

Roll No.

Total No. of Pages : 02

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

ANTENNAS AND RADIATING SYSTEMS

Subject Code : MTEC-103-18

M.Code : 76259

Date of Examination : 05-06-2023

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. a) Derive the expression of average power radiation from a half wave dipole antenna.
b) Explain the current distribution and radiation mechanism of single wire antenna.
2. a) Consider a circular loop antenna of radius 0.25 m carrying a current of 10 A at 7.5 MHz and is symmetrically placed in the x - y plane at the origin. Determine total power radiated and the magnitude of the electric field intensity in the x - y plane at a distance of 10 km.
b) Explain the radiation principle of circular loop antenna with uniform and non-uniform current.
3. Consider an end side antenna array of n elements. Each antenna element carries current equal in magnitude but with progressive phase shift. If the distance between each element is ' d ' then derive the expression of direction of pattern maxima, pattern minima and beam width of major lobe.
4. a) With the help of a suitable example, explain the Dolph-Tchebyscheff method of optimization for a linear broadside array.
b) Explain the principle of antenna array with binomial distribution of current. Also discuss its advantages and disadvantages.
5. a) Explain Huygen's field equivalence principle and radiation mechanism of a circular aperture antenna.

- b) Explain the operating principle and design of pyramidal horn antenna.
- 6. a) Explain Friis transmission equation in detail. What is super directivity?
b) Explain the basic characteristics and method of analysis of a circular patch antenna.
- 7. With the help of suitable diagram, explain Cassegrain reflector on the basis of design equations, working principle, applications, directive gain and radiation pattern.
- 8. **Write short notes on :**
 - a) Antenna parameters like Effective aperture, Efficiency, antenna temperature
 - b) Horizontal and circular polarization
 - c) Broadside antenna array .

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC case against the Student.