Physics 112
Quiz #14
October 15, 1999

Name: _____

IF YOU WANT A QUESTION GRADED OUT OF THREE POINTS (–1 [MINUS ONE] FOR WRONG ANSWER!!) WRITE "3" IN SPACE PROVIDED ON EACH QUESTION.

$e = 1.60 \times 10^{-19}$ **C**

1. A proton is located at $(-1$ m, 0 m$)$ and two protons are located at $(+1$ m, 0 m$)$. A 1-C charge is located at the origin. What is the magnitude of the **net electrical force** experienced by the charge at the origin?
    - A. 0 N
    - B. 0.36×10^{-9} N
    - C. 0.72×10^{-9} N
    - D. 1.08×10^{-9} N
    - E. 1.44×10^{-9} N
    - F. 2.88×10^{-9} N
    - G. 4.32×10^{-9} N

2. A three-ohm resistor and a four-ohm resistor are connected in series to a battery. In a separate circuit, a three-ohm resistor and a four-ohm resistor are connected in parallel to a battery with the **same** battery voltage as in the first circuit. Which resistor will have the **largest** amount of current flowing through it?
    - A. The three-ohm resistor in the series circuit.
    - B. The four-ohm resistor in the series circuit.
    - C. The three-ohm resistor and the four-ohm resistor in the series circuit, which have the **same** amount of current flowing through them.
    - D. The three-ohm resistor in the parallel circuit.
    - E. The four-ohm resistor in the parallel circuit.
    - F. The three-ohm resistor and the four-ohm resistor in the parallel circuit, which have the **same** amount of current flowing through them.

    Grade out of 3? Write "3" here: _____

3. Resistor A has twice the resistance of resistor B. They are connected in parallel to a battery. Then:
    - A. Resistor A dissipates four times as much power as resistor B.
    - B. Resistor A dissipates twice as much power as resistor B.
    - C. Resistor A dissipates the same amount of power as resistor B
    - D. Resistor A dissipates half as much power as resistor B.
    - E. Resistor A dissipates one fourth as much power as resistor B.

4. A 10-ohm and a 5-ohm resistor are connected in parallel to a battery as shown in the diagram. The power dissipated in the 5-ohm resistor is P_5. What will happen to P_5 if the **10-ohm** resistor is removed, and another resistor with resistance *less* than 5 ohms is put in its place? (No other changes are made to the circuit.)

    Then P_5:
    - A. will increase.
    - B. will decrease.
    - C. will remain equal to 0 W.
    - D. will not change, but is not equal to 0 W.
    - E. might increase, decrease, or remain the same, depending on the precise value of the new resistance.

    Grade out of 3? Write "3" here: _____