

Assignment

PHYSICS (Hons)

Paper: PHY-HC-2016

Full Marks : 50

Submission Date: 08/08/2020

- 1. Answer the following.** **1x5=5**
- a. What is an electric dipole ?
 - b. Write the S.I unit of electric potential.
 - c. What is Lorentz force ?
 - d. What is the basic cause of induced emf ?
 - e. State 1volt potential difference.
- 2. Answer the questions:** **2x5=10**
- a. State Kirchhoffs voltage law.
 - b. Define magnetic susceptibility and permeability .
 - c. State the uniqueness theorem.
 - d. Distinguish between polar and non-polar dielectrics.
 - e. What is mutual induction ?
- 3. Answer the following question.** **5x3=15**
- a. Solve Laplace's equation to find the potential at a distance r from the axis of an infinitely long conducting cylinder of radius a_0 charged with a surface charge density λ . Take the potential of the cylinder to be zero.
 - b. What is parallel plate capacitor ? Derive an expression for its capacitance .
- 4. State Biot – Savart law . Apply this law to find the magnetic field due to a circular current carrying loop at a point on the axis of the loop .** **10**
- 5. (a) Deduce Neumann's formula for mutual inductance between two loops .** **5+5=10**
(b) Write a note on the reciprocity theorem in electromagnetic induction .