Reg. No. : | | | | | | | | | | |

Question Paper Code: 12022

M.E. DEGREE EXAMINATION, MAY 2014.

First Semester

Communication Systems

01PCM102 - ADVANCED RADIATION SYSTEMS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Find the radiation resistance of an infinitesimal dipole for overall length is $l = \lambda/25$.
2. What do you mean by Handset Antenna?
3. State Huygen's principle for Aperture Antenna.
4. What are the types of feeds widely used for Reflector Antenna?
5. What is the need for phase shifter in phased array Antenna?
6. What are the advantages for DolphTschebycheff array over Binomial array?
7. List the limitations of Microstrip Patch Antenna.
8. List the different techniques are used for feeding Microstrip Antenna.
9. Define CATR.
10. Which types of antennas are called Frequency independent Antenna? Why?

PART - B (5 x 14 = 70 Marks)

11. (a) (i) Derive an expression for power density and radiation resistance of a Dipole Antenna. (10)

(ii) Discuss briefly about balance and unbalance transformer. (4)

Or

(b) (i) Explain the procedure to find the electric and magnetic fields generated by an electric and magnetic current source. (7)

(ii) Explain in detail about Reciprocity theorem and its application in antenna. (7)

12. (a) (i) Explain the working principle of Pyramidal horn and derive the expression for directivity. (10)

(ii) Derive the expression for Hygen's principle with neat diagram. (4)

Or

(b) Derive the expressions for the radiated fields for a uniform rectangular aperture. (14)

13. (a) (i) Derive the expressions for directivity of maxima, minima and beam width for an End fire array. (10)

(ii) Differentiate Broadside array and End fire array. (4)

Or

(b) Explain the design procedure for broadside DolphTchebycheff array of 2M (or) 2M+1 elements with spacing 'd' between elements. (14)

14. (a) Explain the concept of cavity model for rectangular microstrip antenna. (14)

Or

(b) (i) Derive expressions for the input impedences of rectangular and circular patch antenna. (4)

(ii) Write short notes on ring antenna (6)

(iii) Describe the applications of microstrip array antenna. (4)

15. (a) With neat diagram explain the working principle of

(i) Log Periodic antenna (7)

(ii) Biconical antenna. (7)

Or

(b) Discuss in detail about

(i) Antenna gain measurement (7)

(ii) Radiation pattern measurement. (7)

PART - C (1 x 10 = 10 Marks)

16. (a) Design Broadband planar antennas and list the applications. (10)

Or

(b) Explain the and principle of wideband single feed circularly polarized microstrip antennas. (10)