

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VIII (OLD) EXAMINATION – SUMMER 2022****Subject Code:181103****Date:04/06/2022****Subject Name:Radar & Navigational Aids****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.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Explain the Radar block diagram and operation. **07**  
 (b) Explain Applications of Radar in detail. **07**
- Q.2** (a) Explain various methods of navigation in detail. **07**  
 (b) Write a short note on Global Positioning System. **07**
- OR**
- (b) Define the Following in terms of Radar: (1) Maximum Ambiguous Range **07**  
 (2) PRF (3) Blind Speed (4) Dead Time (5) Marker Beacons (6) Land clutter  
 (7) Sea Clutter
- Q.3** (a) Derive the equation for the maximum range of radar and discuss the factor **07**  
 affecting the radar range.  
 (b) How FMCW radar overcomes the shortcomings of Doppler CW radar? **07**  
 Explain the principle and operation of FM-CW radar in brief.
- OR**
- Q.3** (a) What is the Doppler effect? Briefly explain the working principle of pulse **07**  
 doppler radar with the help of a block diagram.  
 (b) Explain any one method of tracking in detail. **07**
- Q.4** (a) Explain a block diagram of the electronic scanning system and its operation. **07**  
 (b) Explain the types of Radar Antennas. **07**
- OR**
- Q.4** (a) Write a short note on the Instrument landing system. **07**  
 (b) Explain the principle of the NAVSTAR GPS receiver. **07**
- Q.5** (a) Explain the block diagram of Digital Signal Processing. **07**  
 (b) What do you mean by VOR? Explain VOR receiving equipment. **07**
- OR**
- Q.5** (a) Enlist & briefly explain various errors in direction-finding. **07**  
 (b) What is DME? Explain the operation of DME inside the aircraft. **07**

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