

Q.P. Code : 587501

(3 Hours)

[Total Marks : 100

- N.B.:** (1) Question **No.1** is **compulsory**.
(2) Solve **any Four** question from **Q. No.2** to **Q. No.7**.
(3) Assume suitable **data** if **necessary**.
(4) Support your answers with **neat sketches / diagrams**, wherever **necessary**.

1. Answer the following (**any Two**) : **20**
- (a) Explain, how the following information can be obtained from processing the echoes :
 - (i) Range measurement;
 - (ii) Determining the Location of target;
 - (iii) Measuring the Velocity of target.
 - (b) Define with neat sketch; Grazing angle, Depression angle & Incident angle; for surface clutter patch.
 - (c) Explain, the working of amplitude comparison mono-pulse tracking system.
 - (d) What is the peak power of the Radar, whose average transmitted power is 200 watts, pulse width of $1\mu\text{s}$ and PRF of 100 Hz.
2. (a) What are the various applications of Radar? Explain. **10**
(b) Explain, how change in PRF can resolve the range ambiguity problem ? **10**
3. (a) What is RCS of target? Describe the chief characteristic of Radar echo from target when its RCS is in; **10**
 - (i) Rayleigh Region;
 - (ii) Resonance Region
 - (iii) Optical region.
- (b) Draw and Explain the operation of simple CW Radar (Zero IF radar). **10**
4. (a) Explain the working of sweep to sweep subtractor with waveform and explain the operation of single DLC with block schematic. **10**
(b) What are the different properties of sea clutter ? **10**

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5. (a) How range is measured in FMCW Radar ? Explain FM-CW Radar with block schematic. 10
(b) What is the limitation of single delay line canceller ? How Double delay line canceller overcomes it ? 10
6. (a) Draw a Block diagram for M.T.I. Radar and Explain the significance of STALO and COHO. 10
(b) State the classifications of Radar systems and Explain High PRF pulsed Radar system with neat sketch. 10
7. Write short notes on (**any Two**) : 20
(a) High PRF pulsed Radar
(b) Land Clutter
(c) Conical scanning, target tracking system
(d) Radar Displays