EC - 604 B.E. VI Semester

Examination, December 2014

Antenna and Wave Propagation

Time: Three Hours Maximum Marks: 70

Note: All questions carry equal marks. Assume data if necessary.

Unit -1

1.Derive the relation for magnetic and electric field components of an alternating current element. 14

Or

2.a) Derive an expression for the power radiated by Quarter Wave Monopole.

b) Discuss the significance of:

i) Retarded potential ii) Radiation resistance

Unit-II

3.a) Write a short note on Effect of earth on vertical patterns,

b) What are different directional characteristics of dipole antennas. 14

Or

4.a) An array contains 100 isotropic radiations with an inter element spacing of 0.5A. It is required to produce broadside and end-fire beams.

i) Find Null to Null beam width and half power beam width in degrees.

ii) Also find the directivity of both forms of array,

b) Explain travelling wave antenna in detail.

Unit-III

5.a) What do you mean by horn antenna? While measuring the gain of a horn antenna the gain oscillator is set for 9 GHz frequency and the attenuation inserted was found to be 9.8 dB. Calculate the gain of the horn, the distance between two horn is 35 cm.

b) What is microstrip antenna. What are different advantages and disadvantages. 14

Or

6.a) Write short notes on:

i) Lens antenna ii) Folded dipole antenna b) Derive the expression for the radiation resistance of a biconical antenna.

Unit-IV

7.a) If the array factor of a line ararray has zeros at Φ= 90, 180°,270° and the elements are spaced at UA. Design the array,

b) Write a detailed description on Planer arrays. 14

Or

8.Explain Dolph-Chebyshev method of antenna array synthesis.

Unit - V

9.a) Obtain the expression of radius of curvature of ray path in terms of rate of change of permittivity with height,

b) Describe Tropospheric propagation. Lists its applications. 14

Or

10.a) With neat diagram explain the important features of different types of space wave propagation of electromagnetic waves over long distances even beyond the horizon,

b) Define the following:

i) Effective length of transmitting and receiving antenna

ii)Virtual height

iii)Skip distance

iv)Maximum usable frequency.