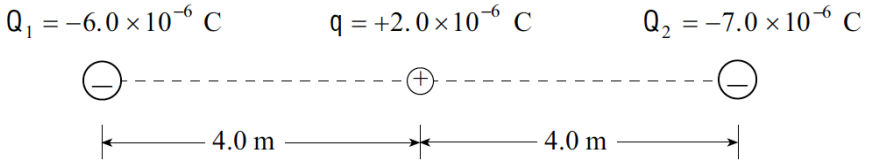
Physics 12: Electrostatic **Practice Test**

Short Answers: Show all work,

1) Two equal charges of magnitude 1.1×10^{-7}C experience an electrostatic force of 4.2×10^{-4} N. How far apart are the centres of the two charges?

Distance)_____

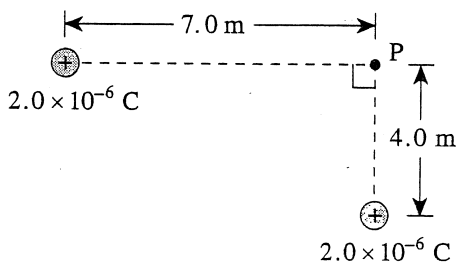
2) What are the magnitude and direction of the electric force on the -6.0×10^{-6} C. [3 marks]



Force)_____

3) Consider the diagram to the right.

a) Determine the electric field (magnitude and direction) at point P. [4 marks]



Magnitude)_____

Direction)_____

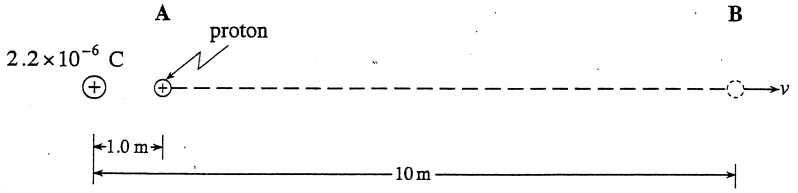
b) Determine the potential (voltage) at point P. [2 marks]

V)_____

4) What potential difference (V) is needed to decelerate an **alpha** particle from 1.4×10^6 m/s to 6.8×10^5 m/s.

ΔV)_____

5) A proton is located at A, 1.0 m from a fixed $+2.2\ \mu C$ charge

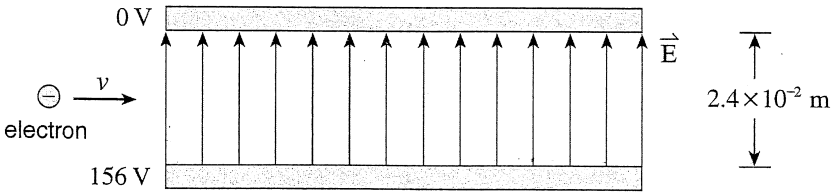


a) what is the change in potential energy of the proton as it moves to B, 10 m from the fixed charge
b) if the proton started from rest at A, what would be it speed at B?

a)_____

b)_____

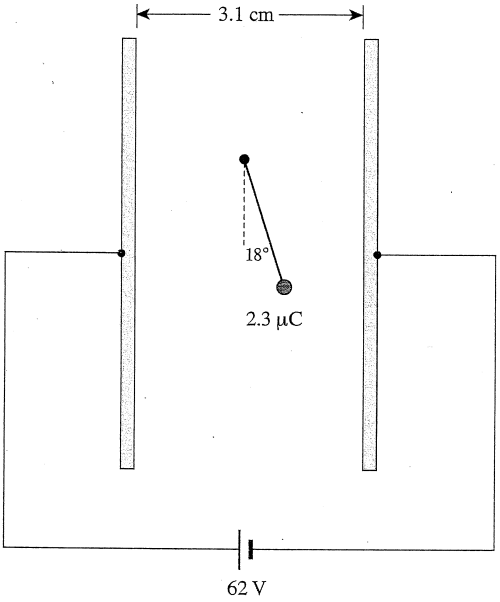
5) An electron with speed of $3.3 \times 10^7\ m/s$ is directed between charged parallel plates as shown.



Determine the **magnitude and direction of the acceleration** of the electron as it passes between the plates. It would probably be a good idea to determine the electrostatic force first. [5 marks]

Acceleration)_____

Direction)_____



6) Consider the setup shown to the right. Note that the hanging charge makes an angle of 18° and has a positive charge of 2.3 μC. Determine the **mass** of the hanging sphere. [2 marks]

Ans)_____