

Code No: M0422

R07

Set No. 1

IV B.Tech I Semester Supplementary Examinations, December 2013

RADAR SYSTEMS

(Electronics and Communication Engineering)

Time : 3 hours

Max. Marks: 80

Answer any Five Questions
All Questions carry equal marks

1. a) Draw the block diagram of conventional pulsed radar with a super heterodyne receiver and explain the function of each block.
b) Define Maximum Unambiguous Range and Pulse repetition Frequency of a RADAR [10+6]
2. a) Write short notes on the following System Losses
i) Microwave Plumbing Losses
ii) Antenna Losses
b) Derive the equation a Probability of detection and False Alarm of RADAR [8+8]
3. a) what is Doppler Effect and how to eliminate this effect in RADAR
b) Draw the Non-Zero if receiver block diagram and explain the function of each block [8+8]
4. a) Draw the block diagram of FM-CW Radar and explain the function of each block
b) Write short notes on FM-CW altimeter [8+8]
5. a) Write the difference between MTI radar and Pulse Doppler radar
b) Write short notes on
i) Blind speed
ii) Range gated Doppler [8+8]
6. a) Explain the amplitude comparison Mono pulse two coordinate system draw the block diagram it
b) Explain the concept of Comparison of trackers [8+8]
7. a) Explain the term Matched filter Receiver and derive the impulse response.
b) Define Correlation Function and Cross correlation function Receiver concept. [8+8]
8. a) Explain the different Display types used in radars
b) Write short notes on
i) Branch type Duplexers
ii) Balanced type Duplexers [8+8]

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Set No. 2

IV B.Tech I Semester Supplementary Examinations, December 2013

RADAR SYSTEMS
(Electronics and Communication Engineering)

Time : 3 hours

Max. Marks: 80

Answer any Five Questions
All Questions carry equal marks

1. a) Derive the simple form of the radar equation with respect to power density.
b) Find the peak power of a radar whose average transmitted power is 200W, pulse width is $1\mu\text{s}$, and pulse repetition frequency of 1000 Hz [8+8]
2. a) Explain the minimum detectable signal concept of radar
b) Derive the radar cross section of targets to find the simple target [8+8]
3. a) Draw the block diagram of CW radar and explain the function of each block
b) Write the applications of CW-RADAR [8+8]
4. a) Explain the FM-CW radar altimeter and draw its block diagram
b) What are the measurement errors obtained in CW radar? Explain with an example. [8+8]
5. a) Draw the block diagram MTI radar with Power amplifier and explain each block
b) Write the difference between coherent and non coherent MTI radar [8+8]
6. a) Draw the block diagram of conical scan tracking radar and explain the function of each block
b) Explain the Limitations to tracking accuracy [8+8]
7. a) Derive the frequency response of the Matched filter receiver.
b) Explain the concept of Matched filter with non-white noise [8+8]
8. a) Explain the difference between series and Parallel feeds of a Phased array antenna.
b) Write short notes on
 - i) Duplexers
 - ii) Circulators[8+8]



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Set No. 3

IV B.Tech I Semester Supplementary Examinations, December 2013

RADAR SYSTEMS

(Electronics and Communication Engineering)

Time : 3 hours

Max. Marks: 80

Answer any Five Questions
All Questions carry equal marks

1. a) Explain the IEEE Standard Radar frequency Bands and write applications of RADAR
b) Define maximum Unambiguous range and derive it [8+8]
2. a) Describe briefly the behavior of the radar cross section of a raindrop and a large aircraft with respect to its dependence on frequency.
b) Write short notes on
i) PRF ii) transmitted power iii) Range ambiguities [8+8]
3. a) Explain the concept of Isolation between transmitter and receiver
b) What are the parameters required to calculate the Receiver bandwidth?
Explain briefly [8+8]
4. a) Briefly explain the characteristics of FM-CW radar with block diagram
b) Explain the concept of Range and Doppler measurement of FM-CW radar [8+8]
5. a) Explain the concept of range gated Doppler filter banks in Doppler radar
b) What is delay line canceller explain the double delay line cancellation concept [8+8]
6. write short notes on
i) sequential lobing ii) Conical scan iii) Monopulse tracking radar [8+8]
7. a) Explain the concept of correlation and cross correlation functions in a receiver
b) Derive the efficiency of non matched filter. [8+8]
8. a) Explain the basic concept of phased array antenna.
b) What are the applications, advantages and limitations of Radar Receiver? [8+8]

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Set No. 4

IV B.Tech I Semester Supplementary Examinations, December 2013

RADAR SYSTEMS
(Electronics and Communication Engineering)

Time : 3 hours

Max. Marks: 80

Answer any Five Questions
All Questions carry equal marks

1. a) Derive the simple form of radar equation in terms of antenna aperture efficiency and minimum detectable signal.
b) Draw and explain the basic principle of radar. [10+6]
2. a) Explain the radar cross-section fluctuations and derive the equation.
b) Mention the few applications of radar [8+8]
3. a) explain the following terms
i) Antenna Gain ii) Effective area and Beam width
iii) Beam shape iv) Revisit time
b) Draw the detailed block diagram of CW radar block diagram and explain the function of each block [8+8]
4. a) Briefly explain the Approaching and receding Echo signal of FM-CW radar
b) Write short notes on multiple frequency CW radar [8+8]
5. a) Draw the block diagram of MTI radar that uses a power amplifier as the transmitter and explain it
b) What is delay line canceller explain the single delay line canceller with block diagram [8+8]
6. a) Briefly explain the concept of amplitude comparison monopulse and phase comparison monopulse.
b) Explain the following terms i) split-gate tracker ii) Range Glint [8+8]
7. a) Explain the Efficiency of matched filter compared with non matched filters and give the summary points of matched filter
b) Write short notes on Matched filter frequency response and matched filter impulse response and compare them [8+8]
8. a) Explain the display concept in radar and give the types of Display presentations in radar
b) Write short notes on Noise figure and Noise temperature in Radar receivers [8+8]