Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 11381

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2012.

Sixth Semester

Electronics and Communication Engineering

EC 1352A — ANTENNAS AND WAVE PROPAGATION

(Regulation 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define directivity and gain of an antenna.

2. What is meant by pattern multiplication?

3. What are the features of Hertzian dipole?

4. What is the need for loading antennas with coil or plate?

5. What are the applications of loop antenna?

6. Why are frequency independent antennas called so?

7. Explain Huygen's Principle.

8. What is the impedance relationship between slot antenna and complementary dipole antenna?

9. What is meant by skip distance?

10. Mention any two applications using horizontal polarization.

PART B — ($5 \times 16 = 80$ marks)

11. (a) Derive the electric and magnetic field components of a small loop with constant current. (16)

Or

(b) For a 2 element linear antenna array separated by a distance $d = 3\lambda/4$, derive the field quantities and draw its radiation pattern for the phase difference of 45°. (16)

12. (a) What are the features of a elementary dipole? Derive its field components and draw the radiation pattern. (16)

Or

(b) Derive the electric and magnetic field components of a finite length dipole antenna and show its current distribution with respect to its length in terms of wavelength. (16)

13. (a) Explain the salient features of Rhombic and Yagi-Uda antenna. (16)

Or

(b) With suitable diagram explain the construction and principle of operation of log periodic antenna. (16)

14. (a) Explain the principle of Horn antenna and different types of Horn antenna. (16)

Or

(b) (i) With neat sketch, explain the operation of reflector antenna. (8)

(ii) Explain the various feed mechanisms for reflector antenna. (8)

15. (a) Radio waves projected towards the atmosphere do not return if the frequency is raised above a particular frequency which also changes with the angle of projection. Explain. (16)

Or

(b) (i) Why do we use high frequency waves in sky wave propagation? Explain the mechanism of propagation. (8)

(ii) Explain the following terms with diagram : (8)

(1) Duct propagation

(2) Virtual height.

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