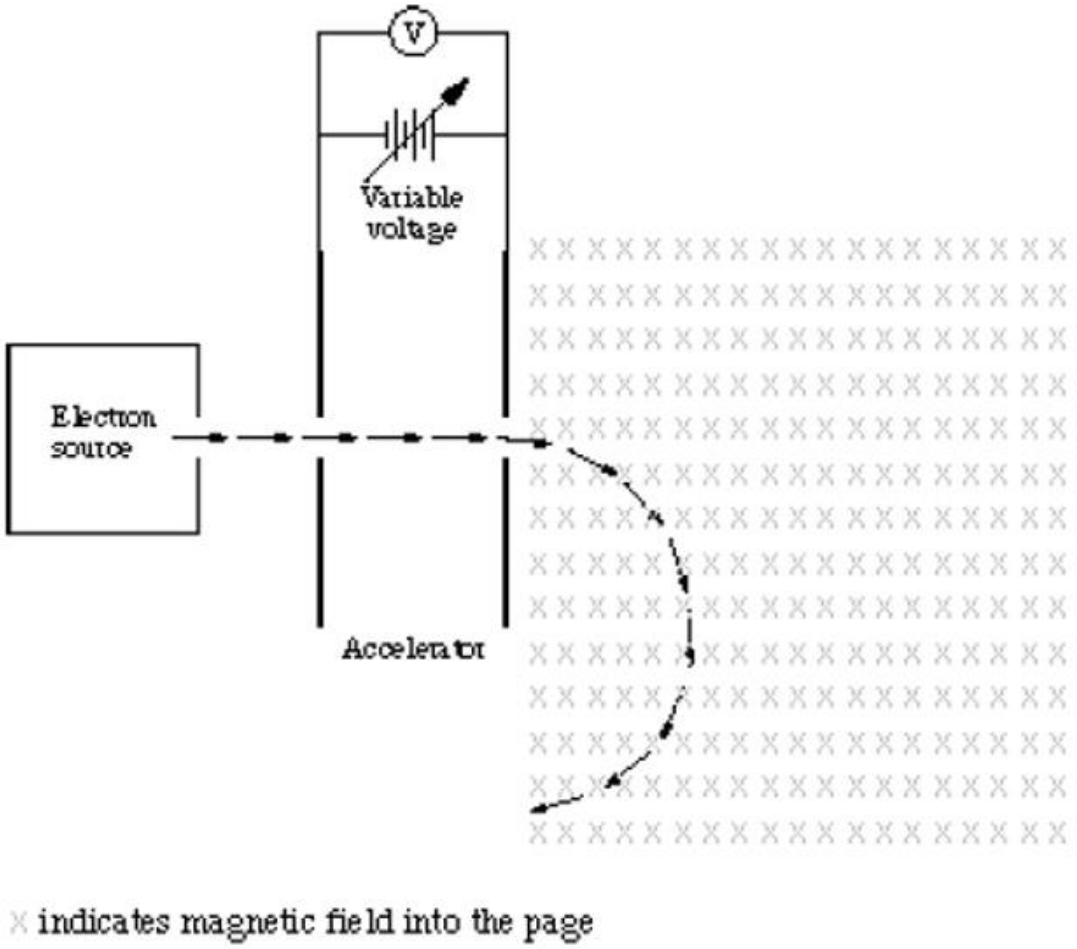
ASSIGNMENT 9

16 Marks Total

Unit B Assessment – Magnetic and Electric Fields

This assignment is worth 16 marks. The value of each question is noted in parentheses in the left margin. Note: The answer areas will expand to fit the length of your response. Important: Complete this assignment after you have reviewed your marked Assignment 8.

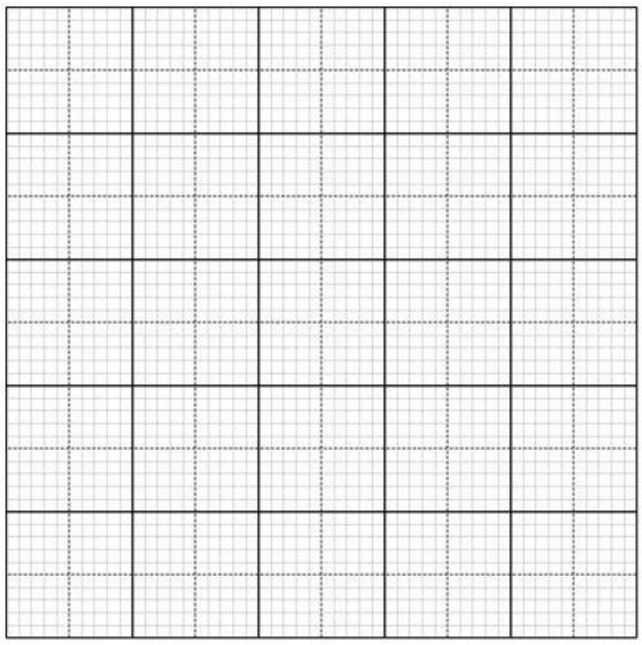
A student used the apparatus shown below to measure the radius of the curvature of the path of electrons as they pass through a magnetic field that is perpendicular to their path. This experimental design has the voltage as the manipulated variable, the speed calculated from the voltage, and the radius as the responding variable.



(6) **1.** Using the data from the table below, plot the graph of radius as a function of speed and construct a best fit line.

Accelerating Potential Difference (V)	Speed (10^6 m/s)	Radius (10^{-2} m)
20.0	2.65	7.2
40.0	3.75	9.1
60.0	4.59	11.0
80.0	5.30	12.8
100.0	5.93	14.1
120.0	6.49	16.3

Answer:



(6) **2.** Using the slope or other appropriate averaging technique, determine the strength of the magnetic field.

Answer:

(4) **3.** Derive the equation that would allow you to calculate the speed of the electrons from the accelerating potential.

Answer:

When you have completed all of the questions in this assignment, submit your work to your teacher.