



# INDIAN SCHOOL NIZWA - WORKSHEET

## PHYSICS

### CH: 4,5 CBSE BOARD QUESTIONS

Name: \_\_\_\_\_

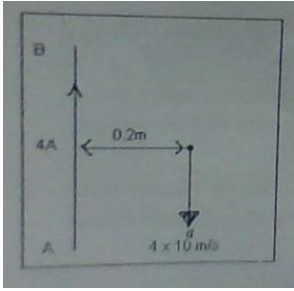
Date: \_\_\_\_\_

Class: XII Sec: A \_\_\_\_\_

1. A proton and an electron travelling along parallel paths enter a region of uniform magnetic field, acting perpendicular to their paths. Which of them will move in a circular path with higher frequency? 1  
(2018 – CBSE)
2. Two long straight wires carrying currents of 2A and 5A in the same direction are kept parallel, 10 cm apart from each other. Calculate the force acting between them and write its nature. (2019 CBSE) 2
3. A bar magnet of magnetic moment  $6\text{ J/T}$  is aligned at  $60^\circ$  with a uniform external magnetic field of  $0.44\text{ T}$ . calculate (a) work done in turning the magnet to align its magnetic moment (i) normal to the magnetic field, (ii) opposite to the magnetic field, and (iii) torque on the magnet in the final position in case (ii). (2018 CBSE) 3
4. (a) An iron ring of relative permeability  $\mu_r$  has windings of insulated copper wire of  $n$  turns per meter. When the current in the winding is  $I$ , find the expression for the magnetic field in the ring. 3  
(b) The susceptibility of a magnetic material is  $0.9853$ . Identify the type of magnetic material. Draw the modification of the field pattern on keeping a piece of this material in uniform magnetic field. (2018 CBSE)  
(c)
5. (a) Depict the magnetic field lines due to a circular current carrying loop showing the direction of field lines. 3  
(b) A current  $I$  is flowing in a conductor placed along the  $X$  axis as shown. Find the magnitude and direction of magnetic field due to a small current element  $dl$  lying at the origin at points (i)  $0, d, 0$  and (ii)  $0, 0, d$  (2019 CBSE)  
(c)
6. (a) Briefly explain how a galvanometer is converted into an ammeter. 3  
(b) A galvanometer has a resistance of  $15\Omega$  and it shows full scale deflection for a current of  $4\text{ mA}$ . Convert it into an ammeter of range  $0$  to  $6\text{ A}$ . (2019 CBSE)
7. (a) Briefly explain how a galvanometer is converted into a voltmeter. 3  
(b) A voltmeter of a certain range is constructed by connecting a resistance of  $980\Omega$  in series with a galvanometer. When the resistance of  $470\Omega$  is connected in series, the range gets halved. Find the resistance of the galvanometer. (2019 CBSE)
8. A long wire  $AB$  carries a current of  $4\text{ A}$ . A proton  $P$  travels at  $4 \times 10^6\text{ m/s}$  parallel to the wire  $0.2\text{ m}$  from it and in a direction opposite to the current as shown. Calculate the force which the magnetic field due to the current carrying wire exerts on the proton. Also give its direction. 3



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(2019 CBSE)

9. A particle of charge  $q$  and mass  $m$  is moving with velocity  $V$  in the  $+x$  direction.
- It is subjected to a uniform magnetic field  $b$  directed along the negative  $z$  direction. Explain briefly the trajectory it would describe.
  - When the particle is subjected simultaneously to both magnetic and electric field directed along  $Z$  axis and  $y$  axis respectively, obtain the condition when the particle will go undeflected.
- (2019 CBSE)