Cu has a molar volume of 7.12 cm³ as given in the table on page 404.

\[ V = 7.12 \text{ cm}^3 \cdot \left(\frac{1 \text{ m}}{100 \text{ cm}}\right)^3 = 1.18 \times 10^{-29} \text{ m}^3 \]

\[ N = 6.02 \times 10^{23} \quad \text{Since one e- / atom, true for e- as well.} \]

\[ E_F = \frac{h^2}{8m} \left(\frac{3}{\pi} \left(\frac{1}{\sqrt{m}}\right)\right)^{2/3} \]

\[ m = \text{molecule} = 9.109 \times 10^{-31} \text{ kg} \]

\[ E_F = \frac{6.626 \times 10^{-34} \text{ J} \cdot \text{s}}{8 \cdot (9.109 \times 10^{-31} \text{ kg})} \left(\frac{3}{\pi} \left(\frac{1}{1.18 \times 10^{-29} \text{ m}^3}\right)\right)^{2/3} \]

\[ E_F = 1.127 \times 10^{-18} \text{ J} = 7.04 \text{ eV} \]

\[ T_F = \frac{E_F}{k} = \frac{7.04 \text{ eV}}{8.617 \times 10^{-5} \text{ eV/k}} = \frac{81,660 \text{ K}}{81,660 \text{ K}} \]

\[ P = \frac{2}{3} \frac{U}{V} = \frac{2}{3} \frac{N}{V} E_F \]

\[ P = \frac{0.4}{1.18 \times 10^{-29} \text{ m}^3} \left(1.127 \times 10^{-18} \text{ J}\right) \]

\[ P = 38.2 \times 10^9 \text{ Pa} \]
\[ B = \frac{10}{9} \text{ mT} \]

\[ = \frac{2}{3} \cdot \frac{1}{1.18 \times 10^{-29} \text{ m}^3} \cdot 1.127 \times 10^{-18} \text{ J} \]

\[ B = 4.37 \times 10^{10} \text{ Pa} \]

If we compare \( kT \) to \( \varepsilon_F \) we find

\( \varepsilon_F \gg kT \) at room temperature. So, [yes,]

room temperature is low temperature for \( e^- \) in \( Cu \)

and so \( e^- \) gas is said to be degenerate.