

K	C	A	T
18	18	40	24

/100

Name: _____

SNC 1D1 TEST
ELECTRICITY

TRUE OR FALSE SECTION (Label T or F):

1. ___ Charges that are alike repel each other.
2. ___ In a neutral material, the number of protons is always greater than the number of electrons.
3. ___ Static charges result from an imbalance of protons and neutrons.
4. ___ An insulator is a substance through which electrons cannot travel easily.
5. ___ In neutral atoms, the number of protons and neutrons is always equal.
6. ___ Electrical current is the result of the flow of electrons.
7. ___ Electrons always leave a battery or a power source from the positive terminal.
8. ___ The number of coulombs per second is measured in amperes (A).
9. ___ The more electric potential in a circuit, the brighter the bulbs will glow.
10. ___ In a series circuit, electrons have only one path to follow.
11. ___ Ohm's law states the resistance R, is the product of voltage, V and current, I.
12. ___ Potential difference can be measured in watts.
13. ___ Current is a measure of the rate at which electric charges pass a point in a circuit.
14. ___ The potential difference across different branches in a parallel circuit is always equal.
15. ___ The current in different branches in a parallel circuit is always equal.
16. ___ In a series circuit the potential difference across each load is always equal to the potential difference of the power supply.

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MATCHING SECTION (Place the Best Letter in each blank):

___ the part of an atom that moves easily	A coulomb
___ does not conduct electricity	B conductor
___ used to detect static electric charge	C ohms
___ type of material through which electrons flow easily	D electrons
___ the part of an atom that has a positive charge	E ammeter
___ caused by the charge separation between cloud and the earth	F lightening
___ flow of electrons	G volts
___ used to measure potential difference	H protons
___ converts electrical energy into other forms of energy	I current
___ contains a total charge of 6.25×10^{18} electrons	J resistance
___ unit of measure for electrical current	K electroscope
___ unit of measure for resistance	L battery
___ a circuit that allows more than one path for electrons	M amperes
___ a circuit that has only one path for electrons to flow around	N series
___ device used to measure current	O insulator
___ calculated by dividing voltage by current	P voltmeter
___ unit of measure for potential difference	Q load
___ composed of several cells	R parallel

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MULTIPLE CHOICE SECTION (Pick the most correct answers):

1. When a negatively charged rod is brought near an uncharged electroscope, the leaves will
 - a) move apart
 - b) move together
 - c) stay the same
 - d) move together and then apart again

2. An object is found to have a charge of positive three on it. This means that it
 - a) gained three electrons
 - b) gained three protons
 - c) lost three electrons
 - d) lost three protons

3. Neutral objects are attracted to charged objects because of
 - a) mutual magnetism
 - b) a nucleus of atoms in the object
 - c) a vacuum occurs between the two
 - d) an induced charge on the object

4. One example of electrical energy being converted into another form of energy is:
 - a) an electric saw
 - b) a roaring fire
 - c) a running automobile

5. This person's work resulted in the law that relates resistance to current and potential difference: $V=IR$
 - a) Henry Cavendish
 - b) James Watt
 - c) Count Alessandro Guiseppe Antonio Anastasio Volta
 - d) Georg Simon Ohm

6. In a series circuit, the current is:
 - a) the same at every point
 - b) largest through the load
 - c) largest near the positive terminal of the dry cell
 - d) largest near the negative terminal of the dry cell

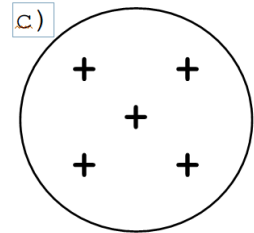
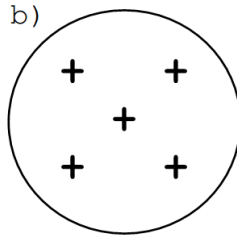
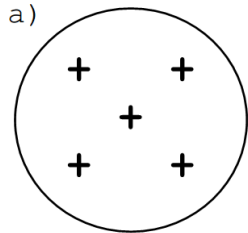
7. Two bulbs X and Y are connected in series to a power supply. If bulb X is removed, bulb Y will:
 - a) glow twice as brightly as before
 - b) glow half as brightly as before
 - c) glow as brightly as before
 - d) go out

8. Two bulbs, X and Y, are connected in parallel to a power supply. If bulb X is removed, bulb Y will:
 - a) glow more brightly
 - b) get dimmer
 - c) glow as brightly as before
 - d) go out

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LONG ANSWER SECTION:

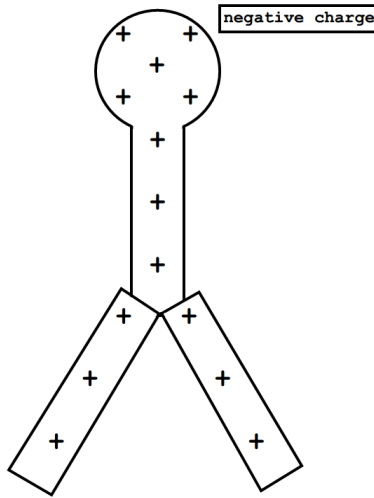
1. Show the charge distribution in:
 a) a neutral pith ball
 b) a neutral pith ball approached by a negative object
 c) a pith ball that has come into contact with the negative object (the negative object has been removed)
 Add negative charges as appropriate for each question.



negative charge

/6A

2. Add electrons to this diagram of an electroscope to show the charge distribution if the SCOPE IS NEUTRAL but has been approached by a negative object. Label regions of charge



/3A

3. Explain how electrical discharge works with reference to ONE of the following (you choose):
 - a cat and a human
 - a bolt of lightning
 - van de Graaff generator

/3C

Clearly explain how static charge build up occurs and why a static spark is observed.

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4. Calculate the resistance in a light bulb, if 0.05 A flows through the bulb when the potential difference (voltage) is raised to 8.0 V. Use full problem solving format including a data table, equation before substitution, equation with substitution and the answer. ($V = IR$)

/3C

/3A

5. A power supply provided 12 V of electrical potential and 4.5 A of current. Draw a diagram that has three identical bulbs in series. Write the current and the potential difference beside all three bulbs and the power supply as well. Be sure to include units!

/3C

/3A

6. Repeat question #5 for a parallel circuit (use three bulbs)

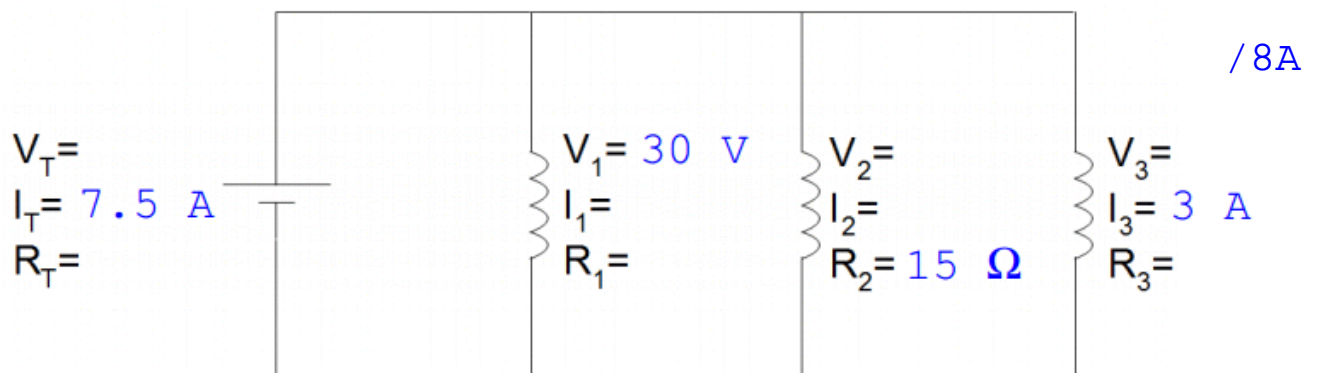
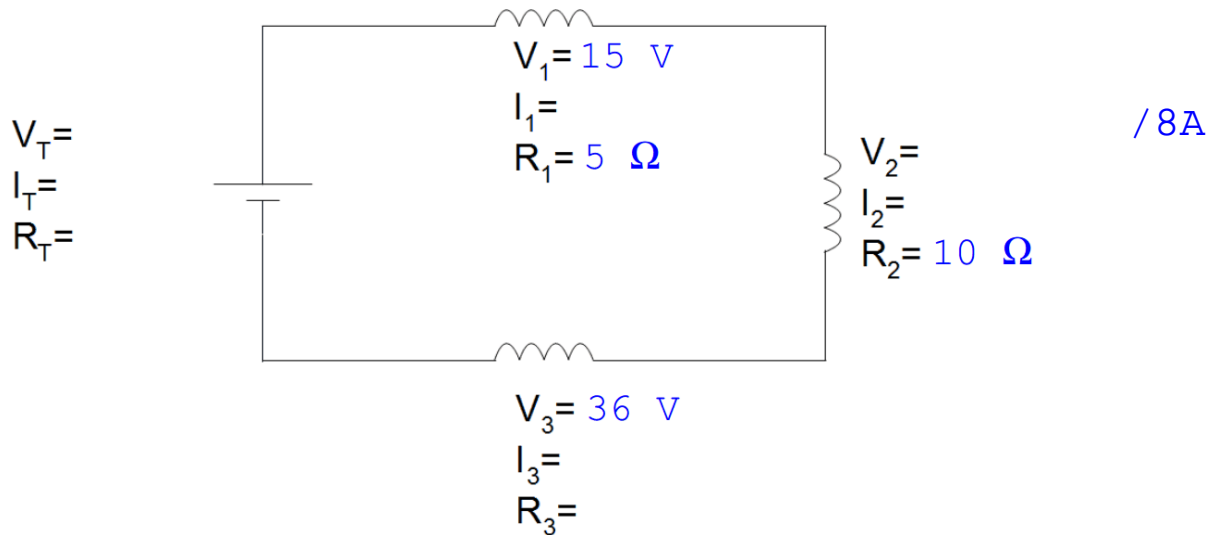
/3C

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7. Solve each circuit (fill in all blanks as best you can).
 Rough work may help, but no marks are given for your rough work.

Series	Parallel
$I_T = I_1 = I_2 = I_3 = \text{etc.}$	$I_T = I_1 + I_2 + I_3 + \text{etc.}$
$V_T = V_1 + V_2 + V_3 + \text{etc}$	$V_T = V_1 = V_2 = V_3 = \text{etc.}$
$R_T = R_1 + R_2 + R_3 + \text{etc}$	$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$
$V = I \times R \quad I = \frac{V}{R} \quad R = \frac{V}{I}$	



R	C	A	T
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8. Calculate the current required to supply a 5000 W heater if the voltage is 110 V. If the heater is rewired to work on a 220 V circuit what is new current draw. Show two separate calculations.

$$P = V \times I$$

$$V = \frac{P}{I}$$

$$I = \frac{P}{V}$$

/3C

/3A

/3C

/3A

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	6	6	