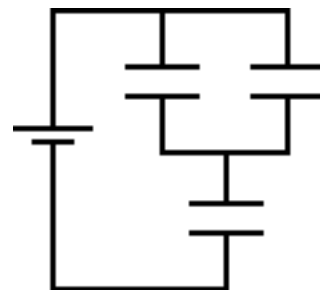


Name: \_\_\_\_\_

Solve the following problems in the space provided. Use the back of the page if needed. Each problem is worth 20 points. You must show your work in a logical fashion starting with the correctly applied physical principles which are on the last page. Your score will be maximized if your work is easy to follow because partial credit will be awarded.

1. In the circuit at the right,  $C_2$  has a potential difference of 5.00V. Find (a) the charge on each capacitor, (b) the potential difference for each capacitor, (c) the battery voltage, and (d) the total charge that flows through the battery ( $C_1=40.0\mu\text{F}$ ,  $C_2=80.0\mu\text{F}$ , and  $C_3=60.0\mu\text{F}$ ).



$Q(\mu\text{C})$	$C(\mu\text{F})$	$V(\text{V})$
	40.0	
	80.0	5.00
	60.0	
	battery	

2. A 1.00mm diameter aluminum wire 15.0m long carries a current of 5.00A. Find (a)the current density, (b)the average speed of the electron's in the wire, and (c)the speed at which electrical energy travels through the wire.

3. For the wire in problem 2, find (a)the resistance and (b)potential difference across the ends.

4. Why does PG&E transmitted large amounts of electric power using high voltage instead of high current?
5. A  $2.00\text{nF}$  capacitor with an initial charge of  $5.00\mu\text{C}$  is discharged through a  $1.30\text{k}\Omega$  resistor. After  $9.00\mu\text{s}$  find (a) the remaining charge on the capacitor and (b) the current through the resistor.