

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 : 08-05-2024

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 an expression for the far field component of a half wave dipole antenna.
b) With the help of proper mathematical expressions, explain how single wire antenna radiate?
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 how the performance of single wire antenna depends on Ground effects.
3. Consider a broad side antenna array of n elements. Each antenna element carries current of equal amplitude and phase. If the distance between each element is 'd' then derive the expression for the 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 Pattern multiplication.
5. a) With the help of proper mathematical expressions and diagram, explain the radiation mechanism from a rectangular aperture antenna.
b) Derive the field components radiated from a thin slot antenna in an infinite cylinder.

6. a) What is Horn antenna? Explain the special features of various types of Horn antennas.
b) Explain the basic characteristics and feeding mechanism of Micro strip antenna.
7. Explain parabolic reflector on the basis of design consideration, working principle, directivity, Gain and efficiency.
8. **Write short notes on :**
 - a) Antenna parameters like Radiation Power Density, Directivity and Gain.
 - b) Polarization.
 - c) End fire 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.