

B.E DEGREE EXMINATIONS NOV/DEC 2010

Seventh Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U07EC703: Microwave Engineering

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. A directional coupler is a _____ port wave guide
A. Single B. Two C. Three D. Four
2. The microwave circulator is a _____ wave guide
A. Single Port B. Multi Port C. Three Port D. Double Port
3. BARITT diode drift regions similar to
A. IMPATT Diode B. Read Diode C. TRAPATT Diode D. Parametric Devices
4. The TRAPATT diode the n-type depletion region width varying from
A. 2.5 to 12.5 μm B. 18.5 to 20.5 μm C. 5 to 10 μm D. 50 to 500 μm
5. Reflex Klystron efficiency range is
A. 60 to 80% B. 20 to 30% C. 90 to 100% D. 40 to 50%
6. The power gain of two cavity klystron amplifier is
A. Above 150 dB B. Below 10dB C. Above 30dB D. Above 400dB
7. Microstrip line is also called an
A. Long strip line B. Medium strip line C. Short strip line D. Open strip line
8. The quality factor for microstrip line is
A. Very high B. Low C. Medium D. Zero
9. Q factor and gain of VSWR meter is
A. High B. Low C. Medium D. Very low
10. The microwave medium power range is
A. 10mW to 10W B. 10W to 10kW C. 10 μW to 10mW D. 10 nW to 10 μW

PART B (10 x 2 = 20 Marks)

11. What is meant by rate race?
12. What is meant by ABCD matrix?
13. Define Gunn effect.
14. Write the principle of TRAPATT diode.
15. Write the principle of two-cavity klystron amplifier.
16. List the major differences between TWT and Klystron.

17. Define open strip line.
18. Give the expression for Z_0 of the shielded strip line.
19. Define VSWR.
20. Write down the expression for attenuation loss.

PART C (5 x 14 = 70 Marks)

21. (a) (i) Briefly explain the operation of an isolator. (7)
(ii) Derive the S-Matrix for Magic Tee. (7)

(OR)
- (b) (i) Briefly explain the operation of a circulator. (7)
(ii) Derive the S-Matrix for directional coupler. (7)
22. (a). Discuss in detail about IMPATT and TRAPATT diode.

(OR)
- (b). Explain the various modes of operation a Gunn oscillator.
23. (a). Explain in detail about Multicavity klystron amplifier.

(OR)
- (b). Explain the working principle of TWT amplifier with neat sketch.
24. (a). (i) Compare MMIC with Hybrid Integrated Circuit. (7)
(ii) Explain briefly about photo resist process. (7)

(OR)
- (b) Draw the diagram of microstrip line and derive expression for characteristic impedance losses and Quality Factor.
25. (a) Explain in detail about various methods of microwave power measurements.

(OR)
- (b) (i) Briefly explain the operation of network analyzer. (7)
(ii) Explain briefly about attenuation measurement. (7)
