

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- VI EXAMINATION – SUMMER 2026

Subject Code:3161003

Date:08-06-2026

Subject Name: Antennas and Propagation

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Define the terms given below (i) Radiation Intensity (ii) Antenna Gain (iii) Antenna Resolution	03
	(b) Explain the concept of polarization for an antenna.	04
	(c) Derive and explain Friss transmission formula	07
Q.2	(a) Find the radiation resistance of a hertzian dipole of length $\lambda/60$.	03
	(b) Differentiate between broadside array and endfire array.	04
	(c) Write a short note on types of antennas with necessary figures.	07
	OR	
	(c) Derive the expression for the radiation resistance of half-wave dipole.	07
Q.3	(a) What is meant by reciprocity Theorem?	03
	(b) Discuss the antenna field zone with necessary figure.	04
	(c) Describe the procedure for the measurement of gain of antenna under test.	07
	OR	
Q.3	(a) Discuss a folded dipole antenna.	03
	(b) Explain the Lens antenna with merits and demerits of lens antenna.	04
	(c) With necessary figure and derivations explain N element array of equal amplitude and spacing. Write the equation for array Factor.	07
Q.4	(a) Explain in brief the Slot antennas.	03
	(b) Write a short note on binomial array.	04
	(c) State Babinet's principle and discuss its usability in the slot antennas and complementary antennas. "Log periodic antenna offers wide band width operations." Justify your answer.	07
	OR	
Q.4	(a) Explain Cassegrain feed with figure.	03
	(b) Explain ultra wide band antenna.	04

- (c) With figure explain the working principle of Three element Yagi-Uda antenna. Explain how improvement in basic Yagi-Uda antenna can be made. Also write the applications of Yagi-Uda antenna. **07**
- Q.5** (a) Explain parabolic reflector antenna **03**
- (b) Describe various types of basic horns with figure. **04**
- (c) Briefly explain different modes of propagation of helical antenna and compare its performance in terms of geometry of that helix. **07**
- OR**
- Q.5** (a) Explain multihop propagation briefly **03**
- (b) List the feeding methods of microstrip patch antenna. Explain microstrip line feed in detail. **04**
- (c) Explain the following **07**
 1) Skip distance 2) Virtual height
