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

PAPER ID : 2890 Roll No. | | | | | | | | | | |

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.