

Centre Number						Candidate Number				
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Other Names										
Candidate Signature										



General Certificate of Education
Advanced Subsidiary Examination
June 2014

Computing

COMP2

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

Monday 9 June 2014 1.30 pm to 2.30 pm

You will need no other materials
You may **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.
- Question 4(b) 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.

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
TOTAL	

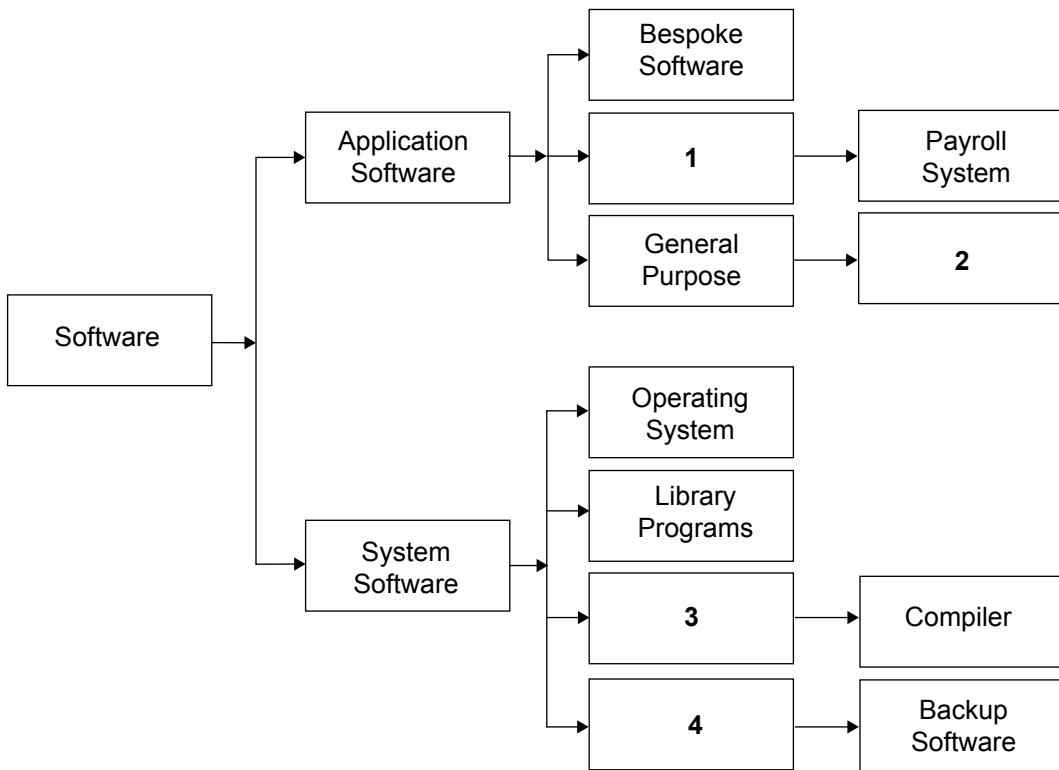


J U N 1 4 C O M P 2 0 1

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

- 1** The diagram in **Figure 1** shows the classifications of various types of software used on a computer system and some examples of these types.

Figure 1



- 1 (a)** Complete **Figure 1** by suggesting labels for the boxes numbered **1** to **4** in the diagram. **[4 marks]**

1

2

3

4



1 (b) (i) Machine code is the first generation of programming language.

What is the second generation of programming language?

[1 mark]

.....

1 (b) (ii) A program written in a second generation programming language has been loaded into a computer. In this form it cannot be directly executed on this computer.

What has to be done to make an executable form of the program, which can be directly executed by this computer, and what would be used, typically, to do this?

[2 marks]

.....
.....
.....

1 (b) (iii) A programmer then finds that when the executable form of the program is transferred unaltered to another computer, the program does not run and an error message is displayed.

Why might the executable form of the program not be able to run on this computer?

[1 mark]

.....
.....

8

Turn over for the next question

Turn over ▶



2 (a) Complete the truth tables for the following logic gates.

[2 marks]

OR gate

Input A	Input B	Output
0	0	
0	1	
1	0	
1	1	

NAND gate

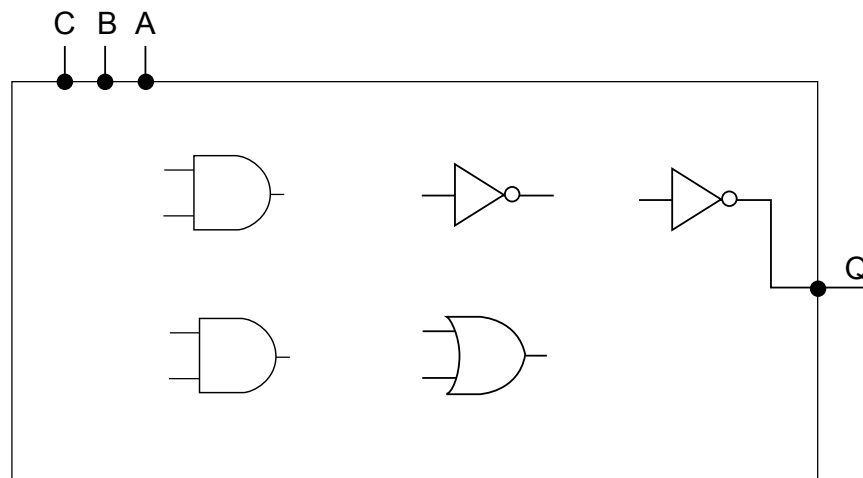
Input A	Input B	Output
0	0	
0	1	
1	0	
1	1	

2 (b) Represent the following Boolean equation as a logic circuit by completing Figure 2.

[5 marks]

$$Q = \overline{\overline{A \cdot B} + B \cdot C}$$

Figure 2



2 (c) Simplify the following expression.

$$\overline{\overline{A} + \overline{B}} + B \cdot \overline{A}$$

Show each stage of your working in the space below.

[2 marks]

Final answer

[1 mark]

10

3 An integrated circuit manufacturer is looking to develop a new processor.

3 (a) What would be the direct consequence on potential performance of increasing the width of the data bus?

.....

increasing the width of the address bus?

.....

increasing the clock speed?

.....

[3 marks]

Question 3 continues on the next page

Turn over ▶



3 (b) A company has designed a new peripheral and is developing the I/O controller for it.

3 (b) (i) What do we mean by the term peripheral?

[1 mark]

.....
.....

3 (b) (ii) The I/O controller is an electronic circuit consisting of three parts. One of these parts is known as the I/O port.

What is the role of the I/O port?

[1 mark]

.....
.....

3 (b) (iii) Describe another part of the I/O controller.

[1 mark]

.....
.....

3 (b) (iv) Peripheral devices are not directly connected to the processor but make use of the system bus.

Give **two** reasons why it is **not** sensible to connect peripherals directly to the processor. **[2 marks]**

Reason 1

Reason 2

8



4 A supermarket uses many hardware devices as part of its daily operations.

A key component at the checkout area is the bar code reader (scanner).

If a product's bar code cannot be read by the bar code reader the checkout operator will have to enter the bar code manually.

4 (a) Name **two** hardware devices that could be used to manually enter a bar code.

[2 marks]

Device 1

Device 2

Question 4 continues on the next page

Turn over ▶



4 (b) Most supermarket product bar codes follow the International Article Number standard which has 13 digits: 12 of these digits are for data and the last one is a check digit.



Describe the principles of operation of a bar code reader **and** how the software in the bar code reader will use the check digit when processing a product.

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

[6 marks]

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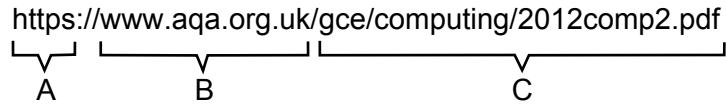
8

Turn over for the next question

Turn over ▶



5 A student uses the following URL to download a copy of a previous year’s COMP2 exam paper.



5 (a) (i) Describe the **three** labelled parts of this URL.

[3 marks]

A

.....

B

.....

C

.....

5 (a) (ii) State the top-level domain part in the URL.

[1 mark]

.....

5 (b) To access the exam paper, the student’s computer might need to make use of a Domain Name System (DNS) query which is transmitted to a DNS server.

5 (b) (i) What is the role of a DNS server?

[1 mark]

.....

.....



5 (b) (ii) In some circumstances the student's computer will not need to contact a remote DNS server to access a resource.

Describe **two** situations when a DNS query will **not** be sent to a remote DNS server.

[2 marks]

Situation 1.....
.....

Situation 2.....
.....

5 (c) In the process of requesting a web page, a browser will generate an HTTP GET request.

5 (c) (i) In which layer of the TCP/IP stack is the browser operating?

[1 mark]

.....

5 (c) (ii) Explain why the student's computer might need to make several HTTP GET requests to display one web page.

[1 mark]

.....
.....

5 (c) (iii) The HTTP GET requests are being sent to port 80 on the remote machine. The browser has been allocated a **client port number**.

What is meant by a client port number?

[1 mark]

.....
.....

10

Turn over for the next question

Turn over ▶



6 (a) Write the HTML code required for a link to www.aqa.org.uk.

The link text should be 'Click me to go to AQA'.

[3 marks]

.....

.....

.....

6 (b) Explain the difference in appearance, when rendered in a browser, between the following segments of HTML code.

Segment 1	Segment 2
<pre> Red Orange Yellow </pre>	<pre> Red Orange Yellow </pre>

[1 mark]

.....

.....

.....



- 6 (c)** In the box below, show the result of the following HTML fragment when rendered in a web browser.

```
<p>The cat sat</p> <h3>on the mat</h3> <p>so the story goes.</p>
```

[2 marks]

<div style="border: 1px solid black; padding: 2px; display: inline-block;">X</div>

- 6 (d)** The HTML code segment below has a mistake in it which means that nothing is actually displayed in the browser.

Identify the mistake by writing the necessary correction in the segment.

[1 mark]

```
<html>
  <head>
    <title>Welcome to The Local History Society
  </head>
  <body>
    <h1>The Local History Society meets in Nottingham</h1>
    <p>We meet weekly at the Central Library.</p>
  </body>
</html>
```

Question 6 continues on the next page

Turn over ▶



6 (e) Responsive Web Design (RWD) is an approach to web design in which a site is designed to provide optimal viewing experiences across a wide range of devices.

When looking at a certain page on a mobile phone, compared to a desktop computer, the content is found to be the same but the page looks quite different.

Describe **two** examples of how CSS could be used to display a page so that it is set out appropriately for a mobile phone.

[2 marks]

Example 1.....

.....

Example 2.....

.....

9

7 (a) Below is a numbered list of the names of some of the legislation that applies in situations where computers are used:

1. Copyright, Designs and Patents Act
2. Computer Misuse Act
3. Regulation of Investigatory Powers Act
4. Health and Safety Regulations
5. Data Protection Act

For each of the situations given below, identify the relevant legislation which is being followed. Write the number that corresponds to the appropriate legislation in the box given after each situation.

Marcus wanted an MP3 of a recent song so he went to an online music store. After paying he was able to immediately download the purchased song.

Legislation

A new workstation is installed in an office and an assessment is performed regarding the lighting for the workstation and the positioning of the desk, monitor and chair.

Legislation

Mr Smith hands over his 50-character encryption key in response to a request from the authorities investigating a fraud case.

Legislation

[3 marks]



7 (b) The operators of a number of multi-storey car parks have installed systems to scan and recognise number plates. The system is used at both the entrance and exit of the car parks so that the arrival and leaving times can be recorded.

Customers can set up an account so that money is automatically debited when their car number plate is recognised as the car leaves the car park.

Customers who do not have an account can use their mobile phones to pay the car parking fees by sending a text message to a specified number with their number plate details and length of stay.

As these car parks are based around the UK the company also collects location-specific data.

7 (b) (i) The number plate recognition system uses CCTV cameras and OCR software.

What is the full name of the technique known by the abbreviation OCR?

[1 mark]

.....

7 (b) (ii) The company will need to follow the Data Protection Act as they will be storing personal data.

What is meant by personal data?

[1 mark]

.....

7 (b) (iii) Why might the storing of number plate details, mobile phone numbers and location-specific data be a concern for privacy campaigners?

[2 marks]

.....

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.....

.....

END OF QUESTIONS

7



There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

