HW #5
Due Nov. 9 (Thursday) in class

1. Problem 10.8 in Chuang.  
   Note:  
   Find the gain for TE polarization.  
   The square of the matrix element is \( |\hat{\mathbf{e}} \cdot \mathbf{p}|^2 = M_{b}^2 = (m_{0}/6)E_{p} \). Find the value of \( E_{p} \) from Appendix K, Table K-2)  
   Please use your favorite math software package to plot the gain spectrum for  
   (a) \( \Delta F = E_{g} + (E_{e1} - E_{hl}) + 0.05 \text{ eV} \)  
   (b) \( \Delta F = E_{g} + (E_{e1} - E_{hl}) + 0.3 \text{ eV} \)

2. Problem 10.9 in Chuang (use \( m_{e}^{*} = 0.0665m_{0} \) and \( m_{b}^{*} = 0.34m_{0} \))