

TL 6-b (electron wavefunction)

$$\psi(x) = A \sin(2.5 \times 10^{10} x) \quad \Rightarrow k = 2.5 \times 10^{10}$$

a)  $p = \hbar k = \boxed{2.6 \times 10^{-24} \text{ kgm/s}}$

b)  $E = \frac{p^2}{2m} = \boxed{3.8 \times 10^{-18} \text{ J}} = \boxed{23.8 \text{ eV}}$

c)  $\lambda = \frac{h}{p} = \boxed{0.25 \text{ nm}}$