

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**
