

**R07**

Code: R7310405

III B. Tech I Semester (R07) Supplementary Examinations, May 2012

**ANTENNAS & WAVE PROPAGATION**

(Electronics &amp; Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Explain how the expression for electric and magnetic fields are obtained from current element in spherical co-ordinates using Maxwell's equation.  
(b) What are principal planes? How the antenna beam widths are defined in such planes?
- 2 (a) Define term directivity. Determine the directivity of  $\lambda/2$ -antenna.  
(b) Find the effective length of a half wave ( $\lambda/2$ ) dipole.
- 3 What is antenna array? Explain about different types of arrays.
- 4 (a) Explain the reason why length of a travelling wave radiation is multiple of half wave length.  
(b) Compare resonant and non resonant antennas.
- 5 (a) Derive the expression for the impedance of a folded dipole.  
(b) Explain in what way the parasitic array is different from other arrays.
- 6 (a) What are the types of lens antennas and explain briefly?  
(b) Give the merits and demerits of a lens antenna.
- 7 (a) Explain the effect of flat earth and spherical earth on ground wave propagation.  
(b) A radio link is to be established in between two points separated by 100 km distance. The height of the transmitting antenna is 80 m, height of the receiving antenna is 10 m, and current applied to transmitting antenna is 20 A. Calculate ground wave field strength if the frequency is 1 MHz.
- 8 (a) Derive the expression for the LOS range of space wave propagation.  
(b) Explain the effect of earth curvature on the space wave propagation.

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