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VT-1

Q.3) We know that the overall attenuation of the signal through fibre of length L is given by,

$$a) \text{ Attenuation} = \left(\frac{10}{L} \right) \log \frac{P_i}{P_f}$$

Given attenuation = 1.2 dB/km ,

$L = 12 \text{ km}$, $P_f = 0.3 \mu\text{W}$

$$1.2 = \frac{10}{12} \log \frac{P_i}{0.3} \quad \text{or} \quad \frac{12 \times 1.2}{10} = \log \frac{P_i}{0.3}$$

$$\frac{P_i}{0.3} = 10^{1.2} \quad \text{or} \quad P_i = 0.3 \times 6.31 = 1.892 \mu\text{W}$$

$$P_i = 8.262681 \mu\text{W}$$