

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2011.

Sixth Semester

Electronics and Communication Engineering

EC 2353 –ANTENNA AND WAVE PROPAGATION

(Regulation 2008)

(Common to PTEC 2353 - Antenna 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 gain of an antenna?
2. Define effective aperture of an antenna.
3. Why is loop antenna called as magnetic dipole?
4. Define Pattern Multiplication.
5. State Babinet's Principle.
6. What are the limitations of Lens antenna?
7. Why is log periodic antenna called so?
8. What are the features of microstrip antenna?
9. Define Critical frequency.
10. What is meant by Faraday rotation?

PART B – (5 × 16 = 80 marks)

11. (a) What are Hertzian dipoles? Derive the Electric and magnetic field quantities of Infinitesimal dipole and radiation pattern. (16)

Or

(b) Explain the following parameters of an antenna:

- (i) Beam solid angle
- (ii) Radiation pattern
- (iii) Gain
- (iv) Polarization
- (v) Bandwidth. (16)

12. (a) Derive the field quantities and Radiation resistance of a half wavelength dipole. (16)

Or

(b) An antenna array consists of two identical isotropic radiators spaced by a distance of $d = \lambda/4$ meters and fed with currents of equal magnitude but with a phase difference ' β '. Evaluate the resultant radiation for $\beta = 0$ and thereby identify the direction of maximum radiation. (16)

13. (a) Explain the radiation mechanism of Microwave Horn antenna with diagram. (16)

Or

(b) Explain the special features of Parabolic Reflector antenna and discuss on different types of feed used with neat diagram. (16)

14. (a) With a neat sketch, explain the construction and operation of Multielement Yagi- Uda antenna. (16)

Or

(b) With necessary illustrations explain the radiation characteristics of microstrip antenna and mention its possible application. (16)

15. (a) (i) Explain the mechanism of ionospheric propagation with neat diagram. (8)

(ii) Discuss the effects of Earth's magnetic field on ionosphere radio wave propagation? (8)

Or

(b) (i) Explain important features of ground wave propagation? (10)

(ii) Explain the terms:

(1) Optimum working frequency

(2) Skip distance

(3) Virtual height. (6)