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

B. Tech IV Year I Semester Supplementary Examinations February-2022

OPTICAL FIBERCOMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 a Explain about the Evolution of optical fiber systems. 6M
b Illustrate on Reflection and Refraction with neat sketch. 6M

OR

- 2 a Explain about the Multimode Step Index fiber with neat sketch 6M
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. 6M

UNIT-II

- 3 a Distinguish between intrinsic & extrinsic Absorption. 6M
b Determine the theoretical cutoff wavelength for single mode fiber. 6M

OR

- 4 a Illustrate on the two main causes of Intra Modal Dispersion. 6M
b Explain the phenomenon of Rayleigh scattering in scattering loss. 6M

UNIT-III

- 5 a Develop the expression for modes and threshold condition of LASER. 8M
b What power is radiated by an LED if its quantum efficiency is 3% and the peak wavelength is 670nm? 4M

OR

- 6 a Illustrate on edge emitter LED with neat diagram. 5M
b Explain about the modulation of LED in detail. 7M

UNIT-IV

- 7 a A given silicon avalanche photodiode has a quantum efficiency of 65% at a wavelength of 900nm. Suppose 0.5 μ W of optical power produces a multiplied photocurrent of 10 μ A. Calculate the multiplication M? 5M
b List the operating parameters of Si, Ge, InGaAs for PIN diode. 7M

OR

- 8 a Explain about the probability of error in detail 6M
b Illustrate on the quantum limit in optical receiver 6M

UNIT-V

- 9 a Summarize on system performance using rise time budget of digital systems. 8M
b Explain about the operating principles of WDM. 4M

OR

- 10 a Illustrate on line coding with neat diagrams. 5M
b Explain the significance of system consideration in point-to-point fiber links. 7M

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