

Final Exam Circuits Review

Chapters 34, 35

Equations:

$$I = \frac{Q}{t} \quad V = IR \quad P = VI \quad R_{series} = R_1 + R_2 + R_3 + \dots$$

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

Constants:

$$e = +/-1.6 \times 10^{-19} \text{ C}$$

Concepts:

1. When building a simple circuit, the ammeter is placed in ____ and the voltmeter is placed in _____.
 - a. Series, series
 - b. Series, parallel
 - c. Parallel, parallel
 - d. Parallel, series

2. Energy per charge is called
 - a. Current.
 - b. Electric potential energy.
 - c. Voltage
 - d. Resistance

3. Resistance is measured in
 - a. Ohms.
 - b. Amps.
 - c. Volts.
 - d. Joules.

4. In a simple circuit, an ammeter placed before a resistor will measure ____ an ammeter placed after the resistor.
 - a. More current than
 - b. Less current than
 - c. the same amount of current as

5. In a simple circuit, energy is ____ at the resistors and takes the form of _____.
 - a. Lost, heat
 - b. Created, heat
 - c. Lost, potential energy
 - d. Created, potential energy

Problems:

1. A simple circuit contains a single 20Ω resistor. The circuit voltage is set to 40 V.
 - a. Sketch the circuit and include the placement of the ammeter and voltmeter.

 - b. Calculate the current in the circuit.

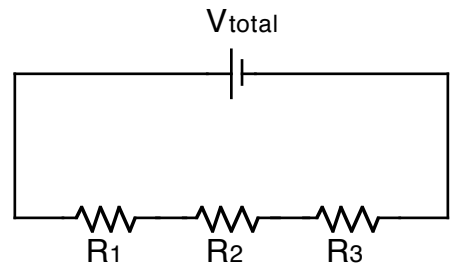
 - c. How much charge flows through the resistor in 5 minutes?

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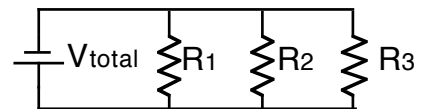
- d. What is the power generated by this circuit?
 - e. How much electrical energy is “lost” in 5 minutes?
 - f. What form does this “lost” energy take?
2. A 75 W light bulb is connected to a 120 V outlet.
 - a. What is the current in the light bulb?
 - b. What is the resistance of the light bulb?
 - c. Why does the light bulb light up?

3. Find the missing numbers for the three circuits shown.

	R	I	V	
R_1	1Ω			$V_t = 10 \text{ V}$
R_2		2 A		$I_t =$
R_3	2Ω			$R_t =$



	R	I	V	
R_1	3Ω			$V_t = 4.5 \text{ V}$
R_2	6Ω			$I_t =$
R_3	6Ω			$R_t =$



	R	I	V	
R_1	$5/3 \Omega$			$V_t = 15 \text{ V}$
R_2			5 V	$I_t =$
R_3		4 A		$R_t =$

