Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER–I(New course)• EXAMINATION – WINTER- 2015

Subject Code:2710504 **Date: 01/01/2016**

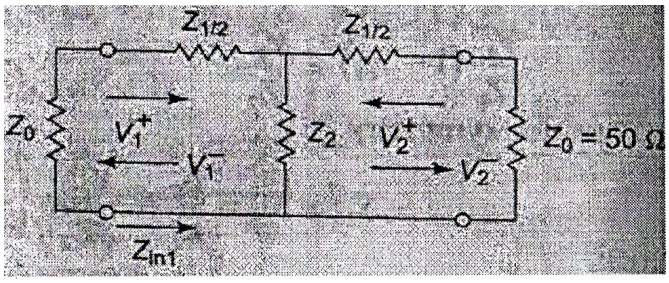
Subject Name: RF AND MICROWAVES

Time:2:30 Pm to 5:00 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 is S-Parameter? Explain S-parameter for multiport N/Ws with its all properties.	**07**
	(b)	Explain in detail with analysis of Rat-Race type Directional Coupler.	**07**
Q.2	**(a)**	Explain in detail with analysis of Cylindrical Cavity Resonaor..	**07**
	(b)	Determine the S-matrix of 3dB T-network attenuator shown in below fig. Terminated in a 50 ohm matched load with Z_1 = 17.12 ohms, Z_2 = 141.78 ohms.	**07**



OR

	(b)	A three port circulator has an insertion loss of 1 dB, isolation 30 dB and VSWR = 1.5. Find the S-Matrix.	**07**
Q.3	**(a)**	State the different types of ferrite isolator and explain in detail with analysis of any one.	**07**
	(b)	Show that the scattering matrix for reciprocal network is symmetric and for a lossless network is unitary.	**07**

OR

Q.3	**(a)**	Explain the gain and stability of two-port amplifier circuit in terms of S-Parameter of transistor.	**07**
	(b)	Explain Balance Microwave Amplifier.	**07**
Q.4	**(a)**	Explain the Tunnel Diode characteristics with the aid of energy band diagram and give its application.	**07**
	(b)	What is Microwave Integrated Circuit? Explain MMIC in brief with advantages and disadvantages.	**07**

OR

Q.4	**(a)**	Explain IMPATT diode with its construction, working and applications.	**07**
	(b)	Describe in details the different steps involved in MIC fabrication techniques.	**07**
Q.5	**(a)**	Using Applegate diagram, Explain working of reflex klystron. Differentiate between klystron and TWT.	**07**

	(b)	What are the different techniques used for the measurement of Impedance at microwave frequency? Explain any one in detail.	**07**
		OR	
Q.5	**(a)**	Explain the mechanisms of oscillation of Magnetron Oscillator with the aid of suitable diagram and discuss its performance characteristics.	**07**
	(b)	Explain in detail with the block diagram of VSWR measurement.	**07**

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