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MAR_APR 2026 SUMMER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Microwave Engineering

Sub. Code: 67631/84860/85040

Day and Date: Friday ,29-05-2026 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:
1. **All questions are compulsory**
2. **Assume suitable data wherever necessary and mention it boldly**
3. **Draw neat labelled diagrams wherever necessary**
4. **Figures to the right indicate full marks**
5. **Use of Scientific calculator is allowed**

Q1) Solve following MCQ. **[14]**

i. Which mode is the dominant mode in a rectangular waveguide?
- A. TM01
- B. TE10
- C. TE01
- D. TM10

ii. The principle used in klystron amplifier operation is:
- A. Frequency modulation
- B. Velocity modulation
- C. Phase modulation
- D. Pulse modulation

iii. MMIC stands for:
- A. Monolithic Microwave Integrated Circuit
- B. Modular Microwave Interference Circuit
- C. Microwave Measurement Integrated Circuit
- D. Magnetic Microwave Integrated Core

iv. Gunn diode operates based on:
- A. Tunneling effect
- B. Avalanche breakdown
- C. Transferred electron effect
- D. Zener breakdown

v. VSWR is a measure of:
- A. Frequency variation
- B. Impedance matching
- C. Power gain
- D. Phase shift

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vi. Which antenna is commonly used for satellite communication?

A. Horn antenna
B. Parabolic reflector
C. Loop antenna
D. Yagi antenna

vii. The cutoff frequency of a waveguide depends mainly on:

A. Material permeability
B. Length of the waveguide
C. Cross-sectional dimensions
D. Input power

Q2) Answer any two questions **[14]**

a. Define TEM, TE, and TM model. Sketch the field patterns for dominant mode in rectangular waveguide. **[7]**

b. Explain types and working of directional coupler with S parameters. Mention its application. **[7]**

c. What are different linear beam tubes? Explain Klystron in detail. **[7]**

Q3) Answer any two questions **[14]**

a. What are slow wave structures? Explain how it can be used in TWT? **[7]**

b. Explain substrate, conductor, dielectric and resistive material used for MMIC. **[7]**

c. Write short note on thin film formation in MMIC **[7]**

Q4) Answer any two questions **[14]**

a. Explain with energy band diagram Tunnel Diode. Also explain V-I characteristics of Tunnel Diode **[7]**

b. What are avalanche transit time devices? Explain the operation, construction and characteristic of IMPATT diodes. **[7]**

c. Explain with diagram low, medium and high microwave power measurement technique. **[7]**

Q5) Answer any two questions **[14]**

a. Explain measurement of VSWR Techniques. **[7]**

b. What are different types of microwave antennas ? Explain the Antenna Parameters. **[7]**

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c. Explain with neat diagram Microstrip antennas. **[7]**

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (84860) Microwave Engineering Part 4 SEM 8
2] (101) Bachelor of Engineering (67631) RF and Microwave Engineering Part 4 SEM 7
3] (101) Bachelor of Engineering (85040) Microwave Engineering Part 4 SEM 8

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