Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– VI EXAMINATION – SUMMER 2020

Subject Code: 2161005   **Date:28/10/2020**

Subject Name: Optical Communication

Time: 10:30 AM TO 01:00 PM   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Mention the advantages of Optical Communication System.	**03**
	(b)	Mention the importance and significance of Optical Windows used for optical communication Purpose.	**04**
	(c)	Describe Any one Method for fiber fabrication.	**07**
Q.2	**(a)**	Define the following w.r.to Optical source and Detectors (i) Response Time(ii) Quantum Efficiency(iii)Sensitivity	**03**
	(b)	Compare S.I. and G.I. fibers.	**04**
	(c)	Describe fiber scattering Losses in brief.	**07**
		OR	
	(c)	Discuss intermodal dispersion in optical fibers.	**07**
Q.3	**(a)**	Compare LED and LASER as fiber optic source.	**03**
	(b)	Determine the normalized frequency at 850 nm for a step index fiber has a core radius of 20μm,core refractive index of 1.46 and cladding refractive index of 1.43. How modes propagate in this fiber at 1320 nm and 1550nm.	**04**
	(c)	Describe different lensing schemes used in optical cable	**07**
		OR	
Q.3	**(a)**	Briefly Explain working of ELED(Edge emitting) as fiber sourc and its Major advantage over SLED.	**03**
	(b)	A multimode graded index fiber exhibits total pulse broadening 0.1 μsec over a distance of 10 km. Calculate(i)Optimum bandwidth on the link assuming no inter symbol interference.(ii) pulse broadening per unit length.	**04**
	(c)	Derive the formula to compute loss for axial mis alignment taking place at fiber to fiber joints.	**07**
Q.4	**(a)**	Explain in brief dark current noise in photo detector.	**03**
	(b)	Describe the structure of APD (Avalanche photo detector)in brief.	**04**
	(c)	Explain different techniques of splicing in brief.	**07**
		OR	
Q.4	**(a)**	Briefly describe temperature effect on Gain of APD.	**03**
	(b)	Explain PIN as photo detector in brief.	**04**
	(c)	Derive the equation for the power launched from LED source in to a G.I. Fiber.	**07**

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Q.5 **(a)** How will you measure intermodal dispersion in frequency domain? **03**

(b) Mention the requirement of good optical switch. **04**

(c) Discuss optical power loss model for a point to point link. **07**

<div align="center">**OR**</div>

Q.5 **(a)** How will you measure chromatic dispersion? **03**

(b) Compare SOA and EDFPA. **04**

(c) Briefly explain Couplers in optical components. **07**

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