Summer 2012
Ve320 Introduction to Semiconductor Device
Homework #1, due next Friday (May 25,2012) **before class**

1. RFP, Problem 1.1(g)
2. RFP, Problem 1.4
3. Ge has the same crystal structure as Si (diamond), with a lattice constant of $0.564\,nm$. Find the atomic density (atoms/cm^3) and the spacing between nearest neighbor atoms in Ge. Recall that 1 nm = 1x10^{-7} cm.
4. RFP, Problem 1.5
5. Graphene has a two dimensional structure. Please sketch the structure and identify a unit cell.
6. We used the relations $E = \hbar\omega$ and $p = \hbar k$ in the expression $E = mc^2$ to derive Schrodinger equation for electrons. Repeat the same analysis for photons ($m_0 = 0$) to show that they obey classical wave-equation, i.e. $\frac{\partial^2 A}{\partial x^2} = \frac{1}{c^2}\frac{\partial^2 A}{\partial t^2}$ where $A(x,t)$ is the amplitude of the wavefunction.

*Note: RFP refers to the textbook (semiconductor device fundamentals by R. F. Pierret)