Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2161005 Date:21/05/2019

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.**

			MARKS
Q.1	**(a)**	Define : Skew ray, Meridional ray.	**03**
	(b)	Compare single mode and Multi mode step index and graded index optical fiber	**04**
	(c)	List the factors that decide the performance of optical reception and explain it. Also draw and explain eye diagram in detail.	**07**
Q.2	**(a)**	Explain various fiber modes	**03**
	(b)	Explain scattering loss in optical fiber.	**04**
	(c)	Explain with neat and clean diagram : The plasma activated chemical vapor deposition (PCVD) technique for the production of optical fiber	**07**
		OR	
	(c)	A multimode step index fiber with a core diameter of **100** μm and a relative index difference of **1.5%** is operating at a wavelength of **0.85** μm. If the core refractive index is **1.485**, calculate: (i) Normalized frequency of fiber (ii) Total number of guided modes.	**07**
Q.3	**(a)**	Compare Direct band gape and Indirect band gape materials	**03**
	(b)	Explain structure of Edge double hetero junction LED	**04**
	(c)	Derive the equation for the power launched from LED Source in to a S.I. fiber	**07**
		OR	
Q.3	**(a)**	Compare LED and LASER diode as a light source in fiber optic communication	**03**
	(b)	Explain structure of Surface LED	**04**
	(c)	Derive LASER rate equation	**07**

Q.4	**(a)**	Define the following terms related to photo detector. (1) Responsivity (2) Quantum efficiency (3) Cut off wavelength	**03**
	(b)	Discuss the fiber splicing techniques with necessary sketches.	**04**
	(c)	Explain Optical Time Domain Reflectometry (OTDR) method with its benefits over other techniques	**07**

OR

Q.4	**(a)**	Explain nature of light and its various polarization	**03**
	(b)	Explain principal of P i N photo detector with its energy band diagram	**04**
	(c)	Discuss the need of optical Amplifier and also describe the architecture and amplification mechanism of Erbium Doped Fiber Amplifier. (EDFA)	**07**
Q.5	**(a)**	Explain : Snell's law.	**03**
	(b)	Discuss system features of WDM and explain WDM in brief also Draw diagram of a typical WDM link containing various components	**04**
	(c)	Explain in detail : SONET/SDH	**07**

OR

Q.5	**(a)**	Short note : Dispersion in fiber cable	**03**
	(b)	Explain the three key transient process involved in LASER action.	**04**
	(c)	Explain reach through avalanche photo diode structure with its electric field and multiplication concept.	**07**

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