

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (OLD) EXAMINATION – WINTER 2018****Subject Code:161005****Date: 20/11/2018****Subject Name: Optical Communication****Time: 02:30 PM TO 05:00 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) Define Numerical Aperture and derive its expression for the step index fiber. **07**

(b) Explain block diagram of optical communication system with neat sketch. Explain functions of each block. **07**

Q.2 (a) Derive the equation of power coupling from LED source to step index fiber: (1) when source radius is less than fiber radius (2) when source radius is greater than the fiber radius. **07**

(b) Discuss the various dispersion mechanisms that contribute to pulse broadening during the fiber transmission. **07**

OR

(b) With figure explain double crucible arrangement for drawing fibers from molten glass. Give the advantages of this method. **07**

Q.3 (a) Explain the high radiance surface emitting LED. Highlight the drawbacks of same and how it can reduce with the help of edge emitting LED. **07**

(b) Explain the advantages of the optical communication system using optical fiber over conventional copper system as a transmission link. State the optical transmission windows. **07**

OR

Q.3 (a) Discuss briefly the distributed feedback LASER with neat sketch. **07**

(b) Define the following terms related to photo detector. **07**
(i) Responsivity (ii) Quantum efficiency (iii) Cut off wavelength. State the responsivity of photodiode.

Q.4 (a) Write a short note on fiber amplifiers. **07**

(b) What is optical coupler? Draw and explain optical coupler in detail. **07**

OR

Q.4 (a) Explain the plasma activated chemical vapor deposition (PCVD) technique for the production of optical fiber. **07**

(b) Write short notes on Synchronous optical fiber networks(SONET) **07**

Q.5 (a) Explain Optical Time Domain Reflectometry (OTDR) method. **07**

(b) Describe briefly the losses in optical fibers. **07**

OR

Q.5 (a) With the help of necessary figure properly explain DWDM in detail. **07**

(b) Explain (1) fusion splicing, (2) V-groove splicing and (3) elastic tube techniques for fiber splicing. **07**
