Q.3 (a) Explain the following:
   (i) Parametric amplifier
   (ii) Digital Link Design

(b) Explain the concept of OFDM in detail? (10)

Q.4 a)) Discuss absorption losses in optical fiber, comparing and contrasting the intrinsic and extrinsic absorption mechanism? (8)

(b) A multimode step index fiber has a relative refractive index difference of 1% and a core refractive index of 1.46. The maximum optical wavelength that may be obtained with a particular source on a 4.5 km link is 3.1 MHz. (12)

(i) Determine the RMS pulse broadening per kilometer resulting from chromatic dispersion

(ii) Assuming waveguide dispersion may be ignored, estimate the RMS spectral width of the source, if the material dispersion parameter for the fiber at the operating wavelength is 90 fs nm/km.

SECTION -B

Q.5 (a) Explain the double HETEROJUNCTION semiconductor LASER working with diagram? (10)

(b) Write short notes on following
   (i) Stimulated Emission
   (ii) Strip Geometry

Q.6 (a) Explain the concept of Mach- Zehnder interferometer? (10)

(b) Write short notes on following
   i. Diffraction Grating
   ii. Tunable filters

Q.7 (a) Explain the working of intensity modulated optical sensors? (10)

(b) Discuss the need for the different types of optical amplifiers. Sketch their amplification wavelength ranges when they are used in long haul optical telecommunication systems. (10)