



1.4.1 Binary Representation & Arithmetic

Q1

The denary number -55 can be represented in a number of different ways.

- a) Show -55 as an 8-bit binary number in sign and magnitude.

[1 mark]

- b) Show -55 as an 8-bit binary number in two's complement.

[1 mark]

Q2

110010101 is a binary number that is represented using sign and magnitude.

Convert this binary number to a denary number.

[1 mark]

Q3

Addition and subtraction can be used on binary numbers that are represented in two's complement.

- a) Demonstrate how the bytes below are added together. Show your working.

$$\begin{array}{r} 00101100 \\ 00111111 \\ \hline \end{array} +$$

[2 marks]

- b) Demonstrate how the bottom byte is subtracted from the top byte. Show your working.

$$\begin{array}{r} 01101100 \\ 00111111 \\ \hline \end{array} -$$

[2 marks]





Q4

Demonstrate subtraction in binary using 8-bit two's complement using the equivalent of the denary calculation $47 - 23$.

You must show all working.

[4 marks]

