		GUJARAT TECHNOLOGICAL UNIVERSITY	
		BE - SEMESTER-VIII • EXAMINATION – SUMMER 2013	
Subj	ect C	ode: 181103 Date: 09/05/2	2013
Subj	ect Na	ame: Radar and Navigational Aids	
Time	e: 10:3	30 am TO 01:00 pm Total Mark	s: 70
Instru	ctions:	attempt all questions.	
		Make suitable assumptions wherever necessary.	
		igures to the right indicate full marks.	
Q.1		Range estimation using basic RADAR equation may be lagging by 50%,	07
Ų.1	(a)	How we can improve the accuracy of estimation of RADAR range? Justify your answer by considering various factors affecting the radar Range in brief.	07
	(b)	What is the peal power of radar whose average power is 200 W, Pulse width is 1 μ Sec, and pulse repetition frequency is 1000Hz? What is the Range (nmi)of this ground based air surveillance radar if it has to detect a target of 2m², When it operate on the S-band frequency of 2.9Ghz, With rectangular shaped antenna having 5m wide and 2.7m height antenna aperture efficiency is 0.6 and minimum detectable signal Smin is equal to 10^{-12} ?	07
Q.2	(a)		07
	(b)	• •	07
		OR	
	(b)	<u>-</u>	07
Q.3	(a)	necessary block diagram Explain the working of Moving target detector. What is the reason for very high scanning speed of Phased array antenna compared to parabolic reflector antenna? How the steering mechanism	07
		works in linear phase array? Configure Digital Phase shifter with four bit diode switch line length with /16 Quantization which gives 135 phase shift.	
	(b)	Derive a RADAR equation for detection of rain.	07
0.3		OR	0.5
Q.3	(a)	How RCS is modeled? What scenarios are address by Swerling Case-I to Case-IV?	07
	(b)	How the severity of clutter disturbance is addressed by Space time adaptive signal processing (STAP) in case of an Air born RADAR?	07
Q.4	(a)	Why FMCW is dominated by pulsed Doppler RADAR as time progress since WW-II?	07
	(b)	What is VOR? Explain its working	07
	(-)	OR	
Q.4	(a)	For air surveillance radar Explain how Tracking is done(TWS)?	07

How we can use RADAR for imaging? Explain working of SAR?

Explain working of Microwave landing system.

Explain working of modern GPS system.

(a) Write short notes on Doppler Navigation.

(b) Explain working of the LORAN system.

Q.5

Q.5

(a)

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