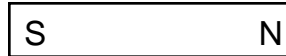


Magnetic Fields and Forces : W.S.-12

1) Draw the field lines around the magnet. Show the direction of the lines.



2) What are the units for the magnetic field?

3) Give the numerical value and the S.I. units for the constant μ_0 , the permeability of free space. The S.I. units include; the meter, the kilogram, the second and the ampere.

4)a) Draw the field lines around the current carrying wire shown below.



b) Find the magnitude of the field at a distance of 1.0 cm from the wire, if the current is 0.85 A.

c) If the wire shown above is in a magnetic field pointing up, what will be the direction of the magnetic force on the wire?

5) The current in a 4.6 cm long wire is 0.32 amps, and it is oriented perpendicular to a 0.50 T magnetic field.

a) Find the magnitude of the force on the wire.

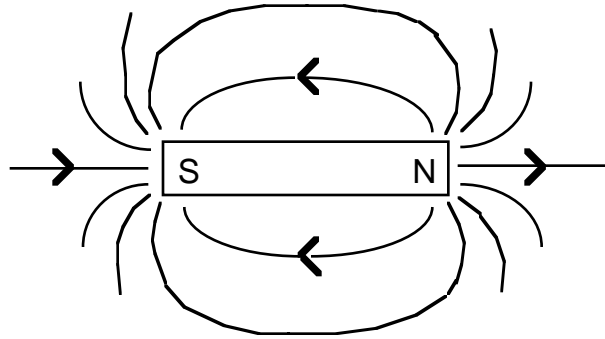
b) Find the force on the wire if the field is parallel to the current direction.

c) Find the force on the wire if the current direction is at an angle of 55 degrees to the field direction.

6) Find the field inside a solenoid, if the current is 1.7 amps, the length of the coil is 15 cm, and the number of turns is 85.

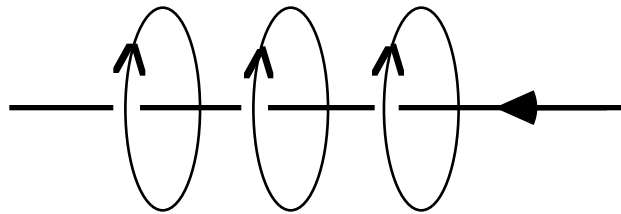
7) Find the current necessary to create a 0.0028 T field inside a solenoid that is 2.5 cm long which has 150 turns.

Answers: 1)



2) teslas (T), 3) $1.3 \times 10^{-6} \text{ kg}\cdot\text{m}/\{\text{A}^2\cdot\text{s}^2\}$,

4)a)



4)b) $1.7 \times 10^{-5} \text{ T}$, c) into the page, 5)a) $7.4 \times 10^{-3} \text{ N}$, b) 0.0 N,

c) $6.0 \times 10^{-3} \text{ N}$, 6) $1.2 \times 10^{-3} \text{ T}$, 7) 0.37 A.