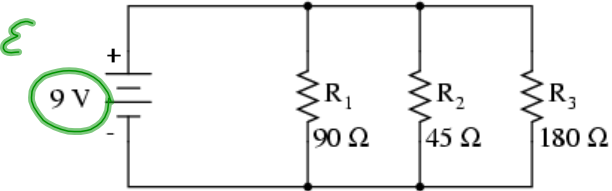


PSC-4011 Quiz#4

Name:

Date:

1. In the circuit diagram below, determine the value of the current supplied by the power supply. All formulas and calculations must be shown.



Find R_{eq}

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

$$\frac{1}{R_{eq}} = \frac{1}{90} + \frac{1}{45} + \frac{1}{180}$$

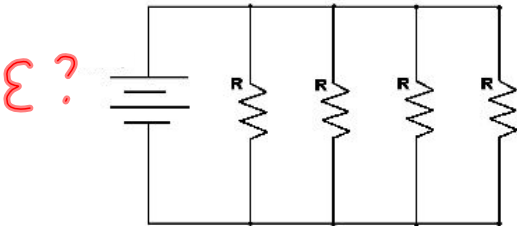
$$\frac{1}{R_{eq}} = 0.038$$

$$R_{eq} = \frac{1}{0.038} = 25.7 \Omega$$

$$I_T = \frac{\mathcal{E}}{R_{eq}} = \frac{9V}{25.7 \Omega}$$

$I_T = 0.35 A$

2. In the circuit diagram below, determine the value of \mathcal{E} , the electromotive force. All formulas and calculations must be shown.



Find R_{eq}

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4}$$

$$\frac{1}{R_{eq}} = 0.42$$

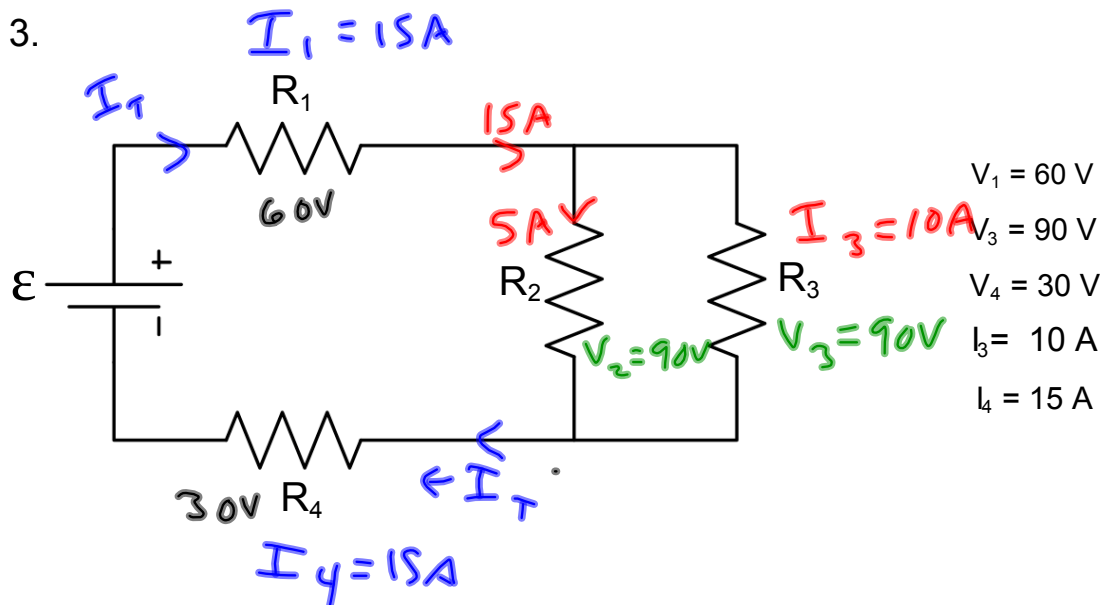
$$R_{eq} = \frac{1}{0.42} = 2.4 \Omega$$

$$\mathcal{E} = I_T R_{eq}$$

$$= (13.3 A)(2.4 \Omega)$$

$\mathcal{E} = 31.7 V$

3.



Without calculating, based only on your understanding of voltage and current laws, find the values below. Explain your answers.

a) $V_2 = 90\text{ V}$ because: R_2 and R_3 are in parallel $\therefore V_2 = V_3$

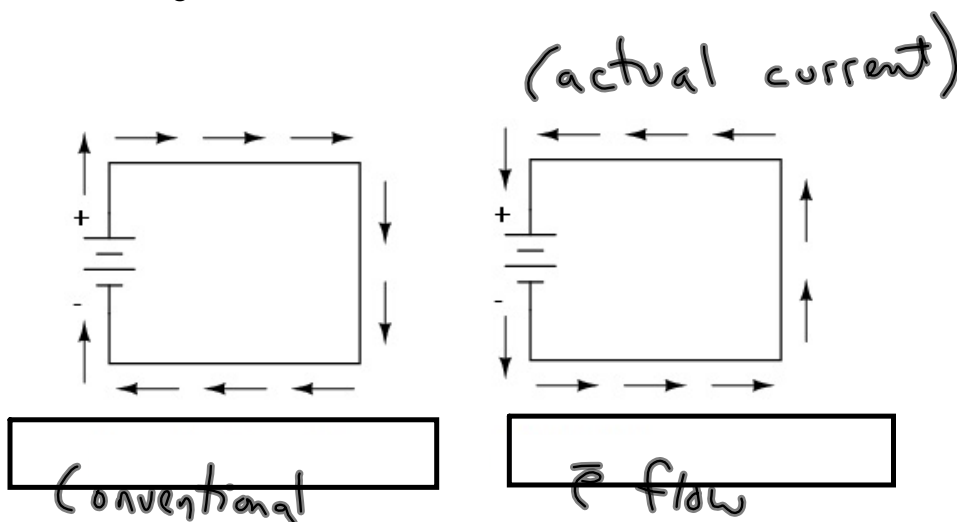
b) $I_1 = 15\text{ A}$ because: $I_1 = I_4$

c) $I_2 = 5\text{ A}$ because: $I_2 = I_1 - I_3$

d) $\mathcal{E} = 180\text{ V}$ because: $60\text{ V} + 90\text{ V} + 30\text{ V} = 180\text{ V} \checkmark$

$$V_1 + (V_2 \text{ or } V_3) + V_4 = 180\text{ V}$$

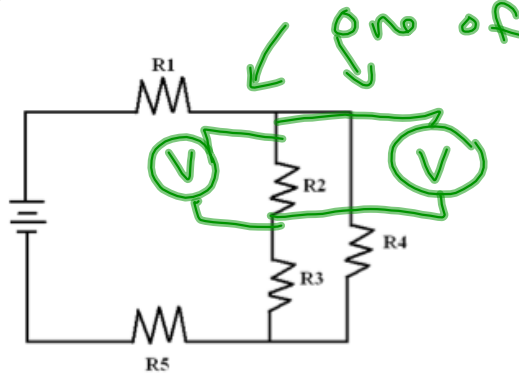
4. One of the diagrams below is depicting the direction of conventional current flow in a circuit, and one is depicting the direction of electron flow in a circuit. Which is which? Place the terms: **electron flow** and **conventional current** in the appropriate rectangles.



5. You want to measure the potential difference across the terminals of R_2 below.
- a) What device will you use?

Voltmeter

- b) On the diagram below, indicate how the device is connected, using the appropriate symbol.



- c) Is this device connected in series or in parallel with R_2 ? Explain your answer.

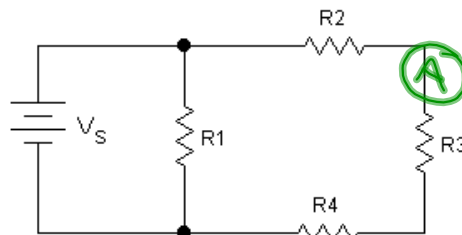
Parallel ; the electrons don't need to flow through it to measure energy difference.

6. You want to measure the intensity of the current flowing through resistor R_3 in the circuit below.

- a) What device will you use?

Ammeter

- b) On the diagram below, indicate how the device is connected, using the appropriate symbol.



- c) Is this measuring device connected in series or in parallel with resistor R_3 ? Explain your answer.

In series; electrons must flow through it for current to be measured.