ELEX 3525 : Data Communications
2018 Fall Term

Solutions to Midterm Exam 2

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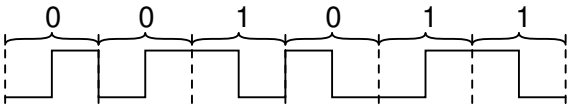
Question 1

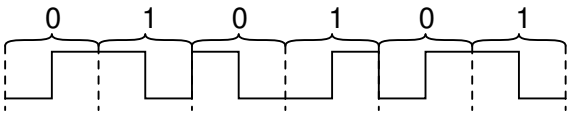
For a differential Manchester line code if a symbol is the same as the previous one, that bit is a zero, otherwise that bit is one. We can divide up the waveform into equal-length symbol intervals and compare the symbols in each interval with the one in the previous interval.

There were two versions of this question. For first waveform:



by inspection, we determine that the second symbol is the same as the first (so it is 0), the third is different than the second (it is 1), etc. The bit values are as shown in the diagram above.

Simiarly for the other version of the question:



Question 2

The PPP framing begins and ends the frame using the PPP flag character (|7E|) and escapes flag and escapes characters with escape characters (|7D|). De-framing proceeds by removing bytes that appear before the start flag, removing escape characters and terminating the frame after the first un-escaped flag character.

The two version of the question were:

~~7E~~ FF 03 00 27 ~~7D~~ 7D ~~7D~~ 7E 3E ~~7E~~

and

~~7E~~ FF 03 00 FF ~~7D~~ 7E ~~7D~~ 7D 3E ~~7E~~

where ~~this~~ marking indicates the bytes dropped because they appear outside the frame and ~~this~~ indicates flag or escape characters removed. The remaining bytes are the bytes in the frame:

FF 03 00 27 7D 7E 3E

and

FF 03 00 FF 7E 7D 3E