Code No: 115DQ

**R13**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech III Year I Semester Examinations, November/December - 2016**

**ANTENNAS AND WAVE PROPAGATION**

**(Common to ECE, ETM)**

**Time: 3 hours** **Max. Marks: 75**

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

## PART - A

**(25 Marks)**

1.a) What is meant by Beam Area? [2]

b) What is meant by Polarization? [3]

c) Why folded dipole antenna is used in yagi antenna? [2]

d) What is axial mode of radiation? [3]

e) What is Lunenburg lens? [2]

f) What are the various feeds used in reflectors? [3]

g) Define isotopic source. [2]

h) What is reciprocity of an antenna? [3]

i) What are the types of Ground wave? [2]

j) What are the factors that affect the propagation of radio waves? [3]

## PART - B

**(50 Marks)**

2. Find the radiation resistance of elementary dipole with linear current distribution. [10]

**OR**

3. Derive the expression for far field components of a small loop antenna. [10]

4. What is Yagi-uda Antenna? Explain the construction and operation of Yagi-uda Antenna. Also explain its general characteristics. [10]

**OR**

5. Explain the Half-Wavelength Folded Dipole. [10]

6. Describe the parabolic reflector used at micro frequencies. [10]

**OR**

7. Explain the different types of lens antennas. [10]

8. State reciprocity theorem for antennas. Prove that the self –impedance of an Antenna in transmitting and receiving antenna are same. [10]

**OR**

9. What is linear array? Compare Broad side array and End fire array. [10]

10. Deduce an expression for the critical frequency of an ionized region in terms of its Maximum ionization density. [10]

**OR**

11. Describe the troposphere and explain how ducts can be used for Microwave propagation. [10]

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