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BIELE-008

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

00913 **Term-End Examination**

December, 2016

BIELE-008 : OPTO ELECTRONICS COMMUNICATION SYSTEMS

Time : 3 hours *Maximum Marks : 70*

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

1. Discuss briefly about linearly polarized modes. Also mention the advantages of optical fiber communication systems. *10*

2. Explain the material dispersion with relevant diagram and expressions. *10*

3. What are the losses on signal attenuation mechanisms in a fiber ? Explain in detail. *10*

4. Why is direct band-gap material used for manufacturing LEDs ? Also compare an LED with a LASER diode. *10*

5. Describe the basic principle of light detection in a p-n photodiode. What are the limitations of a p-n photodiode ? *10*

6. Explain the principle of operation of Erbium doped fiber amplifiers. *10*

7. Derive the equation of signal-to-noise ratio of an analog optical receiver. *10*

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

9. (a) A given Avalanche photodiode has a quantum efficiency of 65% at a wavelength of 900 nm. If 0·5 μW of optical power produces a multiplied photocurrent of 10 μA, find the multiplication M. *7*

   (b) What is 'V' number of fiber or normalized frequency of fiber ? *3*

10. Write short notes on any ***two*** of the following : *2×5=10*

    (a) Self Phase Modulation

    (b) Raman Amplifier

    (c) Concept of Sensitivity and Quantum Efficiency