EECS 217C *Nanotechnology*
Homework #3
Due Monday, May 10, 2004 at the beginning of class

1) How does the R_T C time of a tunnel junction depend on the area of the junction?

2) Estimate the R_T C time for the tunnel junction measured in class.

3) For a tunnel junction which exhibits Coulomb blockade at 1K, estimate the R_T C time.

4) Calculate the change in the Gibbs free energy for a two-island circuit with no gates. (I.e. three tunnel junctions in series) for all possible electron transitions. (Left lead to island 1, island 1 to left lead, island 1 to island 2, island 2 to island 1, island 2 to right lead, right lead to island 2). Describe the conditions under which current can and cannot flow from the left lead to the right lead.