

IT-01
14

Roll No.

Total Pages : 03

017403

May 2024

B.Tech. (EEIOT) (Fourth Semester)

Electromagnetic Waves (ECC-02)

Time : 3 Hours]

[Maximum Marks : 75

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1. (a) Define the terms Reflection coefficient and VSWR. 1.5
- (b) Give any *two* applications of Transmission lines. 1.5
- (c) What is meant by Phase and Group velocity ? 1.5
- (d) Define total internal reflection. Also give its conditions. 1.5
- (e) What is meant by Field Visualization and Attenuation in waveguide ? 1.5
- (f) Enlists Radiation parameters of an antenna. Explain any *two*. 1.5

- (g) Define the term potential function. Give its application. **1.5**
- (h) What is meant by Wave Polarization ? Give its significance. **1.5**
- (i) What are basic laws of Electromagnetics ? Give their applications. **1.5**
- (j) Define Poynting vector. Give its significance. **1.5**

Part B

- 2. (a) Define characteristic impedance and impedance matching. Using schematics, explain the use of transmission line sections as circuit elements. **10**
- (b) Define Smith Chart and give its uses. Explain Low loss Transmission line. **5**
- 3. (a) What is meant by Vector calculus ? Using an example, explain basics of Vectors. **5**
- (b) State and explain Maxwell's equations and boundary conditions at Media Interface. **10**
- 4. Define Poincare's Sphere, Uniform plane wave and Wave propagation. Discuss the concept of Surface current and Power loss in a conductor. **15**

- 5. (a) Explain the concept of Reflection from a conducting boundary. **5**
- (b) Define plane wave. Using schematics, discuss Reflection and Refraction at dielectric interface. **10**
- 6. (a) Define Rectangular-waveguide. Explain the concept of modal propagation in rectangular waveguide. Give any *two* applications of Rectangular-waveguide. **10**
- (b) Briefly describe the concept of Surface currents on the waveguide walls. **5**
- 7. Differentiate between Monopole and Dipole antenna. Explain the concept of Power radiated by Hertz dipole. Give any *two* applications of Hertz dipole. **15**