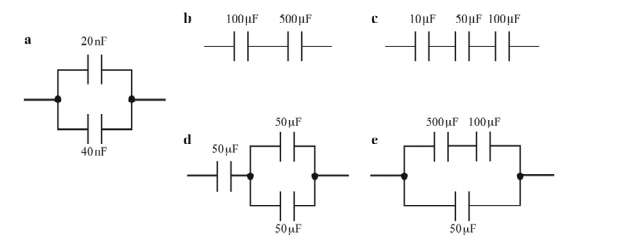
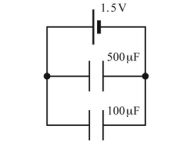
**Worksheet – Intro to Capacitance**

1. A 30 μF capacitor is connected to a 9.0 V battery.
   1. Calculate the charge on the capacitor.
   2. How many excess electrons are there on the negative plate of the capacitor? (Elementary charge e = 1.6 × 10–19 C)
2. The potential difference across a capacitor is 3.0 V and the charge on the capacitor is 150 nC. Determine the charge on the capacitor when the potential difference is:
   1. 6.0 V
   2. 9.0 V.
3. A 1000 μF capacitor is charged to a potential difference of 9.0 V.
   1. Calculate the energy stored by the capacitor.
   2. Determine the energy stored by the capacitor when the potential difference across it is doubled.
4. You have three capacitors: 1.5 mF, 2.0 mF and 3.0 mF. What are the maximum and minimum equivalent capacitances you can obtain by combining these three capacitors? How did you combine the capacitors in order to obtain a minimum and maximum?
5. For each circuit below, determine the total capacitance of the circuit.



1. The diagram shows an electrical circuit.



1. Calculate the total capacitance of the two capacitors in parallel.
2. What is the potential difference across each capacitor?
3. Calculate the total charge stored by the circuit.
4. Calculate the total energy stored by the capacitors.

Answers:

1. a. 3.3 x 10-6 C b. 2.1 x 1013 electrons
2. a. 30 μF b. 45 μF
3. a. 0.041 J b. 0.16 J
4. MAX = 6.5 mF – connect in parallel MIN = 0.67 mF connect in series
5. a. 60 nF b. 83 μF c. 7.7 μF d. 33 μF e. 130 μF
6. a. 600 μF b. 1.5 V c. 9.0 x 10-4 C d. 6.8 x 10-4 J