Code No.: EC602PC | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
III–B.TECH–II–Semester End Examinations (Regular) - June- 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 Half Power Beam Width.	[2M]
b)	Compare the far fields of small loop and short dipole.	[2M]
c)	Define uniform array antenna.	[2M]
d)	How can we eliminate minor lobes in Binomial array?	[2M]
e)	List out characteristics of Folded dipole.	[2M]
f)	Draw the Helical Antenna structure.	[2M]
g)	What are the Applications of Microstrip antennas?	[2M]
h)	List out the characteristics of parabolic reflector antenna.	[2M]
i)	At what distance the sky wave propagation is present from the earth surface?	[2M]
j)	In which mode of propagation the waves are guided along the surface of the earth?	[2M]

PART-B   (50 Marks)

2. Derive the expressions for radiating electric field (E_Θ), magnetic field (H_ϕ) for short dipole. [10M]

OR

3. Derive the expression for the field quantities radiated from a $\lambda/2$ dipole and prove the radiation resistance to be 73Ω. [10M]

4.a) Derive expression for the Array factor of an 'N' element uniform linear array. [6M]

b) Distinguish between Broad side array and End fire array. [4M]

OR

5. Explain the gain measurement of an antenna using three antenna method with neat sketch. [10M]

6. Explain about horn antenna and classify different types of horn antennas? Explain about Fermat's principle for design of horn antenna? [10M]

OR

7. Discuss the construction of a Yagi Uda array with neat diagram. [10M]

8. Discuss the characteristics of microstrip patch antenna and also write advantages and disadvantages. [10M]

OR

9. With neat diagram explain the principle of parabolic reflector antenna and various types of feed used. [10M]

10.a) Define Critical frequency, MUF and find the critical frequency when the refractive [5M]
index of the layer is 0.54 and MUF is 9MHz?

b) Explain Skip distance and virtual height? [5M]

OR

11.a) Explain Tropospheric scatter propagation. [5M]

b) Explain duct propagation. [5M]

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