

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2890

Roll No.

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B.Tech.

(SEM. VIII) THEORY EXAMINATION 2011-12

INTRODUCTION TO RADAR SYSTEMS

Time : 3 Hours

Total Marks : 100

Note :— Attempt **all** questions. All questions carry equal marks.

1. Attempt any **four** parts :— (4×5=20)
 - (a) What are the basic functions of Radar ?
 - (b) Derive Radar Range Equation.
 - (c) What is Doppler Effect and how it is useful in long distance communication ?
 - (d) Define Radar cross-section. Describe briefly some of the factors governing the relation between the Radar cross-section of a target and its true cross-section.
 - (e) Show that the maximum range of Radar operating at a given frequency is proportional to the linear dimension of the antenna.
 - (f) Write short notes on Pulse Repetition Frequency (PRF) and its significance.
2. Attempt any **four** parts :— (4×5=20)
 - (a) Describe the various antenna parameters.
 - (b) Discuss M.T.I. Radar and its applications.

- (c) Write short note on Delay-Line Cancellers.
 - (d) Explain the working of Moving Target Detector.
 - (e) Describe matched filter for the pulse burst waveform.
 - (f) Write short note on staggered pulse repetition frequencies.
3. Attempt any two parts :— (2×10=20)
- (a) What do you understand by Tracking with Radar ? Explain mono pulse tracking in detail.
 - (b) Explain conical scan and sequential lobing in detail. Write limitations of tracking accuracy.
 - (c) Write short note on Automatic Tracking with Surveillance Radars.
4. Attempt any two parts :— (2×10=20)
- (a) Derive an expression for probability of false alarm. Distinguish it from probability of miss.
 - (b) Write short note on detection of signals in noise.
 - (c) What do you mean by coherent, non-coherent and binary integration ? Discuss non-coherent integration of non-fluctuating targets.
5. Attempt any two parts :— (2×10=20)
- (a) Write short note on Radar Clutter.
 - (b) What is ambiguity function ? Discuss the ambiguity function of a simple pulse.
 - (c) Write short note on accuracy of Radar measurement.