Physics 200

Chapter 26: Capacitors (Lecture Examples)

Ex:1 Determine the capacitance of a parallel plate capacitor (plate area = A, separation distance = x)

Ex:2 Determine the capacitance per unit length of a coaxial cable whose inner conductor has radius, "a", and whose outer conductor has radius, "b".

Ex:3 Determine the capacitance of a two concentric conducting spheres. The radius of the inner sphere is "a" and the radius of the outer sphere is "b".

Ex:4 Determine the effective capacitance of three capacitors that are connected in series.

Ex:5 Capacitors: C_1 and C_2 are in parallel. They in turn are in series with capacitor C_3. What is the charge on capacitor, C_1, if there is voltage, V, across C_3?

Ex:6 A parallel plate capacitor has a plate area, A, a plate separation distance, x, and a charge, Q.   Find the energy stored and the energy density.

Ex:7 What is the total energy stored in two identical parallel plate capacitors if one of them is charged and the other is not? How much is stored after you connect them together? (They have plate area, A, charge, Q, and plate separation, x.)

Ex:8 Calculate the capacitance of a parallel plate capacitor with a dielectric. (Plate area = A, separation distance = x, dielectric constant = κ)

Ex:9 How much energy is stored in a parallel plate capacitor before and after a dielectric slab inserted?

Ex:10 Calculate the capacitance of a parallel plate capacitor partially filled with a dielectric.