Code: R7310405

R07

B.Tech III Year I Semester (R07) Supplementary Examinations December 2015
ANTENNAS & WAVE PROPAGATION
(Electronics and Communication Engineering)
(For 2008 regular admitted batch only)

Time: 3 hours   Max Marks: 80

Answer any FIVE questions
All questions carry equal marks
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1 (a) Define term antenna efficiency. Obtain the expression for antenna efficiency. Write different types of losses in antenna.
   (b) A transmitting antenna has an effective height of 61.4 meter and takes a r.m.s current of 50 A at a wavelength of 625 meter. Find the radiation resistance, radiation power and antenna efficiency if the antenna loss is 5 ohm.

2 (a) What is loop antenna? Explain about different types of loop antennas.
   (b) Calculate the rms current required to radiate a power of 150 W at 100 MHz from 0.01 m long infinitesimal dipole. Find the magnitudes of E and H at (100 m, 0 and 90 degrees).

3 (a) How an unidirectional pattern is obtained in an end fire array? Explain in detail.
   (b) Derive the expression for HPBW and BWFN in End Fire Array.

4 (a) Explain about the following in detail:
        (i) Resonant antenna.
        (ii) Non Resonant antenna.
   (b) Explain about parallel and series connection in rhombic antenna.

5 (a) Define the parabola and explain how waves are collimated by a parabola.
   (b) A circular parabolic reflector having the directivity of 20 dB, frequency of 10 MHz and effective aperture 2 m. Calculate the mouth diameter and illumination efficiency.

6 (a) Explain the bench set-up required for the antenna measurement.
   (b) Explain the pattern requirements for the antenna measurements.

7 (a) Define sky wave propagation and explain its characteristics.
   (b) Derive the expression for the refractive index of ionosphere.

8 (a) From the fundamentals, derive the expression for the free-space propagation equation.
   (b) A communication link is to be established between two points separated by 100 km using half wave dipoles for maximum directive gain. The transmitter power is 1 kW and the frequency of operation is 100 MHz. What is the maximum power received by the receiver?

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