[1] A fiber has a coupled power -8dBm and attenuation of 6 dB/km, and a length 2 km. calculate the output power.

[2] A fiber coupled power -8dBm and attenuation of 6 dB/km. Find the fiber length if the output power is -30dBm.

[3] The LEDs used in early systems had a spectral width $\Delta\lambda_o$ of about 20 nm around λ_o = 825 nm. Using D_m = 84.2 (ps/km.nm), what is the time by which the pulse will be broadened after 1 km?

[4] A step-index single mode fiber has a core index of 1.45, a relative refractive index difference (Δ) of 0.3 %, and a core diameter of 8.2 μm. Calculate the waveguide dispersion coefficient for this fiber at λ = 1.3 μm.

[5] Consider an optical fiber with a chromatic dispersion coefficient 8 $ps.nm^{-1}.km^{-1}$ at an operating wavelength of 1.5 μm. Calculate the bit rate distance product (***B.L***), if a laser diode source with spectral width $\Delta\lambda_o$ = 2 nm is used.

[6] An 8 km optical fiber link without repeaters uses multimode graded index fiber which has a bandwidth-length product of 400 MHz km. Estimate the total pulse broadening on the link.

[7] Given the following, cable length L = 40 [km] with attenuation, α = 0.3 [dB/km], LED emits optical power P_T [watts] = 100 mw, Couplers and connectors have total losses L_C = 2 [dB], Photo detector (receiver) having sensitivity R_S = 1 [mw]. Find the system margin.

[8] The mean optical power launched into an optical fiber link is 1.5 mW and the fiber has an attenuation of 0.5 dB/km. Determine the maximum possible link length without repeaters (assuming lossless connectors) when the minimum mean optical power level required at the detector is 2 μW.

Good Luck

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