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Reg. No. : .....

Name : .....

**Eighth Semester B.Tech. Degree Examination, November 2015  
(2008 Scheme)**

**08.825 : MICROWAVE DEVICES AND CIRCUITS (T)  
(Elective – V)**

Time : 3 Hours

Max. Marks : 100

***Instruction : Provide Smith Chart to students on their request.***

**PART – A**

Answer **all** questions. **Each** question carries **4** marks.

1. Explain the need for S parameters in the analysis of microwave networks.
2. Prove that the ABCD matrix of two 2-port network in cascade can be obtained by multiplying the ABCD matrix of the individual networks.
3. Explain how impedance matching is done using lumped elements.
4. Explain how microwave BJT and FET are biased.
5. Explain High Field Domain formation in a GUNN Diode.
6. Derive expressions for the power output of an IMPATT diode.
7. What do you mean by unconditional stability ? State the conditions for unconditional stability.
8. What do you mean by Stripline ? What are its disadvantages ?
9. Write a brief note on print capacitors.
10. Explain how attenuators are implemented in MIC's.



P.T.O.



## PART – B

Answer **any two** questions from **each** Module. **Each** question carries **10** marks.

**Module – I**

11. Explain how equivalent voltages and currents are defined for waveguide modes.
12. Derive expressions for Z parameters in terms of S parameters for a 2-port network.
13. Design an L-section matching network to match a series RC load with an impedance of  $Z_L = 200 - 100j \Omega$ , to a  $100 \Omega$  line at a frequency of 500 MHz.

**Module – II**

14. Explain the two valley theory for GUNN diode operation. With the help of appropriate derivations, deduce the condition to be satisfied by a semiconductor material to exhibit negative resistance.
15. Explain the structure and operation of a TRAPATT diode.
16. Explain the steps involved in the design of a one port negative resistance microwave oscillator.

**Module – III**

17. Explain the even and odd mode of operation of a coupled stripline ? Draw its equivalent circuit and obtain expression for mutual capacitance.
  18. Write short note on the following :
    - a) Resonators in MICs
    - b) Low Pass Filter implementation in MICs.
  19. Explain the structure, field configuration and different types of losses in a Microstrip line.
- (6×10=60 Marks)**
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