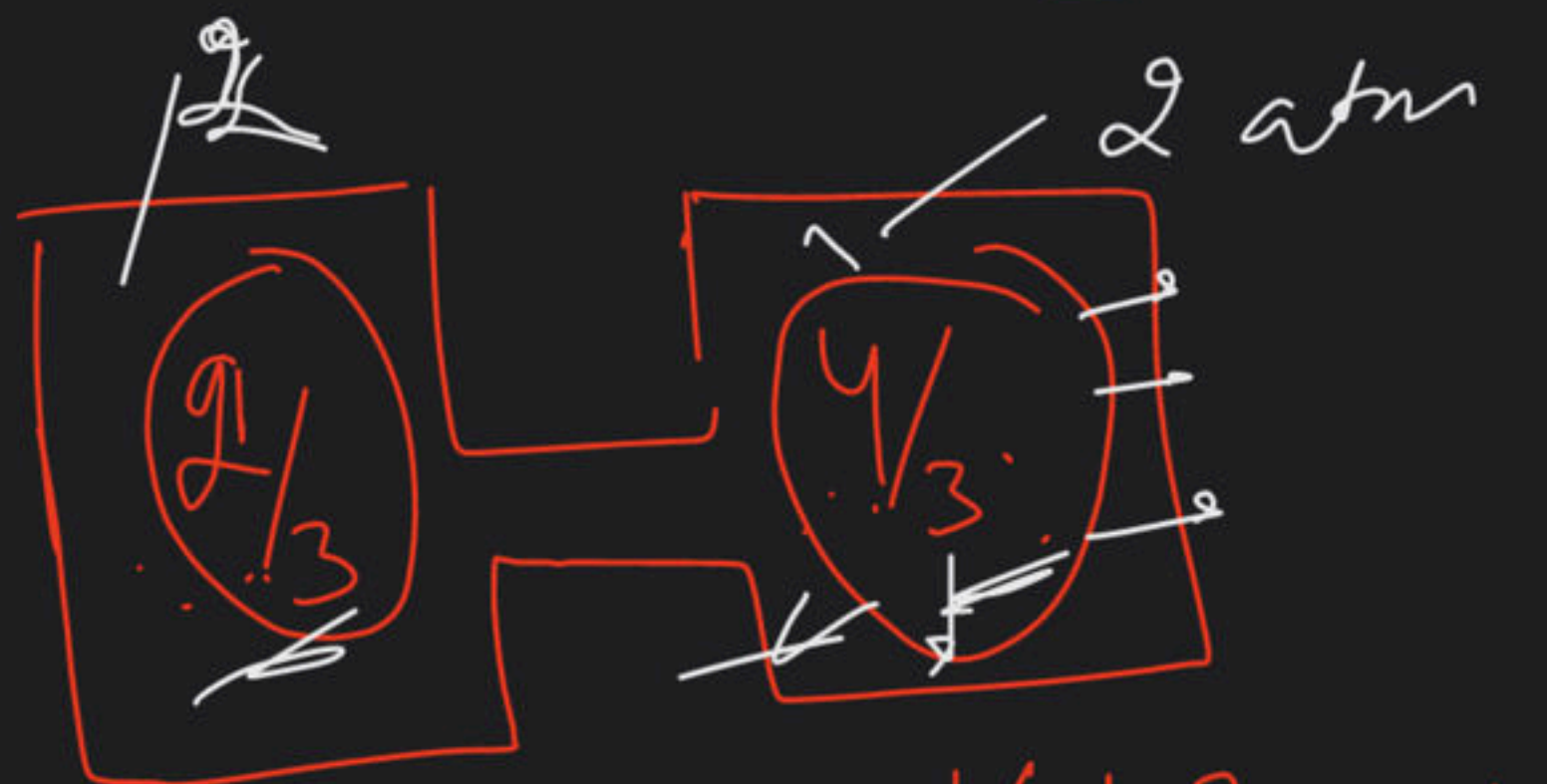
✓



3

$$6 \times 8.21 = n \times 0.0821 \times 300$$

$$n = 2$$



8.21

16.42 L

$$V \propto n$$

$$P \times 8.21 = \frac{2}{3} \times 0.0821 \times 300$$

$$\underline{P = 2 \text{ atm}}$$

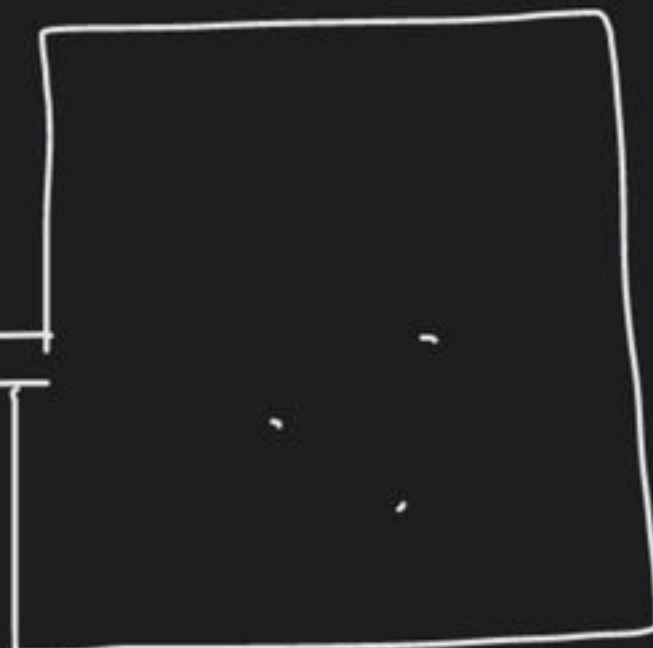


8.



8.21 L

300 K



16.42 L

500 K

$P = ?$

$$n \propto \frac{V}{T}$$

- (A) 4 atm -
- (B)  $\frac{24}{11}$  atm -
- (C)  $\frac{30}{11}$  atm
- (D) None

$$\frac{6 \times \cancel{8.21}}{R \times \cancel{300}} = \frac{P \times \cancel{8.21}}{R \times \cancel{300} K} + \frac{P \times 2 \times \cancel{8.21}}{R \times 500}$$

$$P = \frac{30}{11}$$



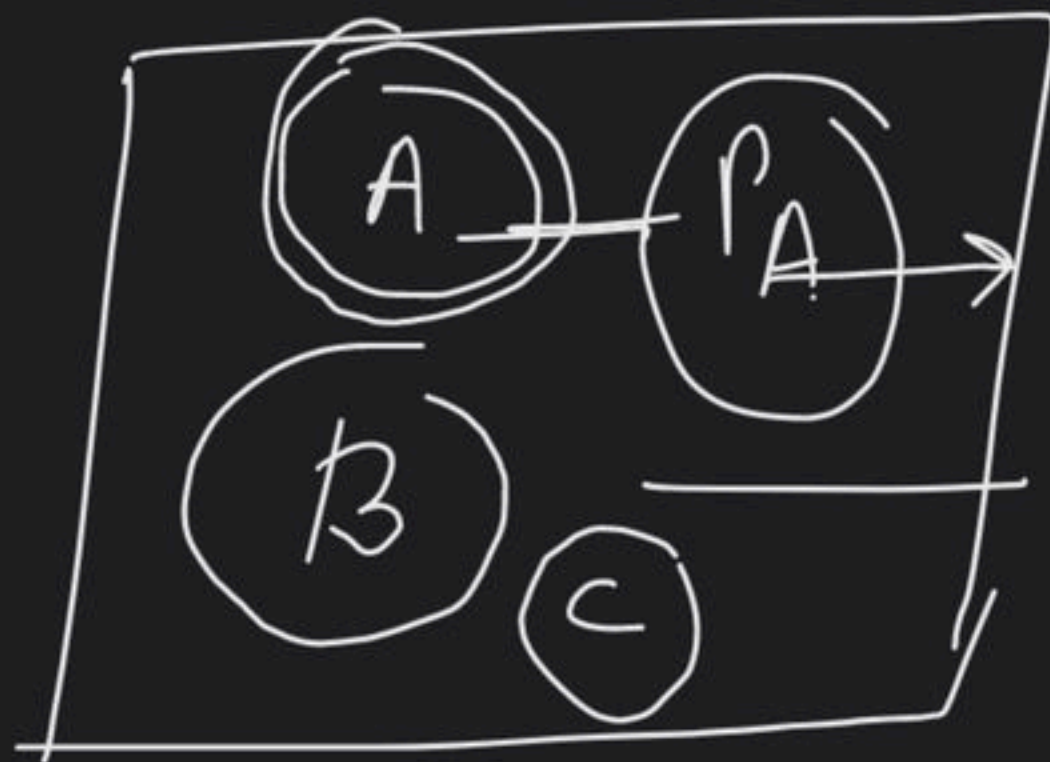
## Dalton's law of Partial Pressure $\Rightarrow$

Total pressure exerted by a mixture containing two or more gases is equal to the sum of partial pressure (individual pressure) of each gas.

Partial Pressure (individual pressure): →

Pressure exerted by the component gas  
when it is present alone in the same  
container at same temperature.





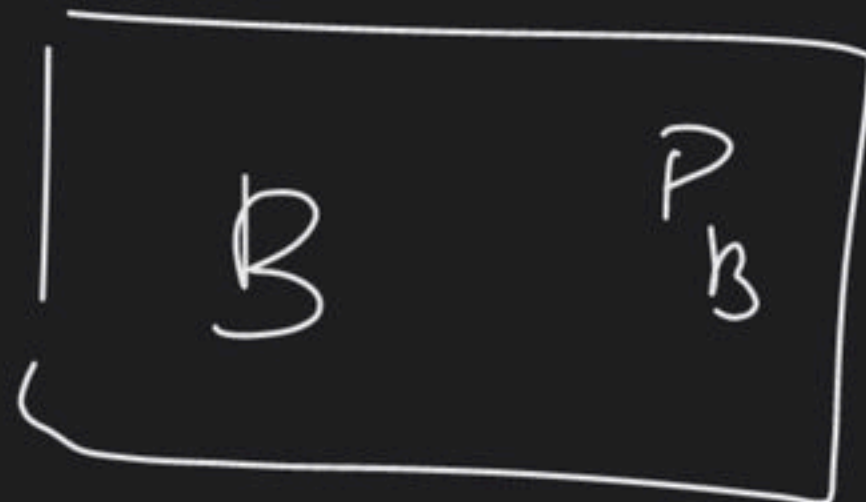
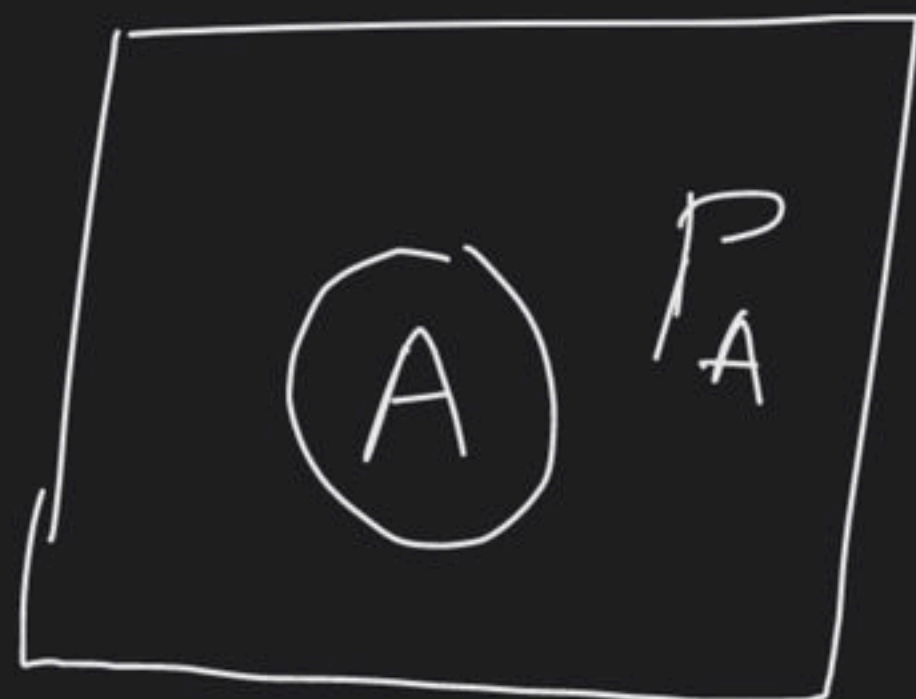
$$P_T = P_A + P_B$$

$$P_T V = (n_A + n_B) RT \quad \text{--- (1)}$$

$$P_A V = n_A RT \quad \text{--- (2)}$$

$$P_B V = n_B RT \quad \text{--- (3)}$$

$$\underline{(P_A + P_B) V = (n_A + n_B) RT}$$



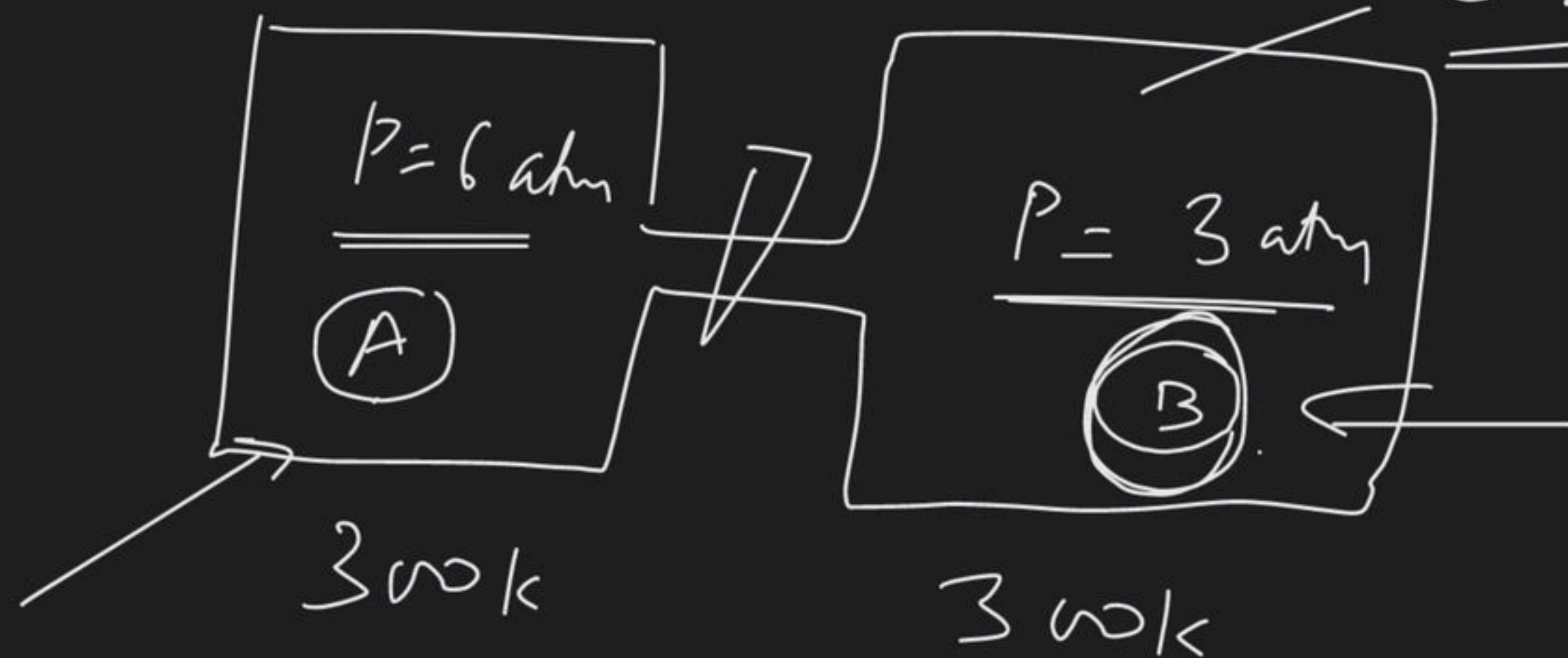
$$\frac{P_A}{P_T} = \frac{n_A}{n_A + n_B} = x_A$$

$$P_A = x_A P_T,$$

$$P_A V = n_A R T$$

$$P V = n R T$$





$P_{\text{Total}} = ?$

(A) 4

(B) 6

(C) 8

(D) 9

2 mol  $8.21$

$P_A = 2 \text{ atm}$

$16.42 \text{ lit}$

$$\begin{aligned}
 & (6 \times 8.21) + (3 \times 2 \times 8.21) \\
 & = P \times 3 \times 8.21
 \end{aligned}$$

$$n_A + n_B = n_T$$

S-II

1, 2, 3

0 - 1

9, 10, 11

S-1

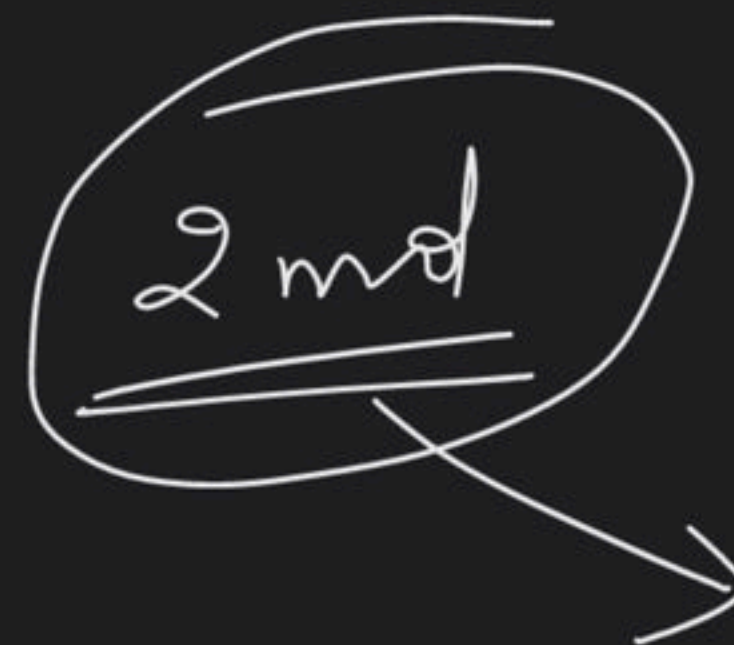
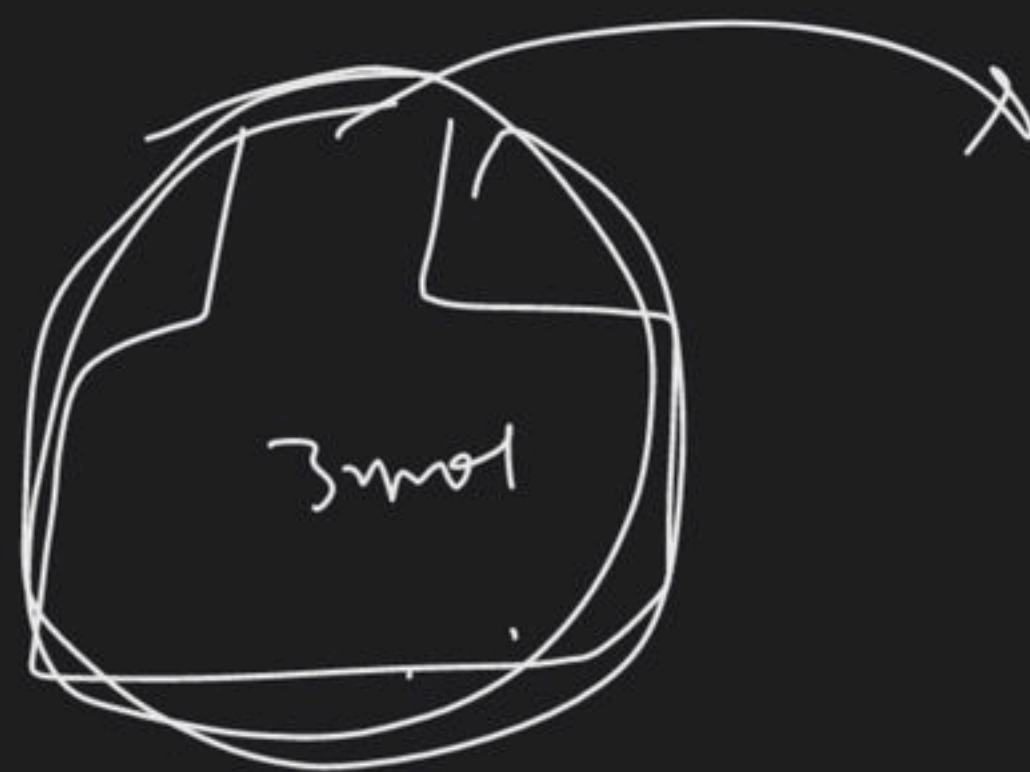
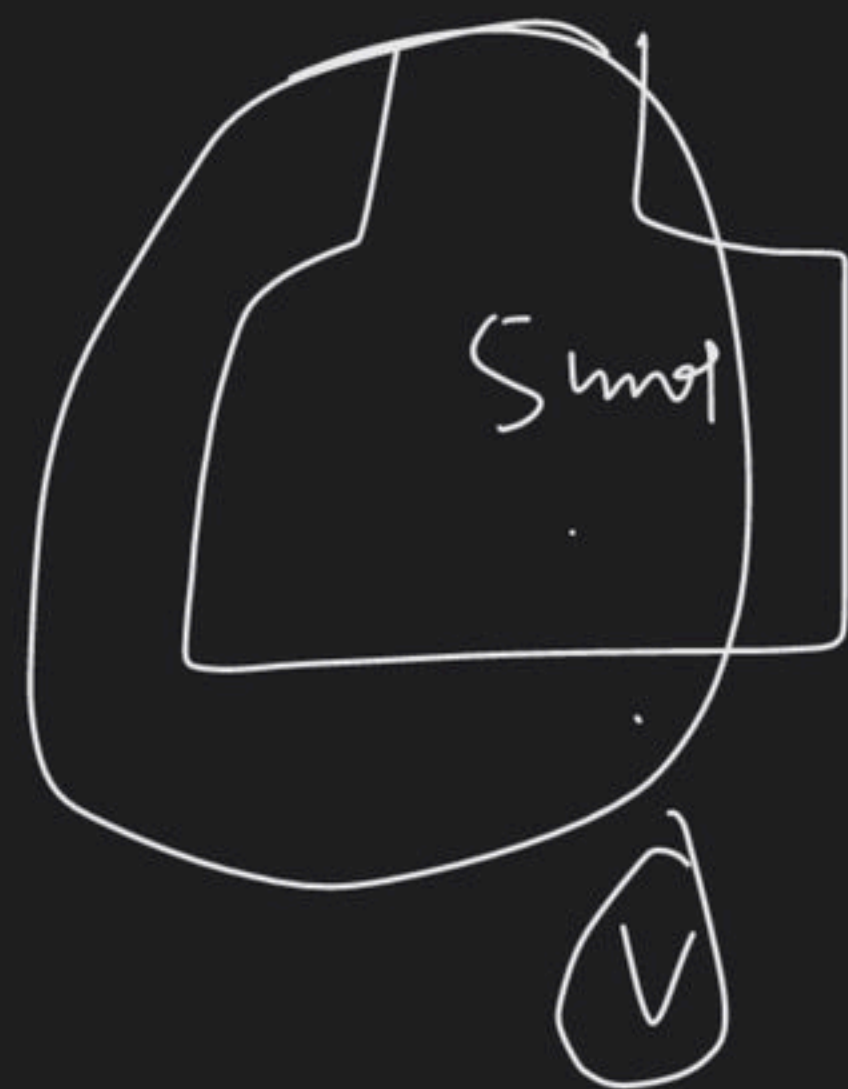
23 - 26

~~2-1~~

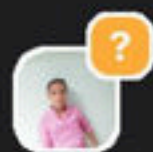


2 mol  
A

2 mol  
B







## Question

from ARNAV GUPTA

HAPPY GURU PURNIMA SIR







## Question

from Rachit tiwari

happy  
guru purnima





## Question

from Anuj Kumar

1 MOLE CHARAN SPARS SIR

happy  
guru purnima

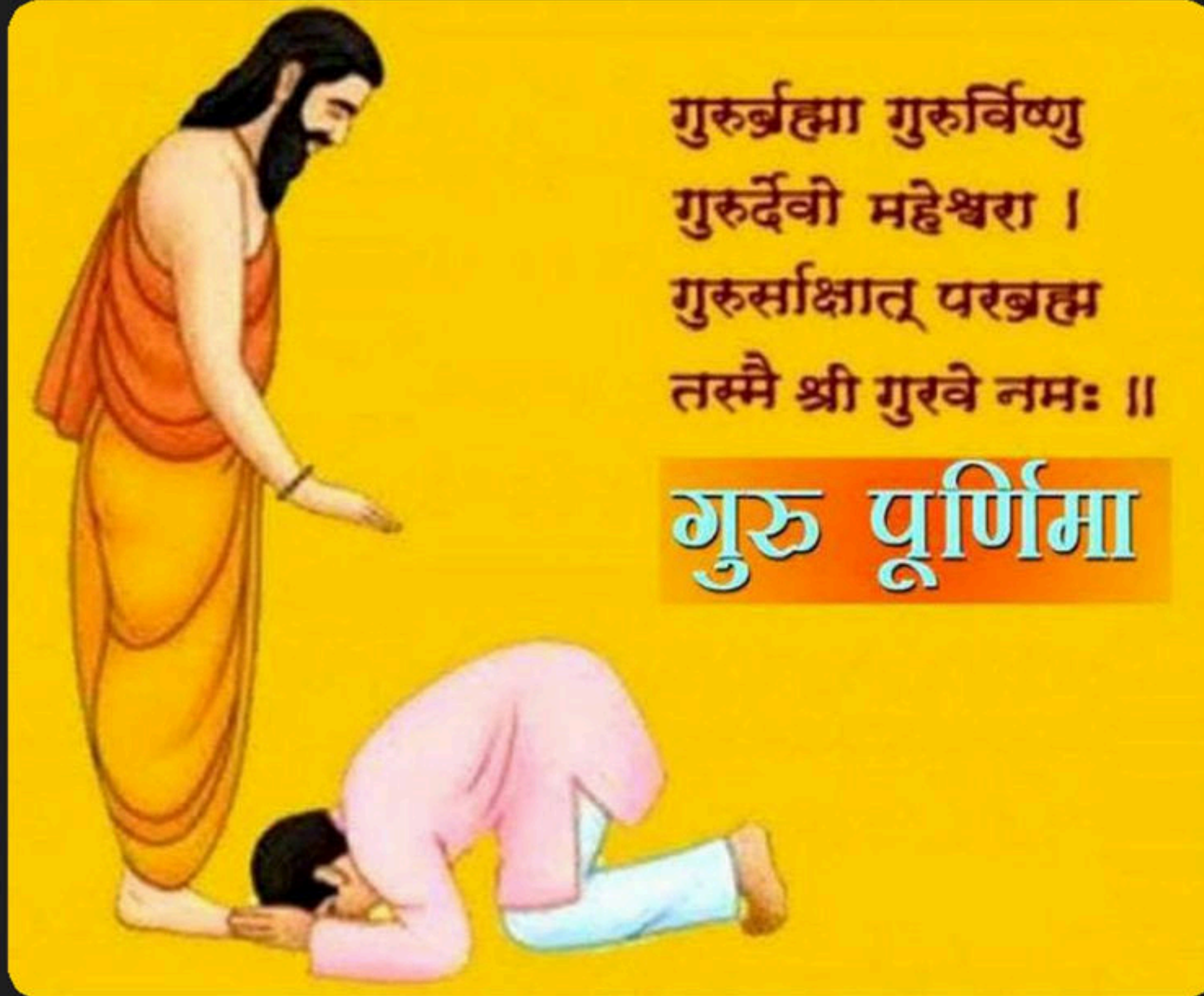






## Question

from Amit Samarth



गुरुर्ब्रह्मा गुरुर्विष्णु  
गुरुर्देवो महेश्वरा ।  
गुरुसाक्षात् परब्रह्म  
तस्मै श्री गुरवे नमः ॥

गुरु पूर्णिमा



## Question

from Krishna Agrawal 2023

Happy Guru purnima sir

Whenever I wanted  
inspiration, You were  
there to guide and be,  
Thanks Guru for being,  
Such a pillar of support  
for me, Happy Guru  
Purnima!



Happy Guru purnima to all teachers  
and parents..