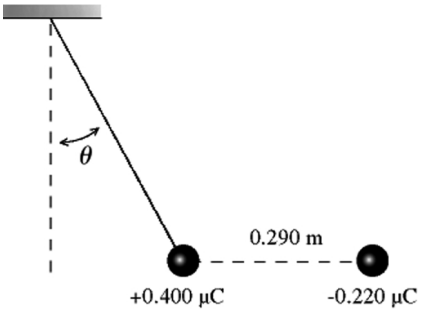
Recitation 2 ~ Physics 220B

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) In the figure, a small spherical insulator of mass 6.00×10^{-2} kg and charge +0.400 µC is hung by a thin wire of negligible mass. A charge of -0.220 µC is held 0.290 m away from the sphere and directly to the right of it, so the wire makes an angle θ with the vertical, as shown. What is the angle θ? ($k = 1/4\pi\varepsilon_0 = 8.99 \times 10^9$ N · m^2/C^2) 1) _____



A) 0.917° B) 1.10° C) 1.50° D) 1.70° E) 1.30°

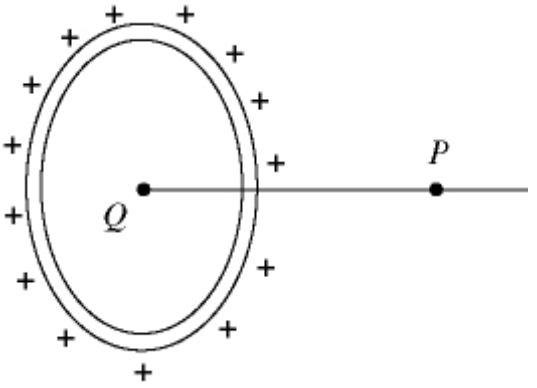
2) A proton is placed in an electric field of intensity 700 N/C. What are the magnitude and direction of the acceleration of this proton due to this field? ($m_{proton} = 1.67 \times 10^{-27}$ kg, $e = 1.60 \times 10^{-19}$ C) 2) _____

A) 6.71×10^{10} m/s^2 in the direction of the electric field
B) 6.71×10^{9} m/s^2 opposite to the electric field
C) 67.1×10^{10} m/s^2 opposite to the electric field
D) 67.1×10^{10} m/s^2 in the direction of the electric field
E) 6.71×10^{10} m/s^2 opposite to the electric field

3) A long, thin rod parallel to the y-axis is located at x = -1.0 cm and carries a uniform linear charge density of +1.0 nC/m. A second long, thin rod parallel to the z-axis is located at x = +1.0 cm and carries a uniform linear charge density of -1.0 nC/m. What is the net electric field due to these rods at the origin? ($\varepsilon_0 = 8.85 \times 10^{-12}$ C^2/N · m^2) 3) _____

A) $(-3.6 \times 10^3$ N/C$)\,\hat{i}$
B) $(1.8 \times 10^3$ N/C$)\,\hat{j}$
C) $(3.6 \times 10^3$ N/C$)\,\hat{i}$
D) $(-1.8 \times 10^3$ N/C$)\,\hat{k}$
E) zero

4) In the figure, a ring 0.71 m in radius carries a charge of + 580 nC uniformly distributed over it. A point charge Q is placed at the center of the ring. The electric field is equal to zero at field point P, which is on the axis of the ring, and 0.73 m from its center. ($\varepsilon_0 = 8.85 \times 10^{-12}\ C^2/N \cdot m^2$) The point charge Q is closest to 4) _____



A) -420 B) 300 C) -300 D) 210 E) -210

5) An electric field is set up between two parallel plates, each of area 2.0 m^2, by putting 1.0 µC of charge on one plate and -1.0 µC of charge on the other. The plates are separated by 4.0 mm with their centers opposite each other, and the charges are distributed uniformly over the surface of the plates. What is the magnitude of the electric field between the plates at a distance of 1.0 mm from the positive plate, but not near the edges of the plates? ($\varepsilon_0 = 8.85 \times 10^{-12}\ C^2/N \cdot m^2$) 5) _____

A) 0.00 N/C
B) 5.6×10^4 N/C
C) 1.4×10^4 N/C
D) 3.1×10^4 N/C
E) 4.2×10^4 N/C

6) A thin, circular disk of radius 30.0 cm is oriented in the yz-plane with its center at the origin. The disk carries a total charge of +3.00 µC distributed uniformly over its surface. Calculate the magnitude of the electric field due to the disk at the point x = 15.0 cm along the x-axis. ($\varepsilon_0 = 8.85 \times 10^{-12}\ C^2/N \cdot m^2$) 6) _____

A) 1.99×10^5 N/C
B) 3.31×10^5 N/C
C) 9.95×10^5 N/C
D) 2.49×10^5 N/C
E) 4.98×10^5 N/C

Answer Key
Testname: CHAPTER 21 ~ PART 2

1) A
2) A
3) C
4) E
5) B
6) B