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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations Nov/Dec 2019

OPTICAL FIBER COMMUNICATION
(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Elaborate about the total internal reflection with the help of suitable optical cable setup. 7M
b Fiber has normalized frequency 26.6 & operating wavelength 1300nm, if the radius of the fiber core is 25 μ m. Compute the numerical aperture. 5M

OR

- 2 a Define linear scattering? Explain about Rayleigh & Mie scattering. 6M
b Derive the expression for waveguide dispersion. 6M

UNIT-II

- 3 a Distinguish between intrinsic & extrinsic Absorption. 6M
b What is attenuation? Explain in detail? 6M

OR

- 4 a How refractive index profile optimizes the design in a single mode fiber? 6M
b Derive the total dispersion in single mode fiber? 6M

UNIT-III

- 5 a Explain LED Structure with neat sketch. 6M
b A GaAs optical source with a refractive index of 3.6 is coupled to a silica fiber that has a refractive index is 1.48. If the fiber and the source are in close physical contact then find the Fresnel reflection at the interface and power loss in dB. 6M

OR

- 6 a Write a short note on Fiber Splicing. 4M
b Derive an expression for power coupling from a large surface emitting LED into smaller step index fiber. 8M

UNIT-IV

- 7 a Discuss any one type of Preamplifier in detail. 8M
b Define inter-symbol interference with diagram. 4M

OR

- 8 a Explain the principle behind the operation of a PIN photo diode. 6M
b Explain the working of depletion layer photocurrent with diagram. 6M

UNIT-V

- 9 a Write short notes on multichannel frequency modulation. 6M
b Analyze the system performance using link power budget of digital systems. 6M

OR

- 10 a What is WDM? Explain the features of WDM. 6M
b Explain the construction & application of dielectric thin film fibers. 6M

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