

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE –SEMESTER 7(NEW SYLLABUS) EXAMINATION- SUMMER 2024

Subject Code: 3171001

Date:

Subject Name: Microwave Theory and Techniques

Time:

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		Marks
Q.1	(a) Show that TEM mode is not possible in rectangular waveguide	03
	(b) Enlist the applications of microwave and explain any one.	04
	(c) What is S- parameter? Why is used at high frequency? Discuss the properties of S- parameters.	07
Q.2	(a) Discuss any one medial application of microwave signal.	03
	(b) Explain the losses associated with microwave transmission.	04
	(c) Explain the quarter wave transformer for impedance matching application.	07
	OR	
	(c) Discuss the Microstrip line. List the Merits and Demerits of Microstrip line. Explain fringing field in Microstrip line.	07
Q.3	(a) What is attenuator? Explain in brief fixed type and variable attenuator.	03
	(b) What is Magic Tee? And derive the S- parameter matrix for the same.	04
	(c) What is directional coupler? Draw and explain its working. Discuss the Isolation, coupling and directivity factors in connection with directional coupler.	07
	OR	
Q.3	(a) What is the difference between microwave active and passive devices? Discuss in brief.	03
	(b) What is Gunn diode? Discuss the construction and V-I characteristics.	04
	(c) What is PIN diode? Discuss the various applications of PIN diode.	07
Q.4	(a) List the antenna used for ground based system, airborne and satellite borne systems.	03
	(b) Discuss in brief various microwave antenna parameters.	04
	(c) Explain Microwave amplifier design steps.	07
	OR	
Q.4	(a) What is Low Noise Amplifier- LNA? What is role of LNA in microwave communication system?	03
	(b) Write short note on IMPATT diode.	04
	(c) Explain Two cavity klystron as an amplifier with neat diagram.	07

- Q.5** (a) Describe any one power measurement technique at microwave frequency. **03**
(b) Discuss microwave imaging **04**
(c) Draw the basic building block diagram of RADAR and discuss in details. **07**

OR

- Q.5** (a) What is MMIC? List various applications of MMIC. **03**
(b) Draw the block diagram of spectrum analyzer and discuss in brief. **04**
(c) What is the effect of microwaves on human body? Discuss the EMI & EMC effect. **07**
