Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEMESTER– 7th EXAMINATION – SUMMER 2015

Subject Code: 173201 **Date: 01/05/2015**

Subject Name: Microwave and Satellite Communication

Time: 02.30PM-05.00PM **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)**	Explain the Advantages of Microwaves and list general applications of Microwaves.	**07**
	(b)	Write a short note on Standing Waves and Standing Wave Ratio.	**07**
Q.2	**(a)**	Derive wave equation for a TE wave and obtain all the field components in a rectangular waveguide.	**07**
	(b)	How are waveguides different from normal two wire transmission lines? Discuss the similarities and dissimilarities.	**07**
		OR	
	(b)	Explain the need of microwave tubes as compare to conventional tubes at microwave frequencies.	**07**
Q.3	**(a)**	Explain the operation of H-plane Tee junction. Derive the scattering matrix for H-plane Tee.	**07**
	(b)	Write a short note on TWT.	**07**
		OR	
Q.3	**(a)**	What is the PIN diode? Describe the construction of a PIN diode and also its applications.	**07**
	(b)	List out application of following devices. (1) IMPATT (2) TRAPATT (3) BARITT	**07**
Q.4	**(a)**	Explain pulse RADAR systems with necessary block diagram.	**07**
	(b)	Explain Doppler effect with respect to RADAR.	**07**
		OR	
Q.4	**(a)**	Derive the radar range equation. Explain the factors that affect the maximum range of radar.	**07**
	(b)	Explain different scanning techniques for RADAR.	**07**
Q.5	**(a)**	What are Kepler's three laws of planetary motion? Give the mathematical formulation of Kepler's third law of planetary motion.	**07**
	(b)	Explain TTC & M system of Satellite communication.	**07**
		OR	
Q.5	**(a)**	List various types of control required to maintain the satellite in space and explain attitude and orbital control system in detail.	**07**
	(b)	With the aid of a neat sketch, explain what is meant by each of the angles: inclination, argument of perigee, right ascension of the ascending node. Which of these angles would you expect, in general, to change with time?	**07**

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