

UNIT-4

S.No	Questions	BT	CO	PO
Part–A(Short Answer Questions)				
1	Define a real gas.	1	4	1
2	What is compressibility factor (Z)	1	4	1
3	State the Vander Waals equation of state.	1	4	1
4	State Dalton's law of partial pressures.	1	4	1
5	Define equivalent gas constant.	1	4	1
6	What is mole fraction	1	4	1
7	State Dalton's law of partial pressures.	1	4	1
8	Define enthalpy of a gas mixture.	1	4	1
9	Write the relation between mole fraction and partial pressure.	2	4	1
10	Differentiate between mole fraction and volume fraction.	2	4	1
Part– B(Long Answer Questions)				
11	a) Explain the deviations of real gases from ideal gas behavior with suitable graphs.	2	4	3,4
	b) A gas occupies 0.5 m³ at 500 kPa and 350 K . Calculate the compressibility factor if the gas mass is 2 kg and gas constant is 287 J/kg-K .	3	4	3,4
12	a) Using Vander Waals equation, determine the pressure of 1 mol CO₂ occupying 0.12 m³ at 320 K .	3	4	3,4
	b) Derive the Vander Waals equation of state and explain the significance of constants 'a' and 'b'.	4	4	3
13	a) Explain Avogadro's law with engineering examples.	2	4	4
	b) A gas mixture consists of 25% oxygen and 75% nitrogen by volume. Determine: • Gas constant • Molecular weight • Equivalent gas constant.	3	4	4
14	Derive expressions for equivalent gas constant of a gas mixture	4	4	4
15	Derive Dalton's law of partial pressures and explain its applications.	4	4	3,4
16	Discuss variable specific heats and explain their importance in thermodynamic analysis.	2	4	3