Q.P. Code: 16EC430 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech IV Year I Semester Regular & Supplementary Examinations Feb-2021

OPTICAL FIBER COMMUNICATIONS

(Electronics and Communication 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.	**6M**
	b	Develop the Expression for Acceptance angle and Numerical aperture.	**6M**
		OR	
2	a	Discuss the single mode step Index fiber with neat sketch.	**6M**
	b	Compare step index & graded index fiber.	**6M**
		UNIT-II	
3	a	How attenuation is caused by scattering losses & bending losses?	**8M**
	b	How to minimize the micro bending losses in the fiber?	**4M**
		OR	
4	a	Distinguish between intrinsic & extrinsic Absorption.	**6M**
	b	Explain the phenomenon of Rayleigh scattering in scattering loss.	**6M**
		UNIT-III	
5	a	A planar LED is fabricated from GaAs which has a refractive index of 3.6. Calculate the optical power emitted into air as a percentage of the internal optical power for the device when the transmission factor at the crystal-air interface is 0.68.(ii) When the optical power generated internally is 50% of the electric power supplied, determine the external power efficiency.	**6M**
	b	Demonstrate on direct and indirect bandgap materials in detail.	**6M**
		OR	
6	a	Illustrate about external quantum efficiency of LASER.	**5M**
	b	Explain in detail about Quantum laser.	**7M**
		UNIT-IV	
7	a	Explain the principle behind the operation of an PIN photo diode.	**7M**
	b	Explain the simple energy band diagram for a PIN photodiode with neat diagram.	**5M**
		OR	
8	a	How the receiver configuration works in optical receiver?	**6M**
	b	Explain about the probability of error in detail.	**6M**
		UNIT-V	
9	a	LED spectral width of 40nm has rise time of 15ns, t_{mat} is 21ns, t_{rx} is 14ns and t_{mod} is 3.9ns. Find total system rise time.	**5M**
	b	Explain the significance of system consideration in point-to-point fiber links.	**7M**
		OR	
10	a	Explain about Carrier to Noise Ratio of analog links in detail.	**7M**
	b	List the advantages & disadvantages of using WDM in optical fiber communication system.	**5M**

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