Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VI (NEW) EXAMINATION – WINTER 2020

Subject Code:2161003 **Date:22/01/2021**

Subject Name:Antenna & Wave Propagation

Time:02:00 PM TO 04:00 PM **Total Marks: 56**

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	What are the functions of antenna?	**03**
	(b)	Define: (1) Directivity (2) Resolution (3) Beam Area (4) Radiation Pattern	**04**
	(c)	Write a short note on types of antennas with necessary figures.	**07**
Q.2	**(a)**	Find the radiation resistance of a hertizian dipole of length λ/10.	**03**
	(b)	Using reciprocity theorem to antenna show that effective lengths of transmitting and receiving antennas are the same.	**04**
	(c)	Explain and derive Friss Transmission Formula	**07**
Q.3	**(a)**	Explain Principle of Pattern Multiplication.	**03**
	(b)	Explain Dolph-Tchebysheff distribution for linear arrays.	**04**
	(c)	Derive the far field components and the radiation resistance of a small circular loop with radius 'a' and with a uniform phase current.	**07**
Q.4	**(a)**	Explain Application of Babinet's Principle.	**03**
	(b)	Explain Yagi-Uda Antenna.	**04**
	(c)	Find out the length L ,width W and Half flare angles θ_E and θ_H of a pyramidal horn antenna for which the mouth height h=10λ.The horn is fed by a rectangular waveguide with TE_{10} mode. (Given : δ = 0.20λ in E plane, δ= 0.375λ in H plane)	**07**
Q.5	**(a)**	Explain Broadband antenna.	**03**
	(b)	Explain Cassegrain feed System with figure.	**04**
	(c)	Draw the Geometry of a helical antenna and explain its physical parameters.	**07**
Q.6	**(a)**	Explain log Periodic antenna.	**03**
	(b)	Explain different feeding techniques of Microstrip antenna with figure.	**04**
	(c)	With neat sketches briefly explain reflector lens antennas. Also write its applications.	**07**
Q.7	**(a)**	Calculate the range of space wave propagation with heights of transmitting and receiving antennas equal to 100 meters each.	**03**
	(b)	Explain Plasma antenna.	**04**
	(c)	Explain gain and phase measurement methods.	**07**
Q.8	**(a)**	Explain UWB Antenna.	**03**

(b) With figure describe Ionosphere layers. **04**

(c) Explain Following: **07**

(i) Duct Propagation
(ii) OWF
(iii) Multi hop Propagation
(iv) Skip Distance

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