R18

Code No: R18A0420

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

IV B.Tech I Semester Supplementary Examinations, April 2023

Microwave Engineering

(ECE)

Roll No										

Time: 3 hours **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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SECTION-I

1		Derive the expression for the field components due to TM waves in a rectangular waveguide.	**[14M]**
		OR	
2	***A***	An air-filled rectangular waveguide has dimensions of a = 6 cm and b = 4 cm. The signal frequency is 3 GHz. Compute the following for the TE10 mode: (a) Cut-off frequency (b) Wavelength in the waveguide	**[7M]**
	B	What is dominant mode of a rectangular waveguide for TE and TM modes and why?	**[7M]**

SECTION-II

3	***A***	Why Matched loads are needed in Microwave circuits? Briefly explain its working with neat diagrams.	**[7M]**
	B	Briefly explain the principle of working a Magic Tee junction with neat schematics?	**[7M]**
		OR	
4	***A***	Explain the principle of Faraday rotation?	**[7M]**
	B	What is the need of microwave junction and derive s-matrix with the help of two port network?	**[7M]**

SECTION-III

5		Explain how velocity modulation is converted into current modulation with Applegate diagram and also derive the equation for output power efficiency.	**[14M]**
		OR	
6	***A***	Draw the diagram of TWT and explain its structures and operation in detail.	**[7M]**
	B	What are the limitations of conventional tubes at microwave frequencies? Explain how these limitations can be overcome.	**[7M]**

SECTION-IV

7	***A***	What are the applications of Magnetron oscillator?	**[7M]**
	B	Describe the operation of IMPATT diode	**[7M]**
		OR	
8	***A***	Explain how Gunn diode is used in waveguide oscillator.	**[7M]**
	B	Describe the operation of TRAPATT diode.	**[7M]**

SECTION-V

9	***A***	Explain microwave test bench with neat diagram	**[7M]**
	B	Discuss the measurement of impedance using reflectometer with block diagram	**[7M]**

OR

10	***A***	Explain VSWR meter, crystal detector , slotted section	**[7M]**
	B	Explain the method of measurement of high VSWR.	**[7M]**

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