Roll No.
Printed Pages : 2

8505

BT-5 / D–15

ANTENNA AND WAVE PROPAGATION

Paper–ECE-301-E

Time allowed : 3 hours] *[Maximum marks : 100*

Note : (i) *Answer any 'five' questions, selecting at least* ***one*** *question from each unit.*

(ii) *All questions carry equal marks.*

Unit–I

1. Explain the following antenna parameters :
   (i) Radiation pattern
   (ii) Effective height
   (iii) Gain
   (iv) Bandwidth
   (v) Radiation resistance. 20

2. (a) Find the effective area of a Hertzian dipole operating at 100 MHz. 5
   (b) An antenna whose radiation resistance is 300Ω operates at a frequency of 1 GHz and with a current of 3 amperes. Find the radiated power. 5
   (c) Compare radiation and induction fields. 10

Unit–II

3. (a) Describe Principle of Pattern multiplication. Also, give its advantages and disadvantages. 8
   (b) Discuss the working of the following :
   (i) Folded dipole
   (ii) Helical antenna. 6+6=12

4. Briefly explain the following :
   (i) Array pattern synthesis
   (ii) Yagi-Uda antenna
   (iii) Broadside arrays
   (iv) Chebyshev array
   (v) Biconical antenna. 20

Unit–III

5. (a) Compare the following :
   (i) Lens and Reflector antennas
   (ii) E-plane and H-plane Horns. 6+6=12
   (b) Describe the concept of radiation from rectangular aperture. 8

6. Describe the following :
   (i) Broadband antenna
   (ii) Log periodic antenna. 10+10=20

Unit–IV

7. (a) If the critical frequency of an ionised layer is 1.5 MHz, find the electron density of the layer. 4
   (b) An HF radio communication is to be established between two points on the earth's surface. The points are at a distance of 2600 km. The height of the ionospheric layer is 200 km and critical frequency is 4 MHz. Find MUF. 8
   (c) Explain wave propagation in the ionosphere. 8

8. Write short note on the following :
   (i) Radio noise of terrestrial and extra terrestrial origin
   (ii) Propagation of radio waves. 10+10=20