



PRESIDENCY UNIVERSITY

BENGALURU

Roll No.													
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End - Term Examinations – May / June 2026

Date: 25-05-2026

Time: 01:00pm – 04:00pm

School: SOE	Program: B.TECH (ECE)	
Course Code: ECE3163	Course Name: ANTENNA AND WAVE PROPAGATION	
Semester: VI	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05	C06
Marks	12	12	14	14	24	24

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1.	State Maxwell's equations in integral form.	2 Marks	L1	C01
2.	Why is circular polarization considered a special case of elliptical polarization?	2 Marks	L1	C02
3.	What is a Marconi Dipole?	2 Marks	L1	C03
4.	Distinguish between Fresnel and Fraunhofer regions.	2 Marks	L2	C03
5.	How do you achieve an Broadside radiation pattern?	2 Marks	L2	C04
6.	What is the effect of increasing the number of elements in an array on the directivity?	2 Marks	L3	C04
7.	What is the typical gain range for a Paraboloidal reflector?	2 Marks	L2	C05
8.	State two advantages of Rectangular Patch Antennas.	2 Marks	L3	C05
9.	Define Maximum Usable Frequency.	2 Marks	L2	C06
10.	What is the different layers of Ionosphere?	2 Marks	L1	C06

Part B

Answer the Questions.

Total Marks 80M

11.	a.	What is the role of the Wave Equation in determining speed of propagation of wave?	20 Marks	L2	C01
	b.	Define the propagation constant γ and its components.		L2	C02
Or					
12.	a.	Define the boundary condition for the normal component of Electric flux density D.	20 Marks	L2	C01
	b.	What are the characteristics of a Plane Electromagnetic Wave in free space?		L2	C02
13.	a.	Calculate the gain of an antenna if the directivity is 20 and efficiency is 80%.	20 Marks	L3	C03
	b.	Compare Broadside and End-fire arrays based on their radiation properties.		L3	C04
Or					
14.	a.	A folded dipole antenna has a radiation resistance of $250\ \Omega$ and loss resistance of $20\ \Omega$. Calculate the radiation efficiency.	20 Marks	L3	C03
	b.	Show how directivity is improved using antenna arrays.		L3	C04
15.	a.	Analyze the geometry and radiation mechanism of a Rectangular Patch Antenna.	20 Marks	L3	C05
	b.	Compare Ground Wave, Space Wave, and Sky Wave propagation modes.		L3	C06
Or					
16.	a.	Explain the working of a Paraboloidal Reflector and its pattern characteristics.	20 Marks	L4	C05
	b.	Analyze the phenomenon of Ground Wave propagation.		L3	C06
17.	a.	Analyze the effect of the dielectric constant on the size of a patch antenna.	20 Marks	L4	C05
	b.	Calculate the skip distance for a given MUF and virtual height.		L3	C06
Or					
18.	a.	Design a Rectangular Patch Antenna for 3 GHz application.	20 Marks	L4	C05
	b.	Examine the factors affecting the refraction and reflection of sky waves.		L3	C06