PHYSICS II: Problem Set 4

P4.1: Giancoli 24-32.

P4.2: In our experiment (on Feb 11) we used a 0.5 \( \mu \text{F} \) capacitor charged to 10 kV. Suppose the capacitor is discharged through a human body. Estimate the increase of the body temperature. (It takes 1 calorie=4.2 J to heat 1 gram of water by 1 degree Celsius).

P4.3: A 100 pF capacitor is charged to 100 V. Then the battery is disconnected, and the capacitor is connected to a 50 pF capacitor. Calculate how much electrostatic energy was lost because of this connection? (Find the difference in electrostatic energies stored in a one- and two-capacitor configurations.) (This is not part of the problem, but think about what happened to the missing energy.)