Charges and Coulomb's Law

1. A metal sphere has a net negative charge of 1.1×10^{-6} coulomb. Approximately how many more electrons than protons are on the sphere?

a) $\quad 5.7 \times 10^{12}$ **b)** $\quad 9.9 \times 10^{12}$ **c)** $\quad 6.9 \times 10^{12}$ **d)** $\quad 1.8 \times 10^{12}$

2. What is the net static electric charge on a metal sphere having an excess of +3 elementary charges?

a) $\quad 4.8 \times 10^{19}$ C   **b)** $\quad 3.0 \times 10^{0}$ C   **c)** $\quad 4.8 \times 10^{-19}$ C   **d)** $\quad 1.6 \times 10^{-19}$ C

3. A sphere has a net excess charge of -4.8×10^{-19} coulomb. The sphere must have an excess of

a) $\quad$ 3 electrons   **b)** $\quad$ 1 proton   **c)** $\quad$ 3 protons   **d)** $\quad$ 1 electron

4. An object can not have a charge of

a) $\quad 8.0 \times 10^{-19}$ C   **b)** $\quad 4.5 \times 10^{-19}$ C   **c)** $\quad 9.6 \times 10^{-19}$ C   **d)** $\quad 3.2 \times 10^{-19}$ C

5. If a small sphere possesses an excess of 5 electrons, the net charge on the sphere is

a) $\quad -3.2 \times 10^{20}$ C   **b)** $\quad -8.0 \times 10^{19}$ C   **c)** $\quad -8.0 \times 10^{-19}$ C   **d)** $\quad -3.2 \times 10^{-20}$ C

6) Calculate the electrostatic force between an electron and a proton a distance of 2.0×10^{-6} m apart.

7) A charge of 3.0×10^{-6} C is located a distance of 1.0×10^{-4} m from a second charge of 2.0×10^{-5} C. What is the magnitude of the electric force?

8) Find the force between a charge of $+4.0 \times 10^{-7}$ C and a charge of -5.0×10^{-7} C when they are a distance of 1.5×10^{-3} m apart.