Name: Period: Date:

**Electrostatics: Electric charges and Coulomb’s Law problems I**

Where:

E: Electric Filed [N/C] r=distance between charges [m]

FE: Electrostatic force (N) k=Coulomb’s constant [9x109Nm2/C2]

q: Test Charge [C]

r: Separation distance [m]

$E=\frac{F\_{E}}{q} $**=** $\frac{kq}{ r^{2}}$

I. Answer the following problems.

1) What is the electric field strength 0.750 m from an 8.00 µC charged object? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2) Calculate the gravitational field strength on the surface of Mars. Mars has a radius of 3.43x106 m and a mass of 6.37x1023 kg. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) At a point a short distance from a 4.60x10-6 C charged object, there is an electric field strength of 2.75x105 N/C. What is the distance to the charged object producing this field? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4) If an alpha particle\* experiences an electric force of 0.250 N at a point in space, what electric force would a proton experience at the same point? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5) What is the electric field strength at a point in space where a 5.20x10-6 C charged object experiences an electric force of 7.11x10-3 N? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6) What is the initial acceleration of an alpha particle when it is placed at a point in space where the electric field strength is 7.60x104 N/C? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7) Calculate the electric field strength midway between a 4.50 µC charged object and a - 4.50 µC charged object if the two charges are 50 cm apart. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8) Calculate the electric field strength midway between a 3.0 µC charged object and a 6.0 µC object if they are 0.80 m apart. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9) Calculate the electric field strength midway between two 3.0 µC objects if they are 90 cm apart.

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10) What is the electric field strength at a point in space where an electron experiences an initial acceleration of 7.50x1012 m/s2? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11) The electric field strength at a distance of 3.00x10-1 m from a charged object is 3.60x105 N/C. What is the electric field strength at a distance of 45 cm from the same object? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



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