matter [7 marks]

1. [Maximum mark: 1]
What happens as ice melts at 0 °C?

I. Molecules gain kinetic energy and temperature increases.

II. Added energy overcomes hydrogen bonds between molecules.

III. Molecules gain sufficient energy to move from fixed positions.

A. I and II only

B. I and III only

C. II and III only

D. I, II and III [1]

2. [Maximum mark: 1]
Which of the following are homogeneous mixtures?

I. An aqueous solution of sodium chloride

II. A mixture of pentane and hexane

III. A mixture of ethanol and water

A. I and II only

B. I and III only

C. II and III only

D. I, II and III [1]

3. [Maximum mark: 1]

What is the change of state for a gas to a solid?

A. Condensation

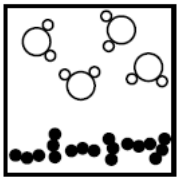
B. Deposition

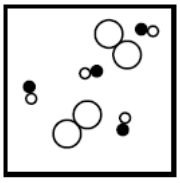
C. Freezing

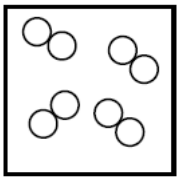
D. Sublimation [1]

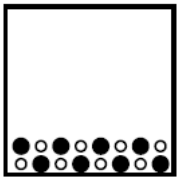
4. [Maximum mark: 1]

Which diagram represents a heterogeneous mixture?

A. 

B. 

C. 

D. 

[1]

5. [Maximum mark: 1]

What is the pressure, in Pa, inside a 3.0 dm^3 cylinder containing 64 g of O_2 at 25.0 °C?

$R = 8.31\ J\ K^{-1}\ mol^{-1}$; $PV = nRT$

A. $\frac{2\times8.31\times25}{3.0}$

B. $\frac{2\times8.31\times298}{3.0\times10^{-3}}$

C. $\frac{2\times8.31\times298}{3.0}$

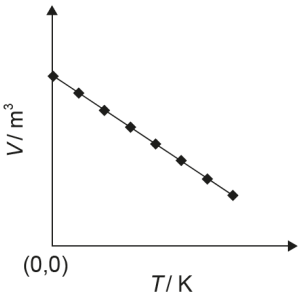
D. $\frac{4\times8.31\times298}{3.0\times10^{-3}}$

[1]

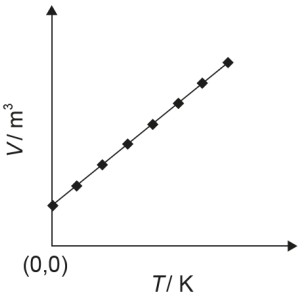
6. [Maximum mark: 1]

Which graph shows the correct relationship between the volume and temperature of an ideal gas at constant pressure?

A.



B.



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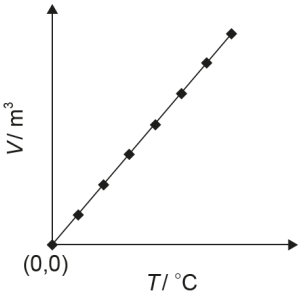
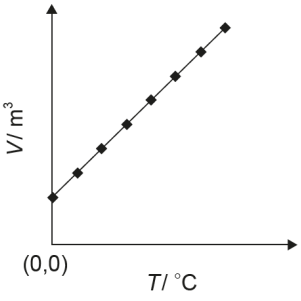


D.



[1]

7. [Maximum mark: 1]

What is the molar mass of a gas according to the following experimental data?

Mass of gas	40.0 g
Volume	220 cm3
Temperature	17 °C
Pressure	98 kPa

Ideal gas constant = 8.31 J K^{-1} mol^{-1}

PV = nRT

A. $\frac{40.0 \times 8.31 \times 290}{98 \times 0.220}$

B. $\frac{98 \times 0.220}{40.0 \times 8.31 \times 290}$

C. $\frac{40.0 \times 8.31 \times 17}{98 \times 0.220}$

D. $\frac{98 \times 0.220}{40.0 \times 8.31 \times 17}$ [1]