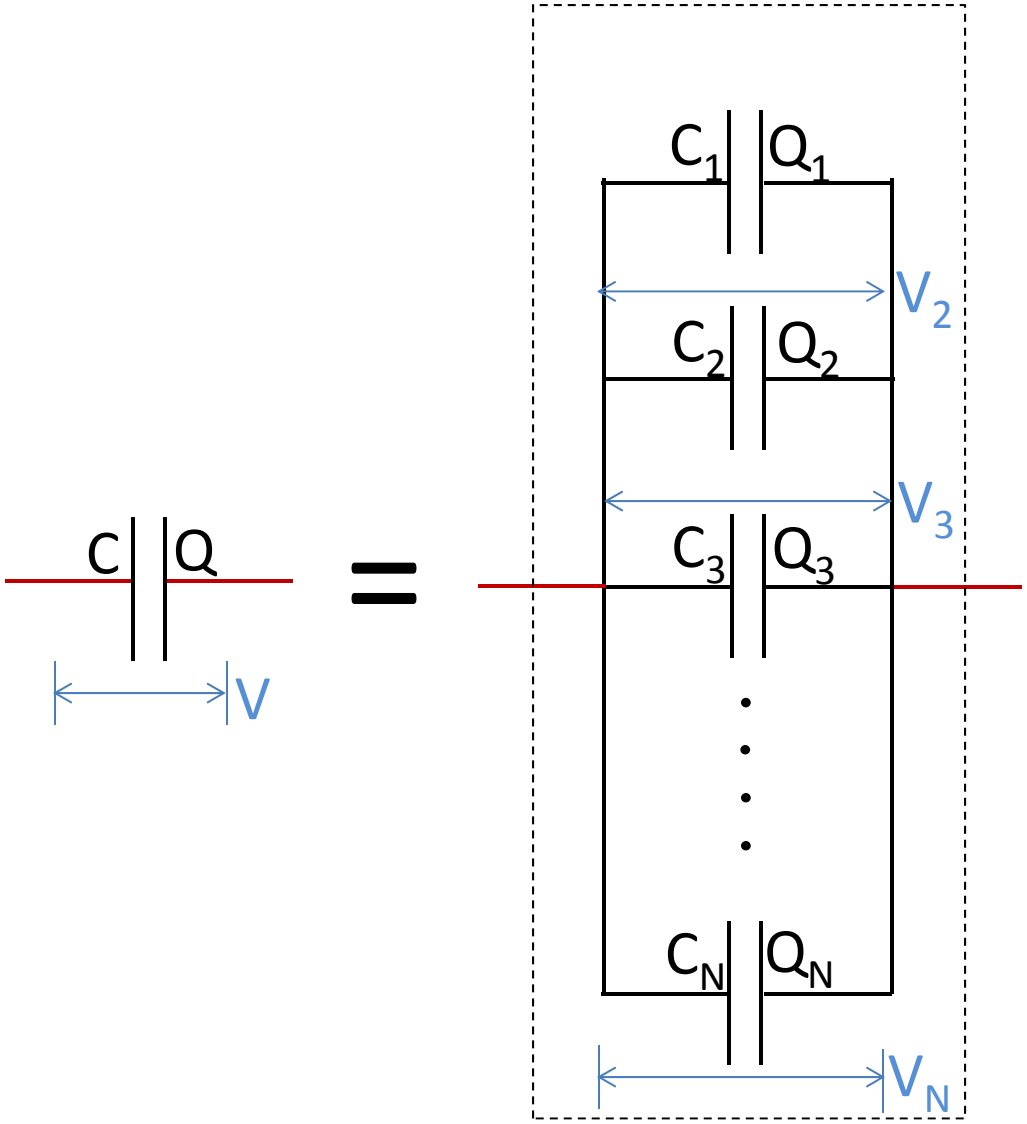
Class 18. Capacitors in parallel and in series II

Test 2 Next Wednesday (Oct 11)

1. Chapters 7, 8 (8.1-8.3).
2. You are not allowed to check your section number during the test. However, you will get 3 bonus points if you fill in your section number correctly.
3. 45 minutes sharp.
4. 4 multiple choices and 2 long problems.
5. Formula sheet provided.
6. Contact me before next Monday for prearrangement if you need special accommodation.

Connecting Capacitors in Parallel



$$C = C_1 + C_2 + C_3 + \cdots C_N$$

$$Q = Q_1 + Q_2 + Q_3 + \cdots Q_N$$

$$V = V_1 = V_2 = V_3 = \cdots V_N$$

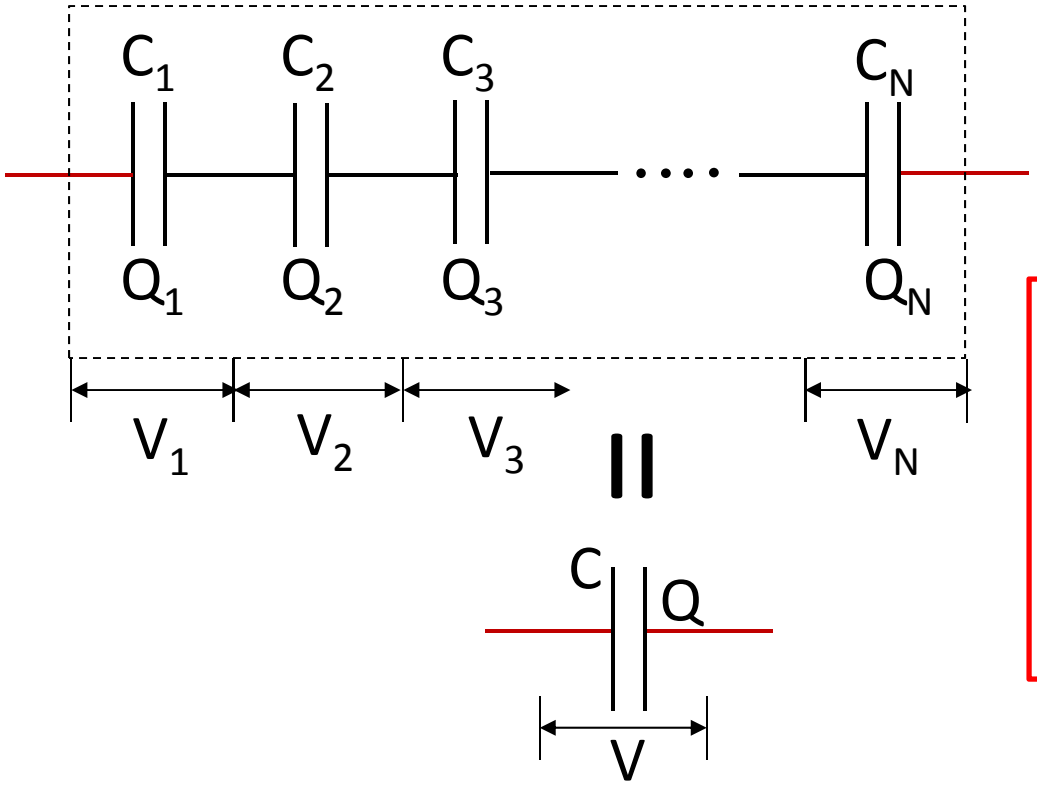
1. Potential difference across each individual capacitor is the same: (why?)

$$V = V_1 = V_2 = V_3 = \cdots V_N$$

$$\Rightarrow \frac{Q_1}{C_1} = \frac{Q_2}{C_2} = \frac{Q_3}{C_3} = \cdots \frac{Q_N}{C_N}$$

2. Charge stored in each individual capacitor should be different (unless they have the same capacitance).

Connecting Capacitors in Series



$$\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} + \cdots \frac{1}{C_N}$$

$$Q = Q_1 = Q_2 = Q_3 = \cdots = Q_N$$

$$V = V_1 + V_2 + V_3 + \cdots + V_N$$

1. Charge stored in each individual capacitor is the same: (why?)

$$Q = Q_1 = Q_2 = Q_3 = \cdots = Q_N$$

$$\Rightarrow CV = C_1V_1 = C_2V_2 = C_3V_3 = \cdots = C_NV_N$$

2. Potential difference across each individual capacitor should be different (unless they have the same capacitance).