Name:_____

Student ID #:_____

ECE 113A
Homework #1
Due 10 A.M. Wednesday, October 8, 2003

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

1a	1b	2a	2b	3	Total
/20	/20	/20	/20	/20	/100

1) If the lattice constant or unit cell length in Si is a = 5.43 x 10^{-8} cm,

    a. Find the number of atoms/cm^3 in Si.
    b. Find the number of atoms/m^3 in Si.

2) 10^{10} electrons pass through an opening 1 cm x 0.5 cm per second.
    a. What is the current, in A.
    b. What is the current density, in A/cm^2.

3) In a modern integrated circuit, there are 10^8 transistors. If each one occupies an area of 0.1 μm x 0.1 μm, how big does the chip have to be in cm^2?