

May 2023

B.Tech.IVSEMESTER

Electro Magnetic Field Theory(E 212)

Time: 3 Hours

Max. Marks:60

- Instructions:**
1. It is compulsory to answer all the questions (2 marks each) of Part -A in short.
 2. Answer any four questions from Part -B in detail.
 3. Different sub-parts of a question are to be attempted adjacent to each other.

PART -A

- Q1 (a) What is Gauss law for magnetic fields? (2)
- (b) What is inconsistency of Ampere's Circuital Law? (2)
- (c) Give the mathematical expression for continuity equation. (2)
- (d) What are solenoidal and irrotational fields? (2)
- (e) What are standing waves? (2)
- (f) What are null identities? (2)
- (g) What is depth of penetration? (2)
- (h) Differentiate between conduction current and displacement current. (2)
- (i) What is Brewster angle? (2)
- (j) Using Divergence theorem, evaluate $\iiint E \cdot ds = 4xz\mathbf{i} - y^2\mathbf{j} + yz\mathbf{k}$ over the cube bounded by $x=0, x=1, y=0, y=1, z=0, z=1$ (2)

PART -B

- Q2 (a) State the boundary conditions at the interface between two perfect dielectrics. (5)
- (b) Write the wave equation in a conducting medium. (5)
- Q3 Determine the reflection coefficient of normal incidence in perfect dielectric for parallel polarization. (10)
- Q4 Derive and explain the Maxwell's equations in point form and integral form using Ampere's circuital law and Faraday's law. (10)
- Q5 (a) Explain the wave propagation in good dielectric with necessary equation. (5)
- (b) What is polarization? Derive the expression for linear, circular and elliptical polarization. (5)
- Q6 Derive the condition under which a finite transmission line behaves as an infinite transmission line. (10)
- Q7 Write notes on: (10)
- a. Uniqueness theorem
 - b. Poynting theorem
 - c. Faradays Law of Electromagnetic Induction
