

SNS COLLEGE OF ENGINEERING (An Autonomous Institution)

INTRODUCTION TO ELECTROMAGNETIC FIELDS



P/E FF











TOPIC OUTLINE

Electromagnetic fields Sources of Electromagnetic fields Effects of Electromagnetic fields **Applications**











Ectromagnetic 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.





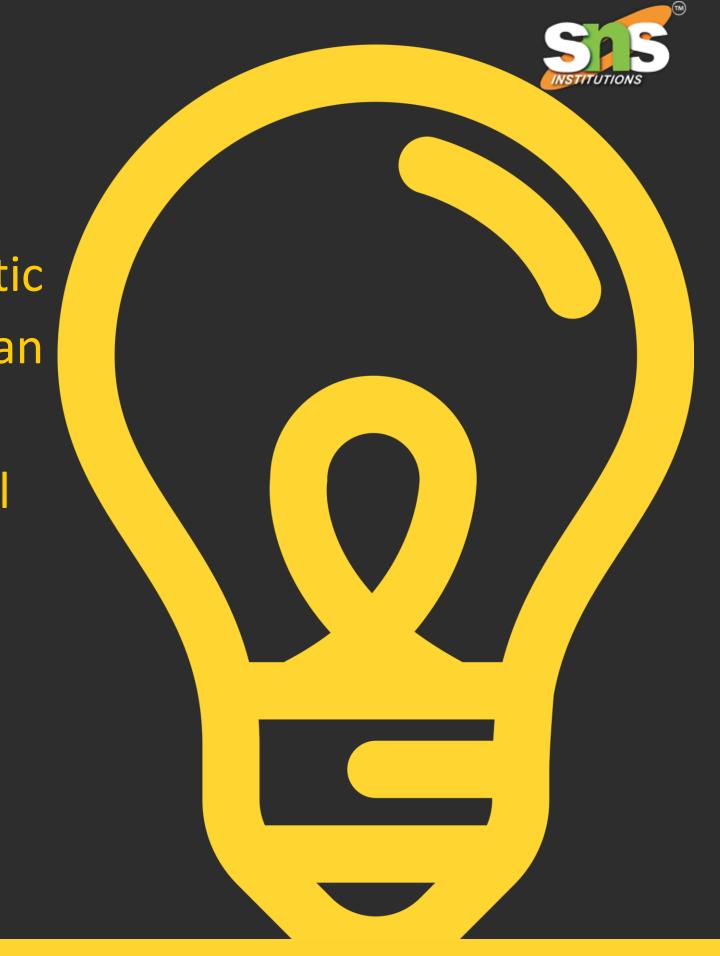
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APPLICATIONS

- 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.





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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.





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THANK YOU