Name: _____ Date: _____

Review Questions for Your Lab Exam

1. Review your units by completing the following table:

$Q = I \times t$

Name	Symbol	Unit	Formula
Charge	Q	C	~~I = Q/t~~ or Q = E/V
Current Intensity	I	A	$I = \frac{Q}{t}$ or $I = \frac{V}{R}$ or $I = \frac{P}{V}$
Potential Difference	V	V	V= E/Q or V= IR
Energy	E	(There are 3 units to remember) W·h, KW·h, J	E = P X t
Resistance	R	Ω	$R = \frac{V}{I}$
Power	P	W or KW	$P = V \times I$ or $P = \frac{E}{t}$

2. Which type of circuit (series or parallel) is being described in each of the following scenarios?

   A. When measuring the potential difference, you will find that it is equal at every point in the circuit. Parallel

   B. When measuring the current intensity, you will find that it is equal at every point in a circuit. Series

   C. When you measure the sum of the current intensity passing through each element (load) in the circuit, it will equal the total current intensity leaving the power supply. Parallel

   D. When you measure the sum of the potential difference at each element (load) in the circuit, you will obtain the total potential difference at the power supply. Series

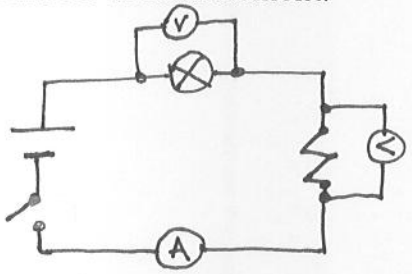
   E. This circuit consists of a single pathway for charges to flow through. Series

   F. This circuit consists of several pathways for charges to flow through. parallel

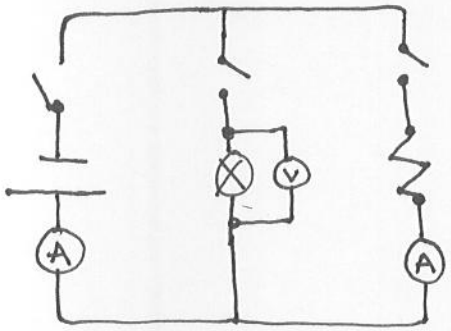
G. The total resistance of this circuit is equal to sum of all of the resistance in the circuit. Series

2. Draw each of the following circuit diagrams; be sure to place the ammeters and voltmeters in the correct position.

   A. A series circuit with a light bulb, a resistor, a switch, an ammeter and a voltmeter at each element.



   B. A parallel circuit with a light bulb, a resistor, a switch at each element, a master switch, an ammeter measuring the total current intensity, an ammeter measuring current at the resistor and a voltmeter measuring the potential difference across the light bulb.



3. The following data was obtained from a light bulb in a series circuit:

   - Current intensity: 250mA
   - Potential Difference: 5V

   What is the resistance of this light bulb?

$V = 5V$

$I = 250mA = 0.25A$

$R = \frac{V}{I} = \frac{5V}{0.25A} = \boxed{20\,\Omega}$

4. A toy company would like to develop more ecofriendly toys that rely on the use of batteries to power electrical features. The developers test the following two toys to investigate which one uses **less energy**.

   Toy #1 relies on a series circuit and has one element incorporated. Element 1 allows 750mA of current to flow through and a potential difference of 10V.

   Toy #2 relies on a parallel circuit and has two elements incorporated. The first element allows for a current intensity of 360 mA and a potential difference of 12V. The second element allows for a current intensity of 240mA.

   Both toys are tested for 30 minutes. Which one should the developers choose?

Toy #1

$V = 10V$

$I = 750mA = 0.75A$

$P = V \times I$

$P = 0.75A \times 10V$

$P = 7.5W$

$E = P \times t$

$t = 0.5h$ or $1800s$.

$E = 7.5W \times 0.5h$

$= \boxed{3.75\ W \cdot h \text{ or } 13\,500J}$

Toy #2

$V_T = 12V$ (same everywhere)

$I_T = I_1 + I_2$

$= 360mA + 240mA$

$= 600\ mA$

$= 0.6A$

$P = V \times I$

$= 12V \times 0.6A$

$= 7.2W$

$E = P \times t$

$= 7.2W \times 0.5h$

$= \boxed{3.6\ W \cdot h \text{ or } 12960J}$

Toy #2 uses less energy.