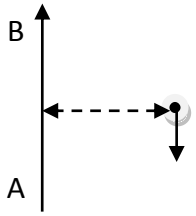
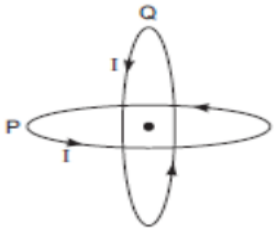
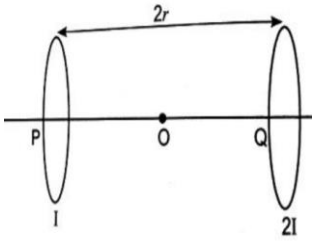
INDIAN SCHOOL DARSAIT
DEPARTMENT OF PHYSICS

Subject: PHYSICS	Topic: MOVING CHARGES & MAGNETISM	Date of Worksheet: 21 .5.19
Resource Person: SUSAN ANIL		Worksheet # 4
Name of the Student: _____	Class &Div: _____	Roll Number: __

1.	Draw the magnetic field lines due to a current carrying (i)straight conductor (ii) circular loop (iii) solenoid (iv) toroid (**2013**)
2.	Write any two important points of similarities and differences each between Coulomb's law for the electrostatic field and Biot-Savart's law for the magnetic field. (**2015**)
3.	Show through an example; how Ampere's circuital law enables an easy evaluation of the magnetic field when there is symmetry in the system? (**2010)**
4.	Why the electrons cannot be accelerated by the cyclotron?
5.	What is the importance of a radial magnetic field and how is it produced?
6.	Find the condition under which the charged particles moving with different speeds in the presence of electric and magnetic field vectors can be used to select charged particles of a particular speed.
7.	An iron ring of relative permeability μ_r has windings of insulated copper wire of n turns per metre. When the current in the windings is I, find the magnetic field in the ring. (**2018**)
8.	Write the magnitude of force between two straight parallel current carrying conductors kept at a distance 'd' apart in air. Use this expression, and the sign convention that the: 'Force of attraction is assigned a negative sign and a force of repulsion is assigned a positive sign'. Draw graphs showing dependence of F on: (i) I_1I_2 when d is kept constant (ii) when the product I_1I_2 is maintained at a constant positive value. (iii) when the product I_1I_2 is maintained at a constant negative value.
9.	A proton, a deutron and an alpha particle, are accelerated through the same potential difference and then subjected to a uniform magnetic field B, perpendicular to the direction of their motions. Compare (i) their kinetic energies, and (ii) if the radius of the circular path described by the proton is 5cm, determine the radius of path described by deuteron and alpha particle. (**2019**)
10.	A coil of N turns, and radius R carries a current I. It is unwound and rewound to make a square coil of side **a** having same number of turns N. Keeping the current I same, find the ratio of magnetic moments of the square coil and the circular coil (**2013**)

11.	A long straight wire AB carries a current of 4A. A proton P travels at $4x10^6$m/s parallel to the wire 0.2m from it and in a direction opposite to the current as shown in the figure. Calculate the force which the magnetic field due to the current carrying wire exerts on the proton. Also specify its direction (**2019**) 
12.	Two identical circular wires P and Q each of radius R and carrying current 'I' are kept in perpendicular planes such that they have a common center as shown in the figure. Find the magnitude and direction of the net magnetic field at the common center of the two coils. 
13.	Two identical circular loops, P and Q, each of radius r and carrying currents I and 2I respectively are lying in parallel planes such that they have a common axis. The direction of current in both the loops is clockwise as seen from 'O' which is equidistant from both the loops. Find the magnitude of the net magnetic field at point 'O'. (**2012**) 
14.	A square shaped plane coil of area $100cm^2$ of 200 turns carries a steady current of 5A. It is placed in a uniform magnetic field of 0.2T acting perpendicular to the plane of the coil. Calculate the torque on the coil when its plane makes an angle 60^0 with the direction of the field. In which orientation will the coil be in stable equilibrium? (**2015**)
15.	A square loop of side 20cm carrying current of 1A is kept near an infinite long straight wire carrying a current of 2A in the same plane as shown in the figure. Calculate the magnitude and direction of the net force exerted on the loop due to the current carrying conductor. (**2015**)