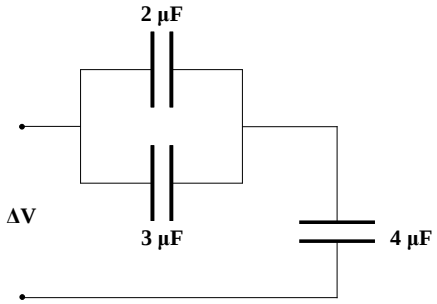
Electric Potential Energy & Electric Potential IV

Name: _____ **# of problems you seriously attempted, groupwork + homework = _____**

1. (a) Find the equivalent capacitance of the network of three capacitors shown in the figure.

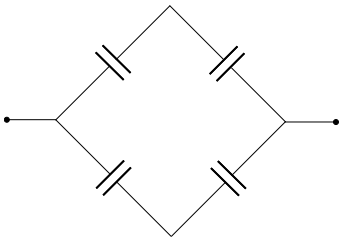
(b) If $\Delta V = 10$ V, find the charge on each capacitor and the voltage across each capacitor.

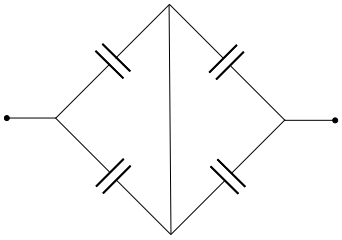
(c) Find the total electric potential energy stored in this system.



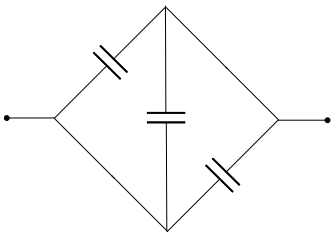
Electric Potential Energy & Electric Potential IV

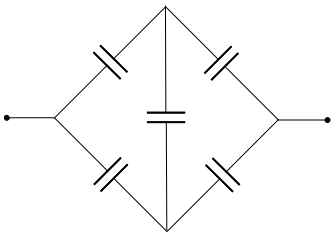
2. Find the equivalent capacitance of the following systems. All of the capacitors have a capacitance of C.





Electric Potential Energy & Electric Potential IV

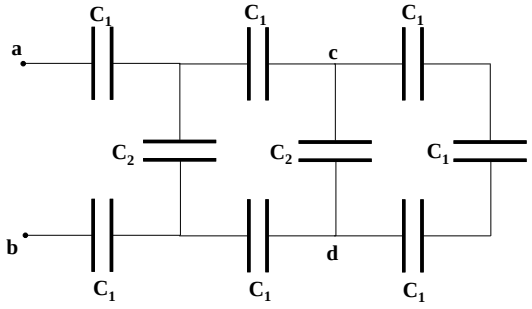




Electric Potential Energy & Electric Potential IV

3. In the figure below, each capacitance C_1 is 6.9 μF, and each capacitance C_2 is 4.6 μF.

   (a) Compute the equivalent capacitance of the network between points *a* and *b*.
   (b) Compute the charge on each of the three capacitors nearest *a* and *b* when ΔV_{ab} = 420 V.
   (c) With 420 V across *a* and *b*, compute ΔV_{cd}.



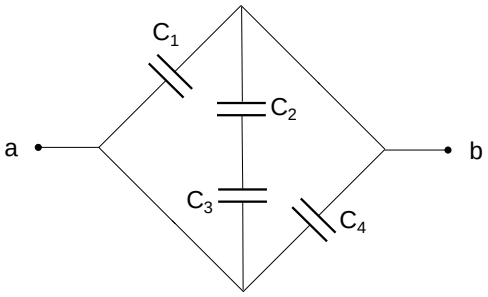
more space →

Electric Potential Energy & Electric Potential IV

Electric Potential Energy & Electric Potential IV

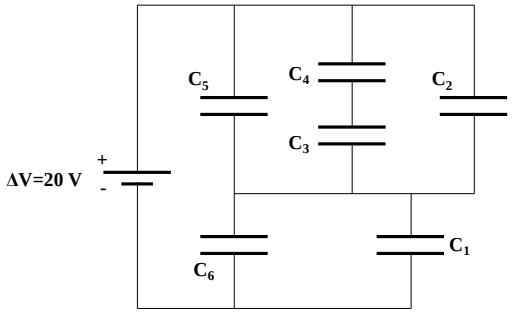
HOMEWORK

1. Find the charge, potential difference, and stored energy in every capacitor in this circuit. Let V_{ab} = 60 V, C_1 = 4.0μF, C_2 = 7.0μF, C_3 = 5.0μF, C_4 = 6.0μF.



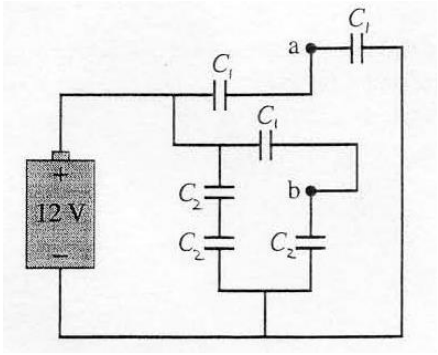
Electric Potential Energy & Electric Potential IV

2. Find the equivalent capacitance of the following circuit. C_1 = 3.0μF, C_2 = 2.0μF, C_3 = 4.0μF, C_4 = 4.0μF, C_5 = 2.0μF, C_6 = 3.0μF.



Electric Potential Energy & Electric Potential IV

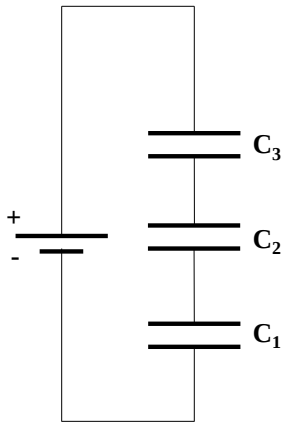
3. Three capacitors with capacitance C_1 = 10 μF and three with capacitance C_2 = 20 μF are connected as shown in the figure.
(a) Find the equivalent capacitance of this system.



(b) What is the potential difference between points *a* and *b*? Indicate which point is at a higher potential.

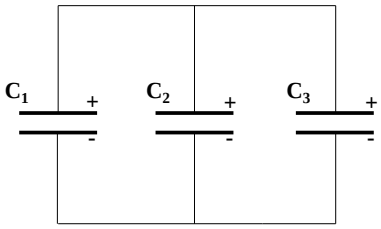
Electric Potential Energy & Electric Potential IV

4. Three capacitors having capacitances of 8.4 μF, 8.4 μF, and 4.2 μF are connected in series across a 36 V potential difference.
(a) What is the charge on the 4.2 μF capacitor?



(b) What is the total energy stored in all three capacitors (whole system)?

(c) The capacitors are disconnected from the potential difference without allowing them to discharge. They are then reconnected in parallel with each other, with the positively charged plates connected together. What is the voltage across each capacitor in the parallel combination?



(d) What is the total energy now stored in the capacitors (whole system)?