

SOMMAIRE – Optical Communications (N. Bala Saraswathi)

UNIT I: INTRODUCTION

- Basics of Optical Communication
- Evolution of Optical Fiber Systems
- Advantages of Optical Fiber Communication
- Optical Fiber Communication System Block Diagram

UNIT II: OPTICAL FIBERS

- Total Internal Reflection
- Acceptance Angle and Numerical Aperture
- Step Index and Graded Index Fibers
- Modes in Optical Fibers

UNIT III: TRANSMISSION CHARACTERISTICS OF OPTICAL FIBERS

- Attenuation
- Dispersion: Intermodal, Material, Waveguide
- Polarization Mode Dispersion
- Optical Fiber Bandwidth

UNIT IV: OPTICAL SOURCES

- Light Emitting Diodes (LED): Structures and Characteristics
- Laser Diodes: Operation and Characteristics
- Comparison of LED and Laser Diodes

UNIT V: OPTICAL DETECTORS

- PIN Photodiode
- Avalanche Photodiode (APD)
- Detector Responsivity, Quantum Efficiency, Noise and Bandwidth

UNIT VI: OPTICAL SYSTEM DESIGN

- Link Budget and Rise Time Budget
- Power Coupling Losses

- Multiplexing Techniques: WDM, TDM
- System Design Examples

APPENDICES

- Solved Problems
- Model Question Papers
- Objective Questions