Tutorial 6

1) The intrinsic carrier concentration of Si at 300 K is $1.5X10^{10}$ /cm^3. Assuming that mobility of electrons is 1300 cm^2/Vs and holes is 500 cm^2/Vs, find out the resistivity of intrinsic Si.

2) The same piece of Si is now uniformly doped with 4 parts per 10^8 of P impurities. Find out the electron and hole concentrations. Assuming that the mobility remains the same, find out the resistivity.

3) Consider a p-n junction. If the doping of the p side is 10^{15}/cm^3, and doping of n side is 10^{16}/cm^3, find out the built-in potential.

4) The following circuit with ideal diode was discussed partly in the class. Find out and sketch the output voltage if the input voltage is 6*sin(ωt) V.