Seat No.:	
No	

GUJARAT TECHNOLOGICAL UNIVERSITY PDDC - SEMESTER-V • EXAMINATION – SUMMER • 2015

	Subj	ect Code: X51101 Date: 07/05/2015	
	Subje Time Instru	 ect Name: Antenna and wave propagation e: 02:30 pm - 05:00 pm Total Marks: 70 ctions: Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. 	
Q.1	(a)	Derive and explain expression for received power of antenna with respect to distance between transmitter and receiver and operating frequency	07
	(b)	 Define the following term: 1. Radiation density 2. Directivity 3. Polarization 4. Effective length of antenna 5. Front to back ratio 6. Near field 7. Far field 	07
Q.2	(a) (b)	State and Prove reciprocity theorem for two antenna Derive the expression for radiation resistance of infinitesimal (Hertzian) dipole.	07 07
		OR	07
	(D)	Derive the expression of radiation resistance in half wave dipole antenna.	07
Q.3	(a) (b)	Draw and explain the radiation pattern for various length of dipole and comment about the beam width and directivity of all dipoles. Explain in brief: Broad side and end fire array.	07 07
	(2)	OR	01
Q.3	(a) (b)	Derive the expression for the terminal resistance for folded dipole antenna. Draw the radiation pattern of 4 element linear array with spacing between elements lambda/4 and current in phase.	07 07
Q.4	(a)	An Antenna has field pattern given by $E(\Theta) = \cos \Theta \cos 2\Theta$ for $0^{\circ} \le \Theta \le 90^{\circ}$ find (a) half power beam width (HPBW) (b) the beam width between first nulls (FNBW).	07
	(b)	Explain Yagi – Uda antenna with its features	07
		OR	
Q.4	(a) (b)	Explain two operating modes of helical antenna in detail. Explain Dolph – Tchebysheff distribution and polynomial in detail in antenna array design.	07 07
Q.5	(a) (b)	Explain various types of horn antenna in detail. Explain the Babinet's principle for slot antenna.	07 07
Q.5	(a) (b)	OR Explain the antenna gain measurement method Enlist the modes of propagation and explain space wave propagation.	07 07
