

International Islamic University Chittagong (IIUC)

Department of Electronics and telecommunication Engineering

Mid Term Examination

Program: B.sc Engr. (ETE)

Course Code: ETE-3649

Total Marks: 30

Section: 5AM+6AM

Semester: Autumn 2022/Spring-2023

Course Title: Antenna and propagation

Time: 1 Hour 30 minutes

Course Outcomes (COs) of the Question		Bloom's Levels
Upon the successful completion of the course, students will be able to		
CO1	Explain different antenna parameters and their use while designing an antenna.	Remember/ Understand
CO2	Understand the basic Working Principle of different antennas and antenna arrays.	Understand
CO3	Design various antennas and arrays to meet the stated specifications in terms of antenna parameters.	Apply/ Analyze

1	a) Distinguish between: <ul style="list-style-type: none"> I. Radiation Intensity and Radiated Power. II. Directive gain and Directivity 	CO1	R/U	4
	b) What is radiation intensity? Prove that the radiation intensity U is independent of the angles ϕ and θ .	CO2	Ap	6
2	a) What is aperture area? Derive the Friis Transmission formula.	CO1	R/U	4
	b) What is polarization of an antenna? Explain different types of polarization with proper expression.	CO1	R/U	4
	c) Define polarization loss factor (PLF).	CO1	R	2
3	a) Calculate the magnetic field intensity for an oscillating electric dipole.	CO2	An	6
	b) Find the radiation efficiency of a dipole antenna of length 0.3λ at frequency of 100MHz if the loss resistance is 0.01Ω .	CO2	Ap	4
OR				
	a) Derive an expression for the resultant radiation pattern of two-element array.	CO3	Ap	4
	b) Given a two-element array shown in Figure 1 where there are infinitesimal dipole elements parallel to the y-axis, Calculate and find the nulls of the total field pattern when the spacing between the two elements is $d = \lambda/2$. <ul style="list-style-type: none"> I. Beta = 0 degree II. Beta = $+\pi/2$ degree III. Beta = $-\pi/2$ degree 	CO3	Ap	6

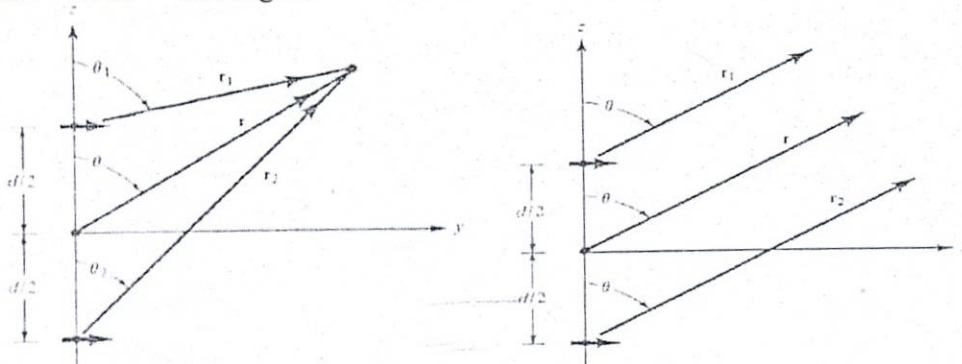


Figure-1