

17/12/14

TE-ET-SEU-VI (REV)

Elective-01 - Radar Engg. QP Code :15254

(3 Hours)

[Total Marks : 100]

- N.B.:** (1) Question No. 1 is compulsory.
(2) Attempt any **four** out of the remaining **six** questions.
(3) Assume **suitable** data wherever **necessary**.

1. (a) Explain the factors which govern the pulse repetition frequency. 5
(b) Discuss about the frequency ranges in which radar operates. 5
(c) An MIT radar operates at 5 GHz & uses PRF of 800pps. Calculate the lowest three blind speeds of the radar. 5
(d) what are the properties of sea and land clutter ? . 5
2. (a) What is the drawback in simple CW Radar ? How does CW-IF offer solution to these drawbacks ? Thus, explain CW-IF radar in detail. 10
(b) Derive the equation for radar range and explain in detail how various factors influence the radar range. 10
3. (a) What are basic differences between a search radar and a tracking radar ? Discuss the various scanning techniques and tracking mechanisms. 10
(b) With a suitable diagram explain the working of conical scan tracking radar. Explain the various factors to be considered in determining the optimum squint angle. 10
4. (a) Define and explain the following terms. Insertion loss, Integration improvement factor, blind speed, noise aperture. 10
(b) Compare and explain the phased array antenna systems and conventional antennas used in radar system. 10
5. (a) Differentiate between amplitude comparison and phase comparison methods of monopulse tracking. 10
(b) Explain in brief radar resolution cell. 10
6. (a) Explain in details matched filter receiver of radar. 10
(b) Describe the chief characteristics of the radar echo from a target when its radar cross section is in the 1. Raleigh region 2. Resonance region 3. In the optical region. 10
7. Write short notes on any **three** :- 20
 - (a) FM-CW altimeters
 - (b) Doppler Filter banks
 - (c) Displays used in radar
 - (d) Monopulse tracking

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