K19P 1500

I Semester M.Sc. Degree (CBSS-Reg./Suppl./Imp.)
Examination, October - 2019
(2014 Admission Onwards)
PHYSICS
PHY1C03-ELECTRODYNAMICS

Time : 3 Hours

Max. Marks : 60

SECTION-A

Answer both questions either a or b. Each question carries 12 marks.

(2×12=24)

I. a) Discuss the motion of charged particles in uniform $\vec{E}$ and $\vec{B}$ fields.

(OR)

   b) Explain Brewster's angle. Describe the method of determining the refractive index of a material using Brewster's angle.

II. a) Explain Guage transformations. Obtain the Lorentz Guage condition.

(OR)

   b) Describe radiation damping and radiation reaction. Derive the Abraham Lorentz formula.

SECTION-B

Answer any **Four** questions. Question (a) carries **1** mark, (b) carries **3** marks, (c) carries **5** marks.

(4×9=36)

III. a) What is a cavity resonator?

    b) What are the applications of cavity resonators?

    c) Explain the operation of a cavity resonator.

IV. a) Define the electric scalar potential.
   b) Show that the electric field generated by a stationary charge is a conservative field.
   c) Explain Gauss's law in electrostatics

V. a) What is Ampere's law?
   b) Explain that you understand by magnetic monopoles.
   c) Explain the law using the example of a magnetic field of current loops.

VI. a) State poynting's theorem.
   b) What is the significance of the Poynting's vector?
   c) Derive the poynting theorem.

VII. a) What is a Hertizan dipole?
   b) Explain radiation resistance of a Hertizan dipole antenna.
   c) Discuss Magnetic dipole radiation and arrive at the equation for magnetic dipole radiation.

VIII. a) What is Tensor?
   b) What is a contravariant tensor?
   c) Explain the physical significance of Tensors.