GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (OLD) EXAMINATION – WINTER 2018

Subject Code: 171001   **Date: 06/12/2018**

Subject Name: 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)**	Define following : (i) Guide wave length (ii) Transmission coefficient (iii) Phase velocity (iv) Gunn effect (v) VSWR (vi) Return loss (vii) Characteristic impedance	**07**
	(b)	Describe the problems associated with conventional tubes at UHF and Microwave?	**07**
Q.2	**(a)**	Explain reflection coefficient of transmission line and standing wave. Derive expression for impedance and reflection coefficient at any point on the line.	**07**
	(b)	A lossless line has a characteristic impedance of 50 Ω and is terminated in a load resistance of 75 Ω. The line is energized by a generator which has an output impedance of 50 Ω and an open-circuit output voltage of 30 V (rms). The line is assumed to be 2.25 wavelengths long. Determine: a. The input impedance b. The magnitude of the instantaneous load voltage c. The instantaneous power delivered to the load	**07**

OR

	(b)	Explain TE , TM and TEM modes in a waveguide. What is meant by the Dominant mode in a rectangular waveguide? Explain why TEM mode can't propagate through a rectangular waveguide.	**07**
Q.3	**(a)**	List different types of Magnetron. Explain mechanism of oscillations of Magnetron Oscillator with diagram.	**07**
	(b)	Explain working of two cavity klystron with necessary diagram and waveforms.	**07**

OR

Q.3	**(a)**	Explain the construction and working of IMPATT diode. What are its applications?	**07**
	(b)	With the aid of Diagram, explain the operation of " Two Hole Directional Coupler"	**07**
Q.4	**(a)**	Write properties of smith chart and explain its application with any one example.	**07**
	(b)	Explain in detail E-plane Tee. With S-matrix prove that the Tee junction cannot be matched to all the three arms simultaneously.	**07**

OR

Q.4	**(a)**	What is microstrip line? Derive equation of characteristic impedance and quality factor of microstrip line.	**07**
	(b)	Explain different display methods of RADAR.	**07**
Q.5	**(a)**	Explain the principle of MTI radar with block diagram.	**07**
	(b)	Define Microwave. Write advantage, disadvantage and industrial application of microwave.	**07**

OR

Q.5	**(a)**	Write short note on Circulators and isolators	**07**
	(b)	Write a note on any one of the following. (1) Step Recovery Diode and its applications. (2) $\lambda/4$ Line and its applications.	**07**

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