

Topic- Magnetic Effect of Current (II)

Assignment-8

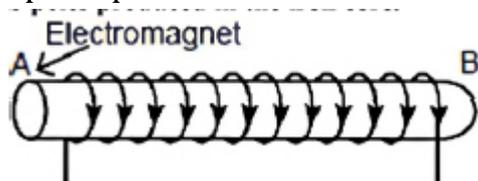
Subject-Physics

Class-XII

1. A positively charged particle (alpha-particle) projected towards west is deflected towards north by a magnetic field. The direction of magnetic field is
 (a) Towards north (b) towards east
 (c) Downward (d) upward 1

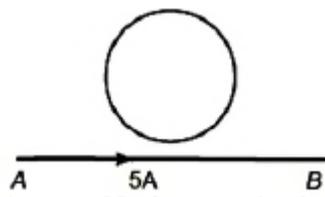
2. A current carrying straight wire held perpendicular to the plane of paper and current passes through this conductor in the vertically upward direction. What is the direction of magnetic field produced around it? 2

3. The diagram shows a coil of wire wound on a soft iron core forming an electromagnet. A current is passed through the coil in the direction indicated by the arrows. Mark the N and S poles produced in the iron core.



2

4. A steady current of 5 A is flowing through a conductor AB. Will the current be induced in the circular wire of radius 1m?



2

5. The diagram shows a beam of electrons about to enter a magnetic field. The direction of the field is into the page.

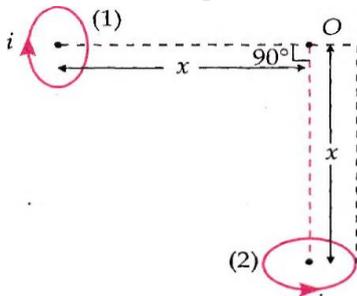


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6. How will you convert a galvanometer into an ammeter of range 0 -1 amperes? What is the effective resistance of an ammeter? 2
7. What is the importance of radial magnetic field in a moving coil galvanometer? 2
8. A proton and an alpha particle of the same velocity enter in turn a region of uniform magnetic field, acting perpendicular to their direction of motion. Deduce the ratio of the radii of the circular paths described by the particles. 2

9. What are the main functions of electric and magnetic fields in a cyclotron? 2

10. Two small identical circular loops, marked (1) and (2), carrying equal currents, are placed with the geometrical axes perpendicular to each other. Find the magnitude and direction of the net magnetic field produced at the point O.



3

11. A long solenoid with closely wound turns has n turns, per unit of its length. A steady current I flows through this solenoid. Use Ampere's circuital law to obtain an expression, for the magnetic field, at a point on its axis and close to its midpoint. 3

12. 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. 3

13. The magnitude F of the force between two straight parallel current carrying conductors kept at a distance d apart in air is given by $F = \frac{\mu_0 I_1 I_2}{2\pi d}$, where I_1 & I_2 the currents are flowing

through the two wires. Use this expression and the sign convention that the: "Force of attraction is assigned a negative sign and force of repulsion is assigned a positive sign".

Draw graphs showing dependence of F on

(i) $I_1 I_2$ When d is kept constant.

(ii) d when the product $I_1 I_2$ is maintained at a constant positive value.

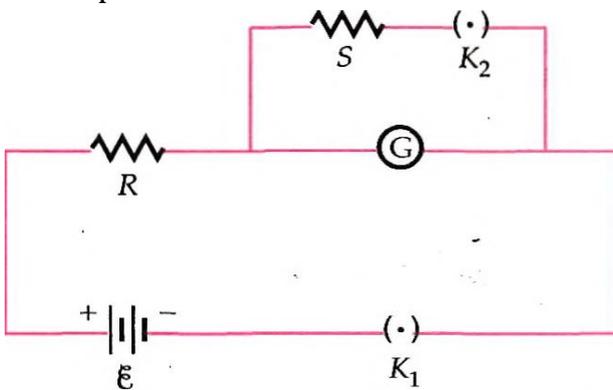
(iii) d when the product $I_1 I_2$ is maintained at a constant negative value. 3

14. Two long straight parallel conductors carrying steady currents I_1 & I_2 are separated by a distance r . Explain briefly, with the help of a suitable diagram, how the magnetic field due to one conductor acts on the other. Hence deduce the expression for the force acting between the two conductors. Mention the nature of the force. 3

15. (a) Two circular coils X & Y having radii R & $\frac{R}{2}$ respectively are placed in horizontal plane with their centres coinciding with each other. Coil X has a current I flowing through it in the clockwise sense. What must be the current in coil Y to make the total magnetic field at the common centre of the two coils, zero?

(b) With the same currents flowing in the two coils, if the coil Y is now lifted vertically upwards through a distance R , what would be the net magnetic field at the centre of coil Y ? 3

16. The current flowing in the galvanometer G when the key K_2 is kept open is I . On closing the key K_2 , the current in the galvanometer becomes $\frac{I}{n}$, where n is an integer. Obtain an expression for resistance R_g of the galvanometer in terms of R, S & n . To what form does this expression reduce when the value of R is very large as compared to S ?



3

17. With the help of a neat and labelled diagram, explain the underlying principle, construction and working of a moving coil galvanometer. What is the function of:
 (i) uniform radial field (ii) soft iron core; in such a device?

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For detail study, numerical problems & conceptual questions click below

<https://www.learnbse.in/important-questions-for-class-12-physics-chapter-4/>