P-106

MSCPH-508

Electrodynamics

M.Sc. Physics (MSCPH)

2nd Semester Examination, 2023 (June)

Time : 2 Hours]   **Max. Marks : 70**

Note : This paper is of Seventy (70) marks divided into two
(02) Sections A and B. Attempt the questions contained
in these sections according to the detailed instructions
given therein. Candidates should limit their answer to
the questions on the given answer sheet. No additional
(B) answer sheet will be issued.

SECTION–A
(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type
questions of Nineteen (19) marks each. Learners are
required to answer any Two (02) questions only.

$(2 \times 19 = 38)$

1. Describe the non-relativistic motion of charged particle in a
slowly space varying magnetic field.

2. Obtain expressions for reflection and transmission coefficients for oblique incidence of EM wave at an interface.

3. Derive an expression for the power radiated from an arbitrary source.

4. Reformulate Maxwell's equations and Lorentz force in tensor notation.

5. What are transmission lines? Derive the transmission line equations and explain the characteristics of the transmission lines.

SECTION–B
(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only.   (4×8=32)

1. Write down the continuity equation in magneto hydrodynamics.

2. What are the static and dynamic Maxwells equations?

3. What is meant by Maxwells stress tensor? Explain its significance.

4. Why TEM waves can not be transmitted through hollow waveguides?

5. Explain the term characteristic impedance.

6. What is a four vector? Give the components of momentum four vector.

7. Explain Lenard-Wiechert Potential.

8. Show that E.B is relativistically invariant.

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