

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME – SEMESTER IV (NEW) – • EXAMINATION – SUMMER 2016**

**Subject Code: 2742602****Date: 04/05/2016****Subject Name: Radar Signal Processing****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.

**Q.1 (a)** Draw and explain the generic block diagram of pulsed Monostatic RADAR. **07**

**(b)** What are the basic RADAR functions? Explain each of them. **07**

**Q.2 (a)** Define the following : **07**

1. Resolution
2. Cross range resolution
3. Maximum unambiguous range
4. Clutter
5. Signal to clutter Ratio
6. Jamming
7. Noise Figure

**(b)** Explain Signal to Noise Ratio concept with respect to Radar Signal Processing. **07**

**OR**

**(b)** Derive generalized equation for distributed target forms for point target and volume scattering case by directly considering radar range equation. **07**

**Q.3 (a)** Write a brief note on I/Q imbalance and offset. **07**

**(b)** What is Ambiguity Function (AF)? List out the properties of it and prove any one. **07**

**OR**

**Q.3 (a)** Derive the SNR of matched filter for the simple pulse. **07**

**(b)** Discuss any one method of digital I/Q. **07**

**Q.4 (a)** Write brief note on dwell-to dwell stagger. **07**

**(b)** Explain radar detection as hypothesis testing. What is Neyman-pearson detection rule? **07**

**OR**

**Q.4 (a)** Draw the block diagram of moving target detector system and explain it. **07**

**(b)** Write note on approximation to the error function. **07**

**Q.5 (a)** Explain Doppler Beam Sharpening Algorithm. **07**

**(b)** What is CFAR? List down different CFAR techniques and explain any one. **07**

**OR**

**Q.5 (a)** Discuss the Computational issues in STAP. **07**

**(b)** Write a note on “Advanced STAP Algorithms and Analysis”. **07**

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