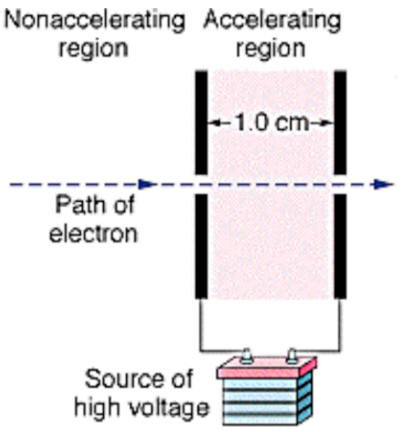
1. **An proton with initial velocity $v_0 = 2.6 \times 10^5$ [m/s] enters a region 1.0 [cm] long where it is accelerated by a pulsed electromagnetic cavity in the LHC. It emerges with velocity $v = 6.30 \times 10^6$ [m/s].**
   a. **What was its acceleration rate?**
   b. **How long did this acceleration phase take?**



2. **A positron (a positively charged electron) enters a region with a velocity of 4.55×10^6 [m/s] and then is decelerated at a rate of 1.15×10^{14} [m/s^2]. How far does the positron take to stop?**

3. **An electric vehicle starts from rest and accelerates at a constant rate of 2.6 [m/s^2] in a straight line until it reaches a speed of 16 [m/s]. The vehicle then slows at a constant rate of 1.0 [m/s^2] until it stops.**
   a. **How much time elapses from start to stop?**
   b. **How far does the vehicle travel from start to stop?**

4. **A startled armadillo leaps upward rising 0.553 [m] in the first 0.192 [s].**
   a. **What is its initial speed as it leaves the ground?**
   b. **What is its speed at the height of 0.553 [m]?**
   c. **How much higher does it go?**

5. **A hoodlum throws a stone vertically downward with an initial speed of 12.7 [m/s] from the roof of a building, 22.0 [m] above the ground.**
   a. **How long does it take the stone to reach the ground?**
   b. **What is the velocity of the stone just before impact?**

HW Set 2 Answers

1a. 1.98×10^{15} [m/s^2]
1b. 3.04×10^{-9} [s]

2. 0.09 [m]

3a. 22.2 [s]
3b. 177 [m]

4a. 3.82 [m/s]
4b. 1.94 [m/s]
4c. 0.192 [m]

5a. 1.19 [s]
5b. -24.3 [m/s]