Code: 22ECMC2T3

I M.Tech - II Semester – Regular Examinations - JULY - 2023

MICROWAVE NETWORKS
(MICROWAVE & COMMUNICATION ENGINEERING)

Duration: 3 hours   Max. Marks: 60

Note: 1. This paper contains 4 questions from 4 units of Syllabus. Each unit carries 15 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.

BL – Blooms Level   CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	With a relevant figures, explain Reciprocal networks and loss less networks.	L3	CO1	8M
	b)	In detail, explain about the Transmission (ABCD) matrix.	L2	CO1	7M
OR					
2	a)	What is Mason's rule? Draw and describe the signal flow graph representation of linear system.	L3	CO1	7M
	b)	How the Signal Flow Graph can be systematically reduced to a simple form and give the desired solution by inspection.	L3	CO1	8M
UNIT-II					
3	a)	What is S-matrix? Describe the significance of S-Matrix. In detail, explain the properties of S-Matrix.	L3	CO2	8M

	b)	What is Single Stub tuning? Draw and explain the basic shunt stub tuner and Series stub tuner.	L3	CO2	7M

<div align="center">**OR**</div>

4	a)	Define lumped element matching. In detail, describe the lumped and distributed elements. Explain the major limitations of a lumped elements matching L network.	L3	CO2	7M
	b)	What are the properties of Smith chart? Discuss the applications of Smith Chart. With a neat illustration, explain the concept of R-Circles and X-Circles.	L4	CO2	8M

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UNIT-III

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5	a)	What is aperture coupling? With a neat sketches, explain the process of coupling through an aperture in a Transverse waveguide wall and broad wall of waveguide.	L3	CO3	8M
	b)	Obtain the expression for resonant frequency of a Circular Cavity Resonator.	L3	CO3	7M

<div align="center">**OR**</div>

6	a)	Explain the basic principle of operation of Cavity resonator. With a neat sketch, explain the features of Rectangular Cavity resonator and describe the Quality factor when lossy walls are present.	L3	CO3	8M

	b)	Design a Rectangular cavity of length d, height b=1.2cm, width a=2.5cm, that will resonate at 10,000MHz. The cavity is critically coupled to a rectangular guide of dimensions a by b. Specify the cavity length "d".	L4	CO3	7M

UNIT-IV

7	a)	What is the significance of π (pi) network? Derive the expression for image impedance of a two-port π (pi) network.	L4	CO4	7M
	b)	With a neat sketches, Briefly explain the following terms and corresponding conditions: i. Low pass filter ii. High pass filter iii. Band pass filter iv. Band stop filter	L3	CO4	8M

OR

8	a)	What is Richard's transformation? Illustrate the significance of Richard's transformation.	L3	CO4	7M
	b)	With a neat sketch, explain the Image-parameter method of filter design.	L3	CO4	8M