

**Reg. No:**

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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech III Year I Semester Regular & Supplementary Examinations Nov/Dec 2019**  
**ANTENNAS AND WAVE PROPAGATION**  
**(Electronics & Communication Engineering)**

Time: 3 hours

Max. Marks: 60

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

- 1 Derive expression for Electric and Magnetic Field radiated by Half Wave Dipole and Sketch its Field Strength pattern. **12M**

**OR**

- 2 Explain the following:
- a Beam Area and radiation intensity. **6M**
- b Effective Height of Antenna and Antenna Temperature. **6M**

**UNIT-II**

- 3 a Discuss about the helical antenna geometry, axial mode of radiation and its applications. **6M**
- b Explain about construction and operation of Yagi-Uda antenna. **6M**

**OR**

- 4 a Derive the expression for radiation resistance of small loop antenna. **6M**
- b Discuss about the horn antenna types & its characteristics. **6M**

**UNIT-III**

- 5 a Explain about Zoned Lens antenna. **6M**
- b What are the different parameters effects the characteristics of micro strip antenna explain? **6M**

**OR**

- 6 a A parabolic reflector having the diameter of 2.1 m and used at 9GHz. Calculate the gain. **4M**
- b Discuss the application of image antenna concept to the 90° corner reflector. **8M**

**UNIT-IV**

- 7 a Derive the expression for far field pattern of an array of two isotropic point sources at unequal amplitude & any phase. **8M**
- b Find the minimum spacing between the elements in a broadside array of 10 isotropic radiators to a have directivity of 7db. **4M**

**OR**

- 8 a Explain pattern multiplication with appropriate examples. **6M**
- 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. **6M**

**UNIT-V**

- 9 a VHF Communication is to be established with 50W transmitted at 100MHz. Calculate the LOS distance if the heights of transmitting and receiving antennas are respectively 50 m and 10m. Assuming the capture area of transmitting antenna is 25  $m^2$ , calculate the field strength at the receiving antenna end neglecting ground reflected wave. **6M**
- b Explain the terms i) Critical frequency ii) MUF. **6M**

**OR**

- 10 a Explain ground wave propagation. **6M**
- b Explain about scattering phenomenon & Super refraction. **6M**

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