

H-2-39-22

Roll No.

II Semester Examination, 2022**M.Sc.****PHYSICS****Paper I****(Electrodynamics)**

Time : 3 Hours]

[Max. Marks : 80

Note : All Questions are Compulsory. Question Paper comprises of 3 sections. **Section 'A'** is Objective type/Multiple Choice questions with no internal Choice. **Section 'B'** is Short answer type with internal Choice. **Section 'C'** is Long answer type with internal Choice.

Section 'A'**1 × 8 = 8****(Objective Type Questions)**

Choose the correct answer :

1. One correct Maxwell's equation in integral form is :

(a) $\oint \vec{H} \cdot d\vec{l} = \int_S \left(\vec{J} + \frac{\partial \vec{D}}{\partial t} \right) \cdot d\vec{S}$

(b) $\oint \vec{E} \cdot d\vec{l} = \oint_S \left(\vec{J} + \frac{\partial \vec{D}}{\partial t} \right) \cdot d\vec{S}$

(c) $\oint \vec{E} \cdot d\vec{l} = 0$

(d) $\int \theta \vec{D} \cdot d\vec{S} = 0$

P.T.O.

2. In Poynting vector, energy may be transported by means of :

(a) Magnetic wave

(b) Electric wave

(c) Acoustic wave

(d) Electromagnetic wave

3. The tangent component of E is continuous across the interface is :

(a) $E_{1t} = E_{2t}$ (b) $E_t = E_n$

(c) $B_{1t} = B_{2t}$ (d) $H_{1t} = H_{2t}$

4. The velocity of individual wave is termed as :

(a) Phase velocity

(b) Group velocity

(c) Group & phase velocity

(d) None of the above

5. Under the Galilean transformation the distance between two points is :

(a) Invariant (b) Variant

(c) Zero (d) None of these

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6. The square of magnitude of four vector is known as :

- (a) Norm of four vector
- (b) Form of four vector
- (c) Transform of four vector
- (d) None of the above

7. Relativistic Retarded potential are popularly known as :

- (a) Lienard potential
- (b) Wiechert potential
- (c) Lienard-wiechert potential
- (d) None of the above

8. For non-relativistic motion of charge the condition are :

- (a) $v \ll c$
- (b) $v \gg c$
- (c) $v \cong c$
- (d) None of the above

Section 'B'

6 × 4 = 24

(Short Answer Type Questions)

Note : Attempt one question from each unit.

Unit-I

1. Derive Maxwell's equation in linear Isotropic medium.

Or

Explain about equation of propagation of electric vector.

Unit-II

2. Describe boundary condition of electric displacement.

Or

Write about intensity ratio of reflected waves to incident wave under total internal reflection.

Unit-III

3. Write about variation of mass.

Or

Describe about invariance of charge.

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Unit-IV

4. Explain about Lienard-Wiechert potential.

Or

Write about radiating system.

Section 'C' 12 × 4 = 48

(Long Answer Type Questions)

Note : *Attempt one question from each unit.*

Unit-I

1. Describe about Anisotropic dielectric.

Or

Write about propagation of electromagnetic wave in ionized gas.

Unit-II

2. Describe about experimental reflection of fresnel's equation.

Or

Explain about Brewster's law and Degree of Polarisation.

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P.T.O.

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Unit-III

3. Derive formula for Galilean transformation.

Or

Describe about concept of four vector in detail.

Unit-IV

4. Derive Larmor's formula.

Or

Describe about electric quadrupole radiation.

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