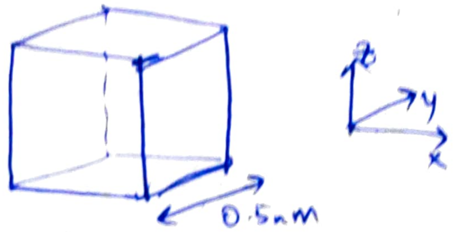

x, y, z directions are mutually independent.

Hence Hamiltonian operator $\hat{H}\psi(x) = E_x \phi(x) + E_y \cdot \phi(y) + E_z \phi(z)$

$\therefore$ The Energy $= \dfrac{n_x^2 h^2}{8mL^2} + \dfrac{n_y^2 h^2}{8mL^2} + \dfrac{n_z^2 h^2}{8mL^2}$

Lowest possible energy $\Rightarrow (n_x, n_y, n_z) = (1, 1, 1)$

$$\Rightarrow \frac{3h^2}{8m(0.5)^2 \times 10^{-18}}$$

$$\Rightarrow 3 \times 2.41 \times 10^{-19} \text{ J}$$

$$= 7.23 \times 10^{-19} \text{ J}$$

$$\Rightarrow \underline{\underline{4.52 \text{ eV}}}$$

Second lowest possible energy :- $(n_x, n_y, n_z) = (1, 1, 2)$

$$\Rightarrow \frac{6 \times h^2}{8m(0.5)^2 \times 10^{-18}}$$

$$= \underline{\underline{9.04 \text{ eV}}}$$

$\therefore$ difference $= \underline{\underline{4.52 \text{ eV}}}$