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CSE -320

Assignment -3

Ans to the Q: N: I

Baseline wandering:

While decoding a digital signal, the incoming signal is evaluated against the baseline. A long string of 0s and 1s can cause ~~to~~ baseline wandering, and makes it difficult to decode.

Dc components:

When the voltage level in a digital signal is constant for a while, very low frequencies are created. This is called dc component.

Baseline wandering and DC components both are problematic for a long sequence. But baseline wandering is for long strings and DC components creates problem with the voltage of a signal. Baseline wandering is an average of the signal power. Whereas DC component is a low frequency spectrum.

Baseline wandering makes it tough to decode the data accurately.

On the other hand, DC components leads to distortion of the signal and creates error at output. ⊕ There is also created unwanted energy loss for DC components.

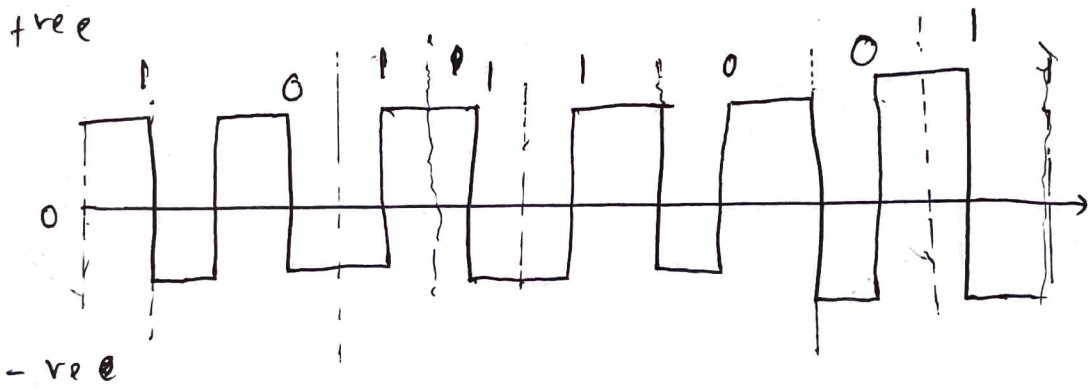
Ans to the Q: N:2

Scrambling is used to substitute long zero strings with a combination of other levels without changing the data.

Bipolar, NRZ, MLT-3 all ~~some~~ method contains ~~to~~ long 0's and it created DC components. These are ~~solved~~ solved by scrambling.

Ans to the Q.N.3

Differential Manchester:



The data stream = 10111001

In D. Manchester, for every bit, a middle transition is needed.

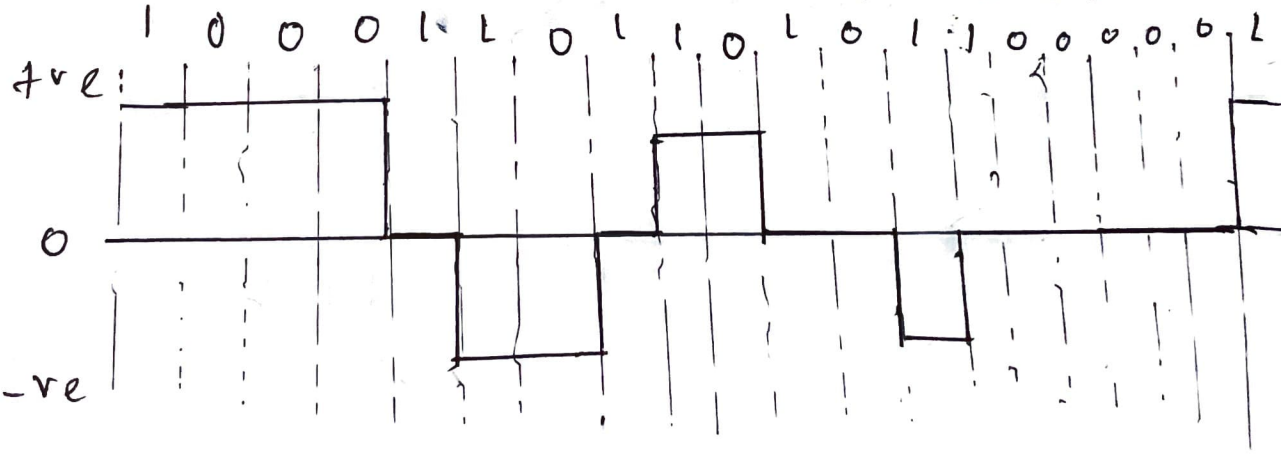
Before every 0, there is a transition. So, there is no DC

components and loss of synchronization. That's why block coding is not needed.

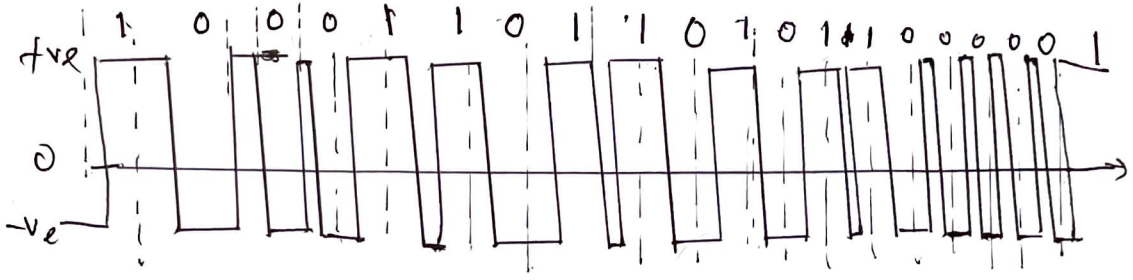
Ans to the Q. No: 4

(i) MLT-3 has the lowest bandwidth.

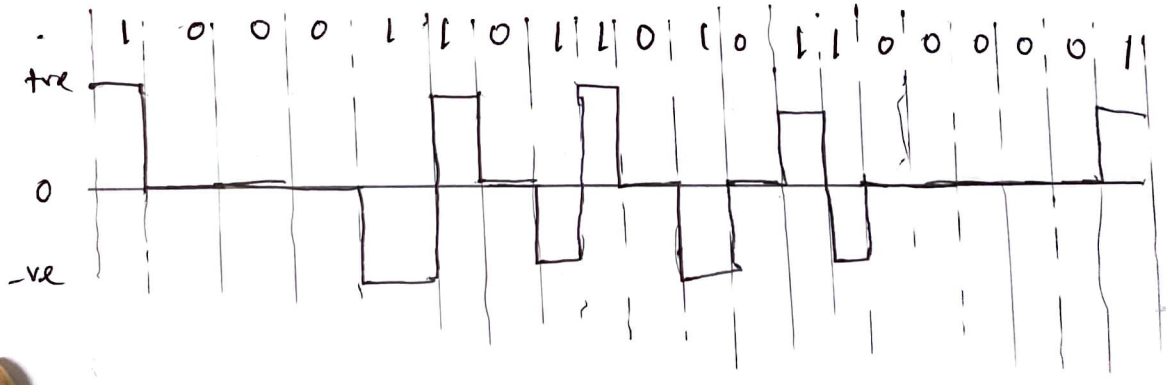
Data: 1 000 11 0 11 0 1 011 000001



(ii) Manchester line coding has no DC components and has self synchronization.



(iii) Bipolar AMI maintain proper bandwith and self synchronization.



Ans to the Q: N: 5

Differential Manchester solves following problems!

(i) No DC components.

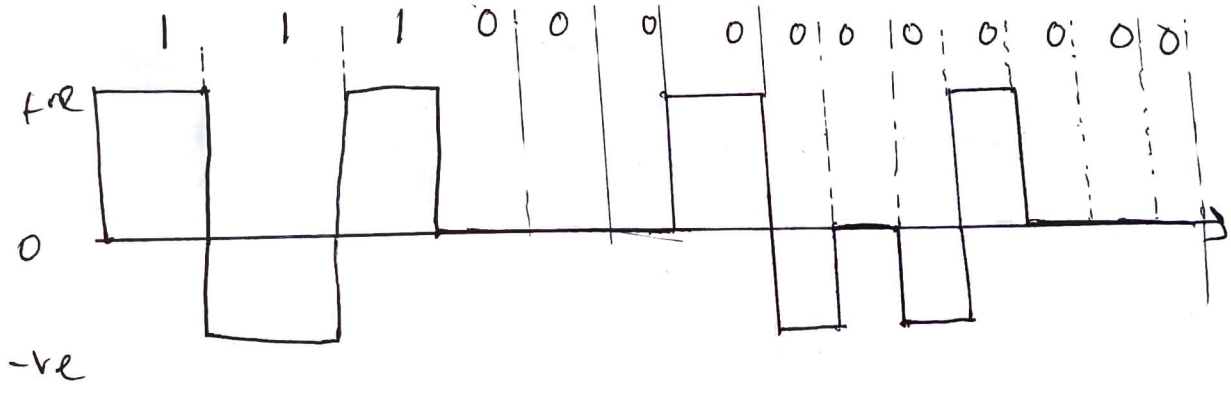
There is are good self ~~cot~~ clocking in D. Manchester because of the mid transition in each bit and another transiton before it. So, for every transition, the reciever's ~~cot~~ clock will synchronise automatically. So, there is no DC component.

(ii) Self synchronisation is also usee' useful in D. Manchester.

Ans to the Q. No 6

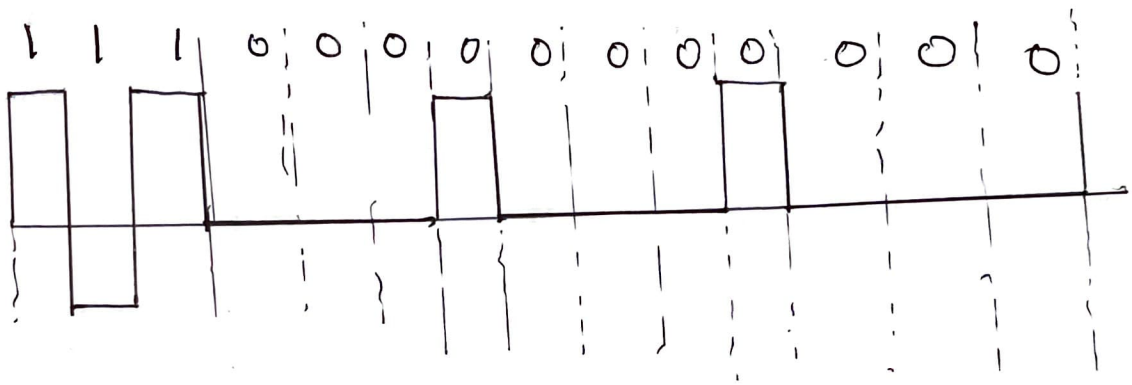
(a)

D825



(b)

~~HDB3~~ HDB3

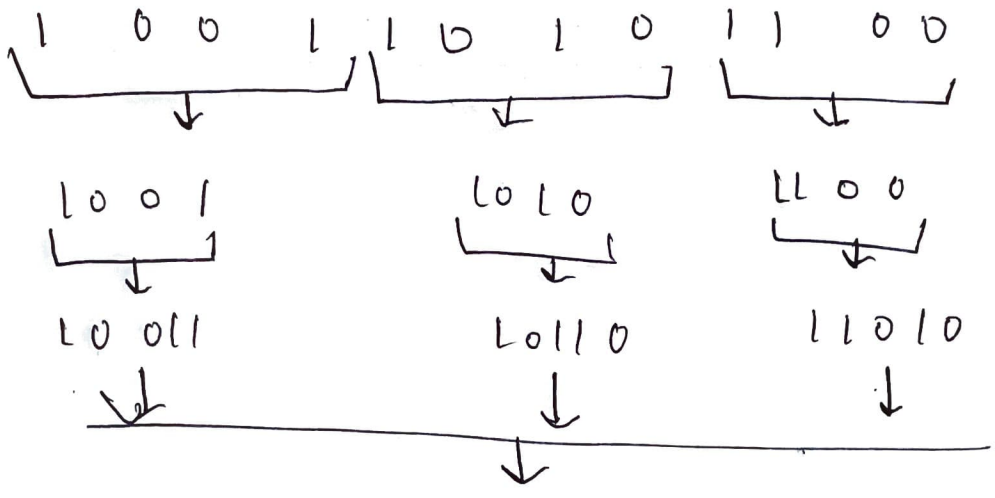


Ans to the Q: No 7

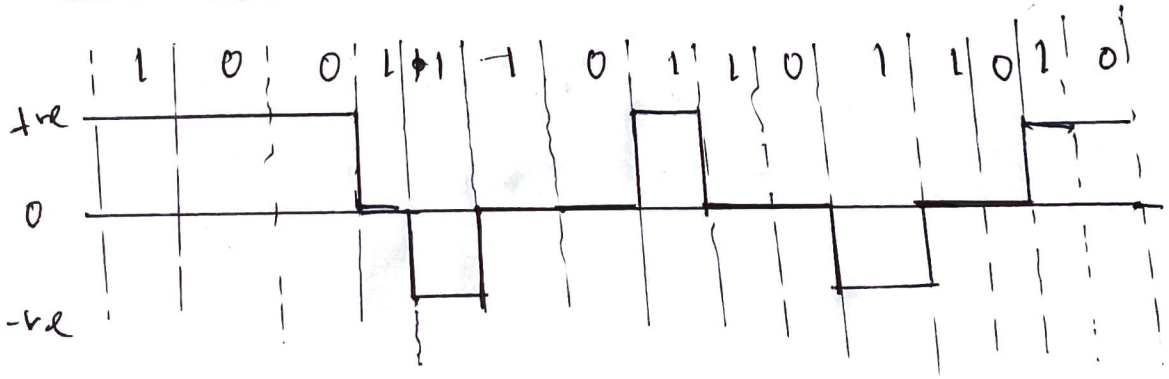
The advantage of block coding is, there is no long sequence of 0. So there in no DC components. But the disadvantage is that it is time consuming. Here, the reciever also has

to decode the signal.

4B/5B block coding.



MLT-3



Ans to the Q: No. 8

In Bipolar-AMI, for 0's, no signal line is used to produce the signal. But in B2S Scrambling, consecutive 8 zeroes, are converted into a sequence of positive, negative and base to substitute the 0's. Thus Bipolar AMI scheme rules are violated.

Ans to the Q: No. 9

Two issues avoided by bipolar encoding are:

(i) Unipolar encoding have low frequency components ~~with~~ which is avoided in Bipolar ~~AMI~~ encoding.

(ii) Unipolar ~~AMI~~ encoding doesn't let us check error detection which bipolar ~~AMI~~ encoding does.

Ans to the Q. No 10

* NRZ-I works with pulse transition. So, if an unknown line gets.

* NRZ-I, the data will be able to decode. Because NRZ-I doesn't depend on positive or negative voltage. Inversion in data stream is 1 and 0 means no change. But, in NRZ-L, if that unknown data line voltage is interchanged, the data becomes unreadable. Because, NRZ-L depends on

voltage value where 0 is positive and 1 is negative. This is why NRZ-I is better than NRZ-L.