Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2724404 **Date: 25/05/2016**

Subject Name: RF and Microwave Engineering

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)**	With reference to the terminated lossless transmission line, derive the equation of reflection coefficient, time-average power, return loss, standing wave ratio and input impedance with their range.	**07**
	(b)	Plot and derive the equation of voltage, current and input impedance for lossless line terminated a) in a short circuit, b) in an open circuit.	**07**
Q.2	**(a)**	Derive the equation of a cutoff frequency for TE mode in the rectangular waveguide.	**07**
	(b)	Compare transmission line, waveguide, strip line and microstrip line	**07**
		OR	
	(b)	Derive the ABCD parameters from the Z parameters of a two-port network. Also prove AD-BC = 1, if the network is reciprocal.	**07**
Q.3	**(a)**	Define the signal flow graph. Discuss decomposition rules of the signal flow graph.	**07**
	(b)	Explain the theory of small reflections in details.	**07**
		OR	
Q.3	**(a)**	Explain single shunt stub and series stub circuits.	**07**
	(b)	Derive the equation of Q-factor for short-circuited $\lambda/2$ line.	**07**
Q.4	**(a)**	Derive the expression for resonant frequencies for rectangular and circular waveguide cavities.	**07**
	(b)	Explain Wilkinson Power Divider with required equations.	**07**
		OR	
Q.4	**(a)**	Explain T-junction divider.	**07**
	(b)	Define: intrinsic impedance, wave impedance, characteristic impedance, group velocity, phase velocity, free-space wavelength, guided wavelength	**07**
Q.5	**(a)**	Write short note on Ferrite phase shifter	**07**
	(b)	Explain filter design by image parameter method	**07**
		OR	
Q.5	**(a)**	Explain filter design by insertion loss method.	**07**
	(b)	Write short note on the Lange Coupler	**07**

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