

1.

$$P_1V_1 = P_2V_2 \text{ [1m]}$$

Substituting the values

$$2 \times 8 = P_2 \times 10 \text{ [1m]}$$

$$P_2 = \frac{2 \times 8}{10} = 1216 \text{ mm of Hg} \text{ [1m]}$$

The pressure that must be maintained = 1216 mm of Hg

[Total 3m]

2.

$$P_1V_1 = P_2V_2 \text{ [1m]}$$

Substituting the values

$$P_1 \times 600 = 4 \times 2400 \text{ [1m]}$$

$$P_1 = \frac{4 \times 2400}{600} = 12160 \text{ mm of Hg}$$

Initial pressure = 12160 mm of Hg [1m]

[Total 3m]

3.

$$P_1 V_1 = P_2 V_2 \text{ ( at constant temp. ) (1mk)}$$

$$4 \times 1 = 1 \times \frac{1}{2}; \quad (1mk)$$

$$V_2 = 4\text{cm}^3. \text{ (1mk)}$$

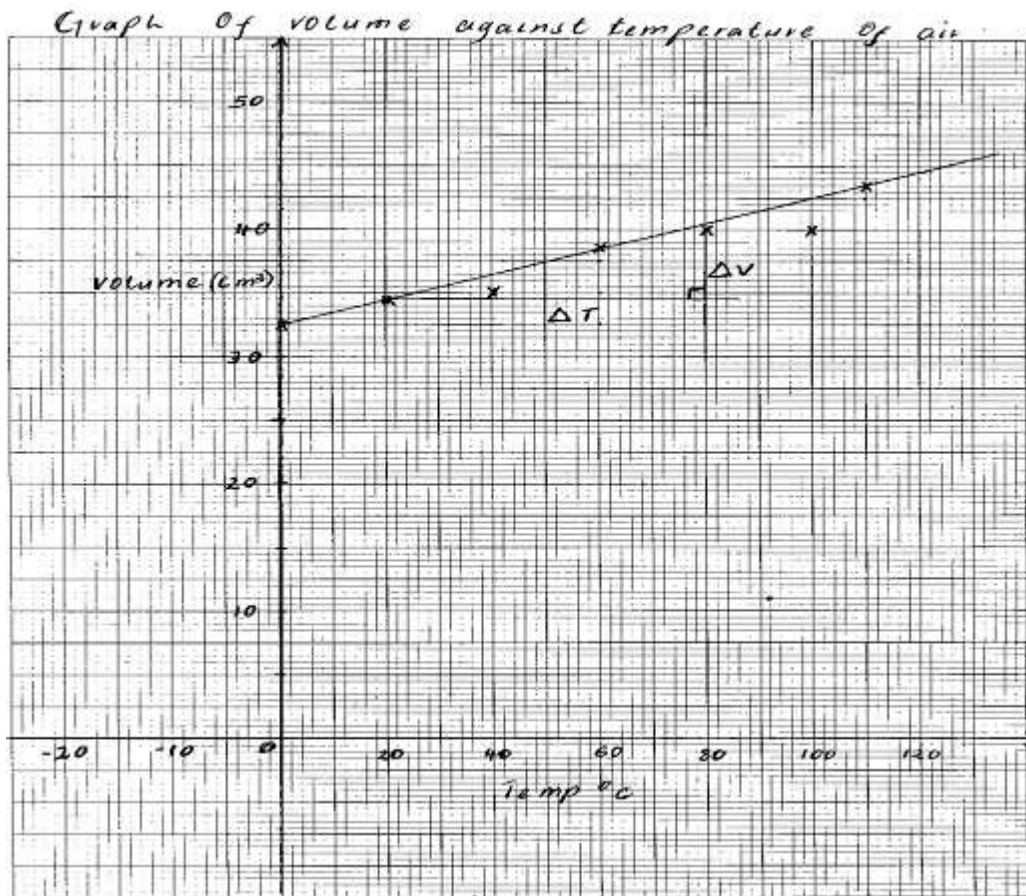
4.

(a) Is the temperature at which a body is assumed to have zero internal energy / volume; (1mk)

(b) Read gases have molecules with definite volume while idea molecules have no volume; (1mk)

Molecules of real gases white for ideal gas it is assumed

(c) (i) A - 1      S - 1      P - 2      C - 1      (3mks)



(1mk)

(iii) Real gases get liquefied before zero

volume is reached

(1mk)

- The molecules of real gases have

definite volume;

(1mk)

5.

- (a) (i) (molecules) hit the wall/cylinder B1  
any other point to explain large pressure, e.g. small distance between molecules or hit often/frequently or many hit walls each sec or hit/move fast B1  
(ii) greater distance between molecules or fewer hit (per sec) or fewer molecules (in cylinder) or molecules leave cylinder B1  
(b)  $P_1 V_1 = P_2 V_2$  or  $PV = \text{constant}$  B1  
0.002. 200 = 1. V or 0.4 seen C1  
0.398 or 0.4 m<sup>3</sup> A1 6

6.

$$V_1 = 400 \text{ ml } V_2 = 600 \text{ ml}$$

$$T_1 = 15^\circ\text{C} + 273 = 288 \text{ K } [1\text{m}]$$

Applying Charles' Law  $\frac{V_1}{T_1} = \frac{V_2}{T_2}$

Substituting the values

$$T_2 = \frac{288 \times 600}{400} [1\text{m}]$$

$$T_2 = 432 \text{ K } [1\text{m}]$$

$$T_2 \text{ in degree Celsius} = 432 - 273 = 159^\circ\text{C} [1\text{m}]$$

[Total 4m]

7.

$$V_1 = 400 \text{ ml, } V_2 = 300 \text{ ml}$$

$$T_1 = (227^\circ\text{C} + 273) = 500 \text{ K } T_2 = ?$$

Applying Charles' Law  $\frac{V_1}{T_1} = \frac{V_2}{T_2}$   
[1m]

Substituting the values

$$T_2 = \frac{500 \times 300}{400}$$

$$T_2 = 375 \text{ K } [1\text{m}]$$

$$T_2 \text{ in degree Celsius} = 375 - 273 = 102^\circ\text{C} [1\text{m}]$$

$$\text{Alteration of temperature} = 227^\circ\text{C} - 102^\circ\text{C} = 125^\circ\text{C}$$

The temperature should be reduced by  $125^{\circ}\text{C}$ . [1m]

[Total 4m]