1. (I) a. What is the force per meter on a wire carrying a 3.6 A current when perpendicular to a 1.2 T magnetic field?   b. What if the angle between the wire and the field is 45 degrees? [a.   4.32 N/m   b. 3.05 N/m]

2. (I) How much current is flowing in a wire 3.0 m long if the force on it is 0.90 N when placed in a uniform 0.080 T field? [3.75 A]

3. (I) Determine the magnitude and direction of the force on an electron traveling 2.84×10^5 m/s horizontally to the east in a vertically upward magnetic field of strength 1.6 T. [7.27×10^{-14} N]
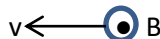
4. (I) Find the direction of the force on a positive charge for each diagram shown below, where "v" is the velocity of the charge and "B" is the direction of the magnetic field.
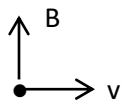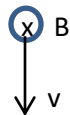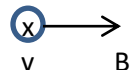

a.   b.   c.   d.   e.

5. (II) An electron experiences the greatest force as it travels 3.4×10^5 m/s in a magnetic field when it is

moving southward. The force is upward and of magnitude 6.8 x 10^{-13} N. What is the magnitude and direction of the magnetic field? [12.5 T west]

6. (II) A particle of charge "q" moves in a circular path of radius "r" in a uniform magnetic field "B". Show that its momentum is p = qBr.
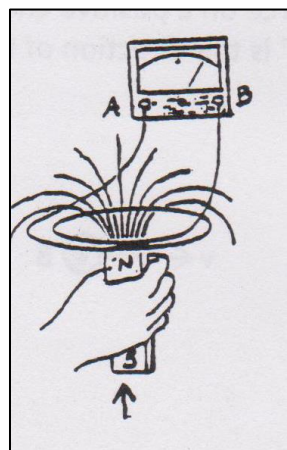
7. (II) An electron is accelerated through a potential difference of 6000 V. What is the strength of the magnetic field if the radius of its path is 8.4 mm? [3.11 x 10^{-2} T]

8. (II) In the drawing below, determine the direction of Conventional current in each of the 5 wires.
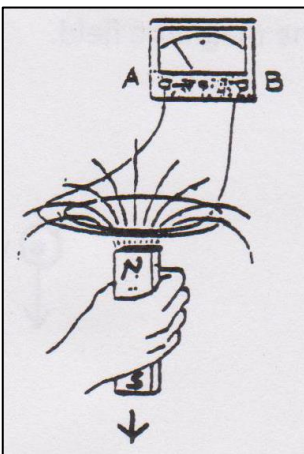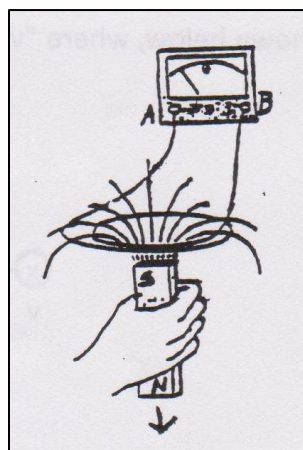

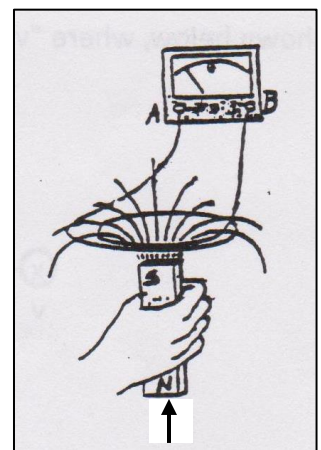A: Into or out   A: Into or out   A: Into or out   A: Into or out

B: Into or out   B: Into or out   B: Into or out   B: Into or out