

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020****Subject Code:2171001****Date:19/01/2021****Subject Name: Microwave Engineering****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Define following :1) VSWR 2) Characteristics impedance 3) Phase velocity	03
	(b) Write all properties of Smith chart.	04
	(c) Define Standing wave and derive equation of the voltage standing wave. Also find equations for the minimum and maximum amplitude and distance between any two successive maxima or minima.	07
Q.2	(a) Discuss the characteristics of TEM, TE and TM Mode.	03
	(b) Explain advantages of microwave and its applications.	04
	(c) Draw equivalent circuit of transmission line and derive basic equations for voltage and current on transmission line.	07
Q.3	(a) Draw schematic of four port circulator and explain its working,	03
	(b) List the Medical and Civil applications of microwaves.	04
	(c) Explain reflex klystron and its working with all necessary detail.	07
Q.4	(a) Write the limitations and applications of TRAPATT diode.	03
	(b) Explain Effect of Microwaves on human body.	04
	(c) Explain the operation, construction and application of the IMPATT diode.	07
Q.5	(a) Describe the applications of the parametric amplifier.	03
	(b) A transmission line has following parameters $R=2\Omega/m$ $G=0.5\text{mho/m}$ $L=8\text{nH/m}$ $C=0.23\text{pF}$ $f=1\text{GHz}$ Calculate the characteristic Impedance and the propagation constant.	04
	(c) Explain the construction of four port circulator and derive its S-matrix.	07
Q.6	(a) Write a note on Directional coupler with all necessary detail.	03
	(b) A lossless transmission line with characteristic impedance of 300 ohm is fed by a generator with impedance 100 ohm. The line is 100 m long and is terminated by a resistive load of 200 ohm. Calculate the load reflection coefficient, VSWR, the transmission loss and the return loss.	04
	(c) Explain circular waveguide with necessary detail.	07
Q.7	(a) Discuss quality factor for a varactor diode.	03
	(b) Explain remote sensing system in detail.	04
	(c) Explain Basic Principal of "RADAR" draw and explain the block diagram of RADAR.	07
Q.8	(a) Explain working of Traveling-wave tube.	03
	(b) Explain Microwave Antennas in detail.	04
	(c) Explain Electromagnetic Interference and Microwave Imaging.	07
