

# C154

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## MPHY-603

### Electrodynamics

M.Sc. Physics(MSCPHY-20)

3rd Semester Examination, 2022 (June)

**Time : 2 Hours]**

**Max. Marks : 40**

**Note :** This paper is of Forty (40) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

### SECTION-A

#### (Long Answer Type Questions)

**Note :** Section 'A' contains Five (05) long answer type questions of Ten (10) marks each. Learners are required to answer any Two (02) questions only.

(2×10=20)

1. State and prove Poynting vector theorem and equation of continuity.
2. Explain the concept of retarded potentials in detail.

3. State Maxwell's equations and explain their boundary conditions.
4. Explain the magnetic dipole radiation. Derive equation for ratio of magnetic to electric power.
5. Using Lienard-Wiechert potential obtain expressions for fields of an accelerated charge particle.

### **SECTION-B**

#### **(Short Answer Type Questions)**

**Note :** Section 'B' contains Eight (08) short answer type questions of Five (05) marks each. Learners are required to answer any Four (04) questions only. (4×5=20)

1. Calculate the work done in assembling a charge sphere of radius R.
2. In an experiment a 1MeV proton moves in a uniform magnetic field in a circular path. What energy must an alpha particle have if it is to circulate in the same orbit?
3. Explain the reflection and transmission at oblique incident using suitable expression.
4. What is magnetic vector potential? Explain magnetostatic boundary conditions.

5. Explain Maxwell's correction to Ampere's law. What is physical significance of displacement current? State Maxwell's equation.
  6. Explain the magnetic effects of an electron.
  7. Explain center-fed linear antenna radiation.
  8. Write down short note on radiation resistance.
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