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Question Paper Code: 36403

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

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. If the radiation resistance of an antenna is 65Ω and loss resistance is 10Ω find its efficiency.
2. Define beam solid angle.
3. State the principle of pattern multiplication.
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. Mention the types of feeding structures used for microstrip patch antennas.
9. Define skip distance.
10. What is gyro frequency?

PART - B (5 x 16 = 80 Marks)

11. (a) What are Hertzian dipoles? Derive the electric and magnetic field of Hertzian dipoles. (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) Draw radiation pattern for a half Wavelength dipole and explain in detail. (16)
- Or
- (b) Discuss in detail about linear array and pattern multiplication. (16)
13. (a) Discuss about the type of Horn antenna and find the directivity and power gain. (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) Describe the construction and basic principle of operation of a helical antenna under (i) normal mode of operation and (ii) Axial mode of operation. Write its application. (16)
- Or
- (b) With a neat sketch and explain the construction and operation of helical antenna. (16)
15. (a) Discuss on the following
- (i) Skip Distance (8)
- (ii) Virtual Height (8)
- 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)