UNIT-5: ELECTROMAGNETIC WAVES

LEARNING OBJECTIVES

In this unit, the student is exposed to

- The displacement current
- Maxwell’s correction to Ampere's circuital law
- Maxwell’s equation in integral form
- Production and properties of electromagnetic waves – Hertz’s experiment
- Sources of electromagnetic waves
- Electromagnetic spectrum

IMPORTANT NOTES AND POINTS

- The name stuck because Maxwell named it. The word displacement is poorly chosen because nothing is being displaced here.
- The displacement current can be defined as the current which comes into play in the region in which the electric field and the electric flux are changing with time.
- When light is allowed to pass through a medium or an absorbing substance then the spectrum obtained is known as absorption spectrum.

- When the spectrum of self luminous source is taken, we get emission spectrum. Each source has its own characteristic emission spectrum.
- Electromagnetic spectrum is an orderly distribution of electromagnetic waves in terms of wavelength or frequency.
- Electromagnetic waves can show interference, diffraction and can also be polarized.
- Electromagnetic waves are produced by any accelerated charge.
- Electromagnetic waves do not require any medium for propagation. So electromagnetic wave is a non-mechanical wave.
- Electromagnetic waves are transverse in nature. This means that the oscillating electric field vector, oscillating magnetic field vector and propagation vector (gives direction of propagation) are mutually perpendicular to each other.