

AQA Computer Science A-Level

4.5.2 Number bases

Past Paper Questions

Additional Specimen AS Paper 2

0 2 . 1

What is the binary equivalent of the decimal number 102_{10} ?

[1 mark]

0 2 . 2

What is the hexadecimal equivalent of the decimal number 87_{10} ?
Show your working.

[2 marks]

0 2 . 3

Provide an example of where we continue to use hexadecimal notation to represent data in computing and explain why we do not use binary.

[2 marks]

Additional Specimen Paper 2

0 2 . 1 A computer represents numbers using **8-bit two's complement** binary.

Using this representation, perform the decimal calculation $78_{10} - 23_{10}$.

Show all of your working.

[3 marks]

0 3 The following value is stored in a byte:

1 0 1 1 0 0 0 1

0 3 . 4 If the byte represents an **unsigned binary integer**, what is its value in **hexadecimal**? **[1 mark]**

0 3 . 5 Explain why programmers often prefer to write numbers in hexadecimal instead of binary. **[1 mark]**

January 2012 Comp 2

- 1 **Figure 1** below shows program code developed using different generations of programming languages.

Figure 1

Program 1 (with comments)

```
//Calculate  
FirstVar := 47;  
SecondVar := FirstVar + 2;  
FourthVar := ThirdVar;
```

Program 2 (with comments)

```
AB2F ; Load value 2F into accumulator  
BC5D ; Store contents of accumulator at address 5D  
E402 ; Add value 2 to accumulator  
BCFF ; Store contents of accumulator at address FF  
AC61 ; Load accumulator with contents of address 61  
BC4A ; Store contents of accumulator at address 4A
```

- 1 (a) What generation of programming language was used to write **Program 1**?

.....
(1 mark)

1 (b) Machine code can be represented in different numeric formats.

1 (b) (i) Which numeric format is used by the machine code program in **Program 2**?

.....
(1 mark)

1 (b) (ii) State **one** reason for using this format.

.....
(1 mark)

1 (b) (iii) The machine for which **Program 2** has been written has limited addressing capability.

What are the lowest and highest memory addresses that can be addressed by this machine?

Lowest address:

Highest address:

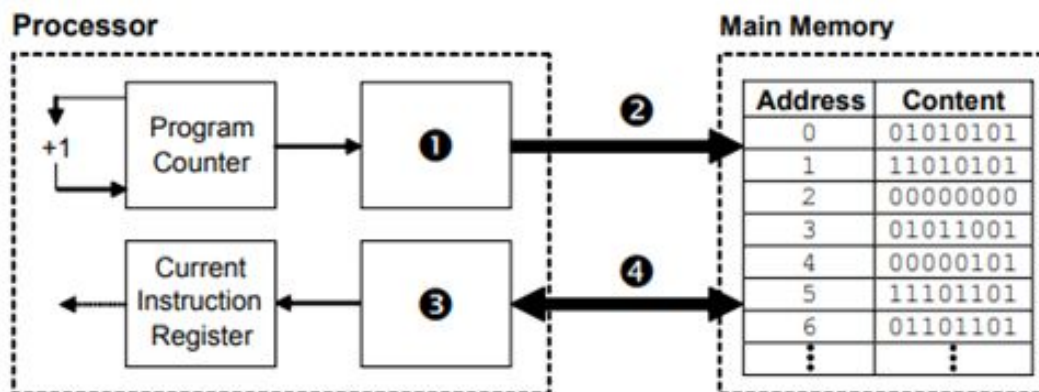
(1 mark)

June 2010 Comp 2

7

Figure 2 shows the processor registers and busses that are used during the fetch part of the fetch-execute cycle, together with the main memory. The values stored in memory locations 0 to 6 in the main memory are machine code instructions.

Figure 2



- 7 (c) The machine code instructions in the main memory in **Figure 2** are shown in binary. When programmers look at machine code instructions they usually prefer to view them in hexadecimal.

State **one** reason why this is the case.

.....

.....

(1 mark)

June 2016 AS Paper 2

0 2

Figure 1 contains a bit pattern.

Figure 1

0 0 1 1 1 0 0 1

0 2 . 1

What is the hexadecimal equivalent of the bit pattern shown in **Figure 1**?

[1 mark]

0 2 . 2

Why do programmers often use hexadecimal instead of binary to represent bit patterns?

[1 mark]

June 2011 Comp 1

0 1 Represent the denary number 123 in binary using 8 bits.

Use the space below for rough working, then copy the answer to your Electronic Answer Document.

(1 mark)

0 3 What is the hexadecimal equivalent of the denary number 123?

Use the space below for rough working, then copy the answer to your Electronic Answer Document.

(2 marks)

0 4 Why are bit patterns often displayed using hexadecimal instead of binary? (1 mark)

June 2013 Comp 1

0 1 What is the denary equivalent of the hexadecimal number A7? (2 marks)

Specimen AS Paper 2

0 2 . **1** What is the decimal equivalent of the hexadecimal number $D6_{16}$? Show your working. **[2 marks]**
