

PRAGATI ENGINEERING COLLEGE: SURAMPALEM
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, May - 2023

RADAR ENGINEERING
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 hours

Max. Marks: 70M

Answer ONE Question from each Unit
All Questions Carry Equal Marks

Q. No.	Questions	BTL	CO	Marks
UNIT – I				
1.	a) Explain the working principle of basic radar system	K2	CO1	7M
	b) What are the various Radar system losses? Explain in detail.	K1	CO1	7M
OR				
2.	a) Derive the modified radar range equation.	K2	CO1	7M
	b) What is Maximum Unambiguous Range? How is it related with pulse repetition rate?	K2	CO1	7M
UNIT – II				
3.	a) Explain the operation of the multiple frequency CW Radar	K2	CO2	7M
	b) Explain various applications of CW and FM-CW radar.	K2	CO2	7M
OR				
4.	a) How the Doppler shift and Radar range can be measured with FM-CW Radar? Explain	K2	CO2	7M
	b) Explain the principle of operation of Frequency Modulated Continuous Wave Radar with a neat block diagram.	K2	CO2	7M
UNIT – III				
5.	a) What is the importance of staggered pulse repetition frequencies in the design of an MTI Radar? Explain	K2	CO3	7M
	b) Explain the principle operation of MTI radar and Pulse Doppler radar.	K2	CO3	7M
OR				
6.	a) Explain the function of a single delay line canceller and derive an expression for the frequency response function	K2	CO3	7M
	b) Draw and explain frequency response characteristics of MTI radar using range gates and filters.	K2	CO3	7M
UNIT – IV				
7.	a) Explain the principle and characteristics of a Matched filter	K2	CO4	7M
	b) Explain about the efficiency of non-matched filters.	K2	CO4	7M
OR				
8.	a) Derive the expression for matched filter's frequency response function.	K2	CO4	7M
	b) Define noise figure and noise temperature. Obtain the relation between them.	K1	CO4	7M
UNIT – V				
9.	a) Draw and explain the radiation pattern of phased array antennas.	K2	CO5	7M

	b)	Draw and explain the structures of balanced duplexer during transmission and reception mod	K2	CO5	7M
OR					
10.	a)	Explain the cross correlation receiver with the help of a neat diagram.	K2	CO5	7M
	b)	Derive the relationship between noise figure and noise temperature for cascaded networks.	K2	CO5	7M