

# PHYSICS WORKSHEET

## GRADE XII A

1. A jet plane is traveling west at 450m/s. If horizontal component of earth's magnetic field at that place is  $4 \times 10^{-4}$  T and angle of dip is  $30^\circ$ , find emf induced between ends of wings having a span of 30m.
2. Give two factors by which voltage sensitivity of a moving coil galvanometer can be increased.
3. Describe qualitatively, the path of a charged particle moving in a uniform electrostatic field with initial velocity (i) parallel to the field (ii) perpendicular to the field, (iii) at an arbitrary angle with the field direction.
4. What are diamagnetic substances? Briefly explain what is the cause for diamagnetism? Give any two examples of diamagnetic substances.
5. What is the effect of temperature on a Ferromagnetic substance? How is it related to Curie temperature? How is susceptibility related to temperature for a temperature above the Curie temperature.
6. A magnetic needle in a uniform magnetic field experiences a torque but not net force. An iron nail near a bar magnet, however, experiences a force of attraction in addition to a torque. Why?
7. An electron does not suffer any deflection while passing through a region of uniform magnetic field. What is the direction of the magnetic field?
8. Using the concept of force between two infinitely long parallel current-carrying conductors, define one ampere of current.
9. What is the work done by a magnetic field on a moving charge and why?
10. A proton and an alpha particle move perpendicular to a magnetic field. Find the ratio of radii of the circular paths described by them when both (i) have equal momenta, and (ii) were accelerated through the same potential difference.
11. Two identical circular coils, P and Q each of radius  $r$ , carrying currents 1 A and 3 A respectively, are placed concentrically and perpendicular to each other lying in the  $xy$  and  $xz$  planes. Find the magnitude and direction of the net magnetic field at the centre of the coils.

12. Consider a long straight cylindrical wire of circular cross section of radius 'a'. The current I is uniformly distributed across this cross section. Calculate the magnetic field B in the region  $r > a$  and  $r < a$ .
13. The current sensitivity of a moving coil galvanometer increases by 20 % when its resistance is increased by a Factor of 2. Calculate by what factor the voltage sensitivity changes ?
14. The magnetic field in a plane electromagnetic wave is given by  $B_y = 2 \times 10^{-7} \sin(0.5 \times 10^3 x + 1.5 \times 10^{11} t)$  T.
- a) What is the wave length and frequency of the wave?
- b) Write an expression for the electric field.
15. A Plane electromagnetic wave of frequency 25 MHz travels in free space along the X direction. At a particular point in space and time,  $E = 6.3 \hat{j}$  V/m. What is B at this point.