

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER- VI EXAMINATION – SUMMER 2020****Subject Code: 2161005****Date: 28/10/2020****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.

- Q.1** (a) Mention the advantages of Optical Communication System. **03**
- (b) Mention the importance and significance of Optical Windows used for optical communication Purpose. **04**
- (c) Describe Any one Method for fiber fabrication. **07**
- Q.2** (a) Define the following w.r.to Optical source and Detectors **03**
 (i) Response Time(ii) Quantum Efficiency(iii)Sensitivity
- (b) Compare S.I. and G.I. fibers. **04**
- (c) Describe fiber scattering Losses in brief. **07**
- OR**
- (c) Discuss intermodal dispersion in optical fibers. **07**
- Q.3** (a) Compare LED and LASER as fiber optic source. **03**
- (b) Determine the normalized frequency at 850 nm for a step index fiber has a core radius of 20 μ m, core refractive index of 1.46 and cladding refractive index of 1.43. How modes propagate in this fiber at 1320 nm and 1550nm. **04**
- (c) Describe different lensing schemes used in optical cable **07**
- OR**
- Q.3** (a) Briefly Explain working of ELED(Edge emitting) as fiber source and its Major advantage over SLED. **03**
- (b) A multimode graded index fiber exhibits total pulse broadening 0.1 μ sec over a distance of 10 km. Calculate(i)Optimum bandwidth on the link assuming no inter symbol interference.(ii) pulse broadening per unit length. **04**
- (c) Derive the formula to compute loss for axial mis alignment taking place at fiber to fiber joints. **07**
- Q.4** (a) Explain in brief dark current noise in photo detector. **03**
- (b) Describe the structure of APD (Avalanche photo detector)in brief. **04**
- (c) Explain different techniques of splicing in brief. **07**
- OR**
- Q.4** (a) Briefly describe temperature effect on Gain of APD. **03**
- (b) Explain PIN as photo detector in brief. **04**
- (c) Derive the equation for the power launched from LED source in to a G.I. Fiber. **07**

- Q.5** (a) How will you measure intermodal dispersion in frequency domain? **03**
(b) Mention the requirement of good optical switch. **04**
(c) Discuss optical power loss model for a point to point link. **07**
- OR**
- Q.5** (a) How will you measure chromatic dispersion? **03**
(b) Compare SOA and EDFPA. **04**
(c) Briefly explain Couplers in optical components. **07**
