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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 J K^{-1} 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 J K^{-1} mol^{-1})
[AIPMT 2015]

(1) 7.0 J K^{-1} mol^{-1} (2) 8.5 J K^{-1} mol^{-1}
(3) 8.0 J K^{-1} mol^{-1} (4) 7.5 J K^{-1} 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 K to T_2 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						