

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

[2]
[3]
[2]
[3]
[2]
[3]
[2]
[3]
[2]
[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]

8R 8R 8R 8R 8R 8R 8R

- 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]

8R 8R 8R 8R OR 8R 8R 8R

- 9.a) In mono pulse radar two antennas are used to produce a phase difference of 25° between the echo signals. It operates at frequency of 1.5 GHz. Find the spacing between the antennas, if the angle $\theta=15^\circ$.
b) Discuss about acquisition and scanning parameters. [5+5]

8R 8R 8R 8R OR 8R 8R 8R

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]

8R 8R 8R 8R ---ooOoo--- 8R 8R 8R

8R 8R 8R 8R 8R 8R 8R

8R 8R 8R 8R 8R 8R 8R

8R 8R 8R 8R 8R 8R 8R

8R 8R 8R 8R 8R 8R 8R