(1) $E_D = \frac{m^*}{m_0 \varepsilon^2}$ $E_i = \frac{0.615 \times 13.6}{18^2} = 6.3 \times 10^{-4} eV$

(2) $r = \frac{4\pi\hbar^2 \varepsilon_0 \varepsilon}{m^* e^2} = \frac{m_0 \varepsilon}{m^*} a_0 = 636 Å$

(3) $N_D \geq \frac{1}{(2r)^3} = 4.86 \times 10^{20} m^-$