5.23 (a) Most probable single-particle energy is \( E_0 = \frac{1}{2} \hbar \omega \).

(b) There is a 3-way tie for the most probable energy: \( E_0, E_1, \) and \( E_2 \).

(c) Most probable energy is \( E_1 \).

5.29

\[
\begin{align*}
(\text{c}) \quad T_c &= \frac{2 \pi \hbar^2}{m k_B} \left( \frac{N}{2.612} \right)^{2/3} \\
(\text{d}) \quad T_c &= 3.1 \text{ K}
\end{align*}
\]