

Roll No. 223112320007
Havi

Exam Code : M-23

Subject Code—59303

B. Sc. EXAMINATION

(Main & Re-appear)

(Batch 2018 Onwards)

(Second Semester)

PHYSICS

CPL-203

Electricity, Magnetism and EMT-II

Time : 3 Hours

Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory.

Compulsory Question

1. (i) What is motional EMF ? Give example.

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P.T.O.

- (ii) Define coefficient of self induction. Give the units in which it is measured. 2
- (iii) Derive $\nabla \cdot \vec{D} = \rho$. 2
- (iv) State Poynting theorem. 2
- (v) What is wave equation ? 2
- (vi) Define Brewster's angle. Give its two applications. 2
- (vii) Define Gauge Transformation. 2
- (viii) Write the advantage and disadvantage of Coulomb gauge transformation. 2

Unit I

2. Derive an expression for impedance in L-C-R series A.C. circuit. Discuss its special cases for different frequencies. 16

Or

- (a) Find energy stored in an Inductor. 4
- (b) Explain self-induction in detail and find the factors on which self-inductance depend. 12

Unit II

3. Derive Expression for Poynting Vector and Propagating Energy. 16

Or

Write short notes on the following :

- (a) Momentum in Electromagnetic Field 8
(b) Energy density in Electromagnetic Field. 8

Unit III

4. Find wave equation for electric and magnetic field. Hence derive :

$$C = \frac{1}{\sqrt{\mu_0 \epsilon_0}}$$

Or

- (a) Explain propagation of Electromagnetic waves in Linear Media. 11
(b) Explain Sinusoidal Wave. 5

Unit IV

5. Derive an Expression for Transformation of Electric fields between two inertial frames. 16

Or

- (a) Write short note on scalar potential and vector potential. 6
- (b) Derive an expression for vector potential. 10

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consists of nine
questions in all
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