1 **(a)** Complete the sentences about number systems.

Use the items from the list.

Some of the items in the list will **not** be used. You should only use an item once.

A	B	C	D	E	F	G
H	W	X	Y	Z	0	1
2	4	8	10	16	127	128
255	256					

The binary number system is base ..... . The smallest denary number that can be represented as an 8-bit binary number is ..... . The largest denary number that can be represented as an 8-bit binary number is ..... .

The hexadecimal number system is base ..... . Each hexadecimal digit is equivalent to ..... bits. The numbers 1 to 9 are used and the number 10 is represented by ..... . The hexadecimal number system continues up to the number 15, which is represented by ..... .

[7]

(b) 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.

```
  10011011
+ 00010011
```

[3]

(c) Binary addition can result in overflow.

Tick (✓) **one** box to show the correct definition of overflow in binary addition.

A The answer has created a negative number that cannot be represented in binary addition. ☐

B The answer is the result of a logical shift that cannot be performed in binary addition. ☐

C The answer is too large to represent in the number of bits available. ☐

D The answer is too small to represent in the number of bits available. ☐

[1]