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**Question Paper Code : 41216**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Sixth Semester

Electronics and Communication Engineering

EC 1352 A — ANTENNAS AND WAVE PROPAGATION

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Radiation intensity
2. State Pattern Multiplication Theorem.
3. What is the radiation resistance of a current element whose overall length is  $\lambda/30$ ?
4. What do you mean by induction field and radiation field?
5. For a 25 turn helical antenna operating at 5GHz with circumference  $C = 20$  cm and the spacing between the turns is  $0.3 \lambda$ . Calculate the directivity and HPBW.
6. Why log periodic antenna is named so far?
7. What is the difference between slot antenna and its complementary dipole antenna?
8. Define spill over.
9. What is the height ranges of different regions in the ionosphere?
10. Define MUF.

PART B — (5 × 16 = 80 marks)

11. (a) State and prove reciprocity principle with regard to antennas.

Or

- (b) Derive the maxima directions, minima directions, and half power point direction for an array of two point sources with equal amplitude and same phase? Plot the radiation pattern.

12. (a) Derive the fields radiated from hertzian dipole antenna? Also obtain its radiation resistance.

Or

- (b) Derive the power radiated, radiation resistance, directivity and effective aperture of a Half wave dipole?

13. (a) Draw the structure of Yagi-uda Antenna? Explain the construction and operation of Yagi-uda Antenna. Also explain its general characteristics.

Or

- (b) Explain the construction, operation and design for a rhombic antenna.

14. (a) Derive the radiated fields and characteristic impedance of the infinite biconical antenna.

Or

- (b) (i) Show the relationship between dipole and slot impedances (8)  
(ii) Explain the methods of feeding parabolic reflectors. (8)

15. (a) Derive an expression for effective dielectric constant and refractive index of the ionosphere.

Or

- (b) (i) Discuss the effects of earth's magnetic field on ionosphere radio wave propagation. (8)  
(ii) Explain about ground wave propagation. (8)
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