

**Physics 112**  
**Quiz #10**  
**October 1, 1999**

Name: \_\_\_\_\_

1. At point A in empty space the potential is 3 V while at another point B, the potential is 5 V. A proton moves along a path taking it **from** point A **to** point B, while experiencing **only** an electrical force. In that case, during its trip from A to B:
  - A. the proton is speeding up, and its potential energy increases.
  - B. the proton is speeding up, and its potential energy decreases.
  - C. the proton is slowing down, and its potential energy increases.
  - D. the proton is slowing down, and its potential energy decreases.
  - E. the proton is traveling at constant speed, and its potential energy increases.
  - F. the proton is traveling at constant speed, and its potential energy decreases.
  
2. Two parallel metal plates are connected to a battery. Which of these is **true** about the situation at a point “P” midway between the plates?
  - A. If there is no particle located at point P — if it is just vacuum, i.e., “empty space” — then the electric potential at point “P” is **zero**.
  - B. The electric potential at point P can **never** be zero because the electric *field* there is never zero.
  - C. The electric potential at point P will have the same value as it does **anywhere** between the plates.
  - D. A test charge  $q$  and a test charge  $2q$  placed at point P will experience **different** magnitudes of electrical **potential** at that point.
  - E. A test charge  $q$  and a test charge  $2q$  placed at point P will possess **different** magnitudes of electric **potential energy** at that point.
  
3. Two parallel metal plates are charged by connecting them to a battery; the **left-side** plate is connected to the positive terminal. A negative charge is placed at rest exactly between the plates, then released and allowed to move freely. Then the charge:
  - A. will move toward the right while experiencing a force of increasing magnitude.
  - B. will move toward the right while experiencing a force of decreasing magnitude.
  - C. will move toward the right while experiencing a force of unchanging magnitude.
  - D. will move toward the left while experiencing a force of increasing magnitude.
  - E. will move toward the left while experiencing a force of decreasing magnitude.
  - F. will move toward the left while experiencing a force of unchanging magnitude.
  - G. will remain motionless.
  
4. A current of positive charges moves through a resistor from point A to point B. Compared to point A:
  - A. the charges’ potential energy is higher at B, and their total energy is higher at B.
  - B. the charges’ potential energy is higher at B, and their total energy is lower at B.
  - C. the charges’ potential energy is higher at B, and their total energy is the same at B as at A.
  - D. the charges’ potential energy is lower at B, and their total energy is higher at B.
  - E. the charges’ potential energy is lower at B, and their total energy is lower at B.
  - F. the charges’ potential energy is lower at B, and their total energy is the same at B as at A.
  - G. the charges’ potential energy is the same at B as at A, and their total energy is higher at B.
  - H. the charges’ potential energy is the same at B as at A, and their total energy is lower at B.
  - I. the charges’ potential energy is the same at B as at A, and their total energy is the same at B as at A.

