Set No. 3

III B.Tech I Semester Regular Examinations, November 2007
ANTENNAS 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
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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. [8+8]

2. (a) Show that the radiation resistance of a small loop is equal to $320\pi\ 4(A/\lambda^2)$ ohms where A is loop area.
   (b) What is Folded Dipole ? Find its Radiation Resistance. [8+8]

3. (a) Explain the procedure for measuring the radiation pattern of a half wave dipole.
   (b) What is the requirement for tapering of arrays.
   (c) State the applications of arrays. [8+4+4]

4. (a) State the advantages and disadvantages of Rhombic Antenna.
   (b) Draw the radiation pattern for traveling wave antenna for L=λ/2,λ,2 λ,4λ and 8 λ. [8+8]

5. (a) What is a Parasitic Element? Describe the use of different types of parasites in TV receiving antennas.
   (b) Derive an expression for aperture field distribution of a parabolidal reflector. [8+8]

6. (a) Describe the method of measuring the gain and radiation pattern of an antenna.
   (b) A standard gain horn antenna with a power gain of 12.5, is used to measure the gain of a large directional antenna by comparison method. The test antenna is connected to the receiver and an attenuator adjusted to 23dB in order to have the same receiver output. Find out the gain of the large antenna. [8+8]

7. It is defined to establish short wave communication between two points on earths surface(assumed flat) separated by 1200km. Calculate MUF and angle of take off

of the transmitted wave from the following: Highest signal frequency returned to earth after vertically upward propagation=7.2MHz. Virtual height of the ionized layer=200kms. Deduce the working formula. [16]

8. (a) Distinguish between Radio and Optical horizons. Give the reasons.

(b) Write short notes on M-Curves. [8+8]

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