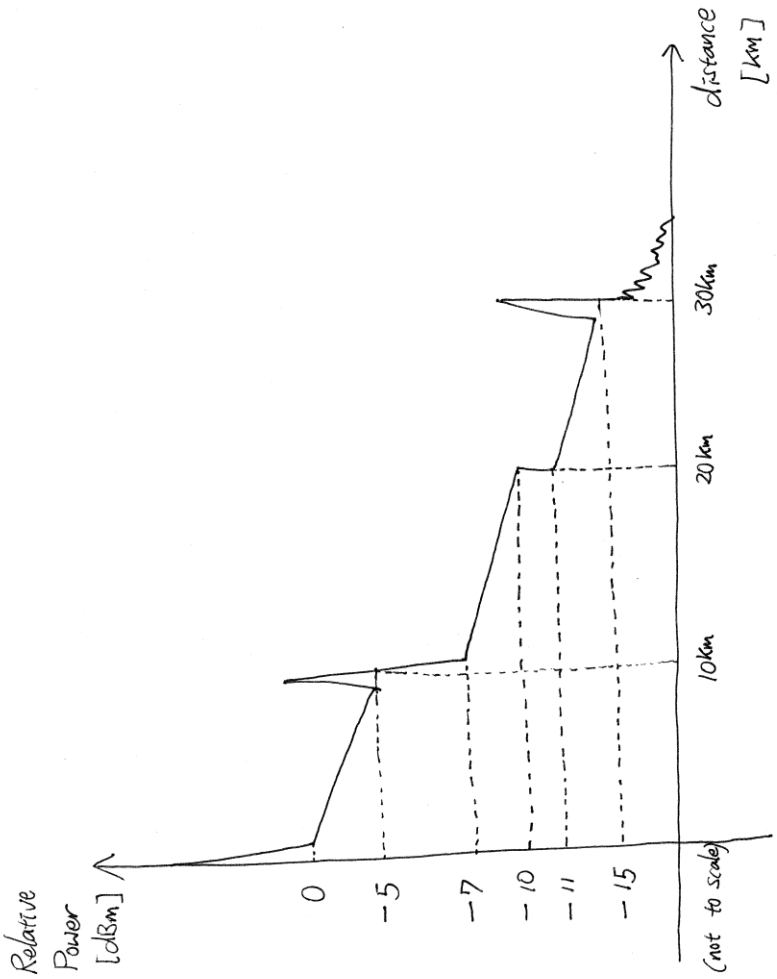
EECE 598, Homework 04,

1. Consider a OTDR (Optical Time Domain Reflectormeter) trace below. Predict possible fiber optic network system which will results in below figure.

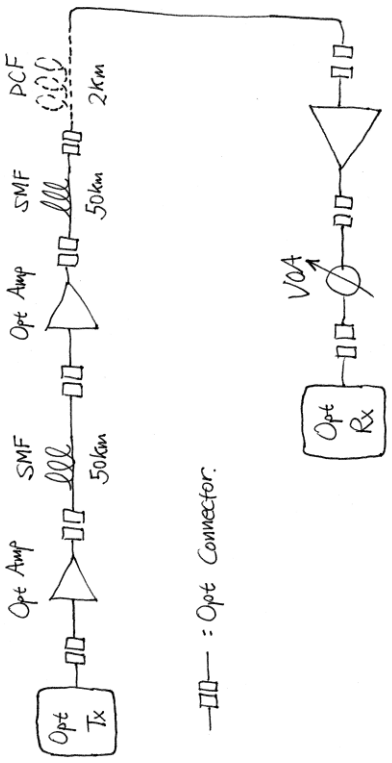
   (a) Explain possible optical components at each point (or between two points)
   (b) Indicate loss [dB], attenuation parameters [dB/km] for the components.



2. Assume you have a fiber optic communication system as shown below.

   (a) Indicate "before" and "after" **Optical Power** for each fiber optic components using the attenuation (loss/gain) parameters shown in below table.
   (indicate the power levels (numbers in "**dBm**") on the system diagram figure)

Opt Tx	Optical Transmitter	Tx Power = 1 mW
Opt Conn	Optical Connector	Loss = 0.5 dB
Opt Amp	Optical Amplifier	Gain = 15 dB
SMF	Optical Fiber (Sgl Mode)	Attenuation Parameter = 0.3 dB/km
DCF	Optical Fiber (Disp Comp)	Attenuation Parameter = 8 dB/km
VOA	Variable Optical Attenuator	Loss = Adjustable



(b) Calculate **BER Power Penalty** if the fiber optic communication system has below BER performances.

a. Fill in the **table** below (Fill in "**Optical Rx Power**")
b. **Plot BER curve** on a semi-log paper.

VOA Attenuation [dB]	Optical Rx Power [dBm]	BER [Error Rate]
13.0		**1.0×10^{-4}**
12.0		**2.0×10^{-5}**
11.0		**4.0×10^{-6}**
10.0		**9.0×10^{-7}**
9.0		**2.0×10^{-7}**
8.0		**4.0×10^{-8}**
7.0		**1.0×10^{-8}**

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