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Eighth Semester B.E. Degree Examination, July/August 2022 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. Derive simple form of radar range equation. (10 Marks)
- b. Define radar and explain basic principle of radar. (10 Marks)

OR

- 2 a. Explain block diagram of a radar with a neat diagram and explain each block. (10 Marks)
- b. Explain various applications of radar. (10 Marks)

Module-2

- 3 a. Define noise figure and derive modified radar range equation. (10 Marks)
- b. Discuss with equation and graph the probability of false alarm. (10 Marks)

OR

- 4 a. Explain the radar cross section of sphere and cone sphere targets. (10 Marks)
- b. Discuss briefly the following types of system losses in radar: i) Microwave plumbing losses
ii) Antenna losses iii) Duplexer losses iv) Connector losses. (10 Marks)

Module-3

- 5 a. With a neat block diagram, explain simple CW Doppler radar. Also mention the advantages and disadvantages. (10 Marks)
- b. Derive equations for clutter attenuation and MTI improvement factor. (10 Marks)

OR

- 6 a. With a neat block diagram, explain the original Moving Target Detector (MTD) signal processor. (10 Marks)
- b. Explain the working of digital Moving Target Indicator (MTI) Doppler signal processor with neat diagram. (10 Marks)

Module-4

- 7 a. Explain types of tracking radar systems. (10 Marks)
- b. Explain the block diagram of conical scan tracking radar. (10 Marks)

OR

- 8 a. Define monopulse tracker. Using block diagram explain amplitude comparison monopulse tracking radar for a single angular coordinate. (10 Marks)
- b. Discuss the concept of phase comparison monopulse. (10 Marks)

Module-5

- 9 a. List the different functions served by radar antenna. (10 Marks)
- b. Explain different types of radar display system. (10 Marks)

OR

- 10 a. Write a note on reflector antennas. (10 Marks)
- b. What is the role of duplexer's in radar system? Illustrate the transmit condition and receive condition in case of balanced mixer. (10 Marks)