

Chapter 4 (SC-300R, SC-500R, SC-750R ONLY)

4.1 Capacitors . . .

- store electric charge.
- can isolate parts of a circuit while letting signals move between them.
- have metal plates separated by dielectric materials.
- All of the above.

4.2 Capacitance is a measure of a capacitor's . . .

- capacity for storing electric charge.
- ability to withstand electrical pressure.
- electromagnetic induction.
- quantity of metal-dielectric layers.

4.3 Why are batteries better at storing electricity than capacitors?

- Batteries store magnetic energy while capacitors store electrical energy.
- Batteries store chemical energy while capacitors store electrical energy.
- Batteries are always larger.
- Higher quality materials are used in batteries, and batteries cost more.

4.4 How do capacitors combine when placed in series or in parallel?

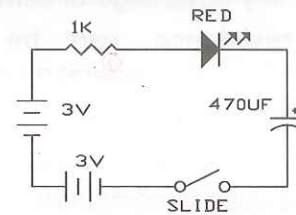
- When capacitors are in series, total capacitance decreases.
- When capacitors are in parallel, total capacitance increases.
- Opposite to how resistors combine.
- All of the above.

4.5 What determines how long it takes to charge or discharge a capacitor?

- The resistance and capacitance in the charge/discharge paths.
- The voltage that is charging the capacitor.
- The capacitance in the charge/discharge paths.
- The resistance in the charge/discharge paths.

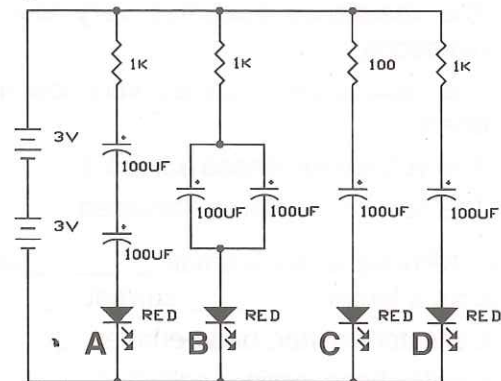
4.6 Draw the schematic for a circuit to charge up a $100\mu\text{F}$ capacitor to 3V, using as few parts as possible.

4.7 How could you change this circuit so the LED stays on longer after the switch is turned on?



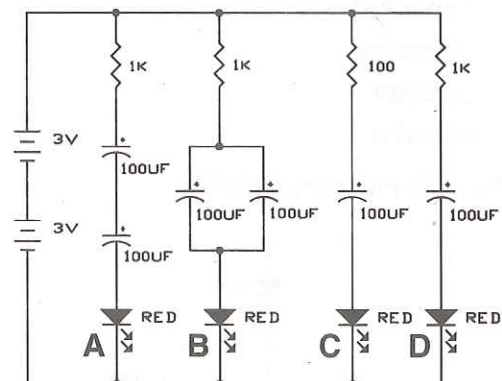
- Place a second capacitor in series with the first.
- Place a second capacitor in parallel with the first.
- Decrease the resistor value.
- Decrease the capacitor value.

4.8 When the switch is turned on, which LED will be brightest in the first moment?



- LED A
- LED B
- LED C
- LED D

4.9 In the circuit for problem 4.8, which LED will stay lit the longest?



- LED A
- LED B
- LED C
- LED D

4.10 Capacitance is measured in _____.

- Farads
- Ohms
- Henrys
- Watts