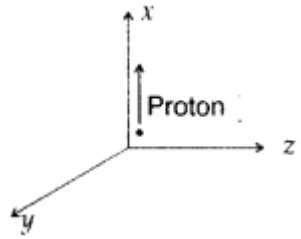
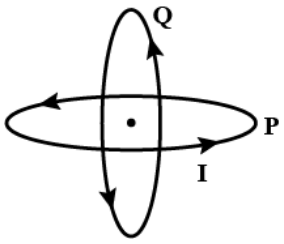
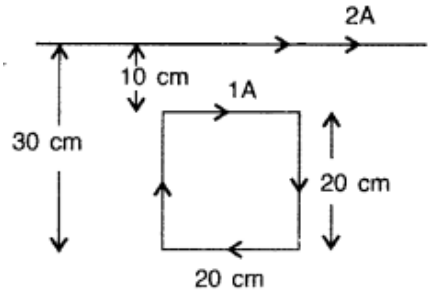
KENDRIYA VIDYALAYA SANGATHAN AHMEDABAD REGION
WORKSHEET ON MOVING CHARGES AND MAGNETISM

ROLL NO.- NAME OF THE STUDENT-

1	A beam of protons, projected along + x-axis, experiences a force due to a magnetic field along the – y-axis. What is the direction of the magnetic field? (All India 2010) 	
2	An ammeter of resistance 0.6 Ω can measure current up to 1.0 A. Calculate (i) The shunt resistance required to enable the ammeter to measure current up to 5.0 A (ii) The combined resistance of the ammeter and the shunt.	
3	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 centre as shown in the figure. Find the magnitude and direction of the net magnetic field at the common centre of the two coils. 	

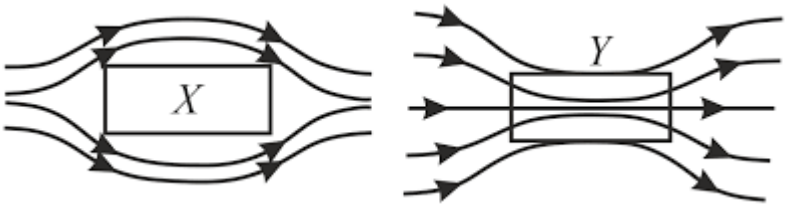
4	A square loop of side 20 cm carrying current of 1A is kept near an infinite long straight wire carrying a current of 2A in the same plane as shown in the figure.  Calculate the magnitude and direction of the net force exerted on the loop due to the current carrying conductor.	
5	A proton and an alpha particle having the same kinetic energy are, in turn, passed through a region of uniform magnetic field, acting normal to the plane of the paper and travel in circular paths. Deduce the ratio of the radii of the circular paths described by them.	

6	Using Ampere's circuital law, obtain an expression for the magnetic field along the axis of a current carrying solenoid of length l and having N number of turns.	

7	State the underlying principle of working of a moving coil galvanometer. Write two reasons why a galvanometer cannot be used as such to measure current in a given circuit. Name any two factors on which the current sensitivity of a galvanometer depends.	
8	Derive the expression for force per unit length between two long straight parallel current carrying conductors. Hence define one ampere.	

KENDRIYA VIDYALAYA SANGATHAN AHMEDABAD REGION
WORKSHEET ON MAGNETISM AND MATTER

ROLL NO.- NAME OF THE STUDENT-

1	In which orientation, a dipole placed in a uniform electric field is in (i) stable equilibrium (ii) unstable equilibrium?	
2	A uniform magnetic field gets modified as shown in the figure, when two specimens X and Y are placed in it.  (i) Identify the two specimens X and Y. (ii) State the reason for modification of the field lines in X and Y.	
3	A short bar magnet placed with its axis at 30o with a uniform external magnetic field of 0.25 T experiences a torque of magnitude equal to 4.5×10^{-2} J. What is the magnitude of magnetic moment of the magnet?	
4	Derive an expression for torque on a magnetic dipole placed in a uniform magnetic field. Hence define magnetic dipole moment.	

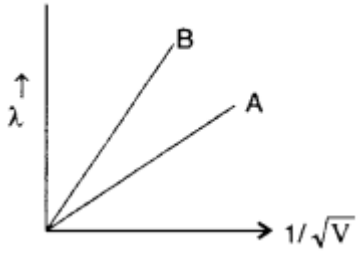
5	(a) How does a diamagnetic material behave when it is cooled to very low temperatures? (b) Why does a paramagnetic sample display greater magnetization when cooled? Explain.	
6	Derive an expression for magnetic field intensity at a point on the equatorial line of a bar magnet. What is the direction of this field?	

7	Explain the origin of diamagnetism. Why are the diamagnetic substances repelled by magnets?	

8	Give six comparative properties of materials to differentiate between dia, para and ferro magnetic substances.	

KENDRIYA VIDYALAYA SANGATHAN AHMEDABAD REGION
WORKSHEET ON DUAL NATURE OF MATTER AND RADIATION

ROLL NO.- NAME OF THE STUDENT-

1	An electron and proton have the same de Broglie wavelength. Which one of these has the higher kinetic energy? Which one is moving faster?	
2	Two monochromatic radiations, blue and violet, of the same intensity, are incident on a photosensitive surface and cause photoelectric emission. Would: (a) the number of electrons emitted per second, and (b) the maximum kinetic energy of the electrons, be equal in the two cases. Justify your answer.	
3	How does the maximum kinetic energy of electrons emitted from a metal vary with its work function?	
4	Two lines, A and B, in the plot given below show the variation of de-Broglie wavelength, λ versus 1V√, Where V is the accelerating potential difference, for two particles carrying the same charge. Which one of two represents a particle of smaller mass?  	

5	Write Einstein's photoelectric equation. State clearly the three salient features observed in photoelectric effect, which can be explained on the basis of the above equation.	
6	An electron has kinetic energy equal to 100 eV. Calculate (1) momentum (2) speed (3) de Broglie wavelength of the electron.	

7	(a) Define photoelectric work function? What is its unit? (b) In a plot of photoelectric current versus anode potential, how does (i) Saturation current varies with anode potential for incident radiations of different frequencies but same intensity? (ii) The stopping potential varies for incident radiations of different intensities but same frequency. (iii) Photoelectric current vary for different intensities but same frequency of radiations? Justify your answer in each case? Ans.	

8	Draw a graph showing the variation of stopping potential with the frequency of incident radiation in relation to photoelectric effect. Deduce an expression for the slope of this graph using Einstein's photoelectric equation.	