

Question 7

The ratio between the root mean square speed of H_2 at 50 K and that of O_2 at 800 K is, *(1996 - 1 Mark)*

- (a) 4 (b) 2
(c) 1 (d) 1/4

(c) The expression of root mean square speed is

$$U_{\text{rms}} = \sqrt{\frac{3RT}{M}}$$

Hence,

$$\frac{U_{\text{rms}}(H_2)}{U_{\text{rms}}(O_2)} = \left[\frac{3R(50K)/(2 \text{ g mol}^{-1})}{3R(800K)/(32 \text{ g mol}^{-1})} \right]^{1/2} = 1$$