Name:_____

Student ID #:_____

EECS 170A

Homework #3

HW will be collected in discussion section.
Please do not turn your HW in anywhere else.
Due: 10:50am Thursday, October 20, 2011.

Please *staple* this sheet to the front of your homework.

1	2	3	4	Total
/25	/25	/25	/25	/100

1) For Si at room temperature (ni = 10^{10} /cm^3), Draw the **band diagram** showing (Ec, Ev, E_F, Ei) and indicate your findings:
   a) For Nd = 10^{15} /cm^3
   b) For Na = 10^{17} /cm^3

2) Calculate n_i , p_i for Si:
   a) When temperature is 0 degree Celcius.
   b) When temperature is 100 degree Celcius.

3) Given a Si semiconductor that has its Fermi level 0.25Eg below the conduction band.
   a) Find the resistivity in (Ohm-cm)
   b) Find the electron mobility in (cm^2/V-s)

4) Given a n-type semiconductor that has (μn) of 380cm^2/V-s
   a) Find the resistivity in (Ohm-cm)
   b) Draw a band diagram (as in Problem #1) and indicate your findings.