

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022****Subject Code:3171001****Date:08/06/2022****Subject Name: Microwave Theory and Techniques****Time:02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Enlist Microwave frequency bands along with their applications.	03
	(b) Define and explain the following 1) TE mode 2) TM mode.	04
	(c) Draw neat diagram of various transmission lines and describe their working.	07
Q.2	(a) What is group velocity and phase velocity?	03
	(b) Derive the properties of S parameters	04
	(c) Compare coaxial lines and rectangular waveguide.	07
	OR	
	(c) Explain the working of E-plane Tee and H- plane Tee with neat diagrams.	07
Q.3	(a) Enlist microwave active and passive components.	03
	(b) What is a directional coupler? Draw and explain its working.	04
	(c) Discuss the working of Gunn diode with suitable diagrams.	07
	OR	
Q.3	(a) State the significance of Magic Tee with neat diagram.	03
	(b) Compare Klystron and Magnetron.	04
	(c) Explain the working of PIN diode.	07
Q.4	(a) Define the following 1) Reflection coefficient 2) VSWR	03
	(b) Discuss the working of microwave mixers.	04
	(c) What is TWT? Explain its working with suitable diagrams.	07
	OR	
Q.4	(a) What is characteristic impedance? Write equation of characteristic impedance for lossy and lossless transmission lines.	03
	(b) Discuss various types of microwave filters.	04
	(c) Explain working of Reflex Klystron with suitable diagrams.	07
Q.5	(a) How does microwave affect the human body? Explain in brief.	03
	(b) Discuss the usage of Spectrum Analyzer for measurement.	04
	(c) Explain the working of GPS.	07
	OR	
Q.5	(a) Give the importance of Microwave Imaging.	03
	(b) Discuss the usage of Network Analyzer for measurement.	04
	(c) Explain the working of RADAR.	07
