

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2161005

Date: 08/05/2017

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 Short Questions	14
1 Mention difference between DB and DBm.	01
2 What is meant by Population Inversion in laser operation?	01
3 Mention : Snell's Law	01
4 Define : (1) Acceptance angle (2) Critical angle	01
5 What is meant by power budget for fiber optic system?	01
6 Define : Scattering Loss in fiber cable	01
7 Differentiate between Homojunction and Heterojunction materials.	01
8 Define: Total internal reflection occurred in fiber cable waveguide.	01
9 Justify that glass fiber is preferred then plastic fiber.	01
10 Define: Refractive index of material.	01
11 List out the requirements of cladding over core for fiber cable	01
12 Differentiate between direct and indirect band gap materials.	01
13 Define : Skew rays in fiber waveguide	01
14 List out the function of optical repeater.	01
Q.2 (a) Discuss the need of fiber optical communication System.	03
(b) Describe in brief : Numerical Aperture	04
(c) Describe the function of each element used in optical fiber transmission link with neat block diagram.	07
OR	
(c) The velocity of light in core of step index fiber is 2.01×10^8 m/s and the critical angle of core cladding interface is 80°. Determine the numerical aperture and acceptance angle for the fiber in air assuming that it has core diameter suitable for consideration in ray analysis.	07
Q.3 (a) List out advantages of graded index fiber	03
(b) Differentiate between step index and graded index fiber.	04
(c) Describe the Modified Chemical Vapour deposition Technique for fabrication of fiber cable using neat diagram.	07
OR	
Q.3 (a) What is meant by attenuation of signal in fiber cable? How this loss can be measured?	03
(b) Differentiate between Micro and Macro banding losses in fiber cable with neat diagram.	04
(c) Discuss surface Emitting LED with neat diagram and also discuss comparison with Edge Emitting LED.	07
Q.4 (a) Discuss the Wavelength division Multiplexing in brief.	03
(b) List out comparisons between LED and LASER.	04
(c) Describe the operations of LASER diode.	07
OR	
Q.4 (a) Differentiate between Single and Multimode fibers.	03
(b) Discuss the EYE Pattern/ Diagram in brief	04

- (c) List out the advantages of fiber cable over copper cable in detail. **07**
- Q.5** (a) Describe the principle used in Photo detector **03**
(b) Discuss the fiber splicing techniques with neat sketches. **04**
(c) Discuss the need of optical Amplifier and also describe the architecture and amplification mechanism of Erbium Doped Fiber Amplifier. (EDFA). **07**
- OR**
- Q.5** (a) Explain the PIN photo diode operation in detail. **03**
(b) Describe in brief : Dispersion in fiber cable **04**
(c) Discuss the various lensing schemes in details for coupling improvement. **07**
