IV B.Tech I Semester Supplementary Examinations, July/Aug - 2021
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
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PART–A *(14 Marks)*

1.　a)　What is Radar Cross Section? What is its significance?　[3]
　　b)　Define CW and FMCW radar?　[2]
　　c)　Determine PRF of an MTI Radar operating at f=10GHz if it shows the lowest blind speed of 20m/s?　[3]
　　d)　Define nutating feed in conical scan tracking?　[2]
　　e)　Write the characteristics of matched filter.　[2]
　　f)　Define parallel feed and draw the circuit?　[2]

PART–B *(4x14 = 56 Marks)*

2.　a)　If a pulse radar operating with a peak power of 1MW has the following parameters: pulse width=1.2μs and PRI= 1ms. Find P_{avg} , duty cycle and R_{max}?　[7]
　　b)　List out the system losses and explain any two losses?　[7]

3.　a)　Explain the principle of FM-CW altimeter?　[7]
　　b)　Derive the Doppler frequency in CW radar? List out the limitations in CW radar?　[7]

4.　a)　List out the types of cancellers and explain any one of them.　[7]
　　b)　Explain the function of Range gated Doppler filters.　[7]

5.　a)　Explain the function of Sequential lobing Radar?　[7]
　　b)　Compare mono pulse tracker and the conical Scan tracker w.r.to accuracy at long, medium and short ranges?　[7]

6.　a)　Define noise temperature? Derive N-stage cascade network?　[7]
　　b)　The signal energy of a linear filter 5T whose impulse response is matched to the signal. If the input noise power spectrum density is $N_0/2$, find the maximum instantaneous SNR?　[7]

7.　　　Write a notes on
　　　(i) Radiation pattern of phased array antennas　[14]
　　　(ii) balanced type Duplexer

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