

(DEC 422)

B.Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Final Year)

ELECTRONICS AND COMMUNICATION ENGG.

Paper - II : Optical Communication

Time : 3 Hours

Maximum Marks : 75

Answer question No. 1 compulsory

(15)

Answer ONE question from each unit

(4 x 15 = 60)

- 1) a) Define MFD of single mode optical fibers.
- b) Define Skew rays of optical fibers.
- c) Mention various losses in optical fibers.
- d) Draw the PIN diode characteristics.
- e) Explain link power budget.
- f) Define OTDR, OTDM, WDM.

Unit - I

- 2) a) Explain the modes of propagation in optical fibers detail.
- b) Explain in detail about ray theory transmission of optical fibers.

OR

- 3) a) Draw and Explain the following in detail :
- i) Elements of optical fiber communication system.
- ii) Graded index and step index fibers.
- b) Calculate the numerical aperture of a step index fiber having $n_1 = 1.48$ and $n_2 = 1.46$. What is the maximum entrance angle θ_{max} for this fiber of the outer medium in the
- i) Air, with $n = 1.0$.
- ii) Water, with $n = 1.33$.

Unit – II

- 4) a) What is Dispersion in Optical fiber? Explain about intermodal and intramodal dispersion in fibers.
- b) Explain in detail about attenuation and scattering mechanism in optical fibers.

OR

- 5) a) What are losses in fiber couplers, Explain in detail about Optic switches?
- b) Explain About Splicing in detail.

Unit – III

- 6) a) Draw the schematic of edge emitting double hetro-junction LED and explain its working in detail.
- b) Explain the following :
- i) Laser diode Rate equation.
 - ii) Quantum efficiency.
 - iii) Resonant frequencies.

OR

- 7) a) With neat diagram explain principle operation of PIN optical detector.
- b) Explain the principle of operation of Avalanche photodiode with the help of a neat diagram.

Unit – IV

- 8) a) Describe a method to carryout rise time budget analysis for a fiber optic link.
- b) Explain the following in respect of digital link :
- i) point to point links.
 - ii) power penalties.

OR

- 9) a) Explain in detail about optical fiber measurements?
- b) Describe the principle and necessity of WDM technique in Optical communication systems.

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