Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2025

Subject Code:3171110 Date:08-05-2025

Subject Name:Radar and Navigational Aids

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	(1) Radar is an acronym of _____. (2) Define Echo signal in Radar (3) Define Range of Radar.	**03**
	(b)	List down the types of Radar. Explain any one.	**04**
	(c)	Derive the simple form of radar range equation.	**07**
Q.2	**(a)**	Define Navigation, Celestial Navigation, Radio Navigation	**03**
	(b)	Write a brief note on Doppler Effect.	**04**
	(c)	Explain the working of FMCW Radar with the help of block diagram.	**07**
		OR	
	(c)	Using a block diagram, describe the operation of a Simple CW Radar and a CW Radar with IF amplification.	**07**
Q.3	**(a)**	What are the drawbacks and applications of CW Radar.	**03**
	(b)	Explain Blind Speed. How you can avoid it?	**04**
	(c)	Using a block diagram with delay line canceller, explain MTI Radar.	**07**
		OR	
Q.3	**(a)**	A MTI radar is operating at a PRF of 1 KHz, find the lowest blind speed, if it is operating at 2 cm wavelengths.	**03**
	(b)	Briefly describe sequential lobbing.	**04**
	(c)	Explain the working of mono pulse radar with the help of a block diagram.	**07**
Q.4	**(a)**	Using simple block diagram, explain Radar transmitter.	**03**
	(b)	Write a brief note on conical scanning	**04**
	(c)	What are the different types of Radar display? Explain PPI scope.	**07**
		OR	
Q.4	**(a)**	List down different types of Radar antennas. Give brief idea about half wave antenna.	**03**
	(b)	Explain Pilotage in navigation.	**04**
	(c)	Explain the principle of Phased array for electronic scanning. Give the advantages of electronic scanning.	**07**
Q.5	**(a)**	How radio range signals are received? What is cone of silence?	**03**
	(b)	Define the purpose of VOR in navigation.	**04**
	(c)	Explain the working of loop antenna as a direction finder and enumerate the error occurs in direction finding.	**07**

OR

Q.5	**(a)**	Define Glide slope, Localiser, and outer marker in ILS.	**03**
	(b)	Explain briefly the principle of hyperbolic electronic navigation system.	**04**
	(c)	Write a short note on Global Positioning system.	**07**

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