PHYSICS IN MOTION
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Unit 5B
Static Electricity
Practice Problems TEACHER

Work each of the following problems. SHOW ALL WORK.

1. Determine the number of electrons or protons that are found in the following:

   a. +1 C of charge

   b. -1 C of charge

   c. -1.6×10^{-6} C of charge

2. A metal ball has a net charge of 4.5×10^{-7} C.

   a. What is the relative number of protons and electrons in the ball?

   b. If just enough charge is removed to make the ball neutral, how much mass does it lose?

questions continued on next page

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3. An uncharged spherical conductor hangs by an insulating thread. If you place a negatively charged rod near one side of the conductor, what is the net charge of the sphere?

   a. positive

   b. negative

   c. neutral

4. Two objects with negative charges of 6.2 nC each are separated by a distance of 0.3 m. What is the size and direction of the force between the two charges?

5. An object with a negative charge of 1.2 mC exerts an attractive force of 13.6 N on a second charged object that is positioned 0.072 m away. What is the charge and polarity (positive or negative) of the second object?

6. How many excess electrons are in a ball with a charge of -5.31×10^{-16} C?

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Work each of the following problems. SHOW ALL WORK.

7. A metal ball with a charge of -8 nC contacts a second metal ball and loses half its excess electrons. What force does the second metal ball exert on a proton 6 m away?

8. Rubbing a plastic bag and a balloon with a cloth gives both objects a net negative charge. The balloon's charge is -1×10^{-10} C, the bag's charge is -1×10^{-5} C, and each object has a mass of 0.02 g. While wearing insulating gloves, you hold the bag above the balloon and release it. How far above the center of the balloon will the bag "levitate"?