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Question Paper Code : 21191

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

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 Power gain of an antenna. Mention the relation between power gain and directive gain.
2. What is Binomial array ? Why is it called so?
3. Write Lorentz gauge condition, State its significance.
4. Compute the radiation resistance of a circular loop antenna.
5. What type of polarization is used in Helical Antenna? Why ?
6. What is the difference between traveling wave antenna and Standing wave antenna?
7. State Babinet's principle For aperture antennas.
8. Write the relation between dipole and slot impedances.
9. Which layer of ionosphere exists during day time only? Why?
10. Define LOS propagation.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Compute the directive gain of oscillating electric dipole. (8)
(ii) Explain the development of folded dipole element from a transmission line and obtain its Z_{in} . (8)

Or

- (b) (i) Explain the normal mode and axial mode operation of Helical antenna with neat diagrams. (8)
(ii) Explain the principle of radiation pattern multiplication with neat diagrams. (8)
12. (a) (i) What are linear antennas? Explain with examples. (8)
(ii) Derive radiation resistance of Half wave dipole antenna. (8)

Or

- (b) (i) Differentiate Half wave dipole from quarter wave monopole antenna. (8)
(ii) Give an account on Capacity hat and loading coil for short antennas". (8)
13. (a) (i) Explain the types of loop antenna with neat diagrams. (8)
(ii) Bring out the design features of Double V antenna with an example. (8)

Or

- (b) (i) Explain the similarities and differences between Yagi Uda and LPDA arrays. (8)
(ii) An LPDA is to be designed to cover the frequency range 80-200 MHz and to have 7.5dB gain. Compute the required element lengths and spacings for optimal design. (8)
14. (a) (i) State and explain Huygen's principle for aperture antennas. (8)
(ii) Discuss the methods of feeding slot antennas with neat diagrams. (8)

Or

- (b) (i) Explain the principle of radiation of offset feed reflector antenna with a neat diagram. (8)
(ii) Write a technical note on "Luxemburg lens". (8)
15. (a) (i) Explain the structure of ionosphere in detail. (8)
(ii) Define and explain the types of fading in detail. (8)

Or

- (b) (i) Explain the two ray model of space wave propagation with a neat diagram. (8)
(ii) Derive the effective dielectric constant of ionosphere. (8)