Code No: 157CM **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, January/February - 2023
MICROWAVE AND OPTICAL COMMUNICATIONS
(Electronics and Communication Engineering)

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

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	What are the limitations of conventional vacuum tubes?	[2]
b)	How the two cavity Klystron acts as an oscillator?	[3]
c)	What is meant by Hull Cutoff Voltage?	[2]
d)	How a Gunn Diode act as an oscillator?	[3]
e)	What is the principle of microwave phase shifter?	[2]
f)	Discuss about waveguide discontinuities?	[3]
g)	Give the properties of S matrix.	[2]
h)	Discuss the significance of slotted section.	[3]
i)	What is a graded index fiber? Sketch its refractive index profile.	[2]
j)	Discuss about "Signal Distortion" in fibres.	[3]

PART – B

(50 Marks)

2.a)	Explain in detail about the classification of M type Microwave tubes.	
b)	Explain the velocity modulation in two cavity Klystron amplifiers.	[5+5]
	OR	
3.a)	Draw the diagram of TWT and explain the operation in detail.	
b)	Explain the significance of Applegate diagram.	[5+5]
4.a)	Explain the growth of oscillations in a travelling wave magnetron.	
b)	Discuss about magnetron and its types.	[5+5]
	OR	
5.a)	Write short notes on "TRAPATT diode".	
b)	What are the different avalanche transit time devices?	[5+5]
6.a)	Discuss in detail about Ferrites Composition and Characteristics.	
b)	Explain about various wave guide attenuators.	[5+5]
	OR	
7.a)	Draw the structure diagram of H-plane Tee and explain its characteristics.	
b)	Explain the principle of Faraday rotation.	[5+5]

8.a) Explain the operation of Directional Coupler with a neat diagram and derive its Scattering Matrix.

b) Describe how a magic tee can be used in constructing a Circulator and a Duplexer. [5+5]

OR

9.a) With the help of a neat sketch, briefly explain the functions of different blocks of a microwave bench.

b) Discuss in detail about measurement of VSWR. [5+5]

10.a) Explain Classification of Optical Fibers.

b) Explain LED Structure with neat sketch. [5+5]

OR

11.a) Describe any two types of Losses in Optical Fiber Communication System.

b) Describe in detail about Rise time Budget of Optical Fibre Communication interms of digital system design. [5+5]

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