

Physics 112
Quiz #7
September 20, 1999

Name: _____

$$e = 1.60 \times 10^{-19} \text{ C}$$
$$k = 9 \times 10^9 \text{ N m}^2/\text{C}^2$$

1. A positive charge is fixed at the origin. Which of these will have the largest potential energy?
 - A. a 0.5-C charge 2 m from the origin
 - B. a 2-C charge 3 m from the origin
 - C. a 4-C charge 5 m from the origin
 - D. a 5-C charge 8 m from the origin
 - E. a 6-C charge 12 m from the origin
 - F. They all have the same potential energy.

2. A 2-C charge is released from rest and allowed to move freely, in a region with a uniform electric field of 6 N/C. After it has traveled 3 m, what will be the kinetic energy of the charge?
 - A. 2 J
 - B. 3 J
 - C. 6 J
 - D. 12 J
 - E. 18 J
 - F. 36 J
 - G. 72 J

3. Suppose you want to push a charged particle, moving it at a *constant speed*, from a position where its potential energy is 10 J, to a position where its potential energy is 20 J. Which of these is true?
 - A. The particle's kinetic energy is not changing, so you don't have to do any net work.
 - B. The particle's total energy is not changing, so you don't have to do any net work.
 - C. The particle's total energy is decreasing, so you have to do *negative* work.
 - D. The particle's total energy is increasing, so you have to do *positive* work *equal* to 10 J.
 - E. The particle's total energy is increasing, so you have to do *positive* work, but *less* than 10 J.
 - F. The particle's total energy is increasing, so you have to do *positive* work, but *more* than 10 J.

4. A -3-C test charge is brought into a room in which a *uniform* electric field is present throughout the room. Two meters from the center of this room, the force on this charge has a magnitude of 600 N and points toward the top of the room. If this charge is taken out of the room, and a +2-C test charge is brought in and placed four meters from the center of the room, what will be the magnitude and direction (toward top, toward bottom, or toward side of room) of the force acting on the +2-C charge? *No partial credit. Your answer must be within 10% of the correct answer to receive credit. Units missing or incorrect: -1 point.*

Answer: magnitude [2 pts] _____; direction [0.5 pt]: _____