1. Given the bandgap energies listed:
   - Ge  0.62 eV
   - GaAs 1.43 eV
   - InP ______
   a. What are the minimum wavelengths for photodetection of photodiodes constructed with Ge, GaAs, and AlAs
   b. What happens if the photodiode is thinner than the absorption depth of light in that material at a given wavelength of light smaller than the critical wavelength?
   c. What is the widest -3dB bandwidth that can be achieved by a photodiode constructed with these three materials? List assumptions and critical dimensions of the diode structure.

2. Discuss tradeoffs in selection dimensions of a PIN detector to decrease transit time and increase speed.