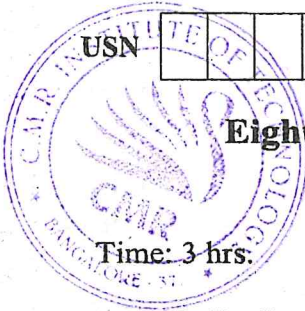


CBCS SCHEME

15EC833



Eighth Semester B.E. Degree Examination, Aug./Sept.2020 Radar Engineering

Time: 3 hrs.

Max. Marks: 80

- Note: i) For Regular Students: Answer any FIVE full questions irrespective of modules.
ii) For Arrear Students : Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- Explain the basic principle of Radar. (04 Marks)
 - Derive simple form of Radar range equation. (08 Marks)
 - Define the following terms used in Radar: i) Duty cycle ii) Average power. (04 Marks)
- Explain block diagram of a Radar with a neat diagram and explain each block. (08 Marks)
 - Explain the various applications of Radar. (06 Marks)
 - Write a brief note on maximum unambiguous range R_{un} . (02 Marks)

Module-2

- Define noise figure of receiver and prove that $R_{max}^4 = \frac{P_t G A_e \sigma}{(4\pi)^2 k T_0 B F_n (S/N)_{min}}$ (10 Marks)
 - Write a brief note on pulse repetition frequency. (06 Marks)
- Briefly explain various radar system losses. (10 Marks)
 - Write a brief note on Envelope detector. (06 Marks)

Module-3

- With a neat block diagram, explain simple CW Doppler radar. Also mention the advantages and disadvantages. (08 Marks)
 - Explain with a neat block diagram the working of a digital MTI doppler signal processor. (08 Marks)
- With a block diagram, explain the working of MTI radar with power amplifier transmitter. (08 Marks)
 - With a neat block diagram, explain Moving Target Detector [MTD]. (08 Marks)

Module-4

- Explain the types of Tracking Radar systems. (08 Marks)
 - Explain the block diagram of conical scan tracking radar. (08 Marks)
- With a neat diagram, explain sequential lobing and conical scan. (08 Marks)
 - Explain the block diagram of amplitude comparison monopulse tracking radar for a single angular coordinate and explain its operation. (08 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

Module-5

- 9 a. What are the functions of the radar antenna? (04 Marks)
b. Explain the following antenna parameters:
i) Directive Gain (04 Marks)
ii) Effective aperture. (08 Marks)
c. Write a brief note on radar displays. (08 Marks)
- 10 a. Write short note on: Superhetrodyne receiver. (08 Marks)
b. Write short note on: Reflector antennas. (08 Marks)
