O.P.Code: 20EC0433	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year II Semester Regular & Supplementary Examinations June-2025
FIBER OPTIC COMMUNICATIONS
(Electronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Explain the Elements of Optical Communication System with neat sketch.	CO1	L2	6M
	b	Derive the expression for i) Critical angle. ii) Numerical aperture.	CO1	L3	6M
		OR			
2	a	What do you mean by pulse broadening? Explain its effect on information carrying capacity of a fibe.	CO2	L2	6M
	b	with neat sketch describe the characteristics of multimode Step index & graded index fibers.	CO2	L2	6M

UNIT-II

3	a	What are the various types of LED structures? Explain about double heterostructure with neat diagram.	CO3	L2	6M
	b	Illustrate the working principle of an edge emitter LED with neat diagram.	CO3	L2	6M
		OR			
4	a	Derive the expressions for LASER modes and threshold conditions.	CO3	L3	6M
	b	Explain in detail the various Characteristics of Light Source.	CO3	L2	6M

UNIT-III

5	a	Explain the principle behind the operation of an PIN Photo diode with its the energy band diagram.	CO3	L2	6M
	b	A given silicon avalanche photodiode has a quantum efficiency 80% at a wavelength of 0.9μm. Suppose 0.5μW of optical power produces a multiplied photocurrent of 11μA. Calculate the multiplication M.	CO3	L3	6M
		OR			
6	a	Explain the digital signal transmission for an optical receiver.	CO3	L3	6M
	b	Construct the optical receiver configuration.	CO3	L2	6M

UNIT-IV

7	a	Explain the significance of system consideration in point-to-point fiber links.	CO4	L2	6M
	b	Summarize on system performance using rise time budget of digital systems.	CO4	L2	6M
		OR			
8	a	Describe about power budget with examples.	CO4	L2	6M
	b	LED spectral width of 20 nm has rise time of 15 ns, tmat is 20ns, trx is 10ns and tmod is 2.5 ns. Find total system rise time.	CO5	L3	6M

UNIT-V

9	a	What is optical Network? Explain the elements of optical network.	CO5	L2	6M
	b	List the advantages of optical networks.	CO5	L1	6M
		OR			
10	a	Illustrate the basic concept of optical CDMA.	CO6	L2	6M
	b	Explain in brief about the working principle of WDM.	CO5	L2	6M

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