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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations August-2021**ANTENNAS & WAVE PROPAGATION**

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Explain Antenna Beam Width and Directivity. 6M
b Describe Radiation Pattern and Beam Efficiency. 6M

OR

- 2 a Derive expression for Electric and Magnetic Field radiated by Hertzian Dipole. 6M
b Define Polarization and list the types of Polarization. 6M

UNIT-II

- 3 a Explain about construction and operation of Yagi-Uda antenna. 8M
b Derive the expression for radiation resistance of small loop antenna. 4M

OR

- 4 a Design 10 turns helix to operate in axial mode for optimum design 7M
i) Determine the circumference (λ_0), pitch angle (degrees) Separation between turns (λ_0)
ii) Determine the Relative wave velocity (free space) Along the wire of helix for ordinary end-fire design, Hansen-wood yard end-fire design
iii) Find Half power beam width of the main lobe (in decrease)
b List the applications of helical antenna. 5M

UNIT-III

- 5 a Explain different parameters effects the characteristics of micro strip antenna. 6M
b Discuss the construction of rectangular patch antenna. 6M

OR

- 6 a Distinguish between different types of lens antenna used in practice. 5M
b A parabolic dish provides a power gain of 50 dB at 10 GHz with 70% efficiency. Calculate 7M
i) HPBW ii) BWFN

UNIT-IV

- 7 a A broad side array operating at 10cm wavelength consists of 4 half wave dipole spaced 50 cm each element carries radio frequency current in the same phase and of magnitude 0.5 amps. Calculate the radiated power, half width of major lobe. 6M
b Demonstrate uniform linear array and Array of two point sources. 6M

OR

- 8 a Derive the expression for far field pattern of an array of two isotropic point sources at unequal amplitude & any phase. 6M
b Explain any two techniques for antenna gain measurement. 6M

UNIT-V

- 9 a Explain i) Virtual height ii) Skip distance iii) multipath fading. 6M
b Discuss the structure of Atmosphere. 6M

OR

- 10 a List the energy losses in Ionosphere. 6M
b Explain the scattering phenomenon and Super refraction. 6M

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