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Question Paper Code : 53010

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Seventh Semester

Electronics and Communication Engineering

EC 1403 — MICROWAVE ENGINEERING

(Regulation 2007)

Time : Three hours

Maximum : 100 marks.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Enumerate the properties of S-parameters.
2. What is H-plane Tee?
3. What is Gunn effect?
4. Write a brief note on BARITT diode.
5. State Floquet's periodicity theorem.
6. An electron of mass 'm' has charge 'e' is moving circularly with velocity 'v' in a magnetic field 'B'. Compute the cyclotron angular frequency.
7. What is coplanar strip line?
8. Write a brief note on dc sputtering deposition method in MMIC.
9. Define return loss.
10. Name few sensors used in microwave power measurement.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the following with neat sketch :
- (i) Magic tee (8)
 - (ii) Circulator. (8)

Or

- (b) Write detailed note on :
- (i) Directional coupler (8)
 - (ii) Microwave isolator. (8)

12. (a) (i) Draw the doping profile, field distribution of read diode and explain its operation. (8)
- (ii) Describe the operating principle of TRAPATT diode with voltage and current waveform. (8)

Or

- (b) (i) Derive the expression of Manley-Rowe power relations. (10)
- (ii) Explain parametric up converter with equivalent circuit in detail. (6)

13. (a) Explain the principle of operation of reflex klystron and derive the expression of bunching parameter.

Or

- (b) (i) Explain the amplification process in helix-type traveling wave tube. (10)
- (ii) Write a detailed note on voltage-tunable magnetron. (6)

14. (a) Discuss the losses in microstrip line in detail.

Or

- (b) Explain MOSFET fabrication technique in detail.

15. (a) Discuss the procedure for measuring scattering parameters.

Or

- (b) Explain the procedure for measuring dielectric constant of a solid using wave guide.