Application of Ampere's law to find the magnetic field of solenoid and toroid.
CLASS-XII

SUBJECT : PHYSICS
CHAPTER NUMBER: 04
CHAPTER NAME : MOVING CHARGES AND MAGNETISM

CHANGING YOUR TOMORROW

Home Assignment

1. State Ampere's circuital law. Show through an example, how this law enables an easy evaluation of the magnetic field inside a very long solenoid having n turns per unit length carrying a current I.

2. Answer the following:

   a) Using Ampere's circuital law, obtain the expression for the magnetic field due to a long solenoid on its axis.

   b) In what respect, is a toroid different from a solenoid? Draw and compare the pattern of the magnetic field lines in the two cases.

   c) How is the magnetic field inside a given solenoid made strong?

Home Assignment

Question 3 : A solenoid coil of 300 turns/m is carrying a current of 5A. The length of the solenoid is 0.5 m and has a radius of 1cm. Find the magnitude of the magnetic field inside the solenoid.

Question 4 : A 0.5 m long solenoid has 500 turns and has a flux density of $2.52 \times 10^{-3} T$ at the center. Find the current in the solenoid. Given $\mu_0 = 4\pi \times 10^{-7} Hm^{-1}$.

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