Name: **Id#**

COE 360, Principles of VLSI Design, Term 043
Quiz# 1

Date: Saturday, July 9, 2005

Determine the **electron and hole concentrations** and the **conductivity** of a piece of silicon at 300K given that it is doped with Arsenic (pentavalent) at a density of $4X10^{16}$ atoms/cm^3 and doped with Boron (trivalent) at a density of $4X10^{12}$ atoms/cm^3. *Assume the following: Electron mobility at 300 K=1500 cm^2/V.s, Hole mobility at 300 K = 475 cm^2/V.s, Intrinsic concentration at 300 K=1.45X10 ^{10} cm^{-3}* , q= 1.6X10^{-19}. *Indicate clearly the **units** in your solution.*