(Pages : 2) **1999**

Reg. No. : .....

Name : .....

Eighth Semester B.Tech. Degree Examination, May 2013
(2008 Scheme)
08.825 : MICROWAVE DEVICES AND CIRCUITS (T)

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. Prove that (5) matrix of a lossless network is unitary.
2. What do you mean by ABCD parameters ? Explain its significance.
3. Explain the parallel rule and self-loop rule used for decomposition of a signal flow graph.
4. Explain the operation of MESFET.
5. What are the conditions that should be satisfied by the band structure of a semiconductor in order to exhibit negative resistance ?
6. Explain the operation of a TRAPATT diode.
7. What do you mean by unconditional stability ? State the conditions for unconditional stability.
8. Explain the even mode of operation of a coupled stipline.
9. Write brief notes on print capacitors used is MIC's.
10. Explain how resistors are implemented in MIC's ? **(10×4=40 Marks)**

P.T.O.

PART – B

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

Module – I

11. Derive expressions for 5-parameters in terms of 2 parameters for a two port network.

12. A certain two-port network is measured and the following scattering matrix is obtained.

$$[S] = \begin{bmatrix} 0.1 < 0^\circ & 0.8 < 90^\circ \\ 0.8 < 90^\circ & 0.2 < 0^\circ \end{bmatrix}$$

Determine whether the network is reciprocal or lossless. If a short circuit is placed on port 2, what will be the resulting return loss at port 1 ?

13. For a load impedance Zi = 15 +10 JΩ, design two single stub shunt tuning networks to match this load to a 50 Ω line. Assume that the load is matched at 2 Ghz and the load consist of a resistor and inductor in series.

Module – II

14. Explain the two-valley model theory of Gunn diodes obtain the condition for negative resistance.

15. With the help of neat diagrams explain the structure and working of IMPATT diode.

16. Explain the procedure for designing a single stage microwave transistor amplifier.

Module – III

17. With the help of neat diagrams explain the construction and working of striplines and microstriplines.

18. Explain how inductors are implemented in microwave integrated circuit ?

19. Explain about the different types of discontinuities in microwave integrated circuits.

(6×10=60 Marks)