

NEET KINETIC THEORY — DEGREES OF FREEDOM AND SPECIFIC HEAT CAPACITIES — PYQS

Max. Marks: 20
Questions: 5

Section A (MCQ) — 5 questions

Q.1 An ideal gas is made of polyatomic molecules. Each of the molecules has three translational, three rotational and f number of vibrational modes. If the ratio of heat capacities C_p/C_v of the gas is $8/7$, then the value of f is: [RE-NEET (UG) 2026]

- (1) 1 (2) 4 (3) 3 (4) 2

Scan or tap for the full solution



Q.2 4.0 g of a gas occupies 22.4 litres at NTP. The specific heat capacity of the gas at constant volume is $5.0 \text{ J K}^{-1} \text{ mol}^{-1}$. If the speed of sound in this gas at NTP is 952 m s^{-1} , then the heat capacity at constant pressure is (Take gas constant $R = 8.3 \text{ J K}^{-1} \text{ mol}^{-1}$)

[AIPMT 2015]

- (1) $7.0 \text{ J K}^{-1} \text{ mol}^{-1}$ (2) $8.5 \text{ J K}^{-1} \text{ mol}^{-1}$
 (3) $8.0 \text{ J K}^{-1} \text{ mol}^{-1}$ (4) $7.5 \text{ J K}^{-1} \text{ mol}^{-1}$

Scan or tap for the full solution



Q.3 The ratio of the specific heats $\frac{C_p}{C_v} = \gamma$ in terms of degrees of freedom (n) is given by

[AIPMT 2015 (Cancelled)]

- (1) $\left(1 + \frac{2}{n}\right)$ (2) $\left(1 + \frac{n}{2}\right)$
 (3) $\left(1 + \frac{1}{n}\right)$ (4) $\left(1 + \frac{n}{3}\right)$

Scan or tap for the full solution



Q.4 The amount of heat energy required to raise the temperature of 1 g of Helium at NTP, from $T_1 \text{ K}$ to $T_2 \text{ K}$ is [NEET 2013]

- (1) $\frac{3}{4} N_A k_B (T_2 - T_1)$ (2) $\frac{3}{4} N_A k_B \left(\frac{T_2}{T_1}\right)$
 (3) $\frac{3}{8} N_A k_B (T_2 - T_1)$ (4) $\frac{3}{2} N_A k_B (T_2 - T_1)$

Scan or tap for the full solution



Q.5 To find out degrees of freedom, the expression is

[AIPMT 2000]

$$(1) f = \frac{2}{\gamma - 1}$$

$$(2) f = \frac{\gamma + 1}{2}$$

$$(3) f = \frac{2}{\gamma + 1}$$

$$(4) f = \frac{1}{\gamma + 1}$$

Scan or tap for the full solution



ANSWER KEY

Ques.	1	2	3	4	5						
Ans.	2	3	1	3	1						