a) Cal. system noise temp. Assume gain of mixer $G_m = 0dB$
b) Cal. system noise temp if the mixer has a loss of 10dB.

Soln a) $$T_S = T_{RF} + T_m + \frac{T_m}{G_{RF}} + \frac{T_{IF}}{G_{RF} G_m}$$

$$= 50 + 25 + \frac{500}{10^{2.3}} + \frac{1000}{10^{2.3} \times 1}$$

$$= 50 + 25 + 2.5 + 5.01$$

$$= 82.5\ K$$

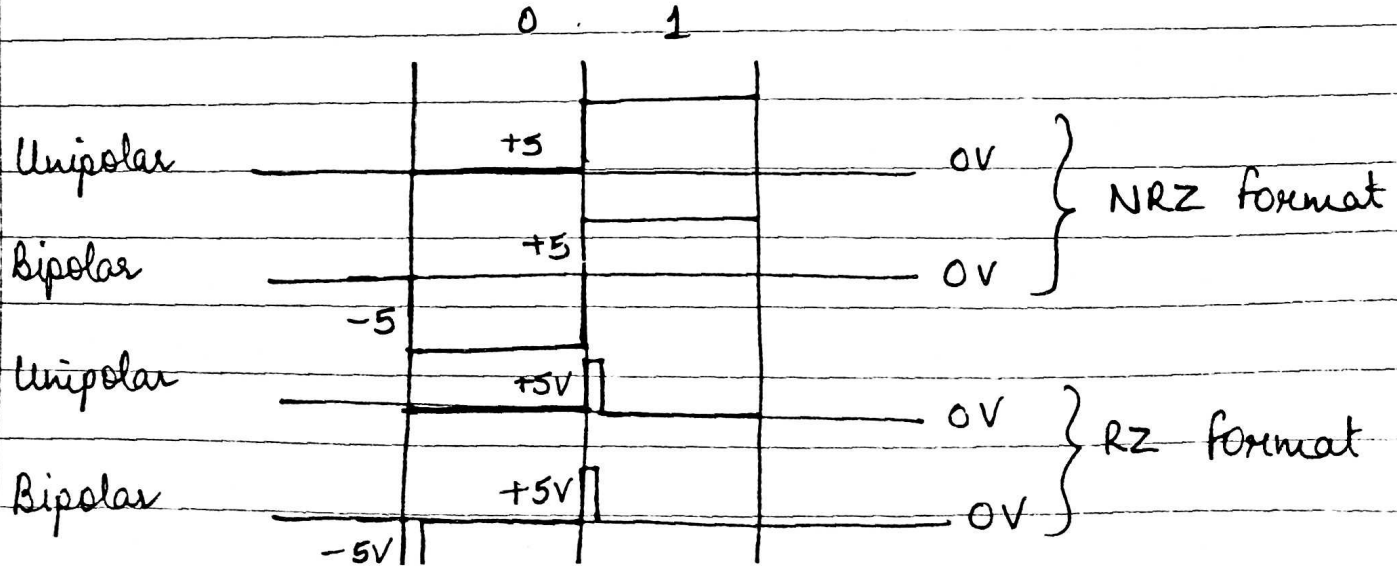
b) $G_m = -10dB = 10^{-1} = 0.1$

$$T_S = 50 + 25 + 2.5 + \frac{1000}{10^{2.3} \times 10^{-1}}$$

$$= 127.62\ K$$

Digital Data Format

1. Unipolar – RZ and NRZ $0 \rightarrow 0V$ (NIL), $1 \rightarrow +5V$
2. Bipolar – RZ and NRZ $0 \rightarrow -5V$, $1 \rightarrow +5V$
3. Not return to zero
4. Return to zero



NRZ Format :

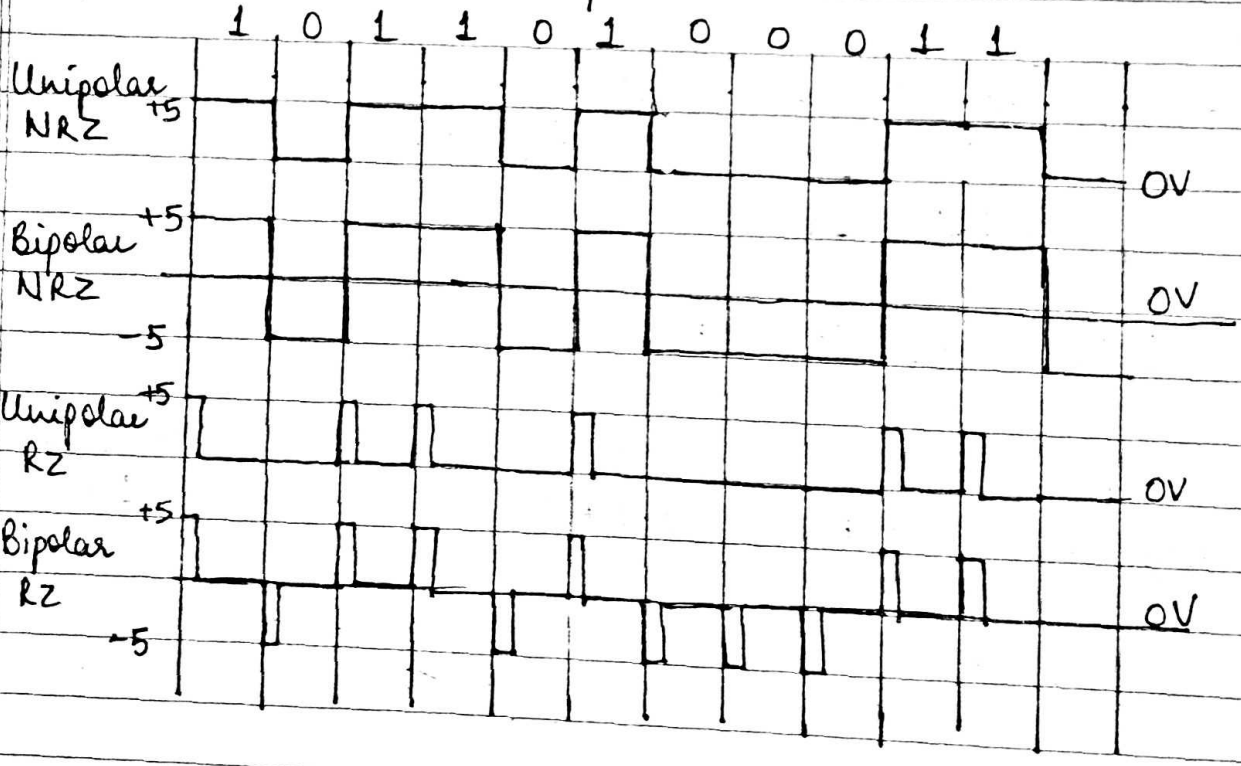
High power requirement for transmission but average dc value is minimum.

RZ Format :

Low power requirement but average dc value is high.

Q. Represent the digital data 10110100011 in following format : unipolar NRZ, unipolar RZ, bipolar NRZ and bipolar RZ.

Soln.



Baseband Transmitter - It is used in analog communication. Signal flows in the form of voltage.

Passband Transmitter - It is used in digital communication. Signal flows in the form of energy.