SNS COLLEGE OF ENGINEERING

(An Autonomous Institution)

INTRODUCTION TO ELECTROMAGNETIC FIELDS

What We'll Discuss

TOPIC OUTLINE

Electromagnetic fields
Sources of Electromagnetic fields
Effects of Electromagnetic fields
Applications

Electromagnetic fields:

- Electromagnetic fields are a combination of invisible electric and magnetic fields of force.
- They are generated by natural phenomena like the Earth's magnetic field but also by human activities, mainly through the use of electricity.
- Electromagnetic theory is concerned with the study of charges at rest and in motion.
- Electromagnetic principles are fundamental to the study of electrical engineering.
- Electromagnetic theory is also required for the understanding, analysis and design of various electrical, electromechanical and electronic systems.

Sources of Electromagnetic fields:

- Natural sources of electromagnetic fields (Earth's magnetic field)
- Human-made sources of electromagnetic fields

(Mobile phones, power lines and computer screens are examples of equipment that generates electromagnetic fields.)

Effects of Electromagnetic fields:

- Low frequency and high frequency electromagnetic waves affect the human body in different ways.
- Human nervous system
- Birds and animals
- Human respiratory system
- Human memory loss
- Plants and Animals.
- Electrical components.

APPLICATIONS

- One of the most common applications of electrostatic fields is the deflection of a charged particle such as an electron or proton in order to control it’s trajectory.
- The deflection is achieved by maintaining a potential difference between a pair of parallel plates. This principle is used in CROs, ink-jet printer etc.

APPLICATIONS

- Electrostatic fields are also used for sorting of minerals for example in ore separation
- The most common applications of static magnetic fields are in dc machines.
- Other applications include magnetic deflection, magnetic separator, cyclotron, hall effect sensors, magneto hydrodynamic generator etc.

THANK YOU