Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VI (NEW) EXAMINATION – WINTER 2020

Subject Code:2161005 Date:01/02/2021

Subject Name:Optical Communication

Time:02:00 PM TO 04:00 PM Total Marks: 56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Briefly describe the block diagram of Optical Communication System.	**03**
	(b)	Explain in brief the transmission windows of OC.	**04**
	(c)	Describe double crucible Method for fiber fabrication.	**07**
Q.2	**(a)**	Define the following w.r.to propogation modes in OFC: (i) Transverse Propagation Constant(ii) V Number(iii)Group Velocity	**03**
	(b)	Compare Single Mode and Multi Mode fibers.	**04**
	(c)	Describe fiber Bending Losses in brief.	**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 25μm,core refractive index of 1.48 and cladding refractive index of 1.46. How modes propagate in this fiber at 1320 nm and 1550nm.	**04**
	(c)	Describe different lensing schemes used in optical cable	**07**
Q.4	**(a)**	Compare SLED (Surface emitting)and ELED(Edge emitting) as fiber source.	**03**
	(b)	A multimode graded index fiber exhibits total pulse broadening 0.1 μsec over a distance of 12 km. Calculate(i)Optimum bandwidth on the link assuming no inter symbol interference.(ii) pulse broadening per unit length.	**04**
	(c)	Explain various losses taking place at fiber to fiber joints.	**07**
Q.5	**(a)**	Explain in brief dark current noise in photo detector.	**03**
	(b)	Describe the structure of P-I-N photo detector in brief.	**04**
	(c)	Explain different techniques of splicing in brief.	**07**
Q.6	**(a)**	Briefly describe temperature effect on Gain of APD.	**03**
	(b)	Explain APD in brief.	**04**
	(c)	Derive the equation for the power launched from LED source in to a S.I. Fiber.	**07**
Q.7	**(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**

Q.8	**(a)**	How will you measure chromatic dispersion?	**03**
	(b)	Compare SOA and EDFPA.	**04**
	(c)	Briefly explain wavelength converter in optical components .	**07**

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