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# APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020

## **Course Code: EC461**

#### **Course Name: MICROWAVE DEVICES AND CIRCUITS**

Max. Marks: 100

**Duration: 3 Hours** 

#### PART A

		Answer any two full questions, each carries 15 marks.	Marks
1	a)	With neat diagram explain Two-Valley model theory of Gunn Diode.	(10)
	b)	What are the Characteristics and advantages of microwaves?	(5)
2	a)	Discuss in detail the term stability with respect to microwave amplifier.	(10)
	b)	Explain the biasing of microwave bipolar transistor.	(5)
3	a)	Classify the modes of operation of Microwave Bipolar transistor.	(8)
	b)	Derive an expression for power output and efficiency of IMPATT diode.	(7)
		PART B	
		Answer any two full questions, each carries 15 marks.	
4	a)	Explain the concept of signal flow graph of a two port network. What are the	(8)
		rules to decompose a signal flow graph?	
	b)	Write a short note on Impedance and Admittance Matrices.	(7)
5	a)	A five element maximally flat Butterworth low pass filter is to be designed for	(10)
		use in 50 $\Omega$ circuit. Its 3 dB point is 500 MHz. Calculate its component value.	
	b)	What are terminated periodic structure? Explain.	(5)
6	a)	With neat diagrams and relevant equations, explain about the theory of small	(8)
		reflections.	
	b)	Explain Richard's Transformation and Kuroda's identities.	(7)
		PART C	
		Answer any two full questions, each carries 20 marks.	
7	a)	Explain about the materials used in Monolithic MIC.	(8)

### 00000EC461121904

	b)	Differentiate strip line and microstrip line.	(6)
	c)	Discuss in detail about the various losses in microstrip lines.	(6)
8	a)	Explain attenuators with neat diagram.	(10)
	b)	Discuss briefly about capacitors.	(5)
	c)	Explain switched line phase shifters with neat diagrams.	(5)
9	a)	Compare Monolithic MICs with Hybrid MICs.	(10)
	b)	With neat diagram explain SPDT Transmit – Receive switch.	(6)
	c)	Explain the configuration of ferrite circulators.	(4)
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