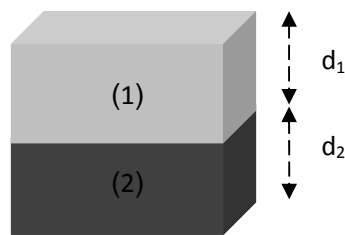**HW No. 6**

1- Two objects made of the perfect conductor are placed in a material with the permittivity ε and the conductivity σ. Show that the capacitance and the resistance defined between the objects satisfy $RC = \varepsilon / \sigma$.

2- The figure shows two neutral materials with the permittivity and the conductivity $(\varepsilon_1, \varepsilon_2)$ and (σ_1, σ_2) which are held together. The system is infinitely long along the other two coordinates. If the upper and the lower surface is held at the differential electrostatic potential V_0, find the surface charge densities on the upper, the middle, and the lower surfaces.

Be Happy,
Amir Jazayeri