Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER IV (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2740503 **Date:04/05/2016**

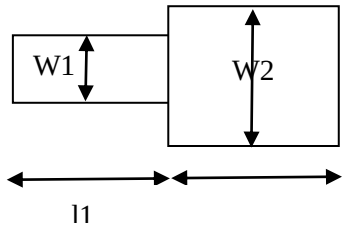
Subject Name: MICROWAVE INTEGRATED CIRCUITS

Time:10:30 am to 01:00 pm **Total Marks: 70**

Instructions:

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

Q.1	**(a)**	What do you understand by thick and thin film technologies? And explain any one technology.	**07**
	(b)	What distinguishes RF / Microwave packages from low frequency or digital packages? And explain basic circuit design goals.	**07**
Q.2	**(a)**	Describe the lange coupler.	**07**
	(b)	Comparison of hybrid and monolithic MICs.	**07**
		OR	
	(b)	Describe the small signal equivalent circuit of MESFET (Metal Semiconductor Field Effect Transistors)	**07**
Q.3	**(a)**	List the advantage of MICs compared to traditional circuits using printed circuit technology. And what is meant by Hybrid technology?	**07**
	(b)	Give the ideal characteristics of following materials: (i) Substrate materials (ii) Conductor materials	**07**
		OR	
Q.3	**(a)**	Explain the operation HEMT and V/I characteristics.	**07**
	(b)	Explain the working of gunn diode, varactor diode and PIN diode.	**07**
Q.4	**(a)**	Explain the narrow band filter using coupler resonator.	**07**
	(b)	Design microstrip content – k type (maximally flat) 2nd order low pass filter, when dielectric constant = 4.3, height of substrate h = 1.6 mm, cutoff frequency = 2GHz, and Zh = 100 Ω, ZL =60 Ω (assume L = C = √2)	**07**



		OR	
Q.4	**(a)**	Explain the microstrip ring resonator and write its application and also explain the any one.	**07**
	(b)	Explain microstrip directional coupler with appropriate equation and find the value of Zoe and Zoo, when coupling factor = -10dB.	**07**
Q.5	**(a)**	Explain quasi-static line (Microstrip) parameters,(ε_{eff},z_0,w/h ratio)	**07**

(b) Give the answer of following question in two to three lines **07**

(i) What are the three basic developments the led to the present MIC technology?

(ii) What is meant by LID packages?

(iii) What are the type of mounting of active devices?

OR

Q.5 **(a)** Write method of full wave analysis of microstrip line and explain any one. **07**

(b) Write down any two short note **07**

(i) Dispersion in microstrip

(ii) Microstrip losses

(iii) Design consideration of R, L & C passive component using microstrip

(iv) Quasi-TEM approximation

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