O.P.Code: 16EC430	R16	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech IV Year I Semester Supplementary Examinations June-2024

OPTICAL FIBER COMMUNICATIONS

(Electronics and Communications Engineering)

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

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

		UNIT-I			
1	a	Explain about the Evolution of optical fiber systems.	**CO1**	**L2**	**6M**
	b	Illustrate on Reflection and Refraction with neat sketch.	**CO1**	**L2**	**6M**
		OR			
2	a	Explain about the Multimode Step Index fiber with neat sketch.	**CO1**	**L2**	**6M**
	b	Fiber has normalized frequency 26.6 & operating wavelength 1300nm, if the radius of the fiber core is 25μm.Compute the numerical aperture.	**CO1**	**L3**	**6M**
		UNIT-II			
3		Demonstrate any two types of Losses in Optical Fiber Communication System.	**CO2**	**L2**	**12M**
		OR			
4	a	Develop the expression for total dispersion in single mode fiber.	**CO2**	**L3**	**6M**
	b	How refractive index profile optimizes the design in a single mode fiber?	**CO2**	**L1**	**6M**
		UNIT-III			
5	a	Illustrate on light source materials in detail.	**CO3**	**L2**	**8M**
	b	Explain about the surface emitter LED with neat diagram.	**CO3**	**L2**	**4M**
		OR			
6	a	Develop the expression for modes and threshold condition of LASER.	**CO3**	**L3**	**8M**
	b	What power is radiated by an LED if its quantum efficiency is 3% and the peak wavelength is 670nm?	**CO3**	**L1**	**4M**
		UNIT-IV			
7	a	Explain the principle behind the operation of an PIN photo diode.	**CO4**	**L2**	**7M**
	b	Analyze photo detector receiver with simple model and equivalent circuit.	**CO4**	**L4**	**5M**
		OR			
8	a	List the operating parameters of Si, Ge, InGaAs for PIN diode.	**CO4**	**L1**	**7M**
	b	A given silicon avalanche photodiode has a quantum efficiency of 65% at a wavelength of 900nm.Suppose 0.5μW of optical power produces a multiplied photocurrent of 10μA. Calculate the multiplication M?	**CO4**	**L3**	**5M**
		UNIT-V			
9	a	Discuss about error correction in digital link.	**CO5**	**L6**	**5M**
	b	Explain multi channel amplitude modulation with a neat block diagram.	**CO5**	**L2**	**7M**
		OR			
10	a	List the advantages & disadvantages of using WDM in optical fiber communication system.	**CO5**	**L1**	**5M**
	b	Explain about the applications of WDM in detail.	**CO5**	**L3**	**7M**

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