A-day: Due Fri., Apr 27 (Assigned 4/25)
B-day. Due Mon., Apr 30 (Assigned 4/26)

Magnetism 4

Fig.1

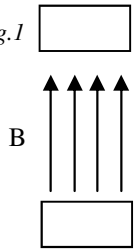


Fig.2

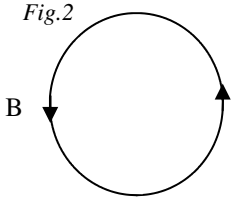


Fig.3

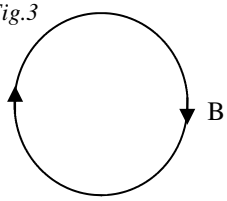
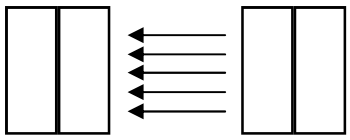
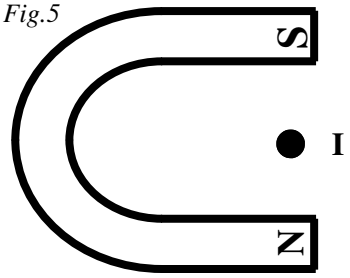


Fig.4



1. Figure 1 shows a magnetic field
   A. Label the magnets as N and S.
   B. Draw a compass inside the magnetic field (be correct as for its direction).
2. (Fig.2) The arrows indicate a circular magnetic field
   A) Draw the direction of the current carrying wire that causes B.
   B) Draw a compass at the bottom of the circle (with correct direction).
3. In Figure 3 draw the direction of the current that causes B.
4. Will Figures 2 and 3 repel or attract one another?
   Why?

Fig.5



5. Label the North and South poles of Figure 4.
6. Using Figure 5 find the force on the wire.
   C) Draw the F_{mag} on the wire.
7. Using the same procedure as above, draw the force on the wire in Fig. 6.
8. If a magnet can lift a 200 g object,
   A) Find the mass in kilograms.
   B) Find the weight of the object.

   C) What force is the magnet exerting to lift the object?

Fig.6

Fig. 7

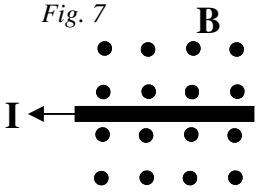
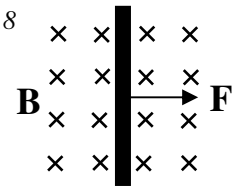


Fig.8



9. In Fig. 7 find the force on the wire.
10. In Fig. 8 find the direction of the current in the black wire.
11. In Fig. 9, find the force on the wire.
12. In Fig. 10, draw the forces on the two charges.

Fig.10

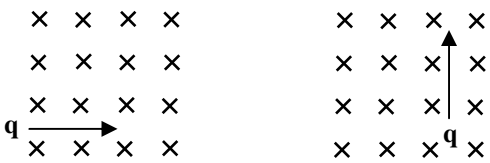
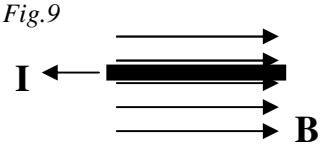


Fig.9



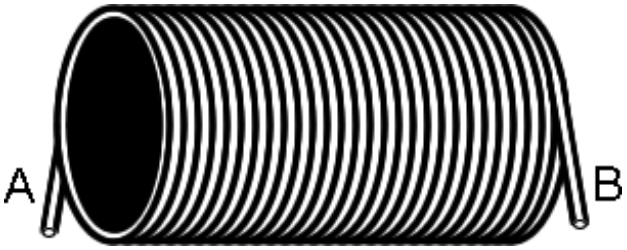
13. So, a charge moving in a magnetic field will follow what shape path?

14. Use Fig. 11 for the following
    A) Draw B above and below the wire.
    B) B in front of the wire is going what direction?
    C) B behind the wire is going what direction?
    D) If you increase I, what happens to B?
    E) Is B stronger at point S or at point T?

Fig.11

15. How fast is a 3μC charge going in a 1.2 T field if the charge feels a 2N force?

Fig.12



16. Use Fig. 12 to answer the following:
    A) The coils of wire is called a: s_____
    B) If electricity is put to the coils with the positive wire to B, which direction is the North pole?

    C) If electricity is put to the coils with the positive wire to A, which direction is the North pole?

17. In Figure 14:
    A) Draw B for wire 1 below wire 1 (be sure that it extends beyond wire 2).
    B) Draw the force on wire 2.
    C) Is wire 2 attracted or repelled by wire 1?

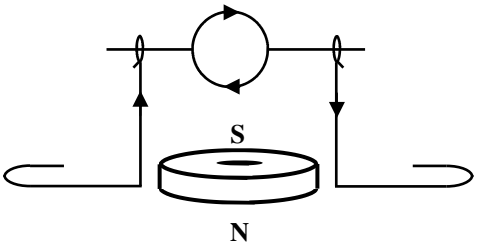
Fig.14

Fig.15

18. In Figure 15 are two current carrying wires shown from above.
    A) Draw the magnetic field lines around both wires.
    B) Will the wires be attracted or repelled by each other?

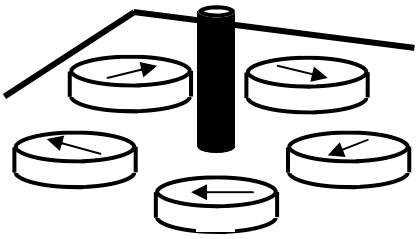
Fig. 16

19. Use Figure 16 to answer the following.
    A) Draw the direction of the North pole of the current carrying loop (in or out of the page)?
    B) Will the front of the loop be attracted or repelled by the permanent magnet below?
    C) If the electricity remains on, will the loop keep turning or stop?
    D) This setup is an example of a simple _____.



20. Using Figure 17, which direction is the current going in the wire?

Fig. 17



21. Use the Figure 18 to answer the following.
    A) What is it?

    B) If electricity is applied to the right side, is that the primary or secondary?

    C) If electricity is applied to the right, will it increase or decrease the voltage?

22. Can transformers change DC voltage?
23. Why or why not?

24. If 10 volts is applied to a transformer with 15 coils on the primary, how much current comes out if there are 45 coils on the secondary?