PreAP: Due Thurs., Apr 27 (Assigned Tues., Apr 25)
Reg. Due Fri., Apr 28 (Assigned Wed., Apr 26)

Magnetism 4

Fig.1

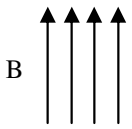


Fig.2

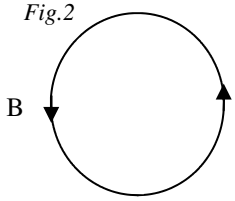


Fig.3

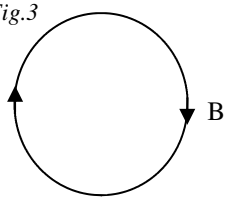
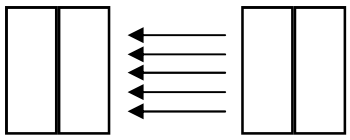
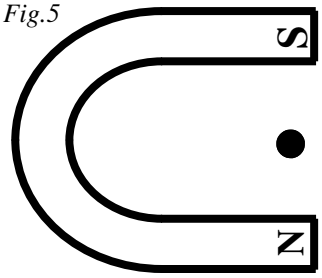


Fig.4



1. What can make magnetic fields? ("Magnets" is incorrect.)

Fig.5



2. Figure 1 shows a magnetic field
   A. Label the sides of the field as N and S.
   B. Draw compass inside the magnetic field (be correct as for its direction).
3. (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).
4. In Figure 3 draw the direction of the current that causes B.
5. Will Figures 2 and 3 repel or attract one another?
   Why?

Fig.6

6. Label the North and South poles of Figure 4.
7. Use Figure 5 to answer the following.
   A) The dot shows a current carrying wire. Is I into or out of the page?
   B) Draw B between the poles.
   C) Draw the F_{mag} on the wire.
8. Using the same procedure as above, draw the force on the wire in Fig. 6.
9. An electromagnet can lift 8 paperclips.
   A) If 15 paperclips have a mass of 6.05 g, find the mass of 1 paperclip.

   B) Find the weight of 1 paperclip (remembering what units mass has to be in).

   C) Find the magnetic force of the electromagnet that allows it to lift the 8 paperclips.

Fig. 7

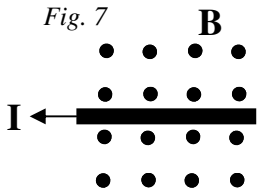
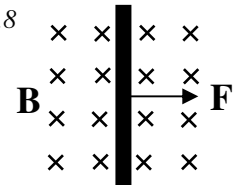


Fig.8



10. In Fig. 7 the dots represent B. Draw the force on the wire.
11. In Fig. 8 the x's represent B. Draw the direction of the current in the black wire.
12. In Fig. 9 B is going to the right. I is to the left. Draw the force on the wire.
13. In Fig. 10, draw the path the charge will follow.

Fig.9

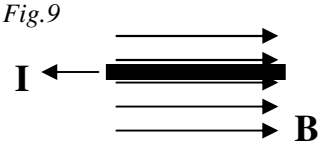
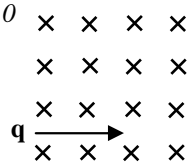


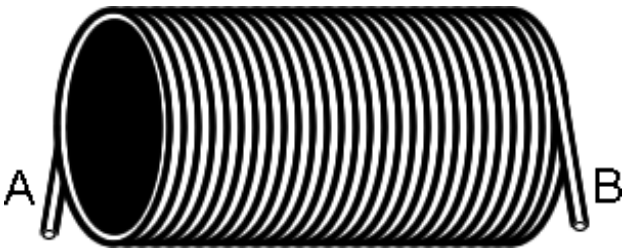
Fig.10



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

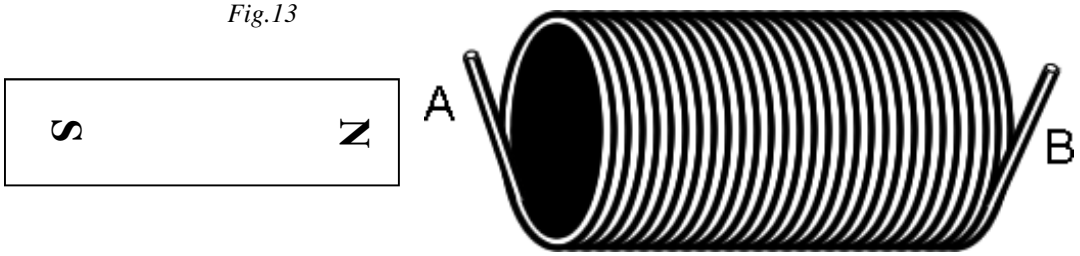
Fig.12



15. 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?

Fig.13



16. (Fig. 13) If the above bar magnet is moved inside the coils, from which end will the induced current come out?

17. (Fig. 13) When the above bar magnet is moved out of the coils, from which end will the induced current come out?

Fig.14

Fig.15

18. 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?

19. 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?

20. A 3.2 N force is felt by a charge going 415 m/s in a 45 T magnetic field. How big is the charge?

21. A 28 loop, solenoid is oriented at an angle of 60 degrees feels a magnetic field of 50 T of in 2 seconds. If the emf felt is -460 volts, find the change of area of the loops.