QP Code : 4427

(OLD COURSE)

(3 Hours) [Total Marks :100]

N.B. : (1) Questions No. 1 is compulsory.
(2) Attempt any four out of remaining six questions.
(3) Support your Answers with neat sketches/ Diagrams
(4) Assume suitable data wherever necessary.

1. Solve Any four of the following :-

   (a) Explain with mathematical expression, how the range can be measured in MFCW (multifrequency CW Radar)? 5

   (b) How the drawback of clutter attenuation problem is overcome by Double delay line Canceller? What is MTI Improvement factor in this respect? 5

   (c) What are the various application of Raddar? 5

   (d) What do you mean by threshold detection? Define the terms"False Alarming"and Missed Detection" 5

   (e) State the types of angels in Radar? Explain them in brief. '5

2. (a) Explain the basic Principle of Radar System with block schematic. State, What are the different informations can be extracted from the received echos after processing. 10

   (b) State and Explain "Radar System Losses" in details. 10

3. (a) Define the term "Radar cross section of Target" (RCS) explain the RCS of simple spherical target. 10

   (b) What do you mean by RCS fluctuations? Explain different model for RCS fluctuations. 10

4. (a) A Radar measures apparent range of 7 nmi, When PRF is 4 KHZ, but measures an apparent range 18.6 nmi, when PRF IS 3.5 KHZ. What is true range.in nmi? 10

   (b) Explain FM CW Radar with block Schematic 10

5. (a) Derive the equation of frequency response of the single delay line canceller. What is blind speed? Derive the equation for blind speed. 10

   (b) Derive the surface -cutter Radar equation Draw Elevation and plan view for illuminated clutter patch in support. 10

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6. (a) Describe conical scan Tracking mechanism with block Diagram description.   10

   (b) What is the function of Duplexer? Explain any two types of Duplexers with   10
necessary Diagram.

7. Write short notes on the following (any four)   20

    (a)   Radar Displays.

    (b)   Properties of sea clutter and land clutter

    (c)   Phased array antenna.

    (d)   Matched filter

    (e)   Blind speed problem resolution method (any one)