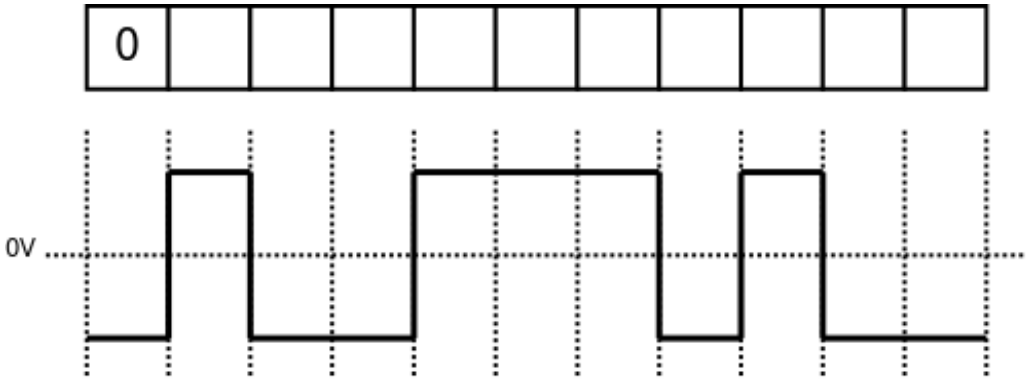
ITS323 – Quiz 3

Name: _____

ID: _____ Mark: _____ (out of 10)

Question 1 [2 marks]

The following signal was created using NRZ-Invert-on-ones. Fill in the boxes to indicate the received bits.



Question 2 [4 marks]

Consider the following digital data.

001001101101

a) Draw the signal produced if Binary FSK is used to modulate the data. [2 marks]

b) Assuming the frequency of the lowest frequency signal in the above analog signal is 100KHz, what is the data rate? [1 mark]

c) If you double the number of signal levels compared to binary FSK, what would the answer of part (b) be? [1 mark]

Question 3 [4 marks]

Consider the Hamming-distance based forward error correction scheme with codewords in the table below.

Data	*Codeword*
00	001100
01	010101
10	110011
11	101110

The source has the data 00 to send.

a) What is received codeword if the last two bits are in error? [1 mark]

b) Explain the outcome at the received. E.g. error detected, corrected, data received, is the received data correct. Why? [2 marks]

c) Assuming no bit errors on a link with data rate 1.2Mb/s, what is the throughput using the above FEC scheme? [1 mark]