Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 11271

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

Sixth Semester

Electronics and Communication Engineering

080290041 — ANTENNA AND WAVE PROPAGATION

(Regulation 2008)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Define gain and directivity of an antenna.

2.   What is vector magnetic potential?

3.   What are the disadvantages of lens antenna?

4.   What are the applications of loop antenna?

5.   Define pattern multiplication.

6.   What is meant by Faraday rotation?

7.   Define Brewster angle.

8.   Define broadside and end-fire array.

9.   What is Huygens principle?

10. If wave of critical frequency 30 Mhz departing at an angle of 60 degrees, what is Maximum usable frequency.

PART B — (5 × 16 = 80 marks)

11. (a) (i)   Derive the expression for the radiated field from an alternating current element.   (8)

          (ii) Obtain the expression for the radiated field from a half wave dipole.
                                                                                         (8)

Or

(b) Explain the following terms with respect to antenna
    (i) Polarization
    (ii) Effective Aperture
    (iii) Directivity
    (iv) Antenna Temperature
    (v) Radiation Pattern. (16)

12. (a) Derive and draw the field pattern of arrays of two point sources with equal amplitude and phase. (16)

Or

(b) With a neat sketch explain the construction and operation of Helical Antenna. (16)

13. (a) Describe the construction, principle of operation and design of Rhombic Antenna. (16)

Or

(b) (i) Explain the principle of operation of Yagi-Uda array. (8)

    (ii) Explain the principle of operation of Log-Periodic array. (8)

14. (a) Explain the special features of parabolic reflector antenna and discuss on different types of feed used with neat diagram. (16)

Or

(b) (i) Briefly explain the working principle of Slot radiator and its complimentary structure. (8)

    (ii) Derive the design equations of the horn antenna and Half-Power beamwidths. How will you find directivity and power gain of the horn antnna? (8)

15. (a) (i) Explain the mechanism of ionosphere propagation. (10)

    (ii) Discuss the effects of earth's magnetic filed on ionosphere radioware propagation. (6)

Or

(b) (i) How does the earth effect ground propagation? Discuss. (8)

    (ii) Explain the terms (1) optimal working frequency (2) duct propagation (3) virtual height. (8)

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