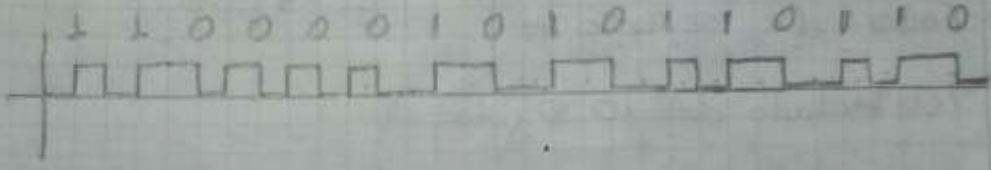


Taller Parcial 1 Comunicaciones

1) Manchester Polcos.



2)  $P_{in} = 150 \mu W$      $P_{out} = 4 \mu W$      $L = 8 \text{ Km}$

$$G_{dB} = 10 \log \left( \frac{4 \mu W}{150 \mu W} \right) = -15.74 \text{ dB}$$

a)  $A_r = 15.74 \text{ dB} \rightarrow 15.74 \text{ dB} / 8 \text{ Km} = 1.9 \text{ dB/Km}$

b)  $1.9 \text{ dB/Km}$

c)  $1.9 \text{ dB/Km} \times 10 \text{ Km} = 19 \text{ dB} + 5 \text{ dB} \Rightarrow A_r = 24 \text{ dB}$

3)  $T = 27^\circ \text{C}$  ;  $B = 20 \text{ KHz}$

a)  $N = kTB = 1.38 \times 10^{-23} \cdot (273 + 27^\circ \text{C}) \cdot 20000 \text{ Hz} = 8.28 \times 10^{-17} \text{ W}$

$$G_{dB} = 10 \log \left( \frac{8.28 \times 10^{-17}}{1 \text{ mW}} \right) = -130.81 \text{ dB}$$

b)  $V_u = \sqrt{4RN} = \sqrt{4 \cdot 8.28 \times 10^{-17} \cdot 50 \Omega} = 0.12 \mu \text{V}$

4)  $W_t = 25 \text{ dB} (1000 \pi f + 45) + 50 + 1.5 \log(20 \pi f) + 80 \log(2 \pi f + 34) - 5 \log(45 \pi f + 30)$

