

75 = 2

Name: _____

SNC 1P Static Electricity Test

1. Match the definition with the word that it best describes.

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a) a subatomic particle that carries a negative charge	<u>i</u> conductor
b) a subatomic particle that carries a positive charge	<u>m</u> contact
c) when the number of protons and electrons in a object are equal the charge is _____	<u>a</u> electron
d) when the number of protons is greater than the number of electrons in a object the charge is _____	<u>l</u> electroscope
e) when the number of protons is less than the number of electrons in a object the charge is _____	<u>k</u> grounding
f) describes the ability of negative electrons to move	<u>g</u> immobile
g) describes the ability of positive protons to move	<u>h</u> insulator
h) a substance in which charge cannot move freely	<u>n</u> lightning
i) a substance in which charge can move freely	<u>f</u> mobile
j) caused by a sudden discharge of static buildup	<u>e</u> negative
k) a process by which a charged object is neutralized (requires contact with a large neutral object)	<u>c</u> neutral
l) a device used to detect and to determine the type of charge	<u>d</u> positive
m) when an object is charged by touching it to either a positive or negatively charge, the object is charged by _____	<u>b</u> proton
n) a natural form of massive static charge buildup and discharge	<u>j</u> spark

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2. True or False

- 7
- a) F only positive charges are mobile
 - b) T a negative charge is caused by a surplus of electrons
 - c) T a positive charge is caused by a deficit of electrons
 - d) F when a static discharge occurs, the spark always travels from the positive object to the neutral object
 - e) T lightening can be compared to a Van de Graaf Generator in that negatively charged electrons are moved from one location to another resulting in a buildup of positive and negative charge
 - f) T in a neutral electroscope, the number of positive charges and negative charges must be equal
 - g) T in a positively charged electroscope the remaining electrons are evenly distributed among the background of positive charge

3. Multiple choice: pick the best answer.

In a conductor:

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- a) electrons can move freely
 - b) protons can move freely
 - c) both protons and electrons can move freely
 - d) neither protons or electrons can move

In an insulator:

- a) electrons can move freely
 - b) protons can move freely
 - c) both protons and electrons can move freely
 - d) neither protons or electrons can move
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4. Clearly state the law of attraction and repulsion that we have used in this class.

LIKE CHARGES REPEL

UNLIKE CHARGER ATTRACT

POSTIVE AND NEGATIVE ATTRACT

POSTIVE AND POSTIVE REPEL

NEGATVIE AND NEGATIVE REPEL

5. Explain how matter can be neutral, positive or negative using the theory that was taught in class.

NEUTRAL - EQUAL NUMBER OF POSTIVE AND NEGATIVE CHARGES

POSTIVE - MORE POSITIVE THAN NEGATIVE CHARGES (REMOVE ELECTRONS)

NEGATIVE - LESS POSITIVE THAN NEGATIVE CHARGES (ADD ELECTRONS)

6. Explain the sequence of events that leads to a static discharge in a device such as a Van de Graaf Generator or a thunderhead cloud.

FRICITION CAUSES A TRANSFER OF ELECTRONS FROM A

MORE ELECTRO-POSTIVE SUBSTANCE TO A LESS-ELECTRO-POSTIVE SUBSTANCE

RESULTS IN POSTIVELY AND NEGATIVELY CHARGES OBJECTS

THE SPARK JUMPS FROM THE NEGATIVE TO THE POSTIVE OBJECT

RESTORING NEUTRAL CHARGE

If a neutral pith ball is approached by a positive strip

- a) the electrons are unaffected, the pith ball is attracted to the strip
- b) the electrons in the pith ball will relocate closer to the strip, the pith ball is attracted to the strip
- c) the electrons in the pith ball will relocate further from the strip, the pith ball is attracted to the strip
- d) the electrons in the pith ball will relocate closer to the strip, the pith ball is repelled from the strip
- e) the electrons in the pith ball will relocate further from the strip, the pith ball is repelled from the strip

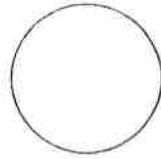
If a positive pith ball is approached by a positive strip

- a) the electrons are unaffected, the pith ball is attracted to the strip
- b) the electrons in the pith ball will relocate closer to the strip, the pith ball is attracted to the strip
- c) the electrons in the pith ball will relocate further from the strip, the pith ball is attracted to the strip
- d) the electrons in the pith ball will relocate closer to the strip, the pith ball is repelled from the strip
- e) the electrons in the pith ball will relocate further from the strip, the pith ball is repelled from the strip

In a positively charged electroscope approached by a negative strip:

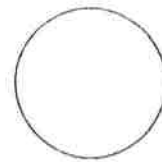
- a) the leaves will remain open due to the positive charge
- b) the leaves will open more due to the movement of electrons within the scope
- c) the leaves will close due to the movement of electrons within the scope
- d) the number of electrons in the positive scope is greater than the number of positive charges

7. Draw a diagram of a neutral pith ball. Remember that a neutrally charged object must contain and equal number of positive and negative charges and that positive charges cannot move.



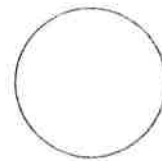
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8. Draw a neutral pith ball interacting with a negatively charged strip. Show the direction of motion.



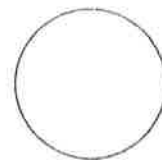
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9. Draw a neutral pith ball interacting with a positive strip.



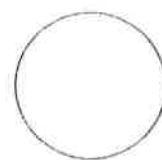
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10. Draw a negative pith ball interacting with a negative strip.



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11. Draw a positive pith ball interacting with a negative strip.

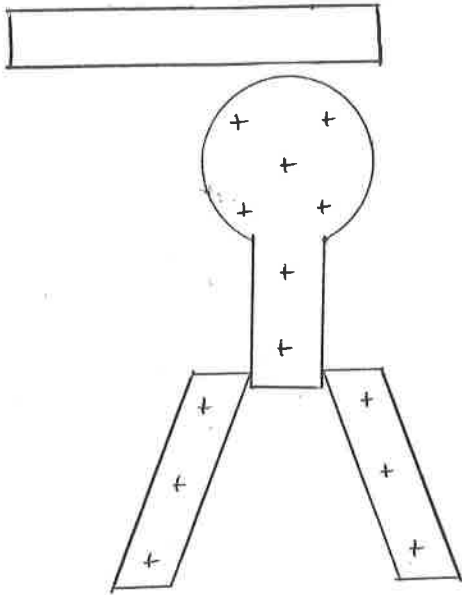


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12. For each of the following static strips and electroscopes, fill in the electrons as appropriate. Be sure to use an appropriate number of electrons for the charge (positive, negative or neutral) of each object. *Label each scope as positive, negative or neutral according to regions.*

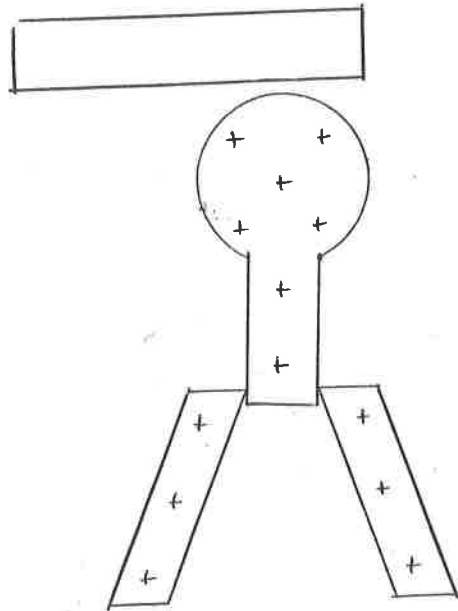
neutral scope approached by a negative strip

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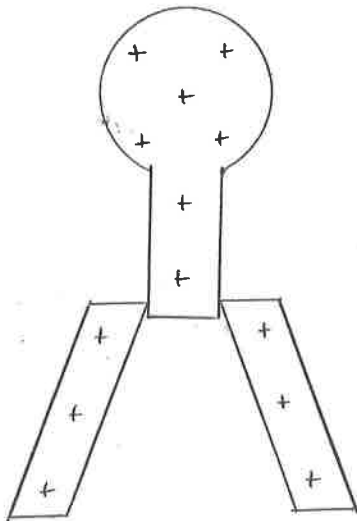
neutral scope approached by a positive strip

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scope charged by contact with a positive strip

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positive scope approached by a negative strip

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