Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VII(NEW) • EXAMINATION – WINTER 2016

Subject Name:Microwave Engineering			Date:18/11/2016 Total Marks: 70	
		0.30 AM to 1.00 PM Total Marks		
	1. 2.	Attempt all questions.Make suitable assumptions wherever necessary.Figures to the right indicate full marks.		
Q.1	(a)	(i) Explain advantages of Microwave and its application. Draw neat diagram of Microwave system.(ii)Discuss the characteristics of TEM, TE and TM Mode.	04	
	(b)	Define the following: (i) Group Velocity (ii) Phase Velocity (iii) VSWR (iv) Return Loss (v) Characteristics Impedance (vi) Transmission Co-efficient (vii) Degenerate Mode	07	
Q.2	(a)	Derive transmission line equations and also derive solution of transmission line equation.	e 07	
	(b)	Derive TE wave field equations for Rectangular Waveguide. OR	07	
	(b)	Sketch Rectangular and Circular Waveguide. Compare their dominant mode List advantages and disadvantage.	e. 07	
Q.3	(a)	(i) A telephone line has following constants. R = 6 ohm/km, L = 2.2 mH/km C = 0.005 μ F/km, and G = 0.05 μ mho/km, operating frequency = 1 KHz. Find characteristic impedance (Z_0), attenuation constant (α).		
		(ii) What is S-Matrix? What are the properties of S-Matrix?	03	
	(b)	What is Reciprocal network? Draw and explain E-Plane Tee with its S-Matrix. OR	07	
Q.3	(a) (b)	Define Klystron. Write short notes Two Cavity Klystron. Explain working principles of Tunnel Diode with Energy-Band diagrams.	07 07	
Q.4	(a)	Explain briefly different methods of Impedance Measurement at microwave frequency.	e 07	
	(b)	Describe Microwave RADAR system. OR	07	
Q.4	(a)	Explain Spectrum Analyzer and how spectrum of a microwave signal i measured.	s 07	
	(b)	What is Gunn effect? Explain working of GaAs diode.	07	

Q.5	(a)	What is MMIC? Which materials are used for MMIC fabrication? Explain any	07
		one fabrication technique of MMIC.	
	(b)	Explain Microwave Communication in Satellite System.	07
		OR	
Q.5	(a)	List out Microwave Antenna and explain any one in detail.	07
	(b)	Write notes on Medical and Civil related application of microwave.	07
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