

(b) Discuss the major consideration in the design of digital drive circuits for an injection laser source. $7\frac{1}{2}$

6. (a) Compare the merits and demerits associated with the advanced multiplexing techniques. $7\frac{1}{2}$

(b) Explain the multiplexing of several signals on a single analog optical fiber link with suitable diagram. $7\frac{1}{2}$

Unit IV

7. (a) Discuss the solution transmission in optical fibers. $7\frac{1}{2}$

(b) Compare the key features of Ethernet, Token ring and FDDI. $7\frac{1}{2}$

8. (a) Explain optical power budget analysis. $7\frac{1}{2}$

(b) Write a short note on 10 Mb/s optical link designs for industrial applications. $7\frac{1}{2}$

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M. Tech. EXAMINATION, May 2018

(Second Semester)

(B. Scheme) (Main & Re-appear)

(ECE/Industry Integrated)

MTEC504B

ADVANCED OPTICAL COMMUNICATION

Time : 3 Hours

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

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P.T.O.

Unit I

1. (a) Derive an expression for r.m.s. pulse broadening due to material dispersion in an optical fiber and define the material dispersion parameter. $7\frac{1}{2}$
- (b) Explain electromagnetic spectrum used for optical communication. $7\frac{1}{2}$
2. (a) Compare stimulated Brillouin and stimulated Raman scattering in optical fibers and indicate the way in which they may be avoided in optical fiber communication. $7\frac{1}{2}$
- (b) Make the comparison between semiconductor and fiber amplifier. $7\frac{1}{2}$

Unit II

3. (a) Discuss in detail the *p-i-n* photodiode with regard to performance and compatibility requirements in photodetectors. $7\frac{1}{2}$

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- (b) Describe the conversion of an analog signal into a pulse code modulated wave form for transmission on a digital optical fiber link. Indicate, how several signals may be multiplexed on to a single fiber link. $7\frac{1}{2}$
4. (a) Explain the working principle of laser transceiver. $7\frac{1}{2}$
- (b) Write a short note on design guidelines for optical channel transceivers. $7\frac{1}{2}$

Unit III

5. (a) The sampling rate for each speech channel on the 30 channel PCM system is 8 kHz and each sample of encoded into eight bits. Determine :
 - (i) The transmission of bit rate for the system
 - (ii) The duration of a time slot
 - (iii) The duration of a frame and multiframe. $7\frac{1}{2}$

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