Name: _____

Period: _____

Electricity In Class Review

1. A) A 24 μC charge and a –1.2 μC are 6 mm away from each other. Calculate the force between them.

   B) Will the two charges attract or repel each other?
   C) If the 24 μC charge touches ground what will happen?

   D) If the distance between them is doubled, by how much does the force change?
   E) If one of the charges was halved, by how much does the force change?

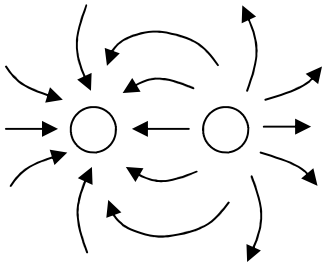
2. If an object is negative, did it gain or lose electrons?

3. How much charge do 25 electrons have?

4. An object has a charge of –3.2μC object. How many electrons did it gain or lose?

5. Why can an object not gain a charge equal to 15.6 electrons?

6. By the direction of the electric field, decide if the charges are positive or negative.

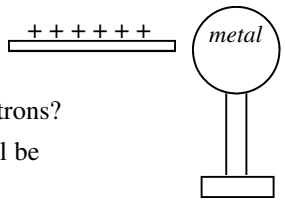


7. When do two charges attract each other?

8. A. Will the two charges attract or repel each other?

   B. To increase the potential energy between the two charges, should you pull them apart or push them together?

9. A positively charged rod is brought close to a conducting sphere.



   A. Did the rod gain or lose electrons?

   B. Which side of the sphere will be negative?

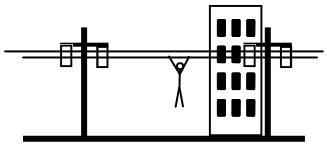
10. Decide which of the wires has the most resistance.
    A. A wire at 5°C OR a wire at 15°C.
    B. A thick 2m wire OR a thick 2cm wire.
    C. A thick 2cm long wire OR a thin 2cm long wire?
    D. A wire made of silver OR a wire made of copper?

11. What do we call a substance with no resistance at very low temperatures?

12. Comparing circuits to water: resistor, battery, switch, wire, light bulb, diode, or capacitor?
    A. _____ A water pump.
    B._____ A pipe.
    C._____ A valve or faucet.
    D. _____ A water wheel (does something useful).
    E._____ A water tower (gives temporary pressure).
    F._____ A restriction in a pipe.
    G. _____ A one-way valve.

13. Draw a circuit with 2 batteries, a switch, and two light bulbs in series.

14. Slim Jim falls off of a building and grabs onto a power line to save himself.



    A. Give two reasons why he is safe.

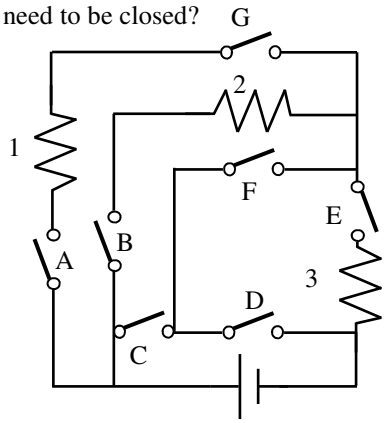
    B. Why would touching the ground be bad?

15. Fuse or circuit breaker?
    A. _____ Can be reset.
    B. _____ Protects against too much current.
    C. _____ Must be replaced.

16. Which switches would need to be closed?
    A. For only resistor 2 to be on?

    B. To short circuit the battery?

    C. For only resistors 1 and 2 to be on?

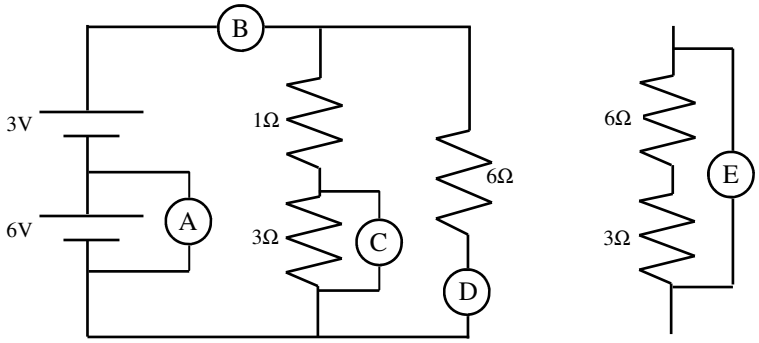


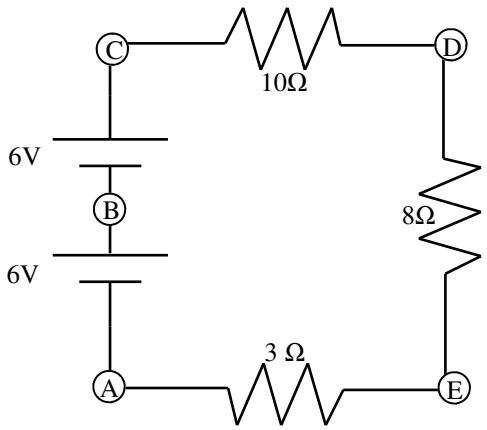
Electricity In Class Review

17. A. Electricity is moving _____. B. Why can't protons move?

18. Voltage _____, current _____, and resistance _____ the flow of current.

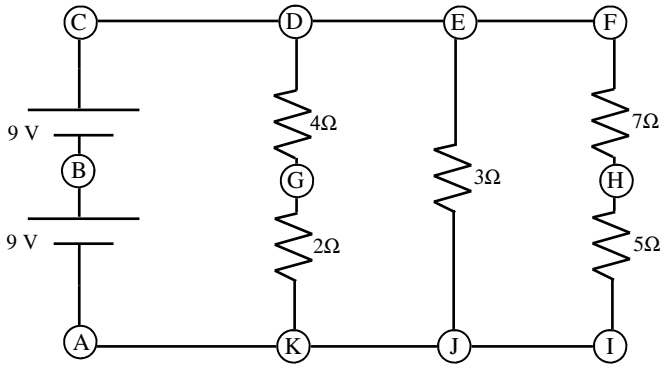
19. Ammeter, voltmeter, or ohmmeter?
    A. Meter A:
    B. Meter B:
    C. Meter C:
    D. Meter D:
    E. Meter E:
    F. What does Meter A read?
    G. What does Meter D read?
    H. What does Meter B read?
    I. What does Meter E read?





20. Use the circuit at the left to answer the following.
    A. Is it a series or parallel circuit?
    B. If the 10Ω resistor is replaced with a wire, how would the current change?
    C. If one of the batteries is replaced with a 3V battery, how would the current change?
    D. I_{total} =
    E. What is the voltage used by the 10Ω resistor?
    F. $V_{at\ D}$?
    G. $P_{\text{used by the } 8\Omega}$?

21. Use the circuit at the right to answer the following.
    A. Is it a series or parallel circuit?
    B. $V_{\text{difference from B to E}}$ =
    C. What is the total resistance between points D and K (branch 1)?
    D. $I_{\text{thru point G}}$ =
    E. If the 4Ω resistor was replaced by a wire, how would the total current change?
    F. If branch 3 was broken at point H, how would the current flowing thru the 4Ω resistor change?
    G. $I_{\text{from J to K}}$ =
    H. I_{total} =
    I. R_{total} =
    J. $V_{\text{at point G}}$=



K. P_{total} =

Name: _____

Period: _____

Electricity In Class Review

1. A) A 24 μC charge and a –1.2 μC are 6 mm away from each other. Calculate the force between them.

$F = 9\times10^{9}\frac{(24\times10^{-6})(1.2\times10^{-6})}{.006^{2}} = 7200\ N$

B) Will the two charges attract or repel each other?

C) If the 24 μC charge touches ground what will happen?

electrons flow to it from ground

D) If the distance between them is doubled, by how much does the force change? 1/4 (r is sq.)

E) If one of the charges was halved, by how much does the force change? 1/2

2. If an object is negative, did it gain or lose electrons?

3. How much charge do 25 electrons have?

$\frac{25e}{1}\left(\frac{-1.602\times10^{-19}C}{1e}\right) = -4\times10^{-18}C$

4. An object has a charge of –3.2μC object. How many electrons did it gain or lose?

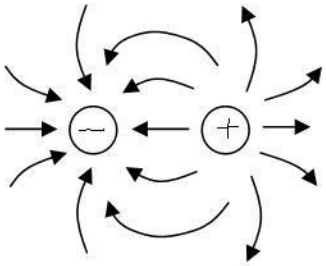
$\frac{-3.2\times10^{-6}C}{1}\left(\frac{1e}{-1.609\times10^{-19}C}\right) = 2.0\times10^{13}e$ gained

5. Why can an object not gain a charge equal to 15.6 electrons?

can't have part of e

6. By the direction of the electric field, decide if the charges are positive or negative.

attract



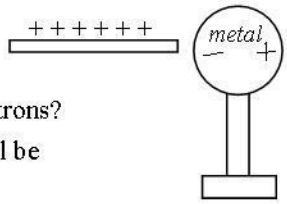
7. When do two charges attract each other?

opp. charges

8. A. Will the two charges attract or repel each other?

B. To increase the potential energy between the two charges, should you pull them apart or push them together?

9. A positively charged rod is brought close to a conducting sphere.



A. Did the rod gain or lose electrons?

B. Which side of the sphere will be negative? left

10. Decide which of the wires has the most resistance.

A. A wire at 5°C OR a wire at 15°C. hotter

B. A thick 2m wire OR a thick 2cm wire. longer

C. A thick 2cm long wire OR a thin 2cm long wire?

D. A wire made of silver OR a wire made of copper?

11. What do we call a substance with no resistance at very low temperatures? superconductor

12. Comparing circuits to water: resistor, battery, switch, wire, light bulb, diode, or capacitor?

A. battery A water pump.

B. wire A pipe.

C. switch A valve or faucet.

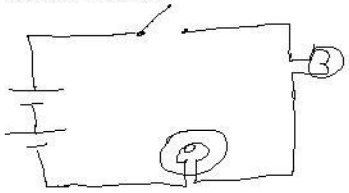
D. light A water wheel (does something useful).

E. capac. A water tower (gives temporary pressure).

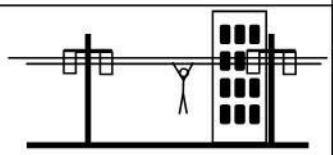
F. resis A restriction in a pipe.

G. diode A one-way valve.

13. Draw a circuit with 2 batteries, a switch, and two light bulbs in series.



14. Slim Jim falls off of a building and grabs onto a power line to save himself.



A. Give two reasons why he is safe.

1) Both hands are at the same voltage, so no voltage difference. 2) wire is less resistance than Jim (short circuit)

B. Why would touching the ground be bad?

Then there is a difference of voltage - ouch!

15. Fuse or circuit breaker?

A. CB Can be reset.

B. Both Protects against too much current.

C. Fuse Must be replaced.

16. Which switches would need?

A. For only resistor 2 to be on?

B, F, D

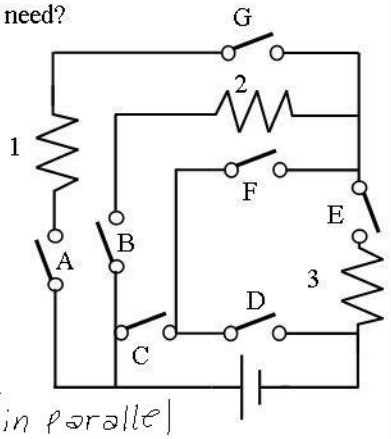
B. To short circuit the battery?

C, D

C. For only resistors 1 and 2 to be on?

A, G, B, F, D

1 and 2 would be in parallel

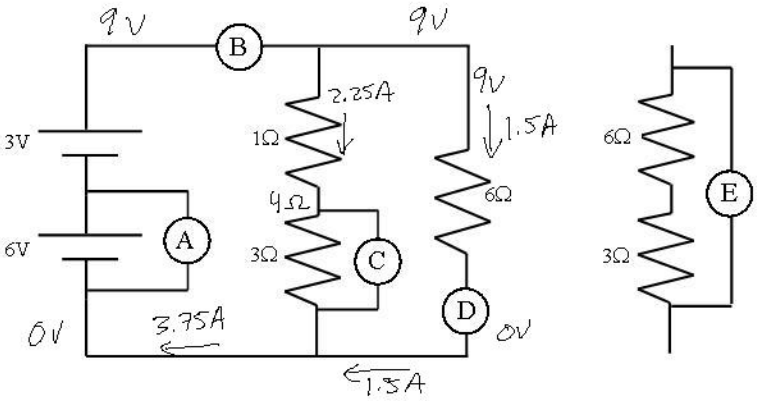


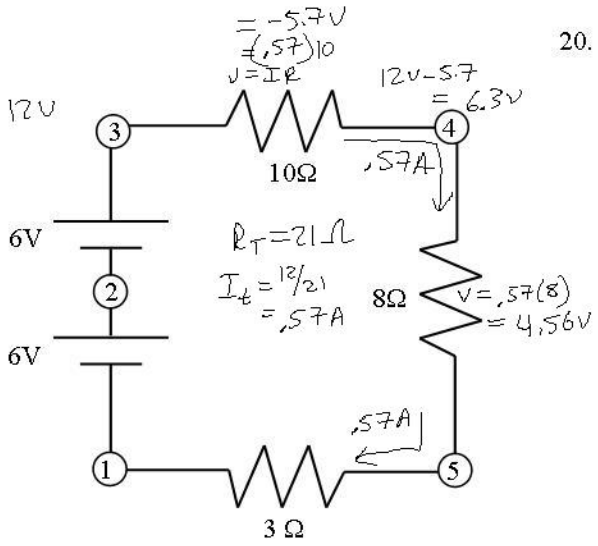
Electricity In Class Review

17. A. Electricity is moving electrons. B. Why can't protons move?
Trapped in nucleus by strong nuclear force.

18. Voltage pushes, current flows, and resistance restricts the flow of current.

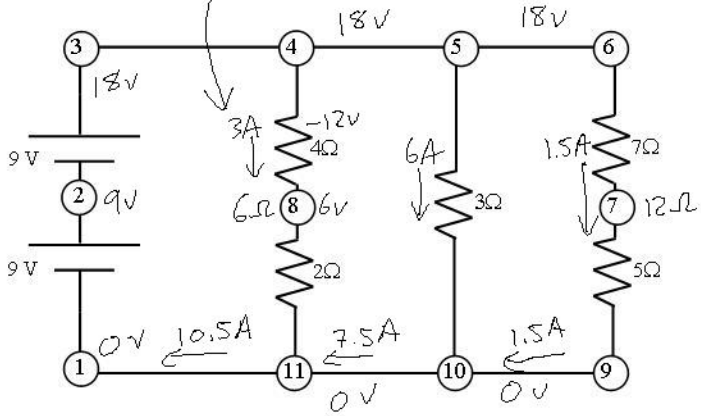
19. Ammeter, voltmeter, or ohmmeter?
A. Meter A: volts
B. Meter B: ammeter
C. Meter C: volts
D. Meter D: ammeter
E. Meter E: ohm meter
F. What does Meter A read? 6V
G. What does Meter D read? 1.5A
H. What does Meter B read? 3.75A
I. What does Meter E read? 9Ω





20. Use the circuit at the left to answer the following.
A. Is it a series or parallel circuit?
B. If the 10Ω resistor is removed, how would the current change?
increase everywhere
C. If one of the batteries is replaced by a 3V battery, how would the current change? decrease everywhere
D. I_{total} = ,57A = 12/21
E. What is the voltage used by the 10Ω resistor?
5.7 volts = IR
F. $V_{at\ 4}$? 12-5.7 = 6.3V
G. $P_{8\Omega}$? = VI
V=IR = ,57(8) = 4.56
P = 4.56(,57) = 2.6W

21. Use the circuit at the right to answer the following.
A. Is it a series or parallel circuit?
B. $V_{difference\ from\ 2\ to\ 5}$ = 9V
C. What is the total resistance between points 4 and 11 (branch 1)? 6Ω
D. $I_{thru\ point\ 8}$ = 3A
E. If the 4Ω resistor was ~~removed~~ placed by wire, how would the total current change? increase
F. If branch 3 was broken at point 7, how would the current flowing thru the 4Ω resistor change? no change
G. $I_{from\ 10\ to\ 11}$ = 7.5A
H. I_{total} = 10.5A
I. R_{total} = 1.71Ω
V=IR 18=10.5(R)
J. $V_{at\ point\ 8}$ = 6V



K. P_{total} = VI
= 18(10.5)