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Total No. of Pages : 02

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# B.Tech.(EIE) (2011 & Onwards) (Sem.-4) ELECTROMAGNETIC FIELD THEORY

## Subject Code : EC-208

# M.Code: 57513

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. Differentiate between scalar quantity and a scalar field and vector quantity and a vector field.
- b. Discuss the cartesian coordinate system.
- c. What is a waveguide? What is its importance and applications?
- d. Define Propagation constant.
- e. Define clearly dominant and degenerate modes with examples.
- f. State the significance of smith chart and its features.
- g. What is meant by characteristic impedance of transmission line?
- h. State and prove Gauss law.
- i. What is the equation of continuity for steady currents?
- j. What are the condition for field to be irrotational?



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#### **SECTION-B**

- 2. Write and explain Maxwell's equation for static and time varying fields in both differential and integral form.
- 3. Explain the electromagnetic wave is transverse in nature.
- 4. Discuss the use of low loss RF and UHF transmission lines.
- 5. A rectangular waveguide with dimensions 4cm  $\times$ 2cm operates at 10GHz. Find f<sub>c</sub> and  $\lambda_c$  of TE<sub>10</sub> mode.
- 6. Explain in brief skin effect.

#### **SECTION-C**

- 7. Derive the boundary conditions for time varying fields.
- 8. Discuss reflection of electromagnetic wave from a perfect insulator incident obliquely.
- 9. What is understood by polarization of EM waves? Explain linear, elliptical and circular polarization with appropriate figures.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.