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**Question Paper Code : 33459**

M.E./M.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2011.

M.E. — Communication Systems

Second Semester

251205 — MICROWAVE INTEGRATED CIRCUITS

(Regulation 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the major differences between MMIC and conventional IC
2. What are the properties to be possessed by dielectric materials used for MMIC?
3. What factors determine the characteristic impedance of a microstrip line?
4. Mention the advantages of coplanar lines over microstrip lines.
5. Distinguish conditional and unconditional stability with respect to microwave amplifiers.
6. What are the limitations of matching using lumped elements?
7. List the advantages and disadvantages of designing microwave oscillators using feedback approach.
8. What are the applications of microwave mixers?
9. What is meant by an integrated antenna?
10. What are the issues to be considered during packaging of integrated antennas?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the different steps involved in the fabrication technology of any two microwave active devices with neat diagrams. (16)

Or

- (b) (i) Describe the multichip module technology. (8)  
(ii) What are the properties and characteristics of substrate and conductor materials used in MMIC? (4)  
(iii) Write the advantages and applications of MMICs. (4)
12. (a) (i) Describe the different types of capacitors and inductors used in MMIC with necessary diagrams. (8)  
(ii) Discuss the construction and operation of different types of microstrip couplers with neat diagrams. (8)

Or

- (b) (i) Describe the operation and applications of microwave switches and attenuators. (10)  
(ii) Give a brief note on micromachined passive components. (6)
13. (a) (i) Explain the reactively matched multi stage amplifier design in detail. (10)  
(ii) Discuss the principle of designing amplifiers under conditional stability conditions. (6)

Or

- (b) (i) Discuss the design of low noise amplifiers. (8)  
(ii) Give a brief account on lumped and distributed matching networks. (8)
14. (a) (i) Explain the basic principle of the CAD techniques suitable for large signal oscillator design. (12)  
(ii) Write the limitations of phase noise on oscillator performance. (4)

Or

- (b) (i) Explain the design of MMIC VCO. (10)  
(ii) Compare the operation and performance of diode and FET mixers. (6)

15. (a) (i) Explain the construction and applications of micro machined antennas. (8)
- (ii) Write a brief note on probe station measurements. (8)

Or

- (b) (i) Explain the basics of photonic band gap antennas and also write their advantages and applications. (8)
- (b) Discuss the experimental field probing techniques. (8)

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