

III B.Tech I Semester Supplementary Examinations, November 2006
ANTENNA AND WAVE PROPAGATION
(Common to Electronics & Communication Engineering and Electronics & Telematics)

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Define and account for the presence of
 - i. Radial power flow
 - ii. Radiation resistance for a short dipole.(b) Obtain the relative amplitudes of radiation, induction and electro-static fields at a distance of 2λ from a short current element having an uniform current of 1 mA along its length. [8+8]
2. (a) Explain the term Antenna terminal impedance and give the RLC equivalent circuit of it.
(b) Derive an expression for the terminal impedance as a function of frequency and hence define its Bandwidth. [8+8]
3. (a) Obtain the expression for the beam width of broadside and end fire arrays and compare them?
(b) Explain the principle of multiplication of patterns. [8+8]
4. (a) Give the current distribution and radiation pattern of a folded dipole antenna. Explain how the radiation pattern will be modified with the addition of a reflector and two directors with such an antenna.
(b) What are the different types of antennas used at very high frequencies? Discuss the advantages of a folded dipole. What is a balun and why it is used at these frequencies? [8+8]
5. (a) With neat sketches distinguish between the band width, selectivity and other radiation characteristics of slot and complimentary dipoles.
(b) What are the special features of loop antennas? Explain how a small loop is treated as equivalent to a short magnetic dipole. [6+10]
6. (a) Explain the basic principles of operation in lens antennas. Hence distinguish between the different types of lens antennas used in practice.
(b) With a neat sketch, explain the constructional features of a parabolic reflector and obtain an expression for its curved profile. [6+10]
7. (a) Explain the gain measurement of antenna by comparison method.
(b) Define beam width of an antenna. Explain the procedure for measuring the beam width and also the side lobe level. [8+8]

8. (a) Explain the following:

- i. Ray path
- ii. Skip distance
- iii. Maximum usable frequency
- iv. Faraday Rotation.

(b) Explain the line of sight propagation of radio waves.

[12+4]
