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Question Paper Code : 51413

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

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. What is the significance of radiation resistance of an antenna.
2. Draw E plane and H plane radiation pattern of a dipole.
3. Compare short dipole from half wave dipole.
4. What are the advantages of antenna arrays?
5. What is called method of imaging?
6. State field equivalence principle.
7. Why frequency independent antennas are called so?
8. Mention any two applications of turnstile antenna.
9. Differentiate Virtual height from actual height.
10. What are the effects of ground on low frequency wave transmission?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Define the following parameters and their dependence on antenna Performance (1) Radiation pattern (2) Input impedance (3) Polarization (8)
(ii) Derive the magnetic field components of a dipole having the dimension $l \ll \lambda/2$. (8)
- Or
- (b) (i) Explain the terms: (1) Beam solid angle (2) Antenna temperature (3) Reciprocity of antenna (8)
(ii) Derive the current and vector potential of a Hertzian dipole. (8)

12. (a) 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)

Or

- (b) (i) Derive the expression for the field produced by a linear array and deduce it for an end fire array. (10)
(ii) Compare End fire and broadside array. (6)
13. (a) (i) Explain the principle of rectangular horn antenna with a neat sketch. (8)
(ii) Explain the salient features of Flat and corner reflector antenna. (8)

Or

- (b) With neat diagram, explain the principle of Parabolic reflector antenna and various types of feed used. (16)
14. (a) (i) Explain the measurement of antenna gain. (8)
(ii) With necessary illustrations explain the radiation characteristics of Yagi Uda antenna (8)

Or

- (b) With suitable diagram explain the construction and principle of Helical antenna in different mode of operation. (16)
15. (a) (i) Explain the ground wave propagation of radio waves. (12)
(ii) Write notes on faraday rotation. (4)

Or

- (b) (i) Describe the space wave propagation and explain the importance of line of sight propagation. (8)
(ii) Explain the following terms with diagram: (1) Duct propagation (2) Critical frequency (3) Skip zone. (8)