

Code No: RT4104A

R13**Set No. 1**

IV B.Tech I Semester Supplementary Examinations, March - 2017

OPTICAL COMMUNICATION

(Electronic and communication Engineering)

Time: 3 hours

Max. Marks: 70

*Question paper consists of Part-A and Part-B**Answer ALL sub questions from Part-A**Answer any THREE questions from Part-B*

PART-A (22 Marks)

1. a) Compare step index and graded index fibers. [4]
- b) Discuss Group delay of a Optical fiber. [4]
- c) Discuss Fiber Splicing. [3]
- d) Differentiate between LED and LASER. [3]
- e) Explain quantum Limit. [4]
- f) Write short notes on WDM. [4]

PART-B (3x16 = 48 Marks)

2. a) What are the advantages, applications and disadvantages of optical fiber as compared to copper cables? [8]
- b) Estimate the maximum core diameter for an optical fiber with refractive index difference of 1.45% and core refractive index of 1.52 in order that it may be suitable for single-mode operation when operating wavelength is $0.85\mu\text{m}$. Also calculate cut off wavelength λ_c if core diameter is $1.1\mu\text{m}$. [8]
3. a) Explain various fiber materials. [8]
- b) In a system, a 2km fiber was used, the 3-dB pulse widths at the input and output are 0.5 ns and 10 ns respectively. Find the pulse broadening for the fiber and bandwidth length product in MHz-km. [8]
4. a) Discuss the effects of various misalignments in fiber to fiber joints. [8]
- b) Discuss about connector return loss. [8]
5. a) Write short note on LED structures. [8]
- b) Explain the principles of PIN and APD. [8]
6. a) Explain Power coupling in Optical Fiber. [8]
- b) Write short notes on digital signal Transmission and error sources. [8]
7. a) Explain link power budget with example. [8]
- b) Explain Rise time budget with example. [8]