

Chapter 18 Worksheet 3 on Electrostatics

1. Two positive charges of magnitude  $5.00 \times 10^{-6} \text{ C}$  and  $6.00 \times 10^{-6} \text{ C}$  are separated by a distance of 0.030 m. Calculate the Coulomb force between the two charges. **300. N**
2. A charge with a magnitude of  $3.00 \times 10^{-6} \text{ C}$  is moved through a potential difference of 80.0 volts. Calculate the work that was done on the charge.  **$2.40 \times 10^{-4} \text{ J}$**
3. A test charge experiences a force of 0.200 N on it when placed in an electric field intensity of  $4.50 \times 10^5 \text{ N/C}$ . What is the magnitude of the charge?  **$4.44 \times 10^{-7} \text{ C}$**
4. The electric field intensity between two charged plates is  $1.50 \times 10^3 \text{ N/C}$ . The plates are 8.00 cm apart. What is the electric potential difference between the plates?  **$1.20 \times 10^2$  or 120. V**
5. A voltmeter indicates that the electric potential difference between two plates is 50.0 V. The plates are 0.20 m apart. What electric field intensity exists between them? **250 V/m or N/C**
6. What must be the distance between two charges with magnitudes of  $7.0 \times 10^{-6} \text{ C}$  and  $5.0 \times 10^{-5} \text{ C}$  for the electrostatic force between them to have magnitude 3.0 N? **1.0 m**
7. A mosquito accumulates  $3.0 \times 10^{-10} \text{ C}$  of positive charge as it flies through the air. What is the magnitude of the electric field at a location 4.0 cm away from the mosquito? **1700 N/C**
8. Ulrich stands next to the Van de Graff generator and gets a shock as he holds his knuckles 0.2 m from the machine. In order for a spark to jump, the electric field strength must be  $3 \times 10^6 \text{ N/C}$ . At this distance, what is the potential difference between Ulrich and the generator?  **$6 \times 10^5 \text{ V}$**
9. An electron is moved through an electric potential difference of 750. V. How much work is being done on the electron?  **$1.20 \times 10^{-16} \text{ J}$**
10. It takes 6.50 J of work to move  $1.2 \times 10^{-3} \text{ C}$  of charge onto a balloon. What potential difference was the charge moved through? **5420 V**