XII PHYSICS TEST ON MAGNETISM

M.M. : 25 **TIME: 40 MIN.**

1. A circular coil of wire consisting of 100 turns, each of radius 8.0 cm, carries a current of 0.40 A. What is the magnitude of the magnetic field $\vec{B}$ at the centre of the coil? **1**

2. A wire of length L is bent in the form of a circle and carries current I. Find magnetic moment of coil? **1**

3. How to convert moving coil galvanometer into ammeter? **1**

4. The magnetic field $\vec{B} = (3\hat{i} - 4\hat{j})$ T and the velocity of an electron is $\vec{v} = (\hat{i} + 2\hat{j} - 3\hat{k})$ ms^{-1}. What is the force experienced by it? **1**

5. Which one of the two, an ammeter or a milliammeter, has a higher resistance and why? **1**

6. What is Bohr's Magneton? **1**

7. The force $\vec{F}$ experienced by a particle of charge q moving with velocity $\vec{v}$ in a magnetic field $\vec{B}$ is given by $\vec{F} = q(\vec{v} \times \vec{B})$. Of these, name the pairs of vectors which are always at right angles to each other. **2**

8. A proton (or an electron) is moving in a uniform magnetic field. What is the path of the proton (or an electron) if it enters (i) parallel to the field, (ii) perpendicular to the field, and (iii) at an angle to the field? **2**

9. A charge q moving in a straight line is accelerated by a potential difference V. It enters a uniform magnetic field B perpendicular to its path. Deduce in terms of V an expression for the radius of the circular path in which it travels. **2**

10. Using Ampere's circuital law derive an expression of magnetic field due to a current carrying solenoid. **2**

11. Derive the expression for force per unit length between two long straight parallel current carrying conductors. Hence define one ampere. **3**

12. An proton, deutron and a alpha particle moving with the same speed in the magnetic field perpendicularly. Then find the ratio of radius of charge particle $r_p : r_D : r_\alpha$. **3**

13. Describe principle construction and working of a moving coil galvanometer. How can the current sensitivity of moving coil galvanometer be increased? **5**