Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

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)	What are the limitations of conventional solid state devices at microwave?	(5)
	b)	Explain modes of operation of Gunn diode	(7)
	c)	State Gunn effect.	(3)
2	a)	Design a one port negative resistance oscillator.	(5)
	b)	Design a single stage Transistor Amplifier used in microwave circuits	(10)
3	a)	What is MESFET ? Mention its structure and operation.	(10)
	b)	An IMPATT diode has carrier drift velocity $V_d = 3 \times 10^7$ cm/s, Drift region length L = 6μm, Maximum operating voltage V_{0max} = 100V, Maximum operating current I_{0max} = 200mA, Efficiency η = 15%, Breakdown voltage V_{bd} = 90V. Find maximum CW output power in watts and the resonant frequency in gigahertz	(5)

PART B

Answer any two full questions, each carries 15 marks.

4	a)	For a microwave circuit , discuss the equivalent voltage and currents .	(10)
	b)	Derive expressions for S parameters in terms of Z parameters for a 2-port network.	(5)
5	a)	Explain the principle of double stub matching	(5)
	b)	What are the steps required to transfer a LPF from HPF .explain.	(10)
6	a)	List the Kuroda's identity.	(5)
	b)	Design a low-pass composite filter with a cut-off frequency of 2MHz and impedances of 75Ω. Place the infinite attenuation pole at 2.05MHz.	(10)

PART C

Answer any two full questions, each carries 20 marks.

7	a)	Analyse the hybrid MMICs	(8)
	b)	Discuss Stripline in planar transmission and also find the Quality factor.	(8)
	c)	What is Monolithic MICs and Discuss its construction.	(4)

8	a)	What are limiters? Explain different types of limiters	(8)
	b)	Explain the working and applications of Circulators and Isolators.	(8)
	c)	Explain the working of diode switches and attenuators?	(4)
9	a)	Explain the configuration of Planar capacitor film	(5)
	b)	Discuss Microwave resonators with neat diagram	(8)
	c)	Classify the losses in Microstrip lines	(7)

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