B.E. Electronics & Telecommunication / Communication Engineering / Electronics Engineering Eighth Semester EC8053 / EN8055 - Elective-II : Antenna And Radar Systems

P. Pa Time	iges : e : Thr	2 ree Hour	S * 1 5 6 1 *	GUG/W/18/2034 Max. Marks : 80
	Note	s: 1. 2.	All questions carry equal marks. Illustrate your answers wherever necessary with the help of neat sk	zetches.
1.	a)	Derive	the poynting vector for elliptically and circularly polarised wave.	8
	b)	Derive	and explain the Friis transmission formulae for Radio communicatio	on link. 8
			OR	
2.	a)	Define	an antenna and explain its various important parameters.	12
	b)	An elli compo	ptically polarized wave travelling in positive z-direction in air has x a nents	and y 4
		Ex = 3	$\sin(\omega t - \beta x)(v_m^{-1})$	
		Ey = 6	$\sin(\omega t - \beta x + 75^{\circ})(v_m^{-1})$	
		Find th	e average power per unit area conveyed by the wave.	
3.	a)	Derive	the expression to relate the impedance of slot and Dipole antenna.	8
	b)	Write a	short note on :	8
		i) Fl	at sheet reflector.	
		ii) Le	ens Antenna.	
			OR	
4.	a)	Descril i) O ii) O	be in detail with diagram. pen out coaxial line antenna pen out two conductor.	10
	b)	Explain	the principle of operation and application of parabolic antenna.	6
5.	a)	State th	he reciprocity theorem and derive the expression for reciprocity theor	rem. 8
	b)	Explain	n in detail about anechoic chambers and absorbing materials.	8

OR

6.		Describe the measurement techniques for different antenna parameters.	16	
7.	a)	What are the basic difference between a search radar and tracking radars ? Discuss the various scanning technique in Radar.		
	b)	Describe the operation of a line pulse modulator.	6	
		OR		
8.	a)	Derive the simplified version of maximum radar range equation in terms of minimum detectable signal $(Pr)_{min}$.	8	
	b)	Draw the block diagram of coherent moving target indicator radar system and explain its operation.	8	
9.	a)	Draw and explain the block diagram of FMCW radar also give its application.	8	
	b)	Define Doppler effect and derive the expression.	4	
	c)	The target is moving with a velocity of 2500 m/s w.r.t. the stationary radar system of frequency 94 Hz. Calculate the Doppler frequency of target.	4	
		OR		
10.	a)	Write short note on any two .	16	

- i) Phased Array Radar.
- ii) Planar Array Radar.
- iii) Blind speed.
