Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER 2012

Subject code: 1710411 **Date: 07/01/2013**

Subject Name: RF and Microwave Engineering

Time: 02.30 pm – 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)**	Write short notes on "Field analysis of terminated lossless transmission line".	**07**
	(b)	State the different types of ferrite isolators and explain in detail with analysis any one of them.	**07**
Q.2	**(a)**	Explain in detail with analysis balance mixer used in microwave circuits.	**07**
	(b)	Explain in detail operation of rectangular waveguide in TM modes by deriving different equations	**07**
		OR	
	(b)	Explain in detail operation of circular waveguide in TE modes by deriving different equations	**07**
Q.3	**(a)**	Derive the following 1) Y-parameters in terms of Z-parameters 2) Z-parameters in terms of ABCD parameters	**07**
	(b)	What is signal flow graph?. Explain in detail basic rules used for decomposition of signal flow graph to obtain any desired wave amplitude ratio.	**07**
		OR	
Q.3	**(a)**	Show that scattering matrix for a reciprocal network is symmetric and for a lossless network is unitary.	**07**
	(b)	State with diagrams some common transmission line discontinuities and their equivalent circuits for rectangular waveguide. Explain in detail model analysis of an H-plane step in rectangular waveguide.	**07**
Q.4	**(a)**	Explain in detail with analysis coupling through an aperture in the broad wall of a waveguide.	**07**
	(b)	Explain in detail with analysis binomial multi section matching transformer	**07**
		OR	
Q.4	**(a)**	Explain in detail with analysis coupling through an aperture in a transverse waveguide wall.	**07**
Q.4	**(b)**	Explain in detail with analysis chebyshev multi section matching transformer	**07**
Q.5	**(a)**	Explain in detail with analysis cylindrical cavity resonator.	**07**
	(b)	Explain in detail with analysis rat-race type directional coupler.	**07**
		OR	
Q.5	**(a)**	Explain in detail with analysis rectangular cavity resonator.	**07**
	(b)	Explain in detail with analysis Wilkinson power divider.	**07**

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