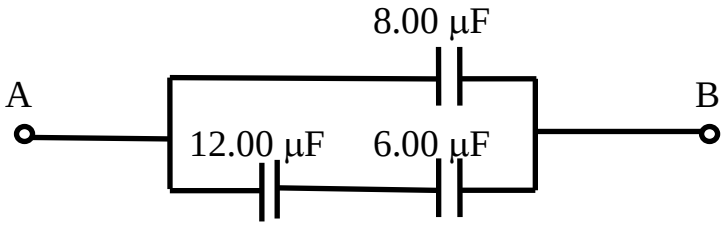
General Physics II Quiz #2 Name_____



A) What is the value of a single capacitor that has the same capacitive effect as the combination of capacitors illustrated above? (6 pts)

First comnbine the 12 μF and 6 μF capacitors in series.

$$\frac{1}{C_S} = \frac{1}{12\mu F} + \frac{1}{6\mu F} = \frac{1}{12\mu F} + \frac{2}{12\mu F} = \frac{3}{12\mu F}$$

$$C_S = \frac{12}{3}\mu F = 4.0\mu F$$

Next combine the 4.0 μF with the 8 μF in parallel.

$$C_P = 4.0\mu F + 8.0\mu F = 12.0\mu F$$

B) If a 50.0 V power supply is attached across points A and B, how much charge will leave the power supply, move past point A onto this collection of capacitors? (3 pts)

Capacitance is defined as

$$C = \frac{Q}{\Delta V}$$

Therefore, the charge is

$$Q = C\Delta V = (12.0\mu F)(50V) = 600\mu\ C$$

C) If the 6.00 μF and 8.00 μF capacitors were interchanged (swapped), what would happen to the capacitance of this combination of capacitors? (Circle one of the following.) (1 pt)

Increase Stay the Same **Decrease**

Just looking at the circuit, it is not obvious what will happen. Redoing the calculations with the different values gives a total capacitance of 10.8 μF. Therefore, it decreases.