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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)**B.Tech III Year I Semester Regular Examinations November/December 2018****ANTENNAS & WAVE PROPAGATION**

(ECE)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)**UNIT-I**

- 1 a Explain radiation and Beam efficiency. 7M
b Derive the expression for radiation resistance $R_r = 80\pi^2(dl/\lambda)^2$. 5M

OR

- 2 a The radiation resistance of an antenna is 72Ω and loss resistance is 8Ω . What is the directivity if the power gain is 16. 7M
b Explain about thin linear wire antennas. 5M

UNIT-II

- 3 a (i) Discuss the types of horn antennas. 7M
(ii) What are parasitic elements & where they are used?
b Derive the expression for radiation resistance of small loop antenna. 5M

OR

- 4 a Discuss about the helical antenna geometry, axial mode of radiation and its applications. 7M
b Explain about construction and operation of Yagi-Uda antenna. 5M

UNIT-III

- 5 a A parabolic reflector antenna with diameter 20 m is designed to operate at frequency of 6 GHz and illumination efficiency of 0.54. Calculate antenna gain and decibels. 7M
b What are the applications of MSA? 5M

OR

- 6 a A parabolic dish provides a power gain of 50 dB at 10 GHz with 70% efficiency. Find out i) HPBW ii) BWFN iii) Diameter 7M
b Explain about flare sheet, corner & paraboloidal reflectors. 5M

UNIT-IV

- 7 a Explain any two techniques for antenna gain measurement. 7M
b Show that Directivity of BSA, $L \gg d$ is $D_0 = 2(d/\lambda)$. 5M

OR

- 8 a Explain the gain measurement using absolute & comparison methods. 7M
b 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. 5M

UNIT-V

- 9 a Explain the terms i) Critical frequency ii) MUF. 7M
b Explain the refraction and reflection mechanisms in sky wave propagation. 5M

OR

- 10 a Explain the different modes of wave propagation. 7M
b Discuss the atmospheric effects in space wave propagation. 5M

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