OPEN STUDENT FOUNDATION
Physics (Class 12)
PRACTICE SHEET DAY 5

CHAPTER 05 | Date : 22/02/24

Section A

● **Write the answer of the following questions. [Each carries 1 Mark]** **[10]**

1. Define magnetisation (M). Write its formula, unit and dimension
2. Write four points for electric dipole and magnetic dipole analogy.
3. Obtain the relation between magnetisation $(\vec{M})$ and magnetic intensity $(\vec{H})$ for a solenoid. Derive formula $\vec{B} = \mu_0(\vec{H} + \vec{M})$.
4. A solenoid has a core of a material with relative permeability 400. The windings of the solenoid are insulated from the core and carry a current of 2A. If the number of turns is 1000 per metre, calculate (a) H, (b) M, (c) B and (d) the magnetising current I_m.
5. (a) Explain paramagnetism and paramagnetic substance.
   (b) Explain ferromagnetism and ferromagnetic substance.
6. A closely wound solenoid of 2000 turns and area of cross-section 1.6×10^{-4} m^2, carrying a current of 4.0 A, is suspended through its centre allowing it to turn in a horizontal plane.
   (a) What is the magnetic moment associated with the solenoid ?
   (b) What is the force and torque on the solenoid if a uniform horizontal magnetic field of 7.5×10^{-2} T is set up at an angle of 30° with the axis of the solenoid ?
7. Give the characteristics of magnetic field lines.
8. A bar magnet of magnetic moment 1.5 J T^{-1} lies aligned with the direction of a uniform magnetic field of 0.22 T.
   What is the amount of work required by an external torque to turn the magnet so as to align its magnetic moment: (i) normal to the field direction, (ii) opposite to the field direction ?
9. A short bar magnet placed in a horizontal plane has its axis aligned along the magnetic north-south direction. Null points are found on the axis of the magnet at 14 cm from the centre of the magnet. The earth's magnetic field at the place is 0.36 G and the angle of dip is zero. What is the total magnetic field on the normal bisector of the magnet at the same distance as the null-point (i.e., 14 cm) from the centre of the magnet? (At null points, field due to a magnet is equal and opposite to the horizontal component of earth's magnetic field.)
10. A short bar magnet of magnetic moment m = 0.32 JT^{-1} is placed in a uniform magnetic field of 0.15 T. If the bar is free to rotate in the plane of the field, which orientation would correspond to its :
    (a) stable, and
    (b) unstable equilibrium ? What is the potential energy of the magnet in each case ?

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Section [A] : 1 Marks Questions					
No	Ans	Chap	Sec	Que	Universal_QueId
1.	-	Chap 5	S8	5	QP23P11B1211_P1C5S8Q5
2.	-	Chap 5	S8	2	QP23P11B1211_P1C5S8Q2
3.	-	Chap 5	S9	19	QP23P11B1211_P1C5S9Q19
4.	-	Chap 5	S9	21	QP23P11B1211_P1C5S9Q21
5.	-	Chap 5	S9	20	QP23P11B1211_P1C5S9Q20
6.	-	Chap 5	S9	17	QP23P11B1211_P1C5S9Q17
7.	-	Chap 5	S9	14	QP23P11B1211_P1C5S9Q14
8.	-	Chap 5	S9	13	QP23P11B1211_P1C5S9Q13
9.	-	Chap 5	S10	20	QP23P11B1211_P1C5S10Q20
10.	-	Chap 5	S10	19	QP23P11B1211_P1C5S10Q19

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