

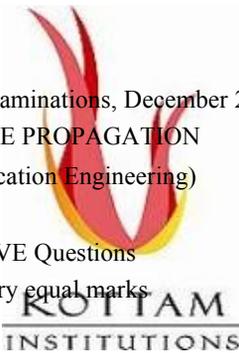
Code No: R5310405

III B.Tech I Semester(R05) Supplementary Examinations, December 2009
 ANTENNAS AND WAVE PROPAGATION
 (Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks



1. (a) Explain the following terms:
 - i. Beam Width
 - ii. Omni Directional pattern
 - iii. Side Lobe Level
 - iv. Radiation resistance
 - v. Field Pattern of antenna.

(b) Define the terms Directivity and Power Gain. Show that the Directivity of a short current element is 1.5.
 [8+8]
2. (a) Obtain the Expression for the Radiation Fields of Half Dipole and Draw the pattern in two planes.
 (b) Explain the effect of Earth in evaluating radiating fields from Antennas close to Earth. [8+8]
3. (a) Show that the directivity can be improved by using a no. of antennas in any broadside and end fire array.
 (b) Derive an array factor of a non uniform linear array of N identical elements. [6+10]
4. (a) Explain how does a Log Periodic Antenna provides a large bandwidth of operation.
 (b) Design a Rhombic Antenna to operate at a frequency of 30MHz with an angle of deviation = 300 with respect to ground. [8+8]
5. (a) Explain all the structural requirements of a 5 element yagi antenna at 475MHz accounting for typical spacing, length to diameter ratios and input impedance Z_{in} .
 (b) Explain the geometry, requirements and properties of parabolic reflectors. [8+8]
6. (a) What is an electromagnetic horn antenna? What are its applications? The length of an E-plane sectoral horn is 15cms. Design the horn dimensions such that it is optimum at 10GHz.
 (b) Calculate the minimum distance required to measure the field pattern of an antenna of diameter 2m at a frequency of 3GHz. Derive the necessary equation. [8+8]
7. (a) Write short notes on "Ground wave propagation and effect of earth".
 (b) In case of ionosphere, explain D, E & F layers. [8+8]
8. (a) Find the maximum distance that can be covered by a space wave when antenna heights are 80m and 50m.
 (b) Explain the concept of Super Refraction. [8+8]