OPEN STUDENT FOUNDATION
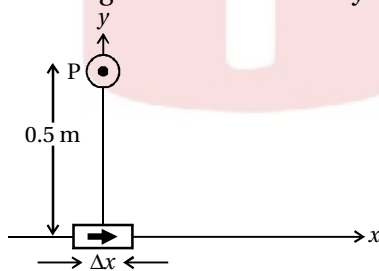## Physics (Class 12)
PRACTICE SHEET DAY 4

Section A

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

1. Explain Biot-Savart law in brief.

2. Derive an expression for the magnetic field at any point on the axis of a circular current loop.

3. A horizontal power line carries a current of 90 A in east to west direction. What is the magnitude and direction of the magnetic field due to the current 1.5 m below the line ?

4. The moving coil meters, M_1 and M_2 have the following particulars :
   $R_1 = 10 \, \Omega$, $N_1 = 30$, $A_1 = 3.6 \times 10^{-3} \, m^2$, $B_1 = 0.25 \, T$
   $R_2 = 14 \, \Omega$, $N_2 = 42$, $A_2 = 1.8 \times 10^{-3} \, m^2$, $B_2 = 0.50 \, T$ (The spring constants are identical for the two meters)
   Determine the ratio of : (a) Current sensitivity and (b) Voltage sensitivity of M_2 and M_1

5. Two long and parallel straight wires A and B carrying currents of 8 A and 5 A in the same direction are separated by a distance of 4 cm. Estimate the force on a 10 cm section of wire A.

6. A square coil of side 10 cm consists of 20 turns and carries a current of 12 A. The coil is suspended vertically and the normal to the plane of the coil makes an angle of 30° with the direction of a uniform horizontal magnetic field of magnitude 0.80 T. What is the magnitude of torque experienced by the coil ?

7. Derive an expression for the torque acting on a current carrying loop which subtends angle θ with uniform magnetic field.

8. Figure shows a long straight wire of a circular cross-section (radius *a*) carrying steady current I. The current I is uniformly distributed across this cross-section. Calculate the magnetic field in the region $r_1 < a$ and $r > a$.
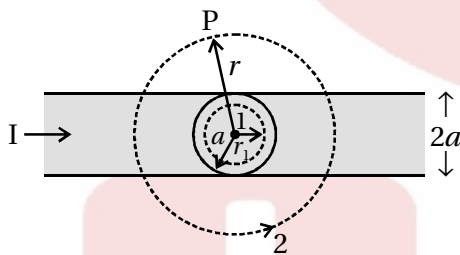
9. An element $\overrightarrow{\Delta l} = \Delta x \hat{i}$ is placed at the origin and carries a large current I = 10 A (Figure). What is the magnetic field on the *y*-axis at a distance of 0.5 m. $\Delta x = 1$ cm.

10. Derive equation of magnetic field inside a long straight solenoid.

Section [A] : 1 Marks Questions				
No	Ans	Chap	Sec	Que	Universal_QueId
1.	-	Chap 4	S8	1	QP23P11B1211_P1C4S8Q1
2.	-	Chap 4	S8	3.1	QP23P11B1211_P1C4S8Q3.1
3.	-	Chap 4	S8	3.2	QP23P11B1211_P1C4S8Q3.2
4.	-	Chap 4	S8	5	QP23P11B1211_P1C4S8Q5
5.	-	Chap 4	S8	6	QP23P11B1211_P1C4S8Q6
6.	-	Chap 4	S8	7	QP23P11B1211_P1C4S8Q7
7.	-	Chap 4	S9	19	QP23P11B1211_P1C4S9Q19
8.	-	Chap 4	S10	18	QP23P11B1211_P1C4S10Q18
9.	-	Chap 4	S10	17	QP23P11B1211_P1C4S10Q17
10.	-	Chap 4	S10	19	QP23P11B1211_P1C4S10Q19

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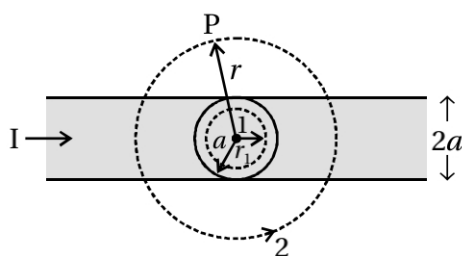
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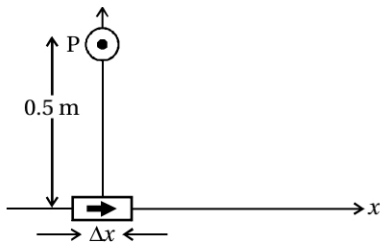
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y

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