FACULTY OF ENGINEERING
B.E. 3/4 (ECE) II Semester (Old) Examination, May 2013
Subject: Antennas and Propagation

Time: 3 Hours   **Max.Marks: 75**

Note : Answer all questions from Part A. Answer any Five questions from Part B.

PART – A (25 Marks)

1. Differentiate between directive gain and directivity.   (3)

2. At what distance from a Hertzian dipole, the far field region exists.   (2)

3. The radiation resistance of one turn loop antenna is 2 ohms. For 4 turn loop antenna radiation resistance is _____   (3)

4. Write the applications of Helical antenna.   (2)

5. What is the effect of array length on beam width of an antenna array.   (3)

6. Explain about the array factor.   (2)

7. A circular aperture parabolic reflector has its diameter equal to 2 m. Calculate its half power beam width at 10 GHz frequency.   (3)

8. An outdoor antenna exhibits a noice figure of 2 dB. Calculate the equivalent noise temperature.   (2)

9. Calculate the line of sight distance between two elevated antennas in a communication link having h_t = 49 m and h_r = 9 m.   (3)

10. State secant law.   (2)

PART – B (50 Marks)

11.(a) What is a Hertzian dipole? Obtain expressions for the radiation fields of Hertzian dipole.   (7)
   (b) Explain about antenna polarization.   (3)

12.(a) Show that for power, P radiated from a half wave dipole a field of magnitude $7\sqrt{P}/d$ is produced at a distance 'd' from the antenna.   (7)
   (b) Why Helical antenna is proposed to be used in some cases? Draw a typical helical antenna.   (3)

13.(a) Why are antennas produced in arrays? What different arrays are commonly used?(3)
   (b) Derive the array factor of n-element uniform linear array.   (7)

14.(a) What is a folded dipole? Where is it used mostly?   (4)
   (b) Draw the scheme of Yagi-Uda array antenna and explain.   (6)

15.(a) Sketch rectangular antenna used in practice. What are flare angle, aperture and length of a horn antenna? How do these determine the gain and directivity of the antenna.   (6)
   (b) What is special about parabolic antenna? Where is it used mostly?   (4)

16.(a) What are different ways a radio wave propagates in treespace?   (4)
   (b) What is MUF? On what factors does it depend? What is known as the skip distance? What does it signify?   (6)

17.   Write short notes on: (5+5)
       (i) Log periodic antenna
       (ii) Gain measurement of antenna.

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