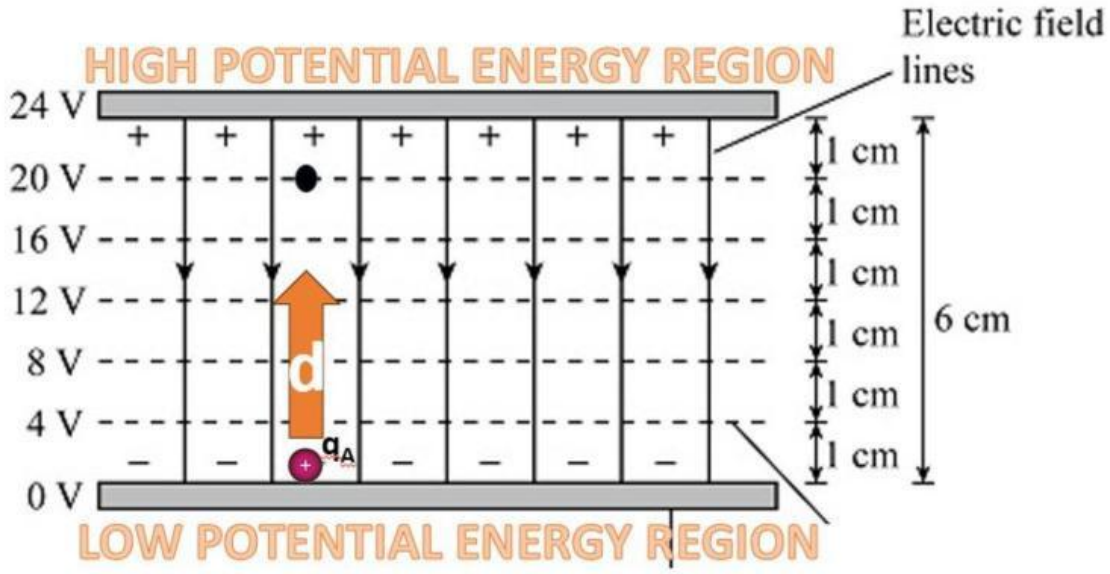
Member 3: Electric Potential and Work

Directions: Analyze the picture below to answer the following questions. For nos., 1-4, choose your answers from the words enclosed with parentheses.

The 24 V, 20 V, and up to 0 V are the electric potentials (V) at specific positions of the charge in the electric field, as shown in the picture below. When q_A moved to the black point, its electric potential changed. However, q_A needs an external force to be moved to the positive plate. An external force means a force that comes outside the system of the two plates.



The picture above shows a positive test charge, q_A positioned at a certain location in the electric field between the two plates. Its movement to the black point is represented by the displacement (d).

1. What is the product of force and displacement called?
   Ans. _____ (Work or Energy)
2. Why does the charge need an external force to be displaced?
   Ans. The external force is needed for a charge to move _____ (against or along) the electric field.
3. How does the electric potential change when external work is applied to the charge?
   Ans. The electric potential _____ (increases or decreases)
4. If the charge moves from the black point to the negative plate, does it need an external force? How does the electric potential change when it goes to the negative plate?
   Ans. _____ (Yes or No). The electric potential _____ (increases or decreases)
5. How is work related to electric potential?
   Ans. The work required to move a/an _____ (charge or electric field) from one location to another location in a/an _____ (charge or electric field) changing its electric potential.