Name: _____ Date: _____ **/29**

SNC1D - Current Electricity Formative Quiz

□ You have successfully demonstrated your *knowledge* □ You need further review of this material.

Parent's Signature: _____

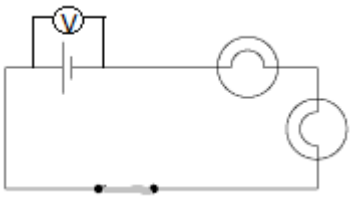
REFERENCE MATERIAL

Equations

$V = I \times R$	$P = E \div t$	Efficiency = $\frac{E_{out}}{E_{in}} \times 100\%$	$E_{consumed}$ = kW x hours
$R = V \div I$	$E = P \times t$	Efficiency = $\frac{E_{useful}}{E_{total}} \times 100\%$	Cost = $E_{consumed}$ x rate
$I = V \div R$	$t = E \div P$		Cost = power x time x rate

SHORT ANSWERS – *answer the questions as directed.*

1) Use the diagram to the right to answer the following questions:



(a) Label the following on the diagram: **(1K)**
- ✓ **Energy Source**
- ✓ **Load**

(b) Is this a **parallel** or **series** circuit? **Explain** how you know. **(1C)**

Parallel or Series?
I know this because…

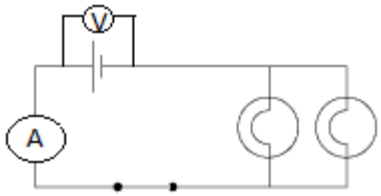
(c) If the cell produced **5 V** of energy, what is the **voltage drop** of each bulb? ASSUME THAT THE BULBS ARE IDENTICAL. ***Be sure to include units!*** **(1T)**

Bulb 1: _____ **Bulb 2:** _____

(d) What will happen to the **brightness** of the first light bulb when you **add** a **third (identical) bulb** into the circuit (i.e. will it be brighter, dimmer, the same, or off)? **Explain** your answer. **(2T)**

(e) What will happen to the **total current** in the circuit when you **add** a **third (identical) bulb** into the circuit? **Explain** your answer. **(2T)**

2) Use the diagram to the right to answer the following questions. ASSUME THE BULBS ARE IDENTICAL.



(a) What is the **voltage drop** of each bulb if the battery produces **5 V** of energy? ***Be sure to include units!*** **(1T)**

Bulb 1: _____ **Bulb 2:** _____

(b) What is the **current** at each bulb if the total current is **0.5 A**? ***Be sure to include units!*** **(1T)**

Bulb 1: _____ **Bulb 2:** _____

(c) What will happen to the **brightness** of the light bulbs when you **add** a **third (identical) bulb** in **parallel** (i.e. will it be bright, dimmer, the same, or off)? **Explain** your answer. **(2T)**

(d) The total current is **0.5 A.** If you **added** a **third (identical bulb)** in **parallel**, what would the **current at the third bulb** be? **(1T)**

(e) The voltage from the battery is **5 V.** If you **added** a **third (identical bulb)** in **parallel**, what would the **voltage at the third bulb** be? **(1T)**

DIAGRAMS – *draw your answer as directed.*

3) Draw a **circuit diagram** of a circuit with the following components: **(6C)**
- ✓ A 3-cell battery (with the + and – terminals labelled).
- ✓ A light bulb and motor in parallel.
- ✓ An open switch ONLY controlling the light bulb.
- ✓ An ammeter only measuring the current of the motor.
- ✓ A voltmeter measuring the total voltage.
- ✓ A fuse on the main path.

CALCULATIONS – *Show all of your work using the GRASS method. Be sure to record your final answer with the correct units.*

4) A radio uses 100 V and has a resistance of 0.05 Ω. How much **current** passes through the radio? **(2T)**

5) **How long (in minutes)** will your cell phone last, if you only have 800 J of energy left and your phone requires 1.00 W of power? **(3T)**

6) How much does it **cost** to watch TV for 2 hours a day every year if your TV has a power rating of 1.0 kW and the electrical company charges you at a rate of $0.05/kWh. Assume a year has 365 days. **(3T)**

7) An electric drill produces 4000 J of **useful energy** and 100 J of **wasted energy**. What is the **efficiency** of this drill? **(2T)**