Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME- SEMESTER II– EXAMINATION – SUMMER 2015

Subject Code: 2724404 **Date: 28/05/2015**

Subject Name: RF and Microwave Engineering

Time: 2:30 PM – 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)**	Discuss the summary of transmission lines and waveguides.	**07**
	(b)	Explain multiple reflection analysis of the quarter-wave transformer with required expression.	**07**
Q.2	**(a)**	Derive the general solutions for TE and TM waves.	**07**
	(b)	Explain stripline and microstrip line with require equations.	**07**
		OR	
	(b)	Explain admittance, impedance, and scattering matrix with their significance.	**07**
Q.3	**(a)**	Define: reflection coefficient, return loss, insertion loss, standing wave ratio, wave velocity, phase velocity and distributed element.	**07**
	(b)	Explain the transmission (ABCD) matrix. Derive the ABCD parameters for a given the Z parameters of a two-port network.	**07**
		OR	
Q.3	**(a)**	Explain single and double stub matching in details	**07**
	(b)	Derive the necessary equations of circular waveguide for TE mode	**07**
Q.4	**(a)**	Explain a rectangular waveguide cavity with necessary equations of resonant frequency, and Q of the $TE_{10\ell}$ mode.	**07**
	(b)	Explain the Wilkinson power divider in details.	**07**
		OR	
Q.4	**(a)**	Derive the equations of quality factor (Q) for short-circuited $\lambda/4$ transmission line and open-circuited $\lambda/2$ transmission line.	**07**
	(b)	Explain quadrature hybrid directional coupler with even-odd analysis.	**07**
Q.5	**(a)**	Explain ferrite phase shifter in details.	**07**
	(b)	Explain filter design by insertion loss method.	**07**
		OR	
Q.5	**(a)**	Explain ferrite phase circulator in details.	**07**
	(b)	Explain filter design by image parameter method.	**07**

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