Question Paper Code: R18A32EC05

R18

ANURAG Engineering College

(An Autonomous Institution)

III B.Tech II Semester Supplementary Examinations, December-2024

MICROWAVE ENGINEERING

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max. Marks: 75**

Section – A (Short Answer type questions) (25 Marks)

Answer All Questions		Course Outcome	B.T Level	Marks
1.	List out different losses in microstrip lines?	CO1	L1	2M
2.	Define phase velocity and group velocity in rectangular waveguide?	CO1	L1	3M
3.	Describe the characteristic features of resonant windows?	CO2	L1	2M
4.	Explain the waveguide discontinuities?	CO2	L2	3M
5.	List the drawbacks of Klystron amplifiers?	CO3	L1	2M
6.	Illustrate velocity and current modulation in a Reflex Klystron?	CO3	L2	3M
7.	Why Magnetron is called as cross field device?	CO4	L1	2M
8.	Illustrate the principle of TRAPATT diode?	CO4	L2	3M
9.	List the methods used for measuring the low and high VSWR?	CO5	L1	2M
10.	Illustrate briefly various methods for measuring attenuation?	CO5	L2	3M

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A)	A rectangular waveguide has dimensions 2.5 X 5 cms. Determine the guide wavelength, phase constant and phase velocity at a wavelength of 4.5 cms for dominant mode.	CO1	L2	10M
	OR			
B)	Explain the wave impedance of a rectangular waveguide and derive the expression for the wave impedance of TE and TM modes?	CO1	L3	10M
12. A)	Explain about the Directional Couplers and list the applications.	CO2	L2	10M
	OR			
B)	Derive the cut-off frequency expression for rectangular cavity resonator?	CO2	L3	10M
13. A)	Explain the principle of working for two-cavity Klystron with velocity diagram?	CO3	L2	10M
	OR			
B)	Explain the principle of operation of a Reflex Klystron oscillator and derive an expression for the bunching parameter?	CO3	L3	10M
14. A)	What is meant by Avalanche Transit Time Devices? Explain the operation, construction and applications of IMPATT Diode?	CO4	L2	10M
	OR			
B)	Derive the criterion for classifying the modes of operation for Gunn effect diodes?	CO4	L3	10M

15. A)	Explain the measurement of Q-factor of a cavity resonator?	CO5	L2	10M
	OR			
B)	Draw a neat diagram of microwave test bench and explain about each block along with its features?	CO5	L2	10M