Review – GEM Forces – grade 12 ****suggested – not exhaustive!**

K&U ----------

1. Describe the electric field in between 2 oppositely charged parallel plates.

2. An electron moves horizontally to the east through a magnetic field that is downward.
   In which direction will the electron feel a force? Draw this out with appropriate symbols.

3. What similarities and differences are there between electric potential energy and gravitational potential energy? Know how to draw & explain the E vs. radius graphs.

4. Sketch the field lines around the cross-section of two parallel wires when the current in each wire flows a) in same direction and b) opposite directions. In each case, will the wires repel each other or be attracted to each other?

Inquiry ----------also know field strength equations (ε) and Ee equations and V equations.

** remember the inside cover of text has good information ie: mass of electrons, protons etc. **
You are responsible for recording mass of proton, neutron and electron on your formula sheet.

5. Two small ball bearings sit 0.75 m apart on a table and carry identical charges. If each ball bearing experiences a force of 3.0 N, how large is the charge on each? **[+/- 14 μC]** *do you now what **μC** is?

6. Two identical pith balls, each with a mass of 0.50 g, carr identical charges and are suspended from the same point by two threads of the same length, 25.0 cm. In their equilibrium (statis) position, the angle between the two threads at their suspension pint is 60˚. What is the charge on the balls? **[+/- 14 μC]**

7. How many electrons make up a charge of 1.0 μC? **[6.2×10^{12} C]**

8. Two horizontal plates used in an oil-drop experiment are 12 mm apart, with the upper plate being negative. An oil drop, with a mass of 6.53×10^{-14} kg, is suspended between the plates. The electric potential difference is 1.6×10^{4} V. Calculate the
   a) total charge on the oil drop [**4.8×10^{-19} C]**
   b) number of excess or deficit electrons on the oil drop **[deficit of 3 electrons]**
   c) electric potential difference required to suspend the oil drop if an electron is knocked off by an X-ray **[1.2×10^{4} V]**

9. A proton travelling at 2×10^{7} m/s horizontally enters a magnetic field of strength 2.4×10^{-1} T which is directed vertically downward. Calculate the consequent radius of orbit of the proton. **[2.2×10^{-13} N]** and the magnitude and direction of its acceleration**.** Hint: Fnet = ma **[1.3×10^{14} m/s^2 upwards]**

Application / communication----------

Be able to explain how a CRT, a mass spectrometer works and how Rutherford's gold foil experiment works – including labeled diagrams.

Be able to draw electric field maps.