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 TE_{10} 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.