Code No: **R1641041** **R16** **Set No. 1**

IV B.Tech I Semester Regular/Supplementary Examinations, Jan/Feb - 2022

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)	Define false alarm time and probability of false alarm.	[2]
	b)	Define pre-detection integration and post-detection integration.	[2]
	c)	MTI radar operates at 5GHz with a PRF of 1KHz, find second lowest blind speed of the radar.	[3]
	d)	Define multimode feeds in monopulse tracking radar.	[3]
	e)	List out the components used in correlation detector.	[2]
	f)	Define beam steering.	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	Classify and explain the effect of variation of normalized RCS with respect to λ.	[7]
	b)	Radar operates at 10GHz and peak power of 500KW. Its minimum receivable power is 0.1pW. Its antenna has a capture area of 5sqm and the radar cross-section of the target is 20sqm. Find maximum range of radar.	[7]
3.	a)	What is the need of Non-zero IF receiver? Explain the function.	[7]
	b)	Explain the working principle of multiple frequency CW radar.	[7]
4.	a)	List out the limitations to MTI performance.	[7]
	b)	Two MTI radars operate at different frequencies but at the same PRF. If the first blind speed of first MTI radar is equal to the third blind speed of second MTI radar, determine ratio of the operating frequencies of the two radars.	[7]
5.	a)	Explain the types of tracking radar systems.	[7]
	b)	Explain the Function of Sample-and –hold Circuits.	[7]
6.	a)	Derive the matched filter - frequency response.	[7]
	b)	Radar receiver has a bandwidth of 30MHz with noise figure of 12dB. Find minimum receivable signal.	[7]
7.		Write a notes on (i) series and parallel feeds (ii) Branch type Duplexer	[14]