Q.1 Match the Van der Waal's for one mole of gas given in column **B** to the conditions in column**A**.

	COLUMN 1		COLUMN 2
A	At low pressure	(i)	P(V-B)=RT
B	At High pressure	(ii)	$(P + \frac{a}{V^2})V = RT$
C	At low pressure and high temperature	(iii)	$PV = RT$
D	At room temperature and high pressure	(iv)	$(P + \frac{a}{V^2})(V - b) = RT$

(A) A – (i); B – (ii); C – (iii); D – (iv) **(B)**A – (ii); B – (i); C – (iii); D – (iv)
(C)A – (iv); B – (iii); C – (ii); D – (i) **(D)**A – (iii); B – (ii); C – (i); D – (iv)

Q.2 At S.T.P, the volume of **1 mole** of gas is measured to be **25 litres** then, nature of gas and type of force dominating are
(A) Real gas with +ve deviation, repulsive force.
(B) Real gas with –ve deviation, attractive force.
(C) Real gas with +ve deviation, attractive force.
(D) Real gas with –ve deviation, repulsive force.

Q.3 Calculate the compressibility factor for a gas, if **1 mole** of it occupy $0.821 litre$ at 300 K and50atm.
(A) 1 **(B)** 1.33 **(C)** 1.67 **(D)** 0.67

Q.4 Find the most probable speed (V_{mp}) of nitrogen gas molecules at$T = 560$ K. (Given: $\sqrt{R} = 2.88$ where R is gas constant)
(A)460 m/s **(B)** 500 m/s **(C)** 576 m/s **(D)** 600 m/s

Q.5 The average time taken by a molecule of oxygen at **300 *K*** to travel a distance equal to the diameter of the earth. (Diameter **of earth**= 12,800 km**)**
(A) 5 hr **(B)** 10 hr **(C)** 8 hr **(D)** 15 hr

Q.6 Suppose a container is evacuated to leave just one molecule of a gas in it. Let $\mathbf{v_{av}}$ and $\mathbf{v_{rms}}$ represent the average speed and rms speed of the gas.

(A) $v_{av} > v_{rms}$ **(B)** $v_{av} < v_{rms}$ **(C)** $v_{av} = v_{rms}$ **(D)** v_{rms} is undefined.

Q.7 Which of the following gases has maximum rms speed at a given temperature?

(A) Hydrogen **(B)** Nitrogen **(C)** Oxygen **(D)** Carbon dioxide

Q.8 The rms speed of oxygen molecules in a gas is v. If the temperature is doubled and oxygen molecules dissociate into oxygen atoms, the rms speed will become

(A) v **(B)** $\sqrt{2}$v **(C)** 2v **(D)** 4v

Q.9 Identify the correct order as indicated in the given diagram of different kind of speed of molecules of same gas.

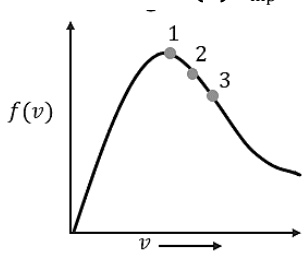
v_{mp} → Most probable speed

v_{rms} → Root mean square speed

v_{av} → Average speed

(A) $v_{mp} - 3,\ v_{av} - 2,\ v_{rms} - 1$ **(B)** $v_{mp} - 1,\ v_{av} - 2,\ v_{rms} - 3$

(C) $v_{mp} - 2,\ v_{av} - 1,\ v_{rms} - 3$ **(D)** $v_{mp} - 3,\ v_{av} - 1,\ v_{rms} - 2$



Q.10 Mean free path depends on which of the following?

(A) Temperature **(B)** Density of molecules

(C) Diameter of the molecule **(D)** Both (b) and (c)

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(B)	(A)	(C)	(C)	(C)	(C)	(A)	(C)	(B)	(A)