



Blue Print (As per PU Board)

Topic	1 mark questions	2 marks questions	3 marks questions	5 marks questions	Total Marks
States of Matter (Gases & Liquids)	1	1	-	1	8

One mark questions

1. Write the expression for compressibility factor Z for one mole of a gas.

Answer: $Z = \frac{PV}{RT}$

2. Name the property of the liquid that measures the resistance to the flow of liquid due to internal friction.

Answer: Viscosity

3. Define Boyle temperature

Answer: Temperature at which a real gas obeys ideal gas law over an appreciable range of pressure.

4. What is meant by most probable speed of gas molecule ?

Answer: Speed possessed by maximum number of molecules.

Two marks questions

5. Under what condition real gases tend to show ideal gas behaviour?

Answer: (i) At low pressure (ii) high temperature

6. Define surface tension. Write the SI unit of surface tension.

Answer: Surface tension is defined as the force acting on unit length perpendicular to the line drawn on the surface of the liquid. SI unit is expressed as $N m^{-1}$

7. What happens to the compressibility factor for gases like CO_2 at

(i) Very high pressure & ordinary temperature

(ii) Low pressure & ordinary temperature

Answer: (i) $Z > 1$ or compressibility factor is more than 1.

(ii) $Z < 1$ or compressibility factor is less than .

8. A drop of liquid assumes spherical shape. why?

Answer: Because of the surface tension, a liquid tends to possess minimum surface area.

For a given volume sphere has minimum surface area. Hence drop of liquid assumes spherical shape

Three marks questions

9. Define the terms

(i) Critical temperature for a gas

(ii) Aqueous tension

(iii) Critical volume

Answer: (i) critical temperature – It is the highest temperature at which liquefaction of gas first occurs

(ii) Aqueous tension – Pressure exerted by saturated water vapour

(iii) Critical volume – Volume of one mole of the gas at a highest temperature where liquefaction of gas first occurs

Or

Volume of one mole of a gas at critical temperature

10. What is the effect of temperature on -

(i) Density

(ii) Surface tension

(iii) Vapour pressure of the liquid.



Answer: (i) Density of liquid decreases with increase in temperature
 (ii) Surface tension decreases with increases in temperature
 (iii) Vapour pressure of the liquid increases with increase in temperature.

11. 2.9g of a gas at 95°C occupies the same volume as 0.184 g of dihydrogen at 17°C at the same pressure . What is the molar mass of the gas?

Answer: $PV = n_1 R T_1 = n_2 R T_2$ since pressure and volume kept constant $n_1 T_1 = \frac{n_2}{T_2}$

$$\left(\frac{m_1}{M_1}\right)T_1 = \left(\frac{m_2}{M_2}\right)T_2 \text{ Where } m \text{ \& } M \text{ are mass \& molecular mass } M_2 = \frac{M_1 m_2 T_2}{m_1 T_1}$$

$$\text{Substituting } M_2 = \frac{(2 \times 2.9 \times 368)}{(0.184 \times 290)}$$

$$M_2 = 40 \text{ g mol}^{-1}$$

12. On a hot summer day, pressure in the well inflated tyre of an automobile increases considerably and the tyre may burst if the pressure is not adjusted properly. Name the gas law suitable for the above phenomenon .State the law & write the mathematical statement for the above law.

Answer: Gay-Lussacs's law

At constant volume, pressure of a fixed amount of a gas varies directly with the temperature

$$P \propto T \text{ or } \frac{P}{T} = \text{Constant at constant volume}$$