ANNA UNIVERSITY COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : MAY / JUNE 2010

REGULATIONS : 2007

SIXTH SEMESTER : ECE

070290073 - ANTENNAS AND WAVE PROPAGATION

TIME : 3 Hours   **Max.Marks : 100**

PART – A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

1.   Define beam solid angle.

2.   Define Directivity.

3.   What is radiation resistance?

4.   A thin dipole is λ/15 long. Find its radiation resistance.

5.   Define beam width.

6.   What is the principle of pattern multiplication?

7.   Compare BSA and EFA.

8.   Draw the radiation pattern of BSA. .

9.   What is smart antenna?

10.   What is loop antenna?

11.   Find the radiation efficiency of a 1-m diameter single turn loop (C = 3.14 m) of 10 –mm diameter copper wire at 1 MHz.

12.   What are the different types of horn antenna?

13.   A HF radio link is established for a range of 2000 km. If the reflection region of the ionosphere is at a height of 200 km and has f_c of 6 MHz, calculate MUF.

14.   Mention the use of duct propagation?

15.   What is selective fading?

16.   Define critical frequency.

17.   What are the methods used to measure antenna gain?

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18.   Define group velocity.

19.   Give the expression for MUF.

20.   What is the basic principle of slotted line method?

PART – B

(5 x 12 = 60 MARKS)

ANSWER ANY FIVE QUESTIONS

21.   Derive an expression for radiated power and radiation resistance of half-wave dipole antenna.

22. a   Write short notes on Reciprocity principle.   6

    b   Derive an expression for directivity in terms of beam solid angle.   6

23. a   Write short notes on Binomial array.   4

    b   Explain the field pattern of arrays of two point sources with equal amplitude and phase.   8

24. a   Describe the features of Log periodic antenna.   6

    b   Write short notes on Embedded antennas.   6

25.   Explain the structure and working principle of parabolic reflector antenna with a neat sketch.

26. a   Derive an expression for effective dielectric constant of Ionosphere.   10

    b   Draw a neat sketch of different ionized regions of ionosphere above the earth surface.   2

2

27. a   Explain ground wave propagation and obtain expression for field strength.   8

    b   Write short notes on Diversity reception.   4

28.   Explain the measurement of vertical incidence along with a brief discussion
        of its results

*****THE END*****