Ajay Kumar Garg Engineering College, Ghaziabad

Department of ECE

Pre-University Test

Course: B.Tech
Session: 2019-20
Subject: Microwave Engineering
Max Marks: 70

Semester: VI
Section: EC-1,2,3
Sub. Code: REC-601
Time: 3Hrs.

OBE Remarks:

Q.No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
CO No.						CO5	CO4						CO4	CO4	CO5	CO5	

Note : Answer **all** the sections.

Section-A

A. Attempt **all** the parts. **(7x2 =14)**

1. Differentiate dominant and degenerative mode in waveguide
2. How the limitations of conventional tubes at microwave frequency can be overcome
3. Define the purpose of slow wave structures used in TWT.
4. Explain the wave velocities in the context of propagation in waveguide.
5. In helical slow wave structure if pitch is 7cm and diameter is 14cm. Calculate the axial velocity with which wave will propagate.
6. What is double minima method?
7. What are the various modes of Gunn diode operation.

Section-B

B. Attempt **Any three**. **(3x7 = 21)**

8. Explain backward wave Oscillator(BWO).
9. What are the limitations of conventional active devices at microwave frequency?
10. Explain the working and application of circulator. Are they reciprocal or Non reciprocal device?
11. A 50mW signal is fed into one of the collinear part1 of a lossless H plane Tee junction. Calculate the power delivered through each port. When other ports are terminated in matched load.

12. Write down the advantage, disadvantage and application of a circular waveguide. A circular waveguide in a dominant mode at a frequency of 10GHz have initial diameter of 3cm. Calculate guide wavelength and cutoff wavelength.

Section-C

C. Attempt **all** the parts.

(5x7 = 35)

13. Attempt any one.

a) Explain the operation of TRAPATT and compare its performance with IMPATT.

b) Explain the classification of microwave solid state devices.

14. Attempt any one.

a) Draw the schematic of BARITT diode and explain its working principle.

b) Explain the Gunn effect with respect to two valley model. Also draw the graph between current density and electric field.

15. Attempt any one.

a) Explain the measurement of microwave power

b) Explain the measurement technique of VSWR.

16. Attempt any one.

a) Explain the frequency measurement using down conversion method and measurement of wavelength.

b) What is meant by insertion loss and attenuation loss. Discuss any one method for measurement of attenuation.

17. Attempt any one.

a) What is Faraday rotation? How it is used in designing microwave component

b) What is microstrip line and explain its losses occurred in microstrip.