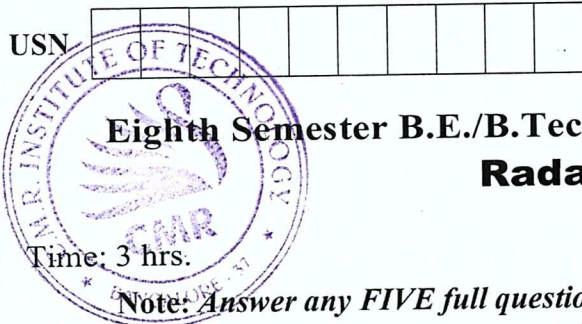


CBCS SCHEME

18EC823

USN



Eighth Semester B.E./B.Tech. Degree Examination, June/July 2025

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 the basic principle of Radar. (04 Marks)
b. Explain the following :
i) Maximum unambiguous range
ii) Radar waveform (12 Marks)
iii) Duty cycle. (04 Marks)
c. State four applications of Radar.

OR

- 2 a. Explain conventional pulse Radar block diagram. (08 Marks)
b. Derive simple form of Radar equation. (08 Marks)
c. Calculate the maximum range of RADAR system which operates at 3 cm with a neat peak pulse power of 600 KW. The capture area of the antenna is 5 m². Radar cross section area of target is 20 m². (04 Marks)

Module-2

- 3 a. Derive modified radar equation in terms of signal to noise ratio. (10 Marks)
b. Explain a portion of radar receiver block diagram and discuss the probability of false alarm and probability of detection with necessary equations. (10 Marks)

OR

- 4 a. Explain various system losses. (10 Marks)
b. Write short notes on simple targets : i) Sphere ii) Cone sphere. (10 Marks)

Module-3

- 5 a. Explain simple CW Doppler RADAR and Pulse RADAR state its advantages and disadvantages. (10 Marks)
- b. Explain three pulse delay line canceller with block diagram and compare with double delay line canceller? Also design equation for N pulse delay line canceller. (10 Marks)

OR

- 6 a. Explain the block diagram of a digital MTI doppler signal processor. (07 Marks)
b. Explain the block diagram of the original Moving Target Detector (MTD) signal processor. (07 Marks)
c. Explain Clutter Attenuation. (06 Marks)

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Module-4

- 7 a. Explain different types of Tracking Radar systems. (08 Marks)
b. Explain Angle Tracking. (04 Marks)
c. Explain the simple block diagram of the Amplitude comparison monopulse in one angle coordinate. (08 Marks)

OR

- 8 a. Explain sequential Lobing. (05 Marks)
b. Explain conical scan tracking radar. (10 Marks)
c. Explain Split-Gate Tracker. (05 Marks)

Module-5

- 9 a. List the functions of RADAR antenna. (10 Marks)
- b. Write short notes on :
- i) Directive gain
 - ii) Antennae Radiation pattern
 - iii) Effective Aperture. (10 Marks)
- c. Explain Electronically Steered Phased Array Antenna.

OR

- 10 a. Explain Receiver Noise figure of cascaded networks. (08 Marks)
b. Write short notes on :
i) Types of Mixer used in superheterodyne receiver
ii) Various Radar displays. (12 Marks)

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