QUESTION:
Calculate the average translational kinetic energy of a nitrogen molecule at 27 degree celcius

SOLUTION:
According to the kinetic theory of gases the average translation kinetic energy of a particle is

$$E_{tr} = \frac{3}{2}kT$$

Here $T = 27 + 273 = 300 \text{ K}$ and

$$E_{tr} = \frac{3}{2} \cdot 1.38 \cdot 10^{-23} \cdot 300 = 6.21 \cdot 10^{-21} \text{ J}$$

Answer
6.21·10⁻²³ J