

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

14EC3014 Advanced Radiation Systems

Set B

Time : 3 hrs
Total Marks: 100

1. a. Describe the resolution capabilities of the antenna to distinguish between two sources in terms of beamwidth in 3D and 2D forms. (8)
b. Explain about antenna aperture and effective height. (5)
c. Derive the relationship between effective aperture and directivity. (7)
- OR**
2. a. Explain about rotation of a plane electromagnetic wave and its polarization. Also discuss about various types of polarization. (10)
b. Explain about antenna input impedance and antenna radiation efficiency. (10)
3. a. Explain about monopole antenna and its characteristics. (5)
b. Using the concept of pattern multiplication, analyze the radiation pattern of 4-isotropic elements fed in phase, spaced $\lambda/2$ apart. (5)
c. Derive the total far field pattern of linear array of n isotropic sources with uniform phase difference between consecutive elements. (5)
d. Discuss about various forms of antenna arrays. (5)
- OR**
4. Discuss about Loop Antenna and its characteristics. Explain how a loop antenna is used in direction finding. Also derive the EMF equation of an electrically small loop antenna. (20)
5. a. Explain about helical antenna and its mode types. (5)
b. Explain about the optimization, matching and design procedure in Yagi array. (15)
- OR**
6. a. Discuss about the structure and operation of Log periodic dipole array. Also give its design steps. (15)
b. With neat sketches, explain about nonmetallic and artificial dielectric lens antenna. (5)
7. a. Explain about Aperture antenna using field equivalence principle. (10)
b. Give the steps that must be used to form an equivalent source to solve an aperture problem in an Aperture antenna. (5)
c. Discuss about Conical, Septum and Corrugated horn antenna. (5)
- OR**
8. a. Explain about horn antenna and also derive the design equations of a rectangular horn radiating structure. (15)
b. Discuss the simulation steps to design Circular aperture antenna using FEKO. (5)
9. Model a microstrip antenna using transmission line model and explain about its fringing effects, effective length, resonant frequency and effective width. (20)

