Home Problem Set #9 Due : October 20, 2014

1. You are given a *p*-type doped silicon crystal and are asked to make an ohmic contact. What material would you use? (refer to Appendix 4)

2. Describe the energy bands for a metal and a semiconductor *before* and *after* contact.
   (a) *n*-type, $\phi_M > \phi_S$
   (b) *n*-type, $\phi_M < \phi_S$
   (c) *p*-type, $\phi_M > \phi_S$
   (d) *p*-type, $\phi_M < \phi_S$

3. Calculate the room-temperature saturation current and the forward current at 0.3 V for a silver/*n*-doped silicon Schottky-type diode. Take for the active area of 10^{-8} m^2 and $C = 10^{19}$ A/m^2K^2.