

End Semester Examinations - 2015-16 Even Semester - May 2016

14EC2020 Antenna Theory and Wave propagation

Set A

Time : 3 hrs
Total Marks: 100

1. a. The radiation resistance of halfwave dipole antenna _____ (1)
b. State reciprocity principle and its uses. (2)
c. Draw the thevenin's equivalent of the antenna system. (2)
d. State and prove reciprocity theorem with a neat sketch. (15)

OR

2. a. Give the relation between gain (G) and directivity (D). (1)
b. Give the maximum power transfer condition in radiating elements. (1)
c. Define FBR. (2)
d. Distinguish between monopole and dipole antenna. (2)
e. Design a halfwave dipole antenna with a physical length of $l=2h$. Also determine its vector magnetic potential and electric fields. (14)

3. a. The progressive phase shift of endfire array is _____. (1)
b. Draw and brief on the radiation pattern of broad side array and endfire array. (4)
c. Calculate maxima and minima direction of uniform linear array for the given condition (BSA) $\alpha=0$, $n = 4$, $d = \lambda/2$, $N=1$ and 2. (15)

OR

4. a. Define array factor (2)
b. Determine the relative amplitudes for five element array using binomial series. (4)
c. Explain the principle of pattern multiplication with an example. (4)
d. Derive the maxima and minima directions and HPPD for two point sources excited with equal amplitude and same phase. (10)

5. a. Give an example for super directive antenna. (1)
b. Draw the structure of LPDA and mention its advantages. (5)
c. Write short notes on axial ratio and pitch angle of helical antenna. (4)
d. Explain the principle and construction of n-element Yagi-Uda array. (10)

OR

6. a. Name different shapes of loop antenna. (2)
b. Brief on the modes of operation of helical antenna? (4)
c. Explain the construction and working of log-periodic dipole antenna. (14)
7. a. What are the different feeding methods of slot antenna? (2)
b. State Huygen's principle. (2)

c. Describe in detail about horn antenna with design parameters. (16)

OR

8.

a. What are the advantages of microstrip antenna? (2)

b. What are all the different feeding techniques of parabolic antenna. (2)

c. Derive the expression for directivity of a Rectangular aperture(Huygen's source). (16)

9.

a. Define skip distance. (2)

b. Derive the critical frequency for sky wave propagation(Ionosphere). (3)

c. Derive the effective dielectric constant of the ionospheric layer. (15)

Wishing you All the Best
