Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 41223

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Sixth Semester

Electronics and Communication Engineering

EC 1352 A – ANTENNAS AND WAVE PROPAGATION

(Regulation 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Driving point impedance.

2. Distinguish between Monopoles and Dipoles.

3. Give the expression for average radiated power Density.

4. Define Beam Efficiency.

5. Calculate the Directivity of 20 turn helix having α =12°, Circumference equal to x.

6. Draw the structure of rhombic Antenna.

7. What is a complementary dipole Antenna?

8. Define Effective Area.

9. Calculate the Critical frequency for reflection and vertical incidence if the maximum electron density in $1.243 \times 10^6 cm^{-3}$.

10. What is direct propagation?

PART B — (5 × 16 = 80 marks)

11. (a) Derive an expression for the Rp of a BSA with 'n' vertical dipoles. Plot the RP in vertical and horizontal planas for a broadside array of 4 dipoles.

Or

(b) (i) Show how the directivity can be improved by using a number of antennas in an array. (8)

(ii) Explain the principles of BSA and EFA. (8)

12. (a) A join dipole of $x/2$ long. If it has loss resistance of $2\,\Omega$, Calculate:
(i) Directivity
(ii) Gain
(iii) Effective aperture
(iv) Beam solid angle and
(v) Radiation Resistance.

Or

(b) Standing from the electromagnetic field components, derive an expression for the power radiation from a current element. What is the radiation resistance of a quarter-wave grounded radiator?

13. (a) Examine the effectiveness of:
(i) Yagi-Uda Antenna (8)
(ii) Log periodic Antenna. (8)

Or

(b) Present the following:
(i) Analysis of rhombic Antenna (8)
(ii) Radiation from a travelling wave on a wire. (8)

14. (a) Describe:
(i) Radiation from the open end of a co-axial line. (8)
(ii) Radiation from a rectangular aperture treated as an array of huygen's source. (8)

Or

(b) Write detailed notes on:
(i) Dish Antenna (6)
(ii) Dielectric less Antenna (5)
(iii) Metal plane lens antenna. (5)

41223

15. (a) (i) Obtain the effective dielectric constant of Ionized region of sky wave propagation. (8)

    (ii) Discuss on reflection from ground for vertically and horizontally polarised waves for space wave propagation. (8)

Or

(b) Bring out important features of ground wave propagation. Discus on attenuation characteristics for ground wave propagation. Calculate the field strength at a distance.

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