R13

Code No: 118EA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, April - 2018
RADAR SYSTEMS
(Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1.a)	Define signal to noise ratio.	[2]
b)	What is maximum unambiguous range?	[3]
c)	Give the advantages of FM - CW radar.	[2]
d)	Write the applications of CW radar.	[3]
e)	What is butterfly shape on radar receiver?	[2]
f)	What is delay line canceller?	[3]
g)	Define squint-angle.	[2]
h)	List the disadvantages of sequential lobbing.	[3]
i)	Define noise temperature.	[2]
j)	Write about correlation function.	[3]

PART - B

(50 Marks)

2.a)	Describe the operation of radar block diagram.	
b)	Derive modified radar range equation.	[5+5]
	OR	
3.a)	Explain, how to minimize the false alarm.	
b)	With the help of expressions explain radar transmitter power.	[5+5]
4.a)	Draw and explain CW radar with nonzero IF receiver.	
b)	Write the merits and demerits of continuous wave radar.	[6+4]
	OR	
5.a)	With suitable waveforms discuss frequency time relationships in FM-CW radar.	
b)	Explain, how the various unwanted signals causes errors in FM altimeter.	[5+5]
6.a)	Describe the operation of MTI Radar with power oscillator transmitter.	
b)	Draw and explain three pulse canceller.	[5+5]
	OR	
7.a)	Write a short note on multiple pulse repetition frequencies.	
b)	What are the factors limits the MTI performance? Explain.	[5+5]

8.a) Describe the operation of conical scanning method.

b) Draw and explain the block diagram of one-coordinate amplitude–comparison mono pulse tracking radar. [5+5]

OR

9.a) In mono pulse radar two antennas are used to produce a phase difference of 25^0 between the echo signals. It operates at frequency of 1.5 GHz. Find the spacing between the antennas, if the angle $\theta = 15^{0.}$

b) Discuss about acquisition and scanning parameters. [5+5]

10. Write a short note on

a) Derivation of matched filter characteristic.

b) Efficiency of non- matched filters. [5+5]

OR

11.a) Draw and explain balanced type duplexer.

b) Explain the merits and limitations of phased array antennas. [5+5]

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