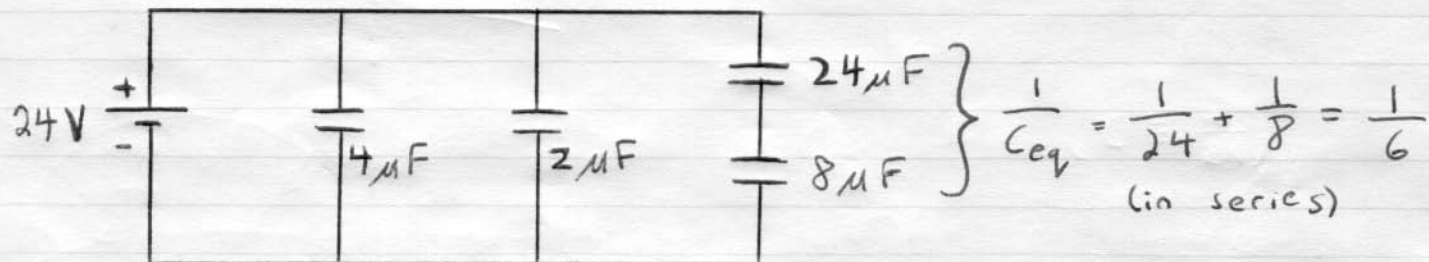


QUIZ 3: Capacitance

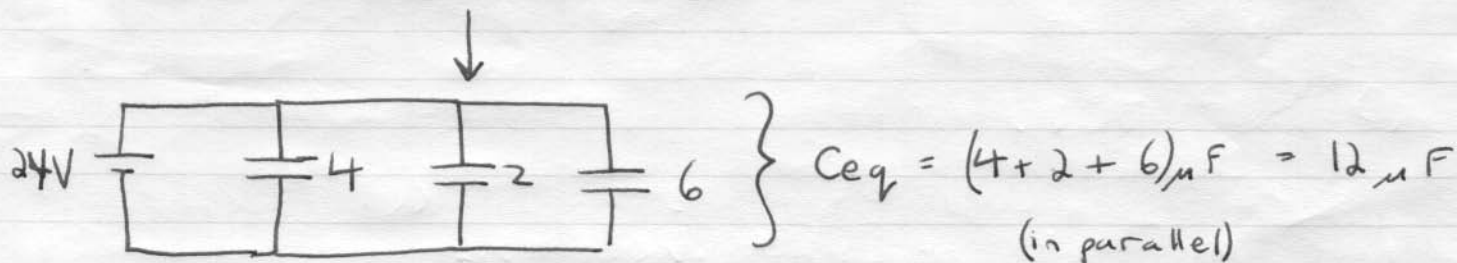
Consider the combination of capacitors below:

- a) What is the equivalent capacitance of the group?
b) Determine the charge on each capacitor.



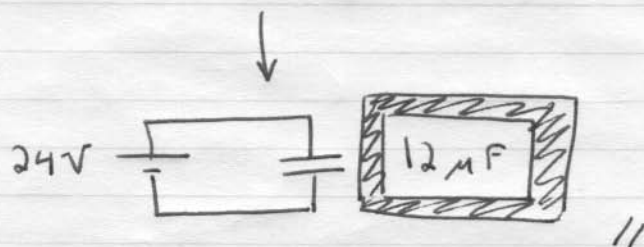
$$\left. \begin{array}{l} 24 \mu\text{F} \\ 8 \mu\text{F} \end{array} \right\} \frac{1}{C_{eq}} = \frac{1}{24} + \frac{1}{8} = \frac{1}{6}$$

(in series)



$$\left. \begin{array}{l} 4 \\ 2 \\ 6 \end{array} \right\} C_{eq} = (4 + 2 + 6) \mu\text{F} = 12 \mu\text{F}$$

(in parallel)



$$C \equiv \frac{Q}{\Delta V} \Rightarrow Q_4 = C_4 \Delta V = (4 \mu\text{F})(24 \text{V}) = \boxed{96 \mu\text{C}} = Q_4$$

$$Q_2 = C_2 \Delta V = (2 \mu\text{F})(24 \text{V}) = \boxed{48 \mu\text{C}} = Q_2$$

$$Q_6 = C_6 \Delta V = (6 \mu\text{F})(24 \text{V}) = 144 \mu\text{C}$$

* Capacitors in series have the same charge \Rightarrow

$$Q_6 = \boxed{Q_{24} = Q_8 = 144 \mu\text{C}}$$