

Roll No.

Total Pages : 3

BT-8/M-20

38011

RADAR ENGINEERING

Paper–ECE-404E

Time Allowed : 3 Hours]

[Maximum Marks : 100

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT-I

1. (a) Draw the block diagram of radar. Briefly describe the working and various applications of Radar. 10
- (b) Derive the simple form of radar range equation in terms of minimum detectable signal to noise ratio $(S/N)_{\min}$ and explain why $(S/N)_{\min}$ is a better measure of radar detection than the minimum detectable signal (S_{\min}) ? 10
2. (a) Explain the role and significance of Signal to noise ratio and Pulse repetition frequency in Radar. 10
- (b) Enlist various propagation effects and losses in Radar system. Discuss them in detail. 10

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UNIT-II

3. (a) Differentiate between FM-CW Radar, CW Radar and Multiple-frequency CW Radar. 10
- (b) Define Delay line canceller. Using block diagram explain the operation of FM-CW Radar. Give its merits and applications. 10
4. (a) What are the limitations of MTI performance ? Explain the working of Pulse Doppler Radar. 10
- (b) Explain the concept and operation of Range-Gated Doppler Filters. Give its merits also. 10

UNIT-III

5. (a) Compare tracking and search Radar. Using neat sketch, explain various tracking mechanisms. 10
- (b) Differentiate between Conical-Scan and Sequential Lobbing. 10
6. Discuss the following :
- (a) Range and Acquisition 10
- (b) Mono-Pulse Tracking Radar 10

UNIT-IV

7. Discuss the following :
- (a) Types of Radar Displays 10
 - (b) Operation of Radar Receivers 10
8. Briefly describe the following :
- (a) Noise figure and Receiver protectors 10
 - (b) Branch-type and Balanced duplexers 10