Capacitor and Dielectric

1. A 6 μF capacitor is connected in series with a 4μF capacitor, a potential difference of 200V is applied across the pair (a) calculate the equivalent capacitance (b) what is the charge on each capacitor
   (c) what is the potential difference across each capacitor?
   (Ans: (a)2.4μF (b) 480μC (c) V6 = 80V V4=120V)
2. A parallel plate capacitor has circular plates of 8.22cm radius and 1.31mm separation (a) calculate the capacitance (b) what charge will appear on the plates if a potential difference of 116V is applied?
   (Ans: (a) 143pF (b) 1.66 x 10^{-8} C)
3. A 32 μF capacitor is connected across a programmed power supply. During the interval from t = 0 to t = 3s the output voltage of the supply is given by V(t) = 6 +4t -2t^2 volts. At t = 0. 5 s find (a) the charge on the capacitor, (b) the current into the capacitor, and (c) the power output from the power supply.(Ans: (a) 240μC (b) 64μA (c) 480μ W)
4. A parallel plate capacitor has plate with dimensions 3cm x 4cm separated by 2mm. The plates are connected across a 60 V battery. Find (a) the capacitance (b) the magnitude of the charge on each plate. (Ans: (a) 5,31 pF (b) 3.19 x 10^{-10} C)
5. For the circuit in figure-1 find: (a) the equivalent capacitance (b) the charge and potential difference for each capacitor.

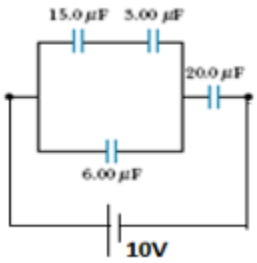

Fig-1