Name _____ Date _____

PH 102 Quiz 5: exam I, redux

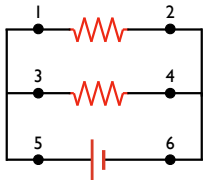
1. Two isolated identical conducting spheres have a charge of q and $-3q$, respectively. They are connected by a conducting wire, and after equilibrium is reached, the wire is removed (such that both spheres are again isolated). What is the charge on each sphere?

- ◯ q, $-3q$
- ◯ $-q$, $-q$
- ◯ 0, $-2q$
- ◯ $2q$, $-2q$

2. If the number of carriers in a conductor n decreases by 100 times, but the carriers' drift velocity v_d *increases* by 5 times, by how much does its **resistance** change?

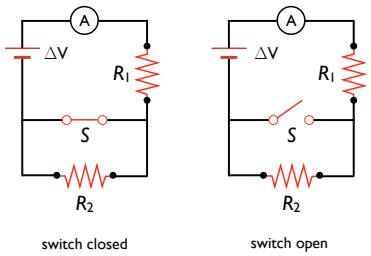
- ◯ It increases by 20 times.
- ◯ It decreases by 500 times.
- ◯ It decreases by 20 times.
- ◯ It increases by 500 times.

3. Rank the currents at points 1, 2, 3, 4, 5, and 6 from *highest to lowest*. The two resistors are identical.

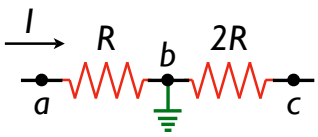


- ◯ 5, 1, 3, 2, 4, 6
- ◯ 5, 3, 1, 4, 2, 6
- ◯ 5=6, 3=4, 1=2
- ◯ 5=6, 1=2=3=4
- ◯ 1=2=3=4=5=6

4. Refer to the figures at right. What happens to the reading on the ammeter when the switch S is opened? Assume the wires and switch are perfect, and have zero resistance.



- ◯ The reading goes up.
- ◯ The reading goes down.
- ◯ The reading does not change.
- ◯ More information is needed.



5. A current I flows through two resistors in series of values R and $2R$. The wire connecting the two resistors is connected to ground at point b. Assume that these resistors are part of a larger complete circuit, such that the current I is constant in magnitude and direction. What is the electric potential relative to ground at points **a** and **c**, V_a and V_c, respectively? *Hint: what is the potential of a ground point?*

- ◯ $V_a = -IR$, $V_c = -2IR$
- ◯ $V_a = 0$, $V_c = -3IR$
- ◯ $V_a = +IR$, $V_c = +2IR$
- ◯ $V_a = +IR$, $V_c = -2IR$