

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

IV B.Tech, I Semester, Academic Year: 2026-27

Course Name : MICROWAVE AND OPTICAL COMMUNICATION (23EC701)
L – T – P : 3– 1– 0
Course Instructor : Mr.M.SREEDHAR REDDY

Prerequisites: Antennas and Propagation

Course Objectives:

- To get familiarized with microwave frequency bands, their applications and to understand the
- Limitations and losses of conventional tubes at these frequencies. To distinguish between different types of microwave tubes, their structures and principles of
- Microwave power generation. To impart the knowledge of Scattering Matrix, its formulation and utility, and establish the S-Matrix for various types of microwave junctions
- Understand the utility of Optical Fibers in Communications.

Course Outcomes (CO's):

- Known power generation at microwave frequencies and derive the performance characteristics.
- Realize the need for solid state microwave sources and understand the principles of solid state devices.
- Distinguish between the different types of waveguide and ferrite components, and select proper components for engineering applications
- Understand the utility of S-parameters in microwave component design and learn the measurement procedure of various microwave parameters.
- Understand the mechanism of light propagation through Optical Fibers.

UNIT WISE QUESTION BANK

Unit-1

S.No	Questions	BT	CO	PO
Part – A (Short Answer Questions)				
1	Define velocity modulation?	L1	C01	PO1
2	Write the applications of Travelling wave tubes.	L1	C01	PO1
3	Write the application's of two cavity klystron	L1	C01	PO1
4	Write the application's of Reflex klystron	L1	C01	PO1
5	Draw the types of slow wave structures used in HTWT?	L2	C01	PO2
6	Define beam coupling coefficient and draw the graph between angle and beam efficiency?	L1	C01	PO1
7	Define drift space?	L1	C01	PO1
8	What is the Replier space of reflex klystron	L1	C01	PO1
9	Write the application of TWT	L1	C01	PO1
10	Distinguish between two cavity klystron and TWT	L2	C01	PO2

Part – B (Long Answer Questions)					
11	a	Explain principle of operation, performance characteristics and applications of Two Cavity Klystron	L1	C01	PO1
	b	Derive the velocity modulation for Two cavity Klystron	L5	C01	PO3
12	a	Derive the Bunching process of two cavity klystron with help of apple gate diagram	L5	C01	PO3
	b	Derive the efficiency of Two cavity klystron?	L5	C01	PO3
13	a	Explain principle of operation, performance characteristics and applications of Reflex Klystron	L1	C01	PO1
	b	Derive the velocity modulation for Reflex Klystron	L5	C01	PO3
14	a	Derive the Bunching process of Reflex klystron with help of apple gate diagram	L5	C01	PO3
	b	Derive the efficiency of Reflex klystron?	L5	C01	PO3
15	a	Explain the operation of TWTA?	L2	C01	PO2
	b	Derive the Electron equation for TWTA	L5	C01	PO3
16	a	Why TWT is used Helix? Explain its applications	L3	C01	PO2
	b	Derive the TWTA gain Consideration?	L5	C01	PO3