

**Subject Code: H4509/R13**

**M. Tech –II Semester Regular/ Supply Examinations, October, 2015**

**RADAR SIGNAL PROCESSING**

**(Common to SSP, DIP, CE&SP, IP, C&SP and SP&C)**

**Time: 3 Hours**

**Max Marks: 60**

**Answer any FIVE questions**

**All questions carry EQUAL marks**

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- 1) a) Draw and explain the block diagram of the pulse radar. Bring out the considerations required to determine the pulse width and PRF of radar system?  
b) What is Bistatic radar? Explain the factors involved in the bistatic range equation?
- 2) a) Explain the principle of a matched filter and derive the expression for frequency response of a matched filter?  
b) Discuss about matched filter and correlation function?
- 3) a) Explain about the detection criteria involved in sequential observer?  
b) Explain in detail about CFAR loss and CFAR uses in radar?
- 4) a) Explain quantitatively about ambiguity function for linear FM pulse?  
b) Explain about the optimum waveforms for the detection in clutter environment?
- 5) a) What is the need of pulse compression? Explain.  
b) Explain the decoding of FM waveforms with neat sketches?
- 6) a) What are the principles of phase coding techniques?  
b) Explain about Barker codes with an example?
- 7) a) Explain in detail about Frank codes an example?  
b) Calculate the maximum range of a radar system which operates at 3 cm with a peak pulse power of 500 KW, if its minimum receivable power is  $10^{-13}$  W, the capture area of its antenna is  $5 \text{ m}^2$  and the radar cross sectional area of the target is  $20 \text{ m}^2$ .
- 8) Write short notes on
  - a) Radar with noise jamming
  - b) SAW pulse Compression

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