

Code No: 136AF**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year II Semester Examinations, December - 2019****ANTENNAS AND WAVE PROPAGATION****(Electronics and Communication Engineering)****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) Define radiation intensity. [2]
- b) What is beam efficiency? What it indicates? [3]
- c) What are the Helix modes? [2]
- d) Write the types of Horn antenna. [3]
- e) Write the applications of microstrip antennas. [2]
- f) Write the feed methods of reflector antennas. [3]
- g) Write the principle of pattern multiplication. [2]
- h) Define Broadside and End fire arrays. [3]
- i) What are the Refraction and reflection? [2]
- j) Explain critical frequency. [3]

PART - B**(50 Marks)**

- 2.a) What is beam area? Define and derive the beam efficiency of antenna.
 - b) Derive the radiating resistance and radiated power of half-wave dipole. [5+5]
- OR**
- 3.a) What is the effective area of a half wave dipole operating at 500 MHz.
 - b) Derive the radiating resistance and radiated power of Half-wave monopole. [4+6]
- 4.a) Explain design and the operation principle of helical antenna with neat diagram.
 - b) Explain design and the operation principle of Pyramidal Horn antenna. [6+4]
- OR**
- 5.a) Explain the operation of any one VHF antenna and write their Characteristics.
 - b) Design Yag-Uda antenna of six elements to provide a gain of 12 dB, if the operating frequency is 200MHz. [6+4]
- 6.a) Explain the principle and operation of microstrip antenna.
 - b) Explain about parabolic reflector with neat diagrams. [5+5]
- OR**
- 7.a) Write applications of rectangular patch antenna, and Explain about rectangular patch antenna with neat diagrams.
 - b) Find the power gain of paraboloid reflector antenna with 1.8m diameter operating at 4GHz. [6+4]

- 8.a) Explain about Near and Far field measurements of an antenna.
b) Discuss about the Measurement of antenna patterns in detail. [5+5]

OR

- 9.a) Write the expression of principle of pattern multiplication and consider an array of eight elements.
b) Write the differences between Broadside array and End-fire array. [5+5]

- 10.a) Explain about reflection factors of earth and write the wave tilt of the ground wave.
b) Explain maximum usable frequency (MUF) and skip distance. [6+4]

OR

- 11.a) Explain about Tropospheric wave propagation.
b) Discuss about the atmospheric effects in space wave propagation. [5+5]

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