Surname

Other Names

Candidate Signature

AQA

General Certificate of Education
Advanced Subsidiary Examination
January 2013

Computing   **COMP2**

Unit 2   **Computer Components, The Stored Program Concept
and the Internet**

Thursday 17 January 2013   9.00 am to 10.00 am

You will need no other materials
You must **not** use a calculator.

Time allowed
● 1 hour

Instructions
● Use black ink or black ball-point pen.
● Fill in the boxes at the top of this page.
● Answer **all** questions.
● You must answer the questions in the spaces provided. Do not write
  outside the box around each page or on blank pages.
● Do all rough work in this book. Cross through any work you do not want
  to be marked.

Information
● The marks for questions are shown in brackets.
● The maximum mark for this paper is 60.
● The use of brand names will **not** gain credit.
● Question 3 should be answered in continuous prose. In this question you
  will be marked on your ability to:
  - use good English
  - organise information clearly
  - use specialist vocabulary where appropriate.

A

Answer **all** questions in the spaces provided.

1 A computer system is made up of *software* and *hardware*.

Explain what is meant by these two terms.

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(2 marks)

2 The data bus, control bus and address bus are three important parts of a modern computer.

2 (a) In this context, explain what is meant by the term *bus*.

....

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(2 marks)

2 (b) Fill in the gaps in the paragraph below.

The data bus can be used to transfer data and ………………………………… between

the main memory and the processor. The control bus carries control signals. An

example of a control signal is ....

....

....
(2 marks)

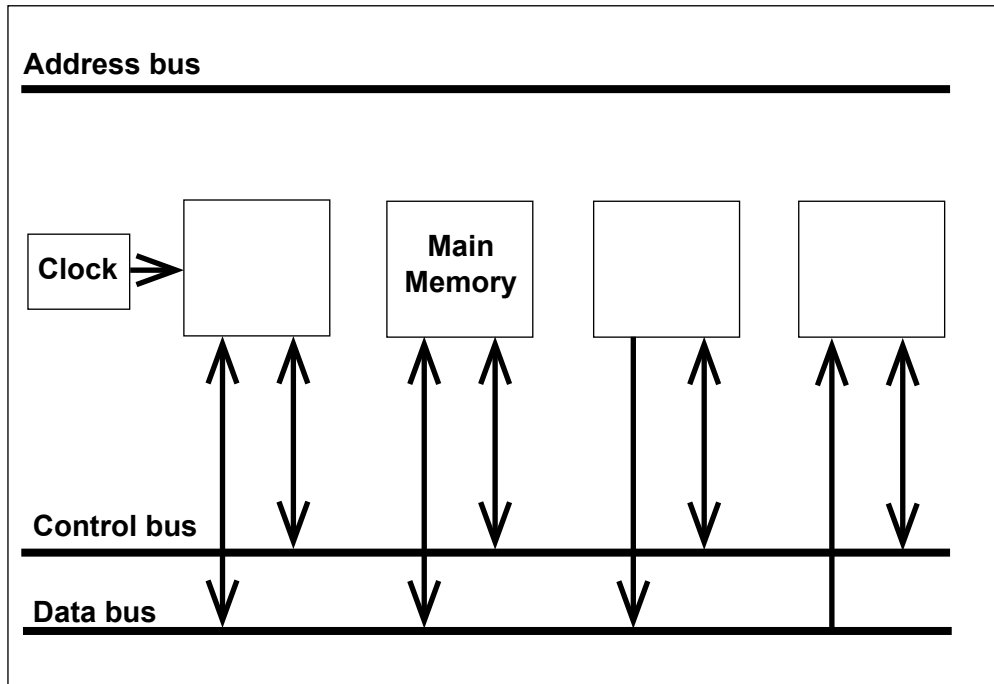**2 (c)** **Figure 1** shows some of the internal components of a computer system.

Figure 1

On **Figure 1** label the following components.

Processor, Keyboard controller, Graphics controller

Draw **all** the connections between the address bus and the components. Make sure that you **clearly** show the direction of each connection.

(5 marks)

9

Turn over for the next question

Turn over ▶

3   When writing a program, a programmer could use an assembly language, a high level imperative language or a high level declarative language.

Outline the major differences in each of these **three** approaches. For each language type, your answer could include:

- advantages and disadvantages compared to other language types
- how the programmer would express their programs
- what translation software could be used, if applicable
- a situation where it might be the most appropriate choice.

In your answer you will be assessed on your ability to use good English and to organise your answer clearly in complete sentences, using specialist vocabulary where appropriate.

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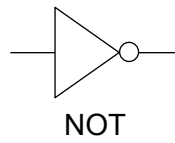..

....
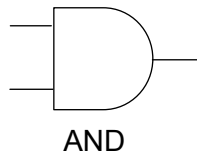
....

(8 marks)

8

Turn over for the next question

Turn over ▶

4 (a) Represent the Boolean equation Q = $\overline{\overline{A}.\overline{B}}$ as a logic circuit by drawing a diagram in the space below using **only** the following symbols:

AND   NOT

(3 marks)

4 (b) Use the following truth tables to demonstrate that A + B = $\overline{\overline{A}.\overline{B}}$

A	B	A + B
0	0	
0	1	
1	0	
1	1	

A	B	$\overline{A}$	$\overline{B}$	$\overline{A}.\overline{B}$	$\overline{\overline{A}.\overline{B}}$
0	0				
0	1				
1	0				
1	1				

(4 marks)

4 (c) What is the name commonly associated with the statement A + B = $\overline{\overline{A}.\overline{B}}$?

....

(1 mark)

4 (d) Simplify the Boolean expression below.

$$A.B.\overline{C} + A.\overline{C}$$

Show each stage of your working in the space below.

(2 marks)

Final answer ....

(1 mark)

11

5 In 1995, a high capacity hard disk drive had a storage capacity of 512 megabytes. In 2012, a typical hard disk drive of the same physical size had a capacity of 1 terabyte.

5 (a) Describe the principles of operation of a hard disk drive.

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(4 marks)

Turn over ▶

5 (b) How many times greater is the storage capacity of a 1 terabyte hard disk drive than that of a 512 megabyte hard disk drive?

Show each stage of your working.

....

....

....

(1 mark)

Final answer ....

(1 mark)

5 (c) Give **one** development in the design of hard disk drives that has enabled this increase in storage capacity.

....

....

....

(1 mark)

5 (d) If you are considering purchasing a high-end desktop or laptop you might be offered the option of a solid-state drive (SSD) rather than a traditional hard disk drive.

A solid-state drive is a data storage device that uses solid-state memory, similar to that in USB flash drives (memory sticks), to store data that is accessed in a similar way to a traditional hard disk drive.

Ignoring any differences in price and assuming that both drives have the same capacity, state **two** reasons why you might choose the solid-state drive.

Reason 1 ....

....

Reason 2 ....

....

(2 marks)

9

6 (a) Explain the differences between the World Wide Web and the Internet.

....

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....

(4 marks)

6 (b) Major parts of the Internet run on a packet switched network.

What is meant by the term *packet switching*?

....

....

....

....

(2 marks)

6 (c) A packet being sent across the Internet may contain the details of a socket, for example 12.23.45.89:80.

Complete the table below to explain what each part of the socket in the table represents.

Part	Represents
12.23.45.89	
80	

(2 marks)

8

Turn over ▶

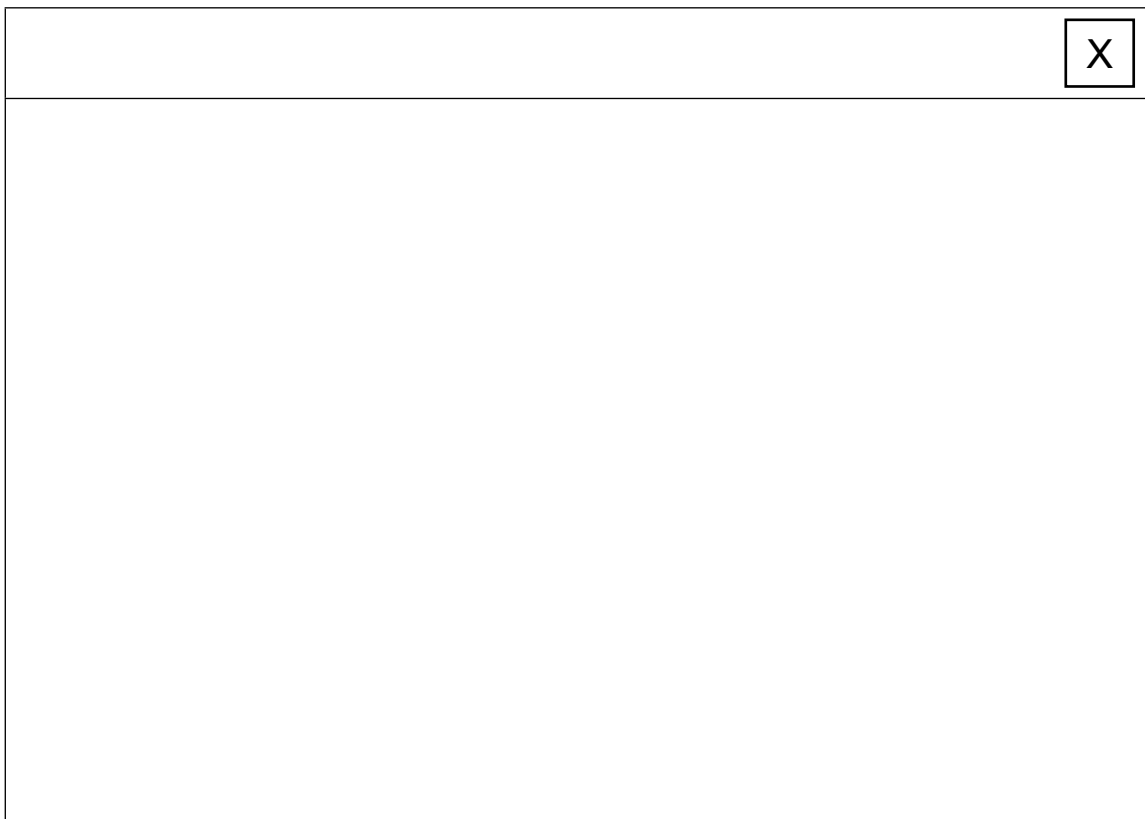**7** **Figure 2** shows the HTML (Hypertext Markup Language) for a web page.

Figure 2

```
<html>
  <head>
    <title>Manor School Library</title>
  </head>
  <body>
    <p>Our favourite genres are:</p>
    <ul>
      <li>Science fiction</li>
      <li>Suspense</li>
      <li>Comedy</li>
    </ul>
    <a href="topten.html">Discover our Top Ten Books</a>
  </body>
</html>
```

7 (a) With reference to the contents of **Figure 2**, draw a diagram in the space below to show how this web page would appear on a screen when viewed through a web browser. If necessary, use labels to make your diagram clear.

	X

(4 marks)

7 (b)   Style rules defined in an external style sheet are to be used to control the look and layout of the page for which the HTML code is provided in **Figure 2**.

7 (b) (i)   One of the style rules is:

```
p { font-family: Arial; color: blue; }
```

Describe the effect of this style rule on the web page.

....

....

....

(1 mark)

7 (b) (ii)   The following HTML code is added to the body of the page.

```
<div id="header">Welcome to the school library</div>
```

Write a style rule so that only the text 'Welcome to the school library' displays as green coloured text with font size 36 point.

....

....

....

(3 marks)

8

Turn over for the next question

Turn over ▶

8 Students often search online for music files and then download them to their computer, mobile phone or music player.

8 (a) State the **full name** of the law that students might have broken by downloading music files in this way.

....

(1 mark)

8 (b) State **two** arguments against music being available for free on the Internet.

Your answers should **not** refer to the law asked for in part (a).

Argument 1 ....

....

Argument 2 ....

....

(2 marks)

8 (c) Many websites now offer the ability to download music files which are without any DRM (Digital Rights Management) protection.

State **two** advantages to students of DRM-free files over files that have DRM restrictions.

Advantage 1 ....

....

Advantage 2 ....

....

(2 marks)

5

END OF QUESTIONS