A 250

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2006

Seventh Semester

Electronics and Communication Engineering

EC 431 — ANTENNAS AND PROPAGATION

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Show the development of a dipole radiator from a transmission line.

2. Write FRIIS transmission formula in terms of Gain of an antenna. (Assume non identical transmitting and receiving antennas).

3. Define :

   (a) Field pattern

   (b) Power pattern.

4. State the features of Binomial Array.

5. Draw the basic structure of a helical antenna with a coaxial line feed.

6. What are the types of loop antennas? List them.

7. What is LPDA? Why is it called so?

8. What are secondary antennas? Give examples.

9. State : Faraday's law.

10. What is multihop propagation?

PART B — (5 × 16 = 80 marks)

11. (i) Compare a Half wave dipole with a quarter wave monopole. (8)

    (ii) Compute effective area and directivity of half wave dipole. (8)

12. (a) (i) Define :

(1) Steradian

(2) Radian. (6)

(ii) What are three antenna field zones? Explain them. (5)

(iii) What is meant by duality of an antenna? Explain with an example. (5)

Or

(b) (i) Compute the directivity of an alternating current element. (5)

(ii) Derive Friis transmission formula. (6)

(iii) Give an account on 'Antenna temperature'. (5)

13. (a) (i) With a neat sketch explain the principle of pattern multiplication. (8)

(ii) What are figure eight squared and figure eight cubed patterns? Explain. (8)

Or

(b) (i) Differentiate Bread Side Array from End Fire Array. (8)

(ii) Derive an expression for Antenna Array factor. (8)

14. (a) (i) Differentiate 'V' antenna from 'Rhombic' antenna. (8)

(ii) Explain the principles of phased array antenna with a neat sketch. (8)

Or

(b) Draw a neat block diagram for antenna gain and radiation pattern measurement. Explain the procedure in detail. (16)

15. (a) (i) Explain the limitations of ground wave propagation. (6)

(ii) Draw the profile diagram of Ionosphere and explain. (5)

(iii) Explain the characteristics of Ionosphere. (5)

Or

(b) (i) Derive an expression for effective permittivity of ionized gas. (8)

(ii) Explain the advantages of Tropospheric wave propagation and skywave propagation. (8)