



B.Tech VII Semester Supplementary Examinations, December 2024

MICROWAVE ENGINEERING
(ECE)

Maximum Marks: 70

Date: 10.01.2025

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20) Marks)		CO	Bloom Tx
1	Define Dominant mode . What is the dominant mode in Rectangular waveguides.	1	L1
2	What are Degenerate modes? Define.	1	L1
3	List few applications of cavity resonator.	2	L1
4	Define Faraday Rotation.	2	L1
5	List the limitations of conventional tubes at microwaves.	3	L1
6	Define velocity modulation.	3	L1
7	What are cross-field devices.	4	L1
8	What are the different modes of Gunn diode.	4	L1
9	Define the method for measuring VSWR<10	5	L1
10	Define Isolator.	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	Derive all the wave equations for a TM mode and obtain all the field components in a Rectangular Waveguide. [10M]	1	L2
OR			
12	An air filled rectangular wave-guide has the dimensions 7*3.5cm.It operates in TE ₁₀ mode . Calculate i)the cut off frequency ii) phase velocity of wave at 3.5GHz. iii) the guide wavelength at same frequency. [10M]	1	L2
13	What is an Attenuator? Discuss the working of a variable attenuator. [10M]	2	L2
OR			
14	Explain the working of Magic Tee with a neat diagram. [10M]	2	L2
15	Explain the bunching process in 2- cavity Klystron amplifier using applegate diagram. [10M]	3	L2
OR			
16	Explain the operation of Reflex Klystron and explain the bunching process by means of applegate diagram. [10M]	3	L2

17	How is bunching achieved in a Cavity Magnetron. Explain with the help of the neat sketch. [10M]	4	L2
	OR		
18	What is TED? Explain the V-I characteristics of GUNN diode with neat diagram. [10M]	4	L2
19	Derive the S-Matrix of directional coupler. [10M]	5	L2
	OR		
20	Draw a neat diagram of microwave test bench and explain about each block along with its features. [10M]	5	L2