53 (EC 710) AAWP

2017

ANTENNA & WAVE PROPAGATION

Paper : EC 710

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)* Define Characteristic Impedance. Explain how characteristic impedance function in a transmission line terminated by a load. 2+8=10

   (b) Explain different regions and shape of an antenna which results in proper working of an antenna. 7

   (c) Define Dipole of an Antenna. 3

2. *(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

3. (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

4. Explain and find out the power in a uniform plane wave 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

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

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(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. 7

(b) Explain YAGI-UDA antenna by showing its radiation pattern, optical equivalent. 9

(c) Point out the main differences between Biconical antenna and Helical antenna. 4

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