

Code No: **R1641041**

R16

Set No. 1

IV B.Tech I Semester Supplementary Examinations, February - 2020

RADAR SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any FOUR questions from Part-B

PART-A (14 Marks)

1. a) List out system losses. [2]
- b) List out the advantages, disadvantages, and applications of CW Radar. [3]
- c) Define blind speed. Represent each term in equation. [2]
- d) Justify the role of error signal in conical scan tracking radar. [3]
- e) Define noise figure and noise temperature. [2]
- f) Define series feed and draw the circuit. [2]

PART-B (4x14 = 56 Marks)

2. a) Derive the modified radar range equation. [7]
- b) Explain the pulse integration technique. [7]
3. a) Prove that $f_d \approx v_t / \lambda$. [7]
- b) Explain the need of isolation between transmitter and receiver. Suggest suitable components. [7]
4. a) Explain the working principle of a MTI Radar. [7]
- b) If a MTI Radar operates at 10GHz with PRF of 0.8KHz, then find the three lowest blind speeds. Assume necessary data. [7]
5. a) Explain the Mechanism of low-angle tracking Radar. [7]
- b) In a monopulse radar, two antennas are separated by $\lambda/2$ and angle θ between the line of sight and perpendicular bisector of the line joining the two antennas is 5° . Find the phase differences between the Echo signals in the Antennas. Assume necessary data. [7]
6. a) The noise figure of a radar receiver is 12dB and if bandwidth is 2MHz. Find its minimum receivable signal. Assume necessary data. [7]
- b) Prove that $R_f \leq 2E / N_0$ in matched filter receiver. [7]
7. Discuss in detail about
(i) Radomes (ii) Displays [14]

