

**B.Tech. – VIEP – ELECTRONICS AND
COMMUNICATION ENGINEERING
(BTECVI)**

Term-End Examination

00464

June, 2017

**BIELE-008 : OPTO ELECTRONICS
COMMUNICATION SYSTEMS**

Time : 3 hours

Maximum Marks : 70

Note : Attempt **seven** questions in all. Missing data, if any, may be suitably assumed. Use of scientific calculator is permitted.

1. Explain step index and graded index fibers in detail. 10
2. Discuss in detail the intermodal dispersion with relevant expressions and diagrams. 10
3. Explain with suitable diagrams, the different mechanisms that contribute attenuation in optical fibers. 10
4. Draw and explain surface and edge emitting LEDs. 10

5. Explain a PIN photodiode in detail. What is the main advantage of PIN photodiode over p-n photodiode ? 10
6. Explain the concept of responsivity in an optical detector. 10
7. Discuss the operation of the avalanche photodiode with neat block diagram. 10
8. (a) Why is a step index single mode fiber preferred for long distance communication ? 5
- (b) Compare LED with a LASER diode. 5
9. (a) For a silica optical fiber with a core refractive index of 1.50 and a cladding refractive index of 1.47, determine
- (i) the critical angle at the core-cladding interface, and
- (ii) the numerical aperture for the fiber. 5
- (b) Explain various types of noises in optical detectors. 5
10. Write short notes on any *two* of the following : $2 \times 5 = 10$
- (a) Dispersion Shifted and Flattened Fibers
- (b) Brillouin Amplifier
- (c) Kerr Non-Linearity