

Roll No. Total No. of Pages: 02

Total No. of Questions: 09

B.Tech.(ECE)/(ETE) (2011 Onwards)/ (Electronics Engg.) (2012 Onwards) (Sem.-4)

# **ELECTROMAGNETICS AND ANTENNAS**

Subject Code: BTEC-403 M.Code: 57595

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) Write the wave equation for free space propagation.
- b) What is waveguide? What is its importance and applications?
- c) Differentiate between ordinary end fire array and Hansen-wood yard end-fire antenna.
- d) Define Babinet's principle.
- e) What is the significance of Poynting theorem?
- f) What is propagation constant?
- g) Define Retarded Vector and scalar potential.
- h) Define Radiation Pattern of an antenna.
- i) Define Maximum Usable Frequency.
- j) Define Skip Distance.

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### **SECTION-B**

- 2. Explain and derive the general solution of transmission line terminated with any load impedance.
- 3. Derive the expression for direction of pattern maxima and minima for array n isotropic sources of equal amplitude and spacing (for broadside).
- 4. What is distortion less transmission line? Derive the expression for the distortion less condition.
- 5. Describe the mapping of constant resistance and constant reactance circle on reflection coefficient plane.
- 6. Derive relation between E and H in uniform plane wave propagation.

### **SECTION-C**

- 7. Explain the concept of polarisation. What are the conditions for different types of polarisation?
- 8. Explain the structure of atmosphere. Discuss the range of space wave propagation.
- 9. Discuss the construction and operation of paraboloid reflector antenna.

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.

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