

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

00803 Term-End Examination

June, 2018

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

Time : 3 hours

Maximum Marks : 70

Note : Attempt any **seven** questions. All questions carry equal marks. Missing data may be suitably assumed. Use of calculator is permitted.

1. Briefly explain the following terms related to optical fiber communications : $4 \times 2 \frac{1}{2} = 10$
- (i) Polarization
 - (ii) Attenuation
 - (iii) Dispersion
 - (iv) Guided modes
2. What do you understand by the term “Self-phase modulation” ? Explain its advantages and disadvantages. $3+7=10$

3. Briefly discuss linearly polarized modes and mention their advantages in context to optical fiber communication systems. 10

4. Explain the construction, operation and the characteristics of a laser diode. 10

5. What are avalanche photodiodes ? Explain their operating principle, construction and characteristics. 10

6. For a PN detector, derive an expression for responsivity, sensitivity and quantum efficiency. 3+3+4=10

7. Why are direct band-gap materials preferred for manufacturing LEDs ? Compare LEDs and laser diodes. 10

8. Compare the phenomenon of intermodal dispersion in multimode step index fiber and graded index fiber. 10

9. Explain the operation of a Raman amplifier. 10

10. Write short notes on any **two** of the following : 2×5=10
 - (a) Dispersion
 - (b) Saturation Induced Crosstalk
 - (c) Amplifier Noise