



CBCS SCHEME

17EC833

Eighth Semester B.E. Degree Examination, June/July 2023 Radar Engineering

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain conventional pulse radar with super-heterodyne receiver block diagram. (10 Marks)
- b. Briefly describe the major areas of radar applications. (10 Marks)

OR

- 2 a. Obtain simple form of the Radar Range equation. (10 Marks)
- b. Draw Radar waveform and calculate:
 - (i) The maximum unambiguous range
 - (ii) Duty cycle
 - (iii) The average transmitted power
 - (iv) BandwidthPeak pulse power of 400 KW, a PRF of 1500 PPS and a pulse width of 0.8 μ sec. (10 Marks)

Module-2

- 3 a. Discuss probability of false alarm and the probability of detection for envelope detector output. (10 Marks)
- b. Discuss different types of losses in Radar system. (10 Marks)

OR

- 4 a. Derive the modified radar equation in terms of signal to noise ratio. (10 Marks)
- b. Explain the radar cross section of sphere and cone sphere targets. (10 Marks)

Module-3

- 5 a. Discuss sweep to sweep subtraction and delay line canceller. (10 Marks)
- b. With neat block diagram, explain Moving Target Detector (MTD) signal processor. (10 Marks)

OR

- 6 a. Explain the working of digital Moving Target Indicator (MTI) Doppler signal processor with neat block diagram. (10 Marks)
- b. Derive the equations for clutter attenuation and MTI improvement factor. (10 Marks)

Module-4

- 7 a. List types of tracking radar systems and explain angle tracking in radar systems. (10 Marks)
- b. Explain the block diagram of two-coordinate amplitude comparison monopulse tracking radar. (10 Marks)

OR

- 8 a. Explain the block diagram of conical scan tracking radar. (10 Marks)
- b. Discuss on tracking in range of a tracking radar with suitable waveforms and equations. (10 Marks)

Module-5

- 9 a. What are the functions of radar antenna? Explain electronically steered phase array antenna. (10 Marks)
b. What is duplexer? Explain balanced duplexer, circulator and receiver protector. (10 Marks)

OR

- 10 a. Explain different types of radar display system. (10 Marks)
b. Explain steered reflector antenna of radar system. (10 Marks)

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