

1 Binary is a number system used by computers.

(a) Tick (✓) **one** box to show which statement about the binary number system is correct.

- A It is a base 1 system
- B It is a base 2 system
- C It is a base 10 system
- D It is a base 16 system

[1]

(b) Denary numbers are converted to binary numbers to be processed by a computer.

Convert these **three** denary numbers to 8-bit binary numbers.

50

102

221

[3]

Working space

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(c) Binary numbers are stored in registers.

Negative denary numbers can be represented as binary using two's complement.

Complete the binary register for the denary number -78

You must show all your working.

Working space

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Register:

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[2]

(d) Two 8-bit binary numbers are given.

Add the **two** 8-bit binary numbers using binary addition.

Give your answer in binary. Show all your working.

$$\begin{array}{r} 00110011 \\ + 01100001 \\ \hline \end{array}$$

[3]

(e) Two binary numbers are added by a computer and an overflow error occurs.

Explain why the overflow error occurred.

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[2]