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Question Paper Code: 36403

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Sixth Semester

Electronics and Communication Engineering

01UEC603 - ANTENNA AND WAVE PROPAGATION

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define half power beam width.
2. Define the term steradian.
3. Summarize the conditions to obtain end fire array.
4. What is a short dipole?
5. Define duality principle.
6. Point out the merits and demerits of lens antenna.
7. What are the drawbacks of antenna measurements?
8. List the applications of log periodic dipole array.
9. Define skip distance.
10. What is meant by Faraday rotation?

PART - B (5 x 16 = 80 Marks)

11. (a) Derive the expression for electric and magnetic fields of a oscillating current element. (16)

Or

- (b) (i) Explain in detail retarded vector potential and scalar potential. (8)
- (ii) Discuss in detail on the following
- (1) Antenna temperature (2) Polarization (8)
12. (a) (i) Derive the expression for the radiated fields of a centre fed $\lambda/2$ dipole antenna. Sketch the radiation pattern. (12)
- (ii) Derive the radiation resistance and directivity of a $\lambda/2$ dipole antenna. (4)
- Or
- (b) Discuss in detail about linear array and pattern multiplication. (16)
13. (a) With a neat sketch and explain the slot antenna and its radiation mechanism. (16)
- Or
- (b) (i) Calculate the beam width between first nulls of a 2.5m paraboloid reflector used at 6 GHz. What will be its gain in decibels. (8)
- (ii) Calculate the angular aperture for a paraboloid reflector antenna for which aperture number is i)0.25, ii) 0.50. Given that diameter of the reflector mouth is 10m , Calculate the position of the focal point with reference to the reflector mouth in each case. (8)
14. (a) With necessary illustrations explain the radiation characteristics of multi element log periodic antenna and mention its possible applications. (16)
- Or
- (b) With a neat sketch and explain the construction and operation of helical antenna. (16)
15. (a) Summarize the structure of the ionosphere and explain the phenomena of wave bending introduced by these layers. (16)
- Or
- (b) Why do we use high frequency waves in sky wave propagation? Explain the mechanism of propagation and its influence by earth's magnetic fields. (16)