

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2018

Subject Code:2161003

Date:20/11/2018

Subject Name:Antenna & Wave Propagation

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Define Following Terms: 1.Beam Solid angle 2 Radiation pattern 3.Radiation density	03
	(b) Define and explain radiation intensity with necessary equations.	04
	(c) Explain radio Communication link between transmitting antenna and receiving antenna.	07
Q.2	(a) Define antenna list the function of antenna.	03
	(b) The radiation resistance of antenna is 80Ω and loss resistance is 10Ω calculate the antenna efficiency.	04
	(c) Derive the expression of friss transmission formula.	07
	OR	
	(c) Derive the expression for radiation resistance for half wave dipole.	07
Q.3	(a) What is the effective area of half wave dipole operating at 500MHz?	03
	(b) Explain normal mode of radiation of helical antenna.	04
	(c) Explain broadside and end-fire array considering linear array of four isotropic sources.	07
	OR	
Q.3	(a) Find the radiation resistance of a hertzian dipole of length $\lambda/60$.	03
	(b) Define and explain axial ratio for helical antenna.	04
	(c) Explain principal of pattern multiplication for array of point sources. Also give two examples of short dipoles.	07
Q.4	(a) Explain reflector lens antenna.	03
	(b) Explain FNBW and HPBW of a parabolic reflector.	04
	(c) Explain frequency scanning arrays with necessary details.	07
	OR	
Q.4	(a) Explain rumsey's principle.	03
	(b) List the advantages and disadvantages of parabolic reflector.	04
	(c) Explain smart antenna with necessary details.	07
Q.5	(a) Explain the working of artificial lens antenna.	03
	(b) List the feeding methods of microstrip patch antenna. Explain microstrip line feed in detail.	04
	(c) Explain the following 1) Skip distance 2) Virtual height	07
	OR	
Q.5	(a) Explain two antenna gain measurement method in detail.	03
	(b) Explain ultra wide band antenna.	04
	(c) Explain different modes of propagation with its practical significance.	07
