

Code No.: EC602PC

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**CMR ENGINEERING COLLEGE: : HYDERABAD**  
**UGC AUTONOMOUS**  
**III-B.TECH-II-Semester End Examinations (Supply) - January- 2024**  
**ANTENNAS AND WAVE PROPAGATION**  
**(ECE)**

[Time: 3 Hours]

[Max. Marks: 70]

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

Part A is compulsory which carries 20 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**

**(20 Marks)**

1. a) Define radiation resistance. [2M]
- b) What is meant by effective height of the antenna? [2M]
- c) What do you mean by Isotropic source? [2M]
- d) Define reciprocity. [2M]
- e) Write the applications of helical antenna. [2M]
- f) List the design considerations of pyramidal horn antenna [2M]
- g) Write the applications of reflector antennas. [2M]
- h) What are the different types of the reflectors? [2M]
- i) Define critical frequency. [2M]
- j) Write about wave tilt. [2M]

**PART-B**

**(50 Marks)**

2. Discuss the front-to-back ratio of an antenna. How is it calculated, and why is it important in antenna performance? [10M]
- OR**
3. Analyze the far fields of small loop and short dipole of loop antenna and derive the expression of radiation resistance and directivity of loop antenna. [10M]
4. Explain the principle of pattern multiplication in antenna array. How does this principle contribute to the overall performance of the array? [10M]
- OR**
5. Explain the concept of near and far fields in antenna measurements and explain the directivity measurement in antenna measurement. [10M]
6. Describe Fermat's principle in horn antenna and design optimum horn antenna. [10M]
- OR**
7. Explain monofilar helical antenna in axial and normal mode. [10M]
8. List the parameters and characteristics of microstrip patch antenna. Explain. [10M]
- OR**
9. Discuss about the feed methods used in Paraboloidal Reflectors. [10M]
10. List the different modes of wave propagation and explain ground wave propagation. [10M]
- OR**
11. Explain space wave propagation. [10M]

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