Reg No.:_____ Name:_____

**00000EC461121904**

**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.***

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|---|---|---|---|
| 4 | a) | Explain the concept of signal flow graph of a two port network. What are the rules to decompose a signal flow graph? | (8) |
| | 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 use in 50 Ω circuit. Its 3 dB point is 500 MHz. Calculate its component value. | (10) |
| | b) | What are terminated periodic structure? Explain. | (5) |
| 6 | a) | With neat diagrams and relevant equations, explain about the theory of small reflections. | (8) |
| | b) | Explain Richard's Transformation and Kuroda's identities. | (7) |

**PART C**

***Answer any two full questions, each carries 20 marks.***

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| 7 | a) | Explain about the materials used in Monolithic MIC. | (8) |

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|---|---|---|---|
| | 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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