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BIEL-017

01619

B.Tech. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

June, 2013

BIEL-017 : OPTICAL FIBER COMMUNICATION

Time : 3 hours *Maximum Marks : 70*

Note : *(i) Attempt **any seven** questions.*
*(ii) All questions carry **equal marks**.*

1. (a) Draw and explain the basic block diagram of optical fiber transmitter and receiver link. 5

(b) Draw the spectrum of electromagnetic radiation and explain spectral band designations used in optical fiber communication. 5

2. (a) Differentiate between working of step index and graded index fibers. 5

(b) Explain optical fiber modes and configurations and ray optics representations of skew rays in step index fiber. 5

3. (a) Explain single mode fiber and justify the importance of MFD parameter and mode delay factor in single mode fiber. 5

(b) Discuss various propagation modes in single mode fiber. 5

4. Explain the terms Intermodel delay, Intramodel dispersion, group delay and material dispersion. 10

5. (a) Explain different practical fiber profiles. 5
   (b) Write a short note on doped fiber amplifier. 5

6. (a) Draw and explain the Fabry Perot quantum well lasers. 5
   (b) Discuss structures of LED and their characteristics. 5

7. (a) Discuss about details of bandwidth in APD. 5
   (b) Provide basic concept of Einstein relations and explain population inversion optical feedback and threshold conditions. 5

8. Draw a schematic diagram of typical optical receiver and describe its complete operation. 10

9. (a) Discuss homodyne and heterodyne detection. 5
   (b) What is the detection principle of coherent optical fiber system ? Explain coherent receivers with block diagram. 5

10. Write note on ***any two*** of the following : 2x5=10
   (a) Avalanche Photodiodes
   (b) Optical modulator
   (c) AGC and equalization