

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
IV B. Tech I Semester Advanced Supplementary Examinations March 2025

RADAR ENGINEERING

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from Each unit

All Questions Carry Equal Marks

UNIT-I

1. a) A radar system transmits pulses of duration $2\ \mu\text{s}$ and repetition rate of 1 KHz. [7M]
Find the minimum and maximum range for radar.
b) Derive and discuss the modified radar range equation. [7M]
(OR)
2. a) Illustrate the radar block diagram and explain its operation. [7M]
b) Discuss the integration of radar pulses and its effect on signal detection. [7M]

UNIT-II

3. a) What are the isolation requirements in CW radar, and how are they achieved? [7M]
b) Describe the range and Doppler measurement capabilities of FM-CW radar. [7M]
(OR)
4. a) Explain the block diagram and working principle of an FM-CW altimeter. [7M]
b) What is the importance of non-zero IF receivers in CW radar? [7M]

UNIT-III

5. a) Discuss the limitations of MTI radar performance and how they are addressed. [7M]
b) Explain the concept of range-gated Doppler filters. [7M]
(OR)
6. a) What are staggered PRFs, and how do they help in MTI radar? [7M]
b) Explain the principle of operation of an Nth order cancellation in MTI radar. [7M]

UNIT-IV

7. a) Compare sequential lobing and conical scan tracking methods. [7M]
b) Describe the operation of phase comparison monopulse radar in detail. [7M]
(OR)
8. a) What are the challenges in radar acquisition and how are they addressed? [7M]
b) Explain the differences between one-coordinate and two-coordinate monopulse radar. [7M]

UNIT-V

9. a) Discuss the role of the matched filter receiver in radar signal detection. [7M]
b) Explain the concept of noise temperature and its effect on radar system performance. [7M]
(OR)
10. a) Write about correlation detection and cross-correlation receiver. [7M]
b) Describe the advantages and applications of Phased array antennas. [7M]
