Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
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5	
6	
7	
8	
9	
10	
11	
12	
TOTAL	

General Certificate of Education
Advanced Subsidiary Examination
January 2011

Computing COMP2

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

Thursday 13 January 2011 1.30 pm to 2.30 pm

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 5 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.

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

1 The internal components of a computer system are connected together by three buses.

1 (a) State the name of the only unidirectional bus.

.....

(1 mark)

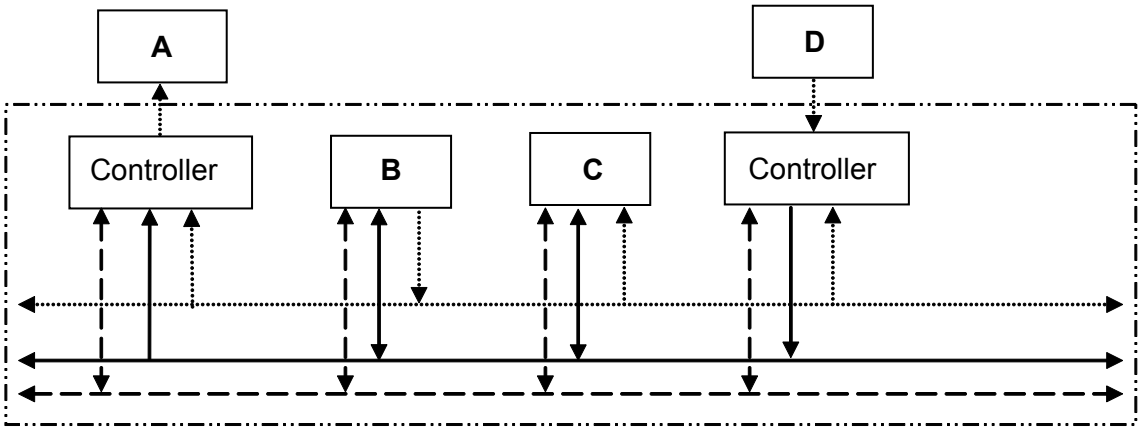
1 (b) If a computer has a 32-bit address bus, of 32 lines, it can access **4 gigabytes** of main memory for all forms of internal use.

How many additional lines does the address bus need for it to be capable of addressing up to **8 gigabytes** of main memory? Write your answer in the box below.

(1 mark)

1 (c) **Figure 1** shows how components of a computer system can be connected.

Figure 1



Write, in the corresponding space below, the correct name for each of **A**, **B**, **C** and **D** from **Figure 1** using only the following:

Processor, Address Bus, Data Bus, Main Memory, Keyboard and Visual Display Unit

A .....

B .....

C .....

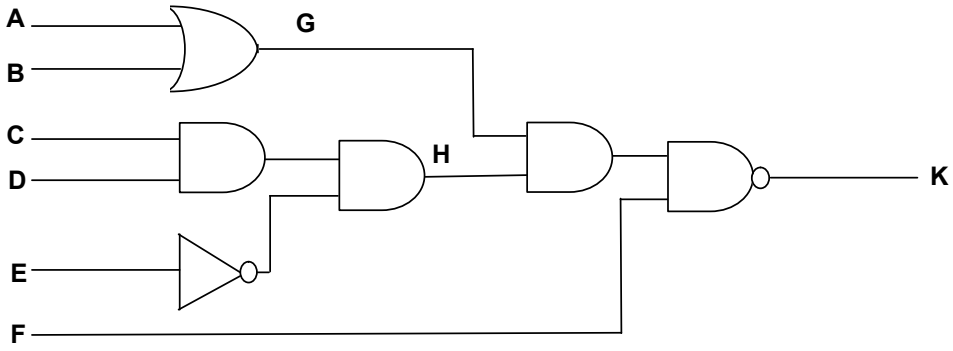
D .....

(4 marks)

6

2 **Figure 2** shows a logic circuit.

Figure 2



Complete the truth table for the inputs that have been given.

Inputs								
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**K**
0	0	1	1	0	0			
0	1	1	1	0	1			
1	0	1	1	1	0			
1	1	1	1	1	1			

(3 marks)

3

3 Write the following Boolean expressions in their simplest forms.

3 (a) $(\overline{\overline{A} \cdot \overline{B}})$

.....

(1 mark)

3 (b) $B + B \cdot \overline{C}$

.....

(1 mark)

3 (c) $A \cdot B + A \cdot \overline{B}$

.....

(1 mark)

3 (d) $A \cdot (B+1)$

.....

(1 mark)

4

4 Some of the assembly language instructions supported by a simple microprocessor are:

Assembly Language
STORE
LOAD
ADD

Examples of the use of these assembly language instructions are:

STORE 5	Copy the contents of the accumulator into memory location 5
LOAD 5	Copy the contents of memory location 5 into the accumulator
ADD 2	Add the contents of memory location 2 to the current contents of the accumulator, storing the result in the accumulator

4 (a) Write into the table below the opcode and the operand parts of the following instruction.

```
LOAD    5
```

Operand	
Opcode	

(1 mark)

4 (b) Write an assembly language program, using the instructions given above, that adds the contents of memory locations 7, 8 and 3, storing the answer in memory location 21.

.....

.....

.....

.....

.....

.....

.....

(3 marks)

4

5 Compare the principles of operation of a laser printer and an inkjet printer when printing. Do **not** include information about how the data is transferred from the computer to the printer.

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

6 (a) One type of software can be described by the phrase "*performs tasks needed to operate the hardware*".

What type of software is being described?

.....

(1 mark)

6 (b) (i) Explain what is meant by *general purpose application software*.

.....

.....

(1 mark)

6 (b) (ii) Give **one** example of general purpose application software.

.....

(1 mark)

6 (c) An IT manager needs to buy software to manage stock control.

6 (c) (i) Why might the manager choose a special purpose application package rather than a bespoke solution? Give **two** reasons.

1 .....

.....

2 .....

.....

(2 marks)

6 (c) (ii) Although special purpose application packages for stock control are available, explain why the IT manager might choose to order a bespoke piece of software.

.....

.....

(1 mark)

6

7 A programmer could use either an assembly language or a high level language to code programs for sale.

7 (a) Give **two** limitations of using assembly language to code a program.

1 .....

.....

2 .....

.....

(2 marks)

7 (b) If a program is coded using a high level language, then either a compiler or an interpreter will need to be used.

Give **two** advantages of using a compiler, rather than an interpreter, to prepare a runnable program ready for sale.

1 .....

.....

.....

2 .....

.....

.....

(2 marks)

4

Turn over for the next question

8 **Figure 3** shows the Hypertext Markup Language (HTML) for a web page.

Figure 3

```
<html>
  <head>
    <title>Computing</title>
    <style type="text/css">
      h2{

        }
    </style>
  </head>

  <!+++++++++++++>
  <body>
    <h2>The examination structure</h2>
    <ol>
      <li>Comp1 – June</li>
      <li>Comp2 – January and June</li>
      <li>Comp3 – June</li>
      <li>Comp4 – <strong>Project</strong></li>
    </ol>
    <br />
    <a href="www.aqa.org.uk">More information</a>
  </body>
</html>
```

8 (a) With reference to the contents of **Figure 3**, draw a diagram in the space below to show how this web page would appear on screen when viewed through a web browser. If necessary, use labels to make your diagram clear.

(5 marks)

8 (b) Write the style rule for h2 that will put the heading in the centre and set its text colour to red.

```
h2 { .....

     .....
   }
```

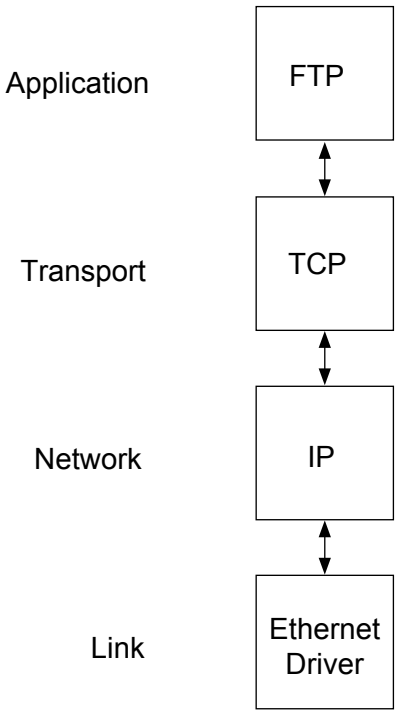
(3 marks)

8

Turn over for the next question

9 **Figure 4** shows the TCP/IP protocol stack as applied to a network.

Figure 4



9 (a) Describe **two** tasks that the transport layer performs.

1 .....

.....

2 .....

.....

(2 marks)

9 (b) FTP is an application layer protocol.

Name another application layer protocol.

.....

(1 mark)

9 (c) A router is a vital component in the structure of the Internet.

In which layer of the TCP/IP protocol stack does a router operate?

.....

(1 mark)

4

10 To request a particular web page on the Internet a user will need to enter into the address bar of their web browser a Uniform Resource Locator (URL).
This is in the form of:

`http://www.aqa.org.uk/courses/computing.html`

10 (a) The first part `http://` is the protocol.

Describe the following parts of this URL.

`aqa.org.uk`

.....

`courses/computing.html`

.....

(2 marks)

10 (b) What is a protocol?

.....

(1 mark)

10 (c) A requested page might be found locally on an intranet or it may be found on the Internet.

State **two** similarities between an intranet and the Internet.

1 .....

.....

2 .....

.....

(2 marks)

10 (d) 192.120.12.67 is a typical IP address.

Why do people prefer to use a Fully Qualified Domain Name (FQDN) rather than an IP address?

.....

.....

(1 mark)

6

Do not write outside the box

11 (a) If you borrow a shop bought music CD and "rip" (copy) the tracks to your hard disk before you give the CD back to your friend, you have probably broken a law.

State which law you are likely to have broken.

.....

(1 mark)

11 (b) Alternatively, you could download music from an official music website on the Internet. The website owners might protect this music using Digital Rights Management.

Give **two** examples of how Digital Rights Management could prevent you from sharing downloaded music with a friend.

1 .....

.....

2 .....

.....

(2 marks)

3

12 What are machines good and bad at, in comparison to humans?

.....

.....

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.....

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.....

.....

(4 marks)

4

END OF QUESTIONS