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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Seventh Semester B.Tech Degree (Hons.) Examination December 2021 (2015 Scheme)(2018 admn.)

Course Code: EC461

Course Name: MICROWAVE DEVICES ANDCIRCUITS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1 a) What are the Characteristics and advantages of microwaves? (5)

   b) With neat diagram and governing equations explain Ridley-Watkin-Hilsum theory. (10)

2 a) A certain GaAs MESFET has the following parameter (3)

   Channel height 'a' = 0.1 μm

   Electron concentration , $N_d = 8*10^{17}/cm^3$

   Relative dielectric constant , $\varepsilon_r = 13.10$

   Calculate Pinch-off voltage (V_p) ?

   b) Derive the expression for available power gain of microwave amplifier. (7)

   c) Design a negative resistance microwave oscillator. (5)

3 a) What does TRAPATT stands for? With neat diagram explain the construction and working of it. (7)

   b) What is MESFET ? Mention its structure and operation. (8)

PART B

Answer any two full questions, each carries 15 marks.

4 a) Convert S-matrix into Z-matrix. (7)

   b) Discuss the working of quarter wave transformer and half wave transformer (8)

5 a) What are the steps required to transfer a LPF to HPF, explain. (8)

   b) Explain working of Double Stub tuning (7)

6 a) List the Kuroda Identity. (5)

   b) Design a low-pass composite filter with a cut-off frequency of 3 MHz and impedances of 75Ω. (10)

PART C

Answer any two full questions, each carries 20 marks.

7 a) Explain in detail about thick film and thin film technology?   (10)

   b) Discuss in detail about the various losses in microstrip lines.   (5)

   c) Discuss briefly about slot line.   (5)

8 a) Compare Monolithic MICs with hybrid MICs   (10)

   b) Discuss discontinuities in MICs.   (5)

   c) With neat diagram explain SPDT Transmit – Receive switch.   (5)

9 a) Explain the working and applications of Circulators and Isolators.   (10)

   b) Explain the frequency characteristics of single layer square inductor.   (5)

   c) Explain the configuration of Planar capacitor film.   (5)

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