

### Quiz 4: Answers

1. Two particles are separated by a distance of 3.0 m; each exerts an electric force of 1.0 N on the other. If one particle carries 10 times as much electric charge as the other, what is the magnitude of the smaller charge? Note  $p = 10^{-12}$ ,  $n = 10^{-9}$ ,  $\mu = 10^{-6}$ ,  $k = 10^3$ .

- 10 pC
- 10  $\mu$ C
- 10 nC
- 10 kC

2. Suppose that a wire has a nonuniform cross section (thicker in some parts than others). Is the drift velocity of the electrons the same everywhere along this wire? The resistivity?

- yes; yes
- yes; no
- no; yes
- no; no

3. Consider a simple parallel-plate capacitor whose plates are given equal and opposite charges and are separated by a distance  $D$ . The capacitor is not connected to a battery. Suppose the plates are pushed together until they are separated by a distance  $d < D$ . How does the final electrostatic energy stored in the capacitor compare to the initial energy?

- The final stored energy is smaller than the initial stored energy.
- The final stored energy is greater than the initial stored energy.
- They are the same.

4. Car batteries are often rated in ampere-hours. This unit by itself designates the amount of which of the following that can be drawn from the battery?

- charge
- power
- energy
- current