

8. (a) Explain the different methods of analysis of Microstrip-patch Antenna. 7
 (b) Design a rectangular microstrip antenna using a substrate RT/Duroid 5880 with dielectric constant of 2.2, $h = 0.14$ cm So as to resonate at 10 GHz. 6
9. (a) Explain the different types of Horn Antenna and gives its Gain expression. Also state the different applications of it. 8
 (b) The aperture dimensions of a Pyramidal Horn Antenna are (16×8) cm. It is operating at a frequency of 8 GHz. Find the beam width and power gain directivity. 6

OR

10. (a) Explain the working principle, radiation pattern and applications of the Corner Reflector. Compare the corner reflector and parabolic reflector. 7
 (b) Explain the dual shaped Reflector system with its applications. 7
11. (a) Explain the different Antenna Ranges to be considered during Antenna Measurement. 7
 (b) State the different methods of measurement of Gain of an antenna. Explain any one in detail. 6

OR

12. (a) Explain the ground wave propagation in detail. 7
 (b) Write a note on : fading, noise and interference. 6

Faculty of Engineering and Technology
**Fifth Semester B.E. (Electronics Communication/
 Electronics Telecommunication) (C.B.S.) Examination**
ANTENNA AND WAVE PROPAGATION

Time : Three Hours] [Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

- (1) All questions carry marks as indicated.
 (2) Due credit will be given to neatness and adequate dimensions.
 (3) Assume suitable data wherever necessary.
 (4) Illustrate your answers wherever necessary with the help of neat sketches.
 (5) Examinee will have to Solve total **SIX** questions as per indicated in Question Paper i.e. :
 Que. No. **1 OR** Que. No. **2**
 Que. No. **3 OR** Que. No. **4**
 Que. No. **5 OR** Que. No. **6**
 Que. No. **7 OR** Que. No. **8**
 Que. No. **9 OR** Que. No. **10**
 Que. No. **11 OR** Que. No. **12**
 (6) Use of smith chart is permitted.
1. (a) What is Non-resonant transmission line ? Explain the different losses present in transmission line.

6

- (b) Derive the expression for the input impedance of transmission line. From it show that $Z_o^2 = Z_{sc} \cdot Z_{oc}$.

7

OR

2. (a) VSWR on a lossless line is found to be 5 and successive voltage minima are 40 cm apart. The first voltage minima is observed to be 15 cm from load. The length of a line is 160 cm and the characteristic impedance is 300 Ω . Using the Smith chart determine :

(i) Load impedance

(ii) Sending end impedance.

7

- (b) (i) Explain the different transmission line sections and their LC equivalents

(ii) Give the relationship between VSWR and Reflection Coefficient.

6

3. (a) Derive the power radiated by a current element and from it obtain the final expression for radiation resistance of a Short Dipole.

7

- (b) A transmitting antenna with an effective height of 100 metres has a current at the base 100 A (rms) at the frequency of 300 kHz. Find :

(i) The field strength at a distance of 10 km and

(ii) The power radiated.

7

OR

4. (a) (i) Explain the ground effects
(ii) Give the applications of Half wave Dipole and Folded Dipole Antenna.

4+4=8

- (b) Calculate the voltage induced by a plane wave of field strength 0.01 V/m and frequency 1 MHz in a vertical antenna 8 m high and also a frame antenna 1 m square of 12 turns. Assume the plane of the loop being in the plane of propagation of the wave.

6

5. (a) Write a note on Planer Arrays and Circular Arrays.

6

- (b) Explain the Pattern Multiplication with examples.

7

OR

6. (a) Derive for the Maxima, Minima directions and half power beam width of the End-fire array of n-isotropic sources of equal amplitude and spacing.

6

- (b) Write a notes on :

(i) Log-periodic Antenna

(ii) Composite Yagi-uda-corner-Log-periodic Array.

7

7. (a) Explain the different Feeding Methods of Microstrip patch Antenna and also compare them.

8

- (b) Write a note on : Multiband Microstrip antenna for mobile communication.

5

OR