53 (EC 710) AWPR

2018

ANTENNA AND WAVE PROPAGATION

Paper : EC 710 (Back)

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer ***any five*** *questions out of* ***seven.***

1. *(a)* Explain transmission line of an Antenna System. Also with the help of figure show the transition region between guided wave and free space wave. 2+5=7

   (b) Define characteristic impedance of a transmission line. Explain how characteristic impedance is important with the length of the transmission line terminated by a load. 2+8=10

   (c) Define Dipole of an Antenna. 3

2. *(a)* Explain the importance of Isotropic radiation in an Antenna System. Also find out the total power radiation from an Isotropic Radiation by considering the poynting vector. 3+7=10

(b) Define Front to Back ratio of an Antenna. Also compare between Effective Area and Effective Length of an Antenna. 4+6=10

3. *(a)* Describe Antenna size of structuring of an Antenna which depends on the wavelength and frequency of the transmitting electro magnetic wave. 6

(b) Explain the main importance of Antenna Feeders in an Antenna system. Also point out the different Antenna Feeders used depending on the range of frequency signals in an Antenna system. 2+8=10

(c) Point out the difference between Radiation pattern and Radiation Intensity. 4

4. Explain and find out the power in a uniform plane waves which is necessary to develop a power theorem or poynting theorem for an electromagnetic wave. 20

5. *(a)* Explain the radiation process from a small current element dipole possessing electromagnetic field. 4

(b) Explain how the field strength is an important term in configuring the radiation pattern of the radiated energy from an Antenna. 8

(c) Define Array of an Antenna. Point out the difference between Broadside Array and Endfire Arrays of an antenna. 4+4=8

6. *(a)* Explain pattern multiplication of array of an antenna. Also point out the multiplication of field pattern and addition of phase pattern. 5+5=10

(b) Explain YAGI-UDA antenna by showing its radiation pattern, optical equivalent. 10

7. *(a)* Find out the fundamental equation for free space propagation. 10

(b) Explain the structure of Atmosphere and point out the different functions of layers present in the atmosphere. 10
