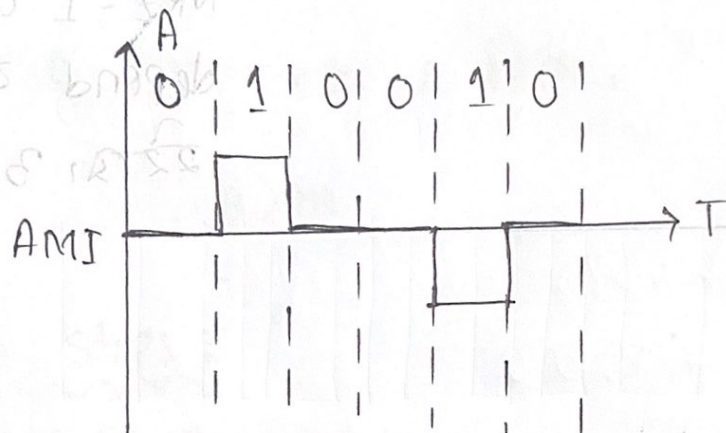


Bipolar (AMI) → Alternate Mark Inversion



3 level

- 0 +

very popular

0 → 0 voltage

1 → invert

by alternating position and

negative voltages.

first 0 → 0 ভে শব্দ

then 1 আসলে +ve

then 1 আসলে -ve

then এবারই চলে

Cons.

→ sync for 00000

→ DC problem

Pros

→ avg signal rate

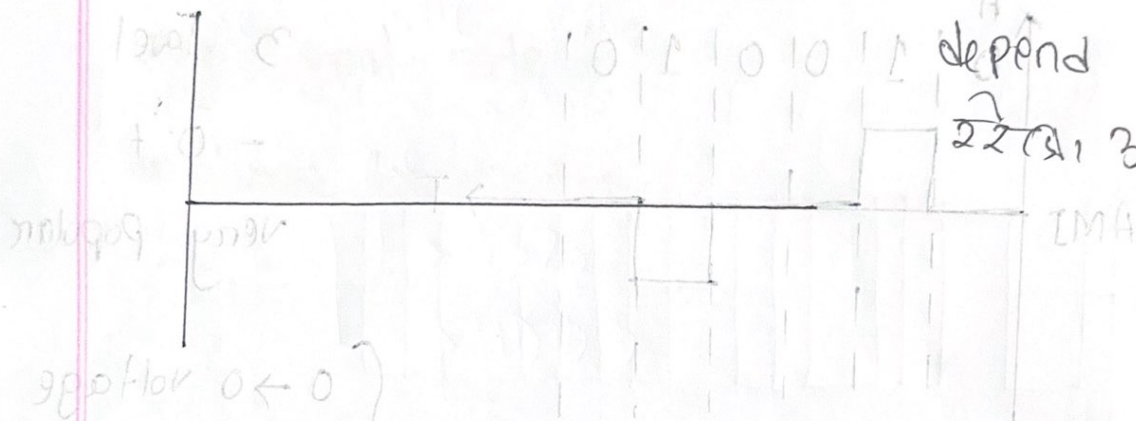
$N/2$

0 এর জন্য self sync problem আছে

1 এর জন্য self sync problem হয় না

MLT-3'

NRZ - I and DMZ
depend 228 228
228, 3 level.



- 1) if the next bit is 0, no transition
- 2) if the next bit is 1 and current bit is not 0 \rightarrow next level is 0.
- 3) if the next bit is 1 and current bit is 0 \rightarrow next level is opposite of the last.

non level zero. not same ←

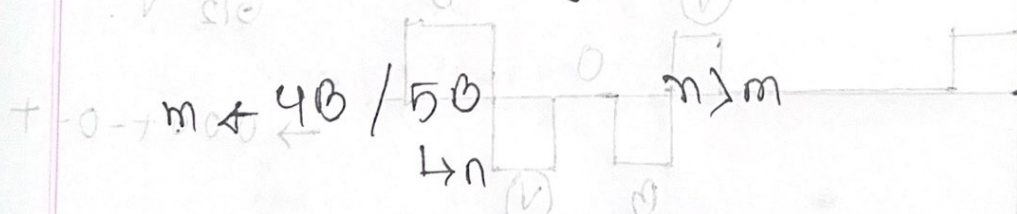
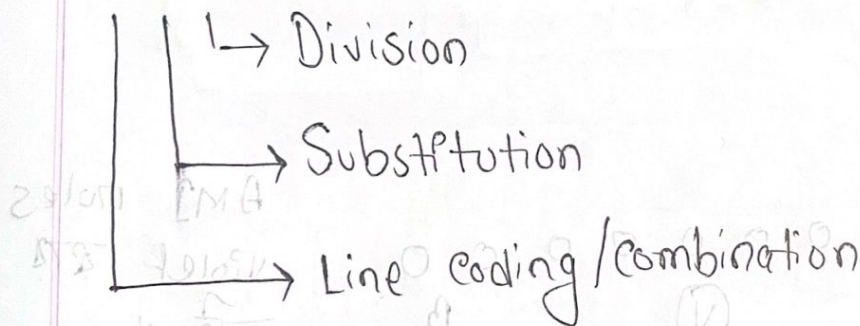
line coding (विधि) 24/2 25/2 26/2 27/2

Block Coding

m bit (shakti) n bit e nitai;

$$n > m$$

3 steps:



consecutive 0/1 handle kaji.

| | | | |
|-------|-------|-------|-------|
| 0101 | 0010 | 0111 | 1000 |
| m | m | m | m |
| 01011 | 10100 | 01111 | 10010 |

table dila shakti ashakti binary ni dinai
 m=4 dila bit hana kaji replacement
 n=5 bit (table shakti) bit replace kaji.



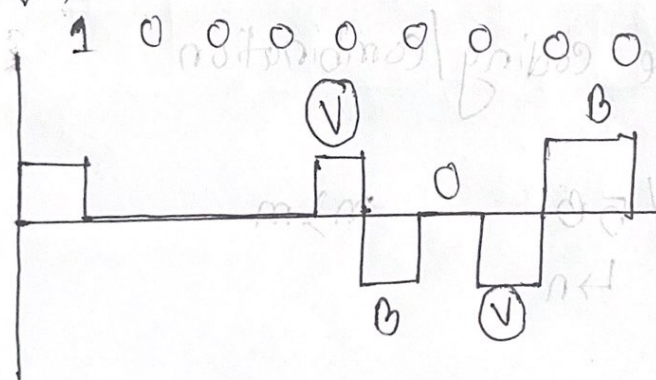
Scrambling

sync handle

2 technique

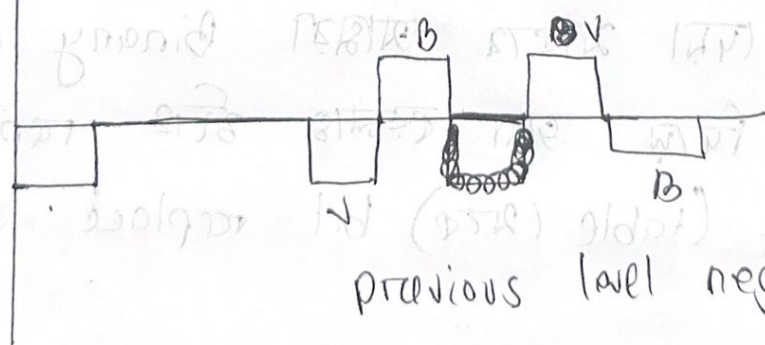
→ B8ZS
→ HDDB3

B8ZS



previous level positive

1 0 0 0 0 0 0 0



previous level negative

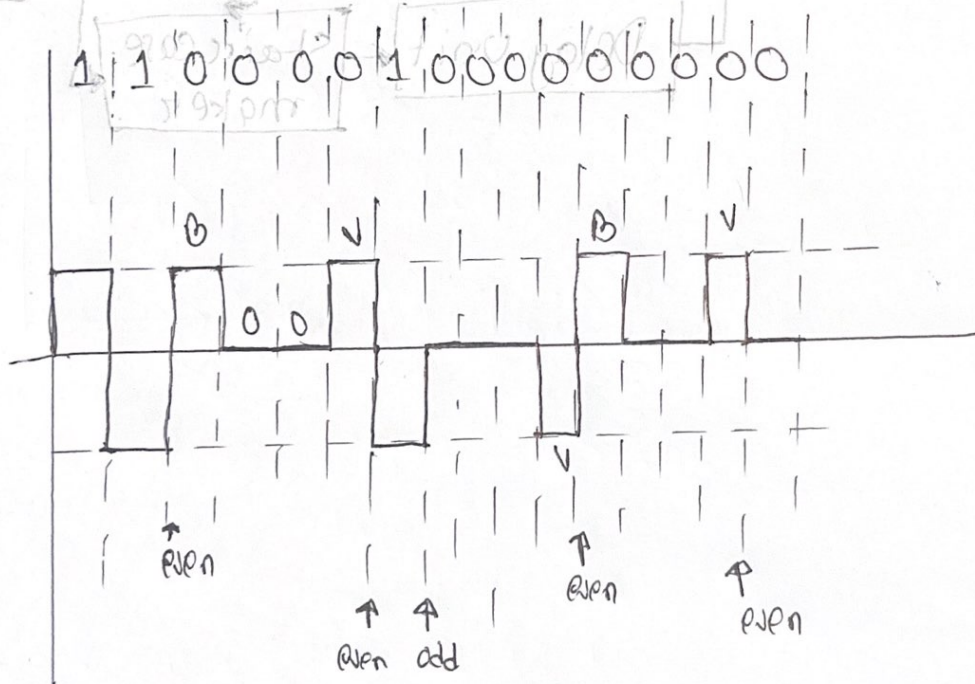
AMI rules

violation

→ 000+-0-+

HDB3 Number of Bipolar Pulses (ones). Since Last Substitution

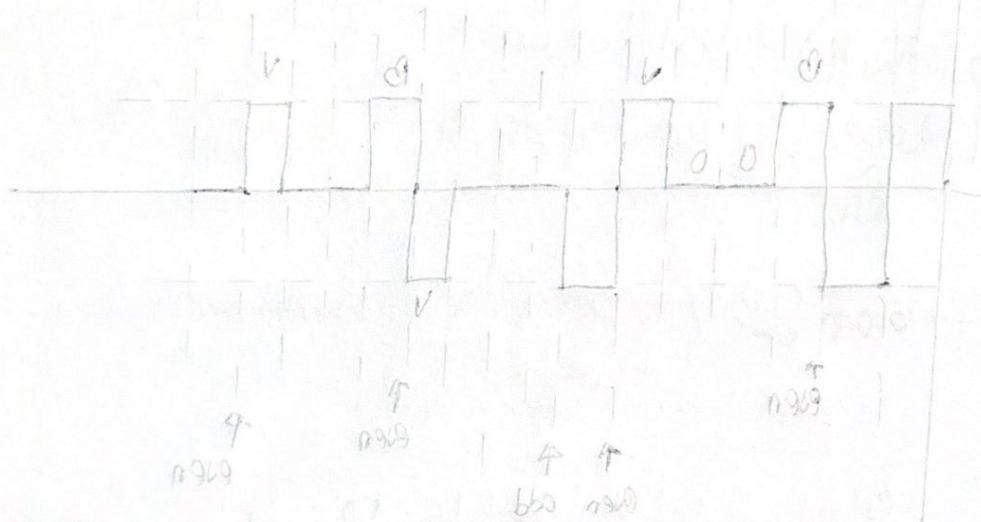
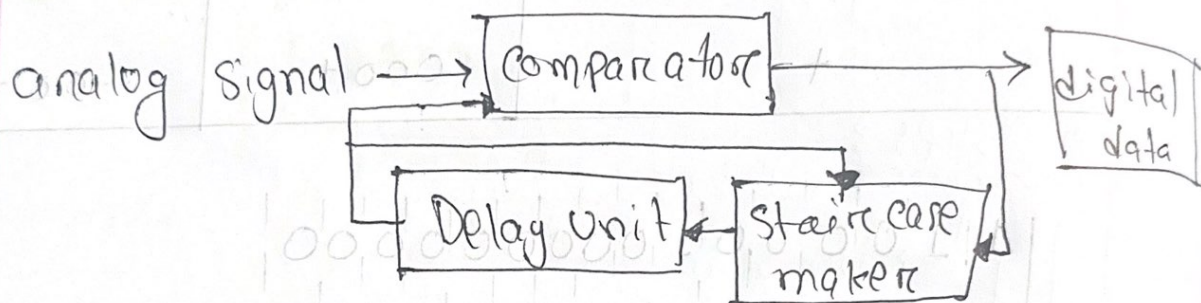
| Polarity of Preceding Pulse | Odd | Even |
|-----------------------------|-------|-------|
| - | 000 - | +00 + |
| + | 000 + | -00 - |



Now analog data to Digital Signal

imp \rightarrow PCM \rightarrow DM

Delta Modulation



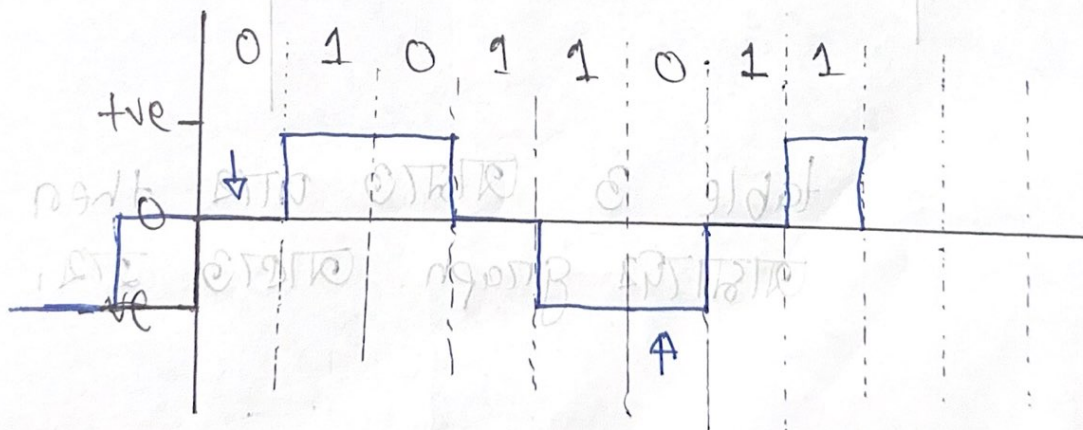
from bit M { (MLT-3) }
Rules: { (+, 0, -) }
 1) bit 0 → no transition

2) bit 1 → 0

Current
level not
0

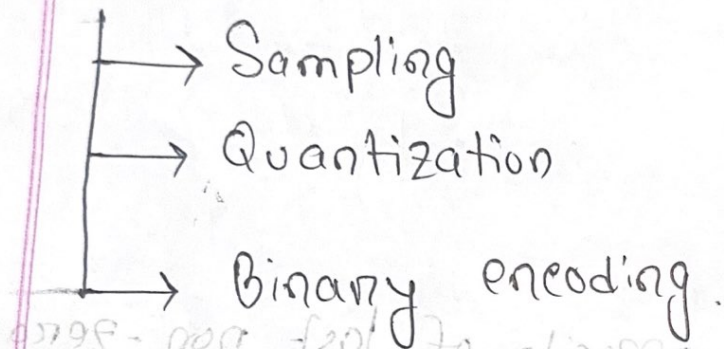
3) bit 1 → opposite of last non-zero
Current level.

*let us assume that, the last level was at 0 voltage and the last non-zero pulse was negative.



PCM (Pulse Code Modulation) } Mid must
 DM (Delta Modulation) } 50% of ch-4.

PCM



Sampling

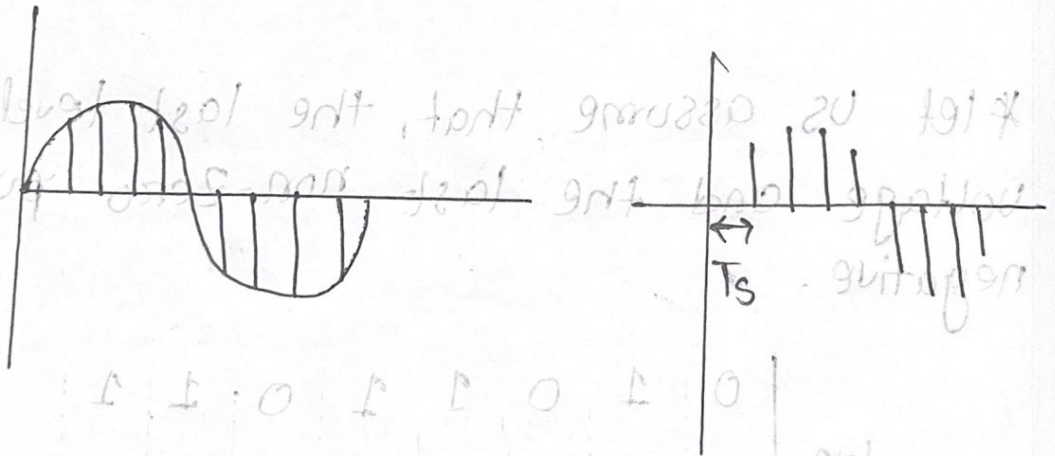


table 3 আদিত চার then
 আদিত graph আদিত হয়.

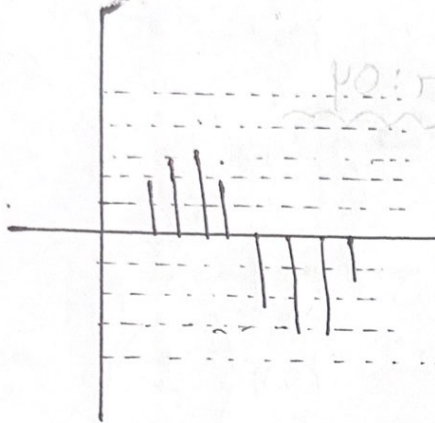
Quantization

$$V_{\min} = -20V$$

$$V_{\max} = 20V$$

$$L = 8$$

$$\Delta = \frac{(\max - \min)}{L}$$



$$\text{Zones} = \frac{20 - (-20)}{8} = \frac{40}{8} = 5$$

Binary Encoding

Quantization \rightarrow binary.

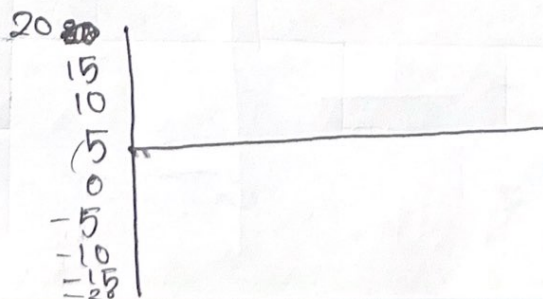
Quantization zones

$$\Delta = \frac{V_{\max} - V_{\min}}{L \rightarrow 8 \text{ bit}}$$

Peak-peak 20 V.

$$\Delta = \frac{20 - (-20)}{8} = 5$$

mid point of
quantization zones



Binary 1 2 4 (8 bit)

(nim-xam) = Chapter: 04

line coding

block coding

Scrambling

PEM

DM

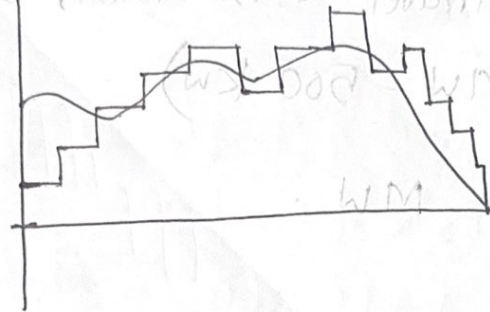
Table + slide {Line coding}

$$\underline{v_{max} - v_{min} = \Delta}$$

$$C = \frac{0.6 - 0.6}{1} = 0$$

[illegible]

Delta Modulation

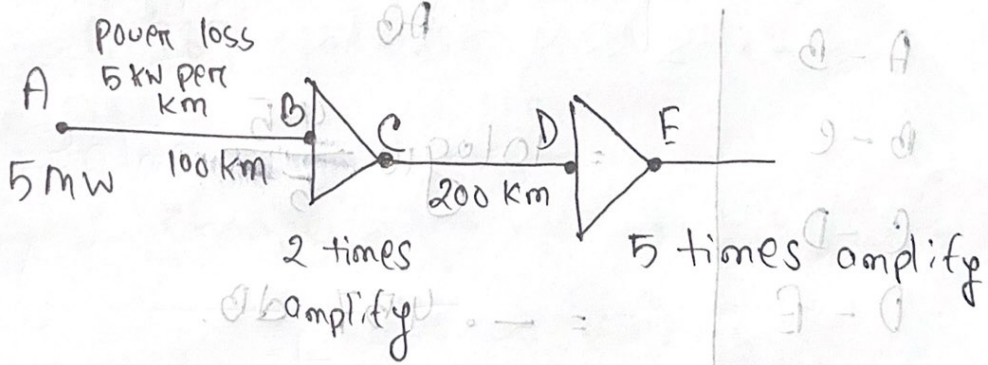


graph সাধাঃ উদঃ
 শ্রাব্যঃ উদঃ মাঃ
 graph সাধাঃ নিঃ
 শ্রাব্যঃ নিঃ মাঃ
 Simple আনঃ

প্রদত্তঃ -
 প্রঃ ফ্রঃ $\leftarrow \frac{2}{\pi}$
 প্রঃ লিঃ $\leftarrow \frac{1}{\pi}$

Summre 23

2(b) লঃ ৭০



@ point a, ১)

Power = 5 MW

Power loss from A to B = $(5 \times 100) \text{ kW}$

$= 500 \text{ kW}$