Name: _____

1. Two parallel metal plates are connected to a battery. A positively charged particle is released from rest on the positive plate and it drifts toward the negative plate, speeding up as it goes. As it moves, the magnitude of the force acting on it will:

   A. decrease as it moves toward the midpoint, then increase as it approaches the negative plate.
   B. increase as it moves toward the midpont, then decrease as it approaches the negative plate.
   C. steadily decrease as it moves away from the positive plate.
   D. steadily increase as it approaches the negative plate.
   E. neither increase nor decrease as it moves from one plate to the other.
   F. decrease as it approaches the midpoint, remain constant for a while, then increase again as it approaches the negative plate.

2. A 4-C charge is released from rest at point *A,* in a region where there is a uniform electric field. When it passes through point *B,* its speed is 20 m/s. If instead a 2-C charge with the *same mass* is released from rest at point *C,* what will be its speed when it passes through point *D:*

   A. greater than 20 m/s
   B. equal to 20 m/s
   C. less than 20 m/s
   D. not enough information to decide
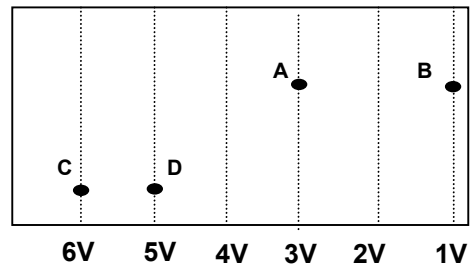
3. A 27-C charge is fixed at the origin. When a 3-C charge is placed at point P, it experiences an electric ***potential*** of 9 V. If the 3-C charge is removed, what will be the electric ***potential energy*** of a 2-C charge placed at point P?

   A. 0 J
   B. 2.25 J
   C. 3.0 J
   D. 4.5 J
   E. 6 J
   F. 9 J
   G. 18 J
   H. 36 J

4. How much external work must be done to force a +3-C charge to move from the negative plate to the positive plate of a parallel plate capacitor that is connected to a 6-V battery? (Remember that a uniform electric field is present. Assume that the speed of the charge ***does not change***.) *No partial credit. Your answer must be within 10% of the correct answer to receive credit. Units missing or incorrect: –1 point. Incorrect sign: –1 point.*

Answer: _____