

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

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IV B.Tech I Sem Supplementary Examinations, NOVEMBER-2017**SUBJECT: OPTICAL COMMUNICATIONS**

(BRANCH: ECE)

Time: 3 Hours

Max Marks: 75

Answer any 5 questions**5 x 15M=75M**

1. a) Define a mode? Explain mode theory in optical fiber? What is Vnumber? Explain. [8]
b) Explain the various elements of an optical communication system in detail. [7]
2. a) Explain the types of losses occur in optical fiber. [8]
b) Explain Signal distortions in optical fibers. [7]
3. a) Explain information capacity determination and group delay with necessary equations. [8]
b) Explain about Connector return loss. [7]
4. a) What is quantum efficiency? Determine the expression of quantum efficiency for LED source? [8]
b) What is the resonant frequency of laser diode? Derive the expression of wavelength spacing between two modes. [7]
5. a) Explain the output patterns of source to fiber power launching. [8]
b) What is Equilibrium Numerical Aperture? Explain. [7]
6. a) What are the basic stages of receiver configuration. Explain. [7]
b) A silicon PIN photo diode which has a depletion layer width $w=5\mu\text{m}$, an area $A=0.05\text{mm}^2$ and a dielectric constant $K_s=11.7$. If the photo diode is to operate with a $10\text{K}\Omega$ load resistor at 800nm , where the absorption coefficient $\alpha_s=10^3\text{cm}^{-1}$, compare the RC time constant and the carrier drift time of this device. [8]
7. a) Explain the point to point fiber optic link and its characteristics with an example. [8]
b) Estimate link power budget in optical communication system. [7]
8. Write short notes on [5*3=15]
a) Measurement of Attenuation b) Measurement of Dispersion c) Eye pattern