

Roll No.

Total No. of Pages : 02

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M.Tech. (ECE) (2018 Batch) (Sem.-2)

## ANTENNAS AND RADIATING SYSTEMS

Subject Code : MTEC-103-18

M.Code : 76259

Date of Examination : 04-07-22

Time : 3 Hrs.

Max. Marks : 60

### INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE questions out of EIGHT question.
2. Each question carry TWELVE marks.

1. Explain the following : (12)
  - a) Radiation power density of an antenna.
  - b) Radiation intensity of an antenna.
  - c) HPBW of an antenna.
  - d) Gain of an antenna.
  - e) Polarization of an antenna.
  - f) Radiation efficiency of an antenna.
2.
  - a) Derive Friis transmission equation to determine the power at the terminals of a receive antenna. (4)
  - b) Explain radiation mechanism of an antenna. (4)
  - c) Explain lens antenna. (4)
3. Derive the expression of electric field intensity, magnetic field intensity, power radiated by small dipole antenna. (12)
4.
  - a) How mutual coupling between the antennas in an array affect the desired reception of the array? Explain this by considering an array of two antennas. (8)
  - b) Differentiate between end-fire array and broadside array. (4)

5. a) Explain the role of Huygen's Principle and image theory in aperture antenna. (6)  
b) Explain the working of E-plane and H-plane sectoral horn antenna. (6)
6. a) Explain circular aperture antenna. (6)  
b) Explain the design constraints to be considered in the case of designing of planar array. (6)
7. a) Explain feeding mechanism and method of analysis used in microstrip antenna. (6)  
b) Explain rectangular patch microstrip antenna in detail. (6)
8. a) Explain the working of Parabolic reflector and Cassegrain reflector antenna. (8)  
b) Explain the concepts of 2\*2 MIMO in detail. (4)

**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.**