04 – Conductors, capacitance, energy stored in E-field (Ch. 25)

$k = 1/4\pi\varepsilon_0 = 8.99 \cdot 10^9$ N m^2/C^2 ; $e = 1.60 \cdot 10^{-19}$ C; $\varepsilon_0 = 8.854 \cdot 10^{-12}$ F/m

3) A parallel-plate capacitor has circular plates of 8.20 cm radius and 1.30 mm separation. (a) Calculate the capacitance. (b) Find the charge for a potential difference of 120 V.

5) What is the capacitance of a drop that results when two mercury spheres, each of radius R = 2.00 mm, merge?

31) A 2.0 mF capacitor and a 4.0 mF capacitor are connected in parallel across a 300 V potential difference. Calculate the total energy stored in the capacitors.

39) In the figure, C_1 = 10.0 μF C_2 = 20.0 μF and C_3 = 25.0 μF. If no capacitor can withstand a potential difference of more than 100 V without failure, what are (a) the magnitude of the maximum potential difference that can exist between points A and B and (b) the maximum energy that can be stored in the three-capacitor arrangement?