(A)1 calorie

| | Chapter 16 | | | | | | |
|-----|--|--|--|---------------------|--------|-------|--|
| | Thermom | etry | | Exercise | | | |
| Q.1 | Which of the fol equation for NH ₃ (A) NH ₃ | lowing gases can be mo $x = 4.17, CO_2 = 3.59, SO_2 = (B) Cl_2$ | ost easily liquified? Given, t = 6.71 & Cl2 = 6.49 (C) SO ₂ | he value of a in va | an der | Waals | |

- Q.2 At relatively high pressure, van der Waals equation reduces to (A) PV = RT (B) $PV = RT + \frac{q}{v}$ (C) PV = RT + pb (D) $PV = RT - \frac{a}{v^2}$
- **Q.3** For one mole of a van der Waals gas for which 1 b = 0 and T = 300 K, the PVvs $\frac{1}{V}$ plot is shown below. The value of the van der Waals constant a (atm L mol⁻²) is



Q.4 The amount of heat needed to increase the temperature of 1 g of water from 14.5 °C to 15.5 °C at one atmosphere is



(D) 42 calorie

Q.5 A body of mass 5 kg falls from a height of 30 meters. If all of its mechanical energy is converted into heat, then heat produced will be [Take $g = 9.8 \text{ m/s}^2$ and J = 4.2 J/cal]



Q.6 A hammer of mass 1 kg having a speed of 50 m/s hits an iron nail of mass 200 g. If the specific heat of iron is 0.105 cal/g°C and half the energy of the hammer is converted into heat, then the rise in the temperature of the nail is



Q.9 Heat is supplied to a solid material at a constant rate. The variation of temperature of the material with heat input is as shown in the figure. The slope of DE represents



(A) latent heat of liquid (C)heat capacity of vapour

not required?

A vessel contains an ideal gas which is pumped out at a dV constant rate $\frac{dv}{dt} = r$. Assume that the Q.10 process takes place dt at constant temperature and the pressure inside the vessel P = P_{o} e^{(\frac{rt}{vo})} depends on time as P = where P_o and V_o are initial pressure and volume of the vessel respectively. To find out the time taken by half the original gas to be pumped out, which of the following data is/are

Volume,V0 Pressure, P_0 Temperature, T $\frac{dV}{dt}$ = r(A) Initial pressure inside the vessel (B) Volume of the vessel (C) Rate of pumping r (D) Temperature of the gas

3

ANSWER KEY

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