II PUC

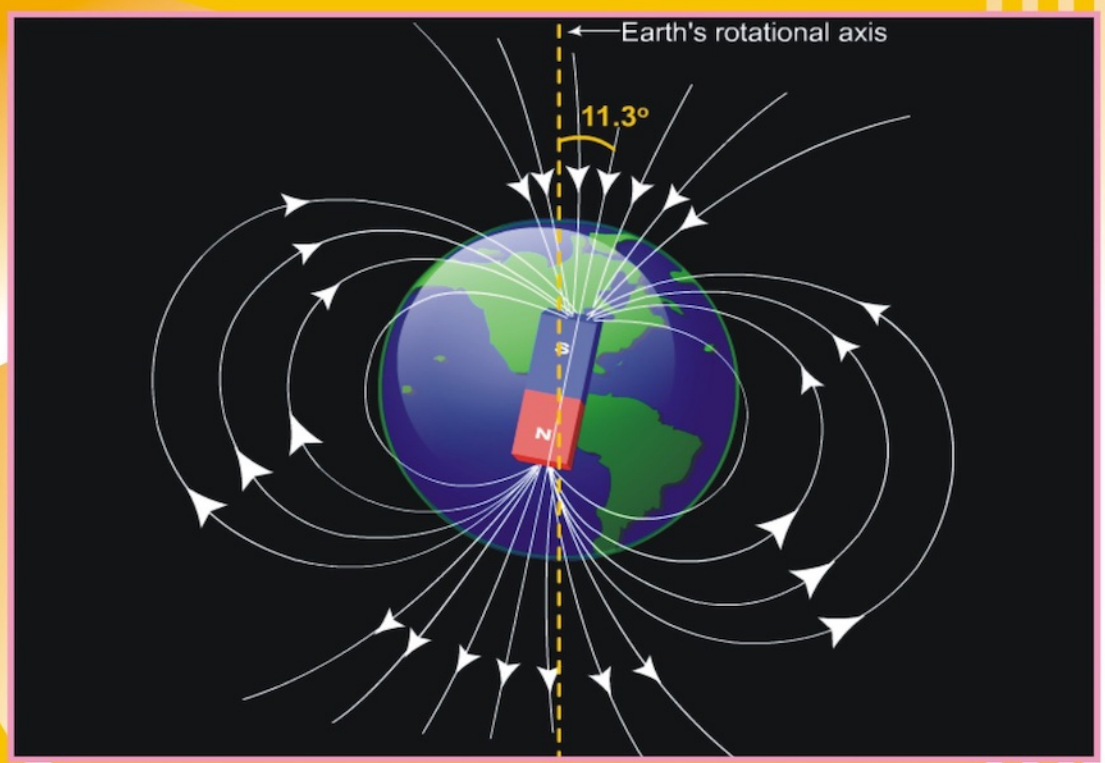
As per New Syllabus

EXPERT

# PHYSICS

## REFRESHER COURSE

For II PUC, DEPARTMENT OF PU EDUCATION, KARNATAKA




## Part- 8

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# PHYSICS

**Volume Two: New syllabus**

**THIRD EDITION**

# REFRESHER COURSE

## FOR PUC – II

by

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# FOREWORD

**Dear readers,**

**For me and EXEPRT, it is an eve of gaiety and splendor to bring to stands the Second Edition of our book 'A Refresher Course in Physics' for the students of Second year PU (Karnataka Board). This pioneering work is the result of the collective and dedicated efforts by the best minds in the field of college education.**

**This book is an ensemble of pearls of wisdom picked carefully by EXPERT from the various oceans of knowledge, unmatched in quality and style. It shall beyond doubt prove a shot in the arm as far as the scoring of students is considered.**

**The Third edition of this book has been put to print as hands on approach to solve the difficulties faced by students while preparing for II PU Board examination. Utmost care is taken to ensure that their hard work gets translated into full success. Optimal use of experience and knowledge has been made to ensure that the book is an unfailing and indispensable companion to students as well as teachers. I am confident that any student who makes use of this book is most likely to get 100/100 in the Board Exam.**

**I hope that all P U teachers and in particular, the students who aim high and earnestly desire to achieve cent percent success will make best use of this book and join the league of excellence.**

**I heartily thank Prof. Harish Bhat, Prof. Vadiraj Rao, Prof. Vijeth Nayak S. R and Prof. Prashanth Rao whose names are synonymous with classes of quality; for the painstaking effort they have put in as authors.**

**NARENDRA L NAYAK; B. E (Mech)**
**Managing Partner, Expert Publishing House &**
**Chairman, Expert Educational & Charitable Foundation, Mangaluru**

## CHAPTER – 8 ELECTROMAGNETIC WAVES

**Q. State Ampere's circuital law.**

**Ans:** The line integral of magnetic field $\vec{B}$ around any closed path in vacuum is equal to $\mu_o$ times the total current I threading the closed path. i.e. $\oint \vec{B} . d\vec{\ell} = \mu_o I$

where $\mu_o$ is permeability of free space.

**Q. Define displacement current. [Model paper]**

**Ans:** Current that result due to the time rate of change of electric flux (or electric field) is called displacement current.

**Q. Define conduction current.**

**Ans:** The current carried by conductors due to time rate of flow of charges is called conduction current.

**Q. Write the expression for displacement current. [Model paper]**

**Ans:** Displacement current $I_d = \varepsilon_o \frac{d\phi_E}{dt}$

$\varepsilon_o$ = permittivity of free space, $\frac{d\phi_E}{dt}$ = rate of change of electric flux

**Q. Derive the expression for displacement current. Or Explain Maxwell's correction in Ampere's circuital law.**

**Ans:** Consider a parallel plate capacitor being charged as shown in fig(a).

Let P be a point outside the parallel plate capacitor at a distance r from the current carrying wire. Consider a plane circular loop of radius r centred at the current carrying wire. The magnetic field is same at all points on the loop and is directed along the circumference.

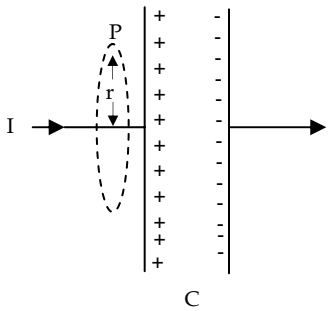

Fig (a)

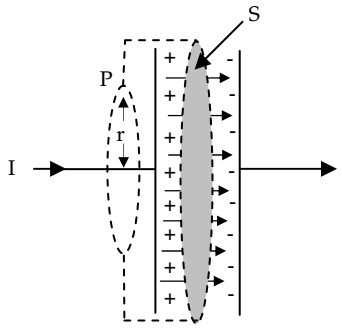

Fig (b)