

FIBRE-OPTIC COMPONENTS AND DEVICES

MODULE – I

Fibre-Optic Light Sources and Detectors

Brief description on the principle of optical sources, Internal Quantum efficiency of LED, Modulation capability, Power-Bandwidth product, Laser diodes, Laser diode modes, Threshold conditions, Resonant frequencies, Laser diode structures, Single mode lasers, modulation of laser diodes.

Brief description on the principle of optical detectors, photodetector noise, Noise sources, Signal-to-Noise ratio, Detector response time, Depletion layer photocurrent, Response time, Avalanche multiplication noise.

MODULE – II

Optical Fibre Connection

Joint loss, Multi mode fibre joints, Single mode fibre joints, Fibre splices, Fusion splices, Mechanical splices, Multiple splices, Fibre connectors, Cylindrical ferrule connectors, Biconical ferrule connectors, Double eccentric connectors, Duplex fibre connectors, Expanded beam connectors, Fibre couplers, Three port couplers, Four port couplers, Star couplers, WDM couplers.

MODULE – III

Optical Amplification and Integrated Optics

Optical amplifiers, Semiconductor laser amplifiers, Fibre amplifiers, Rare earth doped fibre amplifiers, Raman fibre amplifiers, Brillouin fibre amplifiers, Integrated optics, Integrated optical devices, Beam splitters, Directional couplers, switches, Modulators, Periodic structures for filters and injection lasers, Opto-electronic integration, Optical bistability and digital optics, Optical computation.

Textbooks:

1. G. Keiser, *Optical Fibre Communications*, Mc-Graw-Hill.
2. J.M. Senior, *Optical Fibre Communications Principles and Practice*, PHI.