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Question Paper Code: 52122

M.E. DEGREE EXAMINATION, DECEMBER 2015

First Semester

Communication Systems

15PCM102 - ADVANCED RADIATION SYSTEMS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. A straight electrical conductor measuring $1/2$ wavelength from end to end and connected at the center to a radio-frequency (RF) feed line _____ antenna.
(a) Dipole (b) Log periodic (c) Biconical (d) Horn
2. Parabolic Dish Antenna is also called as _____.
(a) Slot (b) Horn (c) Reflector (d) Dipole
3. In order to increase the directivity the array length should be _____.
(a) Increased (b) Remain constant (c) Decreased (d) Depend Capacity
4. Identify the uncommon type of patch antenna.
(a) Triangle (b) Square (c) Circular (d) Hexagon
5. A multi-element, directional, antenna designed to operate over a wide band of frequencies is _____
(a) Dipole (b) Log periodic (c) Biconical (d) Horn

PART - B (5 x 3 = 15 Marks)

6. Differentiate Mono pole and a dipole.
7. State field equivalence principle.
8. Distinguish broad side array and end fire array.
9. List some applications of Micro-Strip antenna.

10. Enumerate the different performance features of an antenna measurement.

PART - C (5 x 16 = 80 Marks)

11. (a) (i) Write a short note on mobile phone antenna and handset antenna. (8)
(ii) State and prove reciprocity theorem. (8)

Or

- (b) (i) Explain the function of balanced to unbalanced transformer. (8)
(ii) Using suitable mathematics, show that the current distribution in a dipole is asymptotic. (8)

12. (a) Using suitable mathematics, explain the radiation principle of a rectangular aperture. (16)

Or

- (b) Discuss about the design considerations and the feed mechanisms of a reflector antenna. (16)

13. (a) Summarize the linear array synthesis techniques. Bring out the salient features. (16)

Or

- (b) (i) Brief a note on Binomial array. (6)
(ii) Derive the general polynomial equation for Chebyshev array. (10)

14. (a) (i) Using suitable mathematics, explain the radiation principle of a rectangular patch antenna. (10)
(ii) Discuss the design considerations and the formulas involved in circular patch antenna. (6)

Or

- (b) (i) Using suitable mathematics, explain the radiation principle of circular patch antenna. (10)
(ii) Discuss the design considerations and the formulae involved in a rectangular patch antenna. (6)

15. (a) Describe the compact antenna test ranges and near field ranges with neat diagram. (16)

Or

- (b) Explain the method of antenna impedance measurement techniques. (16)