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

Question Paper Code: 12023

M.E. DEGREE EXAMINATION, DECEMBER 2013.

First Semester

Communication Systems

01PCM102 - ADVANCED RADIATION SYSTEM

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Write the significance of Radiation pattern.
2. State the reciprocity theorem and write its significance.
3. Compare the slot and horn antennas in terms of its performance and applications.
4. Mention the two conditions to be satisfied in a binomial array to eliminate the secondary lobes.
5. Why folded dipole is most preferably used in Yagi uda antennas? Write its applications.
6. What do you mean by Microstrip antenna? Write its applications.
7. What is the basic procedure to measure the radiation properties of antenna?
8. Mention few typical sources of error in antenna measurements.
9. Write the practical processes that are followed to measure the pattern of test antenna.
10. Compare the input impedances of rectangular and circular patch antennas.

PART - B (5 x 14 = 70 Marks)

11. (a) (i) Derive the expression for the radiated field components of an infinitesimal dipole antenna. (10)

(ii) Write notes on BALUNs. (4)

Or

(b) (i) Derive the expression for electric and magnetic field radiated by small loop dipole antenna. (10)

(ii) Derive the radiation resistance of a half wave dipole with the help of its total power radiation. (4)

12. (a) (i) Derive the expression for the radiated field of a slot antenna. (7)

(ii) Explain the radiation from circular aperture. (7)

Or

(b) (i) Explain about the working principle of reflector antenna and their feed systems. (7)

(ii) Discuss the design issues of reflector antenna in detail. (7)

13. (a) (i) Derive the expressions for the direction of pattern maxima, minima and HPBW of a broad side array and end fire array. (10)

(ii) Write notes on phased array antenna. (4)

Or

(b) (i) Explain about the array of two isotropic point sources separated by a distance (say d) and have the same polarization. (8)

(ii) What is meant by a uniform linear array and mention its types. (3)

(iii) What do you mean by beam scanning? Explain. (3)

14. (a) (i) Explain the radiation mechanism and excitation techniques of rectangular patch antenna in detail. (10)

(ii) Derive the input impedances of rectangular and circular patch antenna. (4)

Or

(b) (i) Explain the radiation mechanism and excitation techniques of circular patch antenna in detail. (10)

(ii) Discuss the Micro strip array and its feed network. (4)

15. (a) (i) Write notes on EMC measuring antennas. (7)

(ii) Explain the antenna factor measurement in detail. (7)

Or

(b) Discuss the measurement of gain and impedance measurement of antenna. (14)

PART - C (1 x 10 = 10 Marks)

16. (a) (i) Discuss about the near field and far field measurements in detail. (5)

(ii) Bring out the design considerations for antenna test range. (5)

Or

(b) Briefly discuss the measurement techniques for directional pattern, gain, phase, polarization, impedance, efficiency and current distribution. (10)

———————