

**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-grove splicing and (3) elastic tube techniques for fiber splicing. **07**

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