Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2710504 **Date:17/05/2016**

Subject Name: RF AND MICROWAVE

Time:02:30 pm to 05:00 pm **Total Marks: 70**

Instructions:

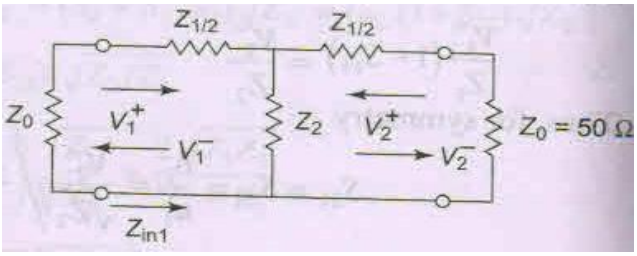
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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 Resonator. **07**

(b) Determine the S-matrix of a 3dB T-network attenuator shown in below 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 any one of them. **07**

(b) Show that 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 Balanced 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 Monolithic Microwave Integrated Circuit (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 Travelling Wave Tube.	**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 mechanism of oscillations 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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