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Question Paper Code : 71463

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Sixth Semester

Electronics and Communication Engineering

EC 2353/EC 63/10144 EC 604 — ANTENNAS AND WAVE PROPAGATION

(Regulation 2008/2010)

(Common to PTEC 2353 – Antennas and Wave Propagation for B.E. (Part-Time)
Fifth Semester – Electronics and Communication Engineering – Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the importance of radiation resistance of an antenna.
2. What is the significance of aperture of the antenna?
3. What are the applications of loop antenna?
4. Define Pattern Multiplication
5. State Huygen's Principle.
6. What are the features of pyramidal horn antenna?
7. What are the applications of microstrip antenna?
8. Differentiate near and far field.
9. Define optimum working frequency.
10. What is meant Faraday rotation?

PART B — (5 × 16 = 80 marks)

11. (a) Derive the Electric and magnetic field components of a Hertzian dipole.

Or

- (b) (i) Two spacecrafts are separated by 3 Km. Each has an antenna with directivity $D = 200$ operating at 2 GHz. If craft A's receives 20 db power what is the transmitted power by craft B? (7)

- (ii) Explain the following terms with respect to antenna:

(1) Polarization

(2) Effective aperture

(3) Directivity. (9)

12. (a) Derive the field quantities and draw radiation pattern for a half wavelength dipole.

Or

- (b) Two identical radiators are spaced $d = 3\lambda/4$ meters apart and fed with currents of equal magnitude but with 180° phase difference. Evaluate the resultant radiation identify the direction of maximum and minimum radiation.

13. (a) Explain the radiation mechanism of horn antenna with diagram. Draw the different types of horn structures.

Or

- (b) Explain the principle of Reflector antenna and discuss on different types of feed used with neat diagram.

14. (a) What are the importance of Helical antenna? Explain the construction and operation of Helical antenna with neat sketch.

Or

- (b) Explain the principle of operation of Log periodic antenna with neat schematic diagram.

15. (a) (i) Draw the structure of ionosphere and explain the mechanism of ionosphere propagation. (10)
- (ii) Explain the effects of magnetic fields on EM wave propagation. (6)

Or

- (b) (i) Explain the terms:
- (1) MUF
 - (2) Virtual height
 - (3) Duct propagation
 - (4) Skip distance
 - (5) Fading. (10)
- (ii) Explain the mechanism of tropospheric propagation. (6)
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