Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 86579

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Sixth Semester

Electronics and Communication Engineering

EC 1352 A - ANTENNAS AND WAVE PROPAGATION

(Regulations 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Driving point impedance.

2. Define directive gain of an antenna.

3. Distinguish between monopoles and dipoles.

4. Write an expression for radiation resistance of current element.

5. What are the advantages of Rhombic antenna?

6. Write the design consideration of a helical antenna in Axial and Normal mode.

7. State Babinet's principle For aperture antennas.

8. Write the relation between dipole and slot impedances.

9. Find the electron density of the layer if the critical frequency of an ionised layer is 1.5 MHz.

10. List the effects of earth curvature on space wave 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.(16)

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) Derive the expression for the power radiated and the radiation resistance of a half wave dipole. (16)

Or

     (b) (i)   Explain how the assumed current distribution is done for wire antenna. (8)

          (ii) Describe the use of capacitor 'hat' and top loading coil antennas. (8)

13. (a) (i)   Explain the types of loop antenna with neat diagrams. (8)

          (ii) Bring out the design features of Double V antenna with an example. (8)

Or

     (b) (i)   Explain the similarities and differences between Yagi Uda and LPDA arrays. (8)

          (ii) An LPDA is to he designed to cover the frequency range 80-200 MHz and to have 7.5dB gain. Compute the required element lengths and spacings for optimal design. (8)

14. (a) With a neat sketch explain the principle of parabolic reflector and cassegrain feed system. (16)

Or

     (b) Explain the radiation from a rectangular aperture treated as an array of huygen's source. (16)

15. (a) Explain the characteristics of ionospheric layers and the mechanism of ionospheric propagation. (16)

Or

     (b) Explain the role of dielectric constant of ionized gas and briefly discuss the atmospheric ducts. (16)

_____

86579