

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2018

Subject Code: 2181103

Date: 30/04/2018

Subject Name: Radar & Navigational Aids(Departmental Elective - III)

Time: 10:30 AM to 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Explain various Application of Radar	03
	(b) Derive basic radar range equation and write radar range equation in terms of noise figure.	04
	(c) Define Following PRT 2) Dwell Time 3) Maximum Unambiguous range 4) clutter 5) Doppler Effect 6) Blind Speed 7) Radar Cross Section	07
Q.2	(a) What is difference between Pulsed Radar and CW Radar	03
	(b) List the four methods of navigation. Describe any one in brief.	04
	(c) With neat diagram of normalized radar cross section of sphere as a function of its circumference. Explain Rayleigh, Mie and Optical Region.	07
	OR	
	(c) What is DME? Explain the operation of DME inside the aircraft.	07
Q.3	(a) Briefly discuss the features of TACAN.	03
	(b) Describe briefly Delay Lines and Cancellers for MTI Radar	04
	(c) Explain Synthetic aperture radar and its applications	07
	OR	
Q.3	(a) Give limitations to MTI performance.	03
	(b) Write short note on Instrument landing system.	04
	(c) How do tracking and scanning radar differ? Explain Monopulse tracking radar.	07
Q.4	(a) Draw and explain DECCA receiver with neat sketch.	03
	(b) Explain LF/MF Four course Radio Range.	04
	(c) Why loop antennas are used in direction finding? Derive an expression for induced output voltage of loop antenna having N turns	07
	OR	
Q.4	(a) Explain principle of hyperbolic electronics system and name four different hyperbolic navigational systems.	03
	(b) What do you mean by VOR? Explain its receiving equipment	04
	(c) Define direction finder term and which antenna is used for this purpose and why? Also briefly explain propagation effects and S/N ratio with respect to radar performance	07
Q.5	(a) Distinguish between COHO and STALO.	03
	(b) Describe the principle of phased array for electronic scanning with advantages and capabilities of electronic scanning.	04
	(c) Name Navigation Satellites of different countries. Explain GAGAN and NAVIC Receiver System.	07

OR

- Q.5**
- (a)** Explain the components of Doppler navigation system. **03**
 - (b)** Draw the block diagram of MTI radar with Power oscillator transmitter and explain its operation? **04**
 - (c)** Name three major segments of GPS System. Explain triangulation in GPS and Application of GPS. **07**
