

Code: 9A04503

R9

B.Tech III Year I Semester (R09) Supplementary Examinations, May 2013

ANTENNAS AND WAVE PROPAGATION

(Electronics and Communication Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Define the terms:
(i) Beam width. (ii) Side lobe level. (iii) Polarization. (iv) Effective aperture area.
(b) What is the effective length of an antenna? Determine the effective length of a half wave dipole antenna.
- 2 (a) Define and explain the terms antennas gain, effective aperture, radiation intensity and effective length in case of a $\frac{\lambda}{2}$ dipole.
(b) Derive an expression for the terminal impedance as a function of frequency and hence define its bandwidth.
- 3 (a) Compute the principle beam width for broad side and end fire array.
(b) Explain the principle beam width for broad side and end fire array.
- 4 (a) Describe the construction and properties of rhombic antenna.
(b) Derive electric field expression for non resonant antenna.
- 5 (a) Describe the case grain feed mechanism of a parabolic reflectors.
(b) What are the different advantages and disadvantages of loop directional antenna?
- 6 (a) Explain the basic principles of operation in lens antennas. Hence distinguish between the different types of lens antennas used in practice.
(b) Calculate the minimum distance required to measure the field pattern of an antenna of diameter 2 m at a frequency of 3 GHz derive the necessary equation.
- 7 (a) Show that MUF of ionized layer is given by $FCP1 + (D/2h)^2$ for flat earth.
(b) Discuss the following:
(i) Ionospheric storms.
(ii) Sudden Ionospheric disturbances.
- 8 (a) What is signal fading? List the various types of fading and explain.
(b) Discuss the atmospheric effects in space wave propagation.
