

Roll No.

Total Pages : 3

008703

Dec. 2021

B.Tech. (ECE/EL)-7th SEMESTER

Fiber Optic Communication (ECEL-704//ELOE-118)

Time : 90 Minutes]

[Max. Marks : 25

Instructions :

1. *It is compulsory to answer all the questions (1 mark each) of Part-A in short.*
2. *Answer any three questions from Part -B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART - A

1. (a) State the condition for TIR in Fiber Optic Cable. (1)
- (b) "Repeaters are used in Fiber Optic Communication" comment. (1)
- (c) Compare direct band gap and indirect band gap semiconductors. (1)
- (d) If a InGaAs photodiode is having responsivity 0.8 A/w and optical power level of 25 μ W then what will be the photocurrent generated by photodiode? (1)

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[P.T.O.]

- (e) What are the problems caused by self-phase and cross-phase modulations? (1)
- (f) Define group velocity. (1)
- (g) What is chirping? (1)
- (h) What do you mean by optical waveguide? How it is different from Electrical waveguide? (1)
- (i) What are the two main causes of Intramodal dispersion? (1)
- (j) What do you mean by Long Haul Communication? (1)

PART - B

- 2. (a) State the different types of fibers based on Index profile and explain it in detail. (3)
- (b) Describe the structure of OTDR. Explain the method of dispersion measurement using OTDR. (2)
- 3. (a) Power generated internally with in a DHLED is 28.4 mW at a drive current of 40 mA. Find the peak emission wavelength from the device when radiative and non-radiative combination of lifetime of minority carriers in the active region are 30 ns and 50 ns respectively. (2)
- (b) Discuss the principle of operation of LASER diodes. What are the effects of temperature on the performance of a LASER diode? (3)

- 4. (a) Explain basic principle of operation of photo detector. Explain the working of PIN and APD as photodetector, also compare their performance. (3)
- (b) Draw and explain the principle of operations of an EDFA. (2)
- 5. (a) State the working principle of Raman amplifier and state its applications. (3)
- (b) Explain with the help of a neat block diagram the working of an optical switch. (2)
- 6. (a) Discuss the concept of Wavelength Division Multiplexing. (2)
- (b) Explain all aspects of Link Power Budget and Rise Time Budget. (3)