

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(EIE) (2011 & Onwards) (Sem.-4)

ELECTROMAGNETIC FIELD THEORY

Subject Code : EC-208

Paper ID : [A0309]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1) Answer briefly :

- a. Why EM waves are called guided waves?
- b. Differentiate between TE and TM mode.
- c. Differentiate between conduction current and displacement current.
- d. Define surface impedance.
- e. What is distortionless condition?
- f. What is the physical significance of a gradient of a scalar field?
- g. What do you mean by magnetic flux?
- h. Differentiate between electrostatics and magneto statics.
- i. What is the equation of continuity for steady currents?
- j. Define plane of incidence.

SECTION-B

- 2) Write and explain Maxwell's equation for static and time varying fields in both differential and integral form.
- 3) State and prove Poynting Vector Theorem. Also explain the significance of each term.
- 4) Discuss the use of low loss RF and UHF transmission lines.
- 5) A rectangular waveguide with dimensions 4cm y 2cm operates at 10 GHz. Find f_c and λ_c of TE₁₀ mode.
- 6) Discuss the wave propagation characteristics in good dielectric.

SECTION-C

- 7) Give the transmission line analogy for waveguides. Also draw the equivalent transmission line circuit representation for TE and TM waves.
- 8) Show that a 2GHz signal cannot propagate in the TM₁ mode in a parallel conducting plates having a plate separation of 5 cm.
- 9) What is understood by polarization of EM waves? Explain linear, elliptical and circular polarization with appropriate figures.