Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–V. EXAMINATION – SUMMER 2016

Subject Code:X51101 Date:11/05/2016

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.**

Q.1	**(a)**	Explain about:-1>Field zones,2>Beam width,3>Directivity,4>Beam solid angle,5>efficiency.	**07**
	(b)	Derive the expression for radiation resistance of a half-wave dipole antenna	**07**
Q.2	**(a)**	Explain Broad side array and End-fire array. Explain binomial array with an example.	**07**
	(b)	Explain the physical significance of antenna synthesis. Explain the Dolph-Tchebysheff Distribution for linear array.	**07**
		OR	
	(b)	Explain about phased array and frequency scanning array.	**07**
Q.3	**(a)**	Derive the far field components and the radiation resistance of a small Circular loop with radius ‘r’ and with a uniform phase current.	**07**
	(b)	Explain about Axial mode and normal mode of operation of Helical antenna. Explain helix in spherical co-ordinate system to find axial ratio and pitch angle.	**07**
		OR	
Q.3	**(a)**	Explain the features of Yagi-uda antenna. Design a 3-element Yagi-uda with folded dipole having operating frequency of 500 MHz.	**07**
	(b)	Classify different types of Horn antennas. Describe their functions.	**07**
Q.4	**(a)**	What is frequency independent antenna? Explain the design concepts and function of log periodic wire antenna.	**07**
	(b)	Write short notes on 1>micro strip antenna and 2>lens antenna.	**07**
		OR	
Q.4	**(a)**	What is a slot antenna ? State Basinet’s principle. Explain its application to slot antenna and complementary antenna.	**07**
	(b)	Explain the features of microwave antennas. Explain different feed mechanisms of parabolic reflector antenna.	**07**
Q.5	**(a)**	Explain radiation pattern and gain measurement of antenna with the experimental set-up.	**07**
	(b)	Write short notes on :-1>Ionospheric fading,2>Duct propagation,3>Critical frequency.	**07**
		OR	
Q.5	**(a)**	Classify the various modes of electromagnetic radio wave propagation. Explain their technical features and applications. Draw figures and mathematical expressions.	**07**
	(b)	Write short notes on:-1>Virtual height,2>MUF,3>Skip distance	**07**

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