New GCSE

4341/01

COMPUTER SCIENCE
UNIT 1: Understanding Computer Science

P.M. THURSDAY, 12 June 2014
1 hour 30 minutes
Suitable for Modified Language Candidates

INSTRUCTIONS TO CANDIDATES
Use black ink or black ball-point pen. Do not use pencil or gel pen. Do not use correction fluid.
Answer all questions.
Write your answers in the spaces provided in this booklet.
If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

INFORMATION FOR CANDIDATES
The number of marks is given in brackets at the end of each question or part-question.
Quality of written communication will be assessed in question 16.
1. **Tick (✓) the correct boxes below to show which **four** of the following items are secondary storage media.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Box</th>
</tr>
</thead>
<tbody>
<tr>
<td>External hard disk drive</td>
<td>1</td>
</tr>
<tr>
<td>CPU</td>
<td>2</td>
</tr>
<tr>
<td>DVD</td>
<td>3</td>
</tr>
<tr>
<td>Cache</td>
<td>4</td>
</tr>
<tr>
<td>Network interface card</td>
<td>5</td>
</tr>
<tr>
<td>Solid state hard drive</td>
<td>6</td>
</tr>
<tr>
<td>USB flash memory stick</td>
<td>7</td>
</tr>
<tr>
<td>ROM</td>
<td>8</td>
</tr>
</tbody>
</table>
2. A tablet computer has many methods for data input and output.

Look at the items listed below. For each item tick (✓) the correct box to show if they are used for:

- Input only
- Output only
- Input and output
- Not used for input or output

<table>
<thead>
<tr>
<th>Item</th>
<th>Input only</th>
<th>Output only</th>
<th>Input and output</th>
<th>Not used for input or output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microphone</td>
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<tr>
<td>Volume button</td>
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<tr>
<td>Touch screen</td>
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<tr>
<td>Speaker</td>
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<td></td>
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<tr>
<td>Memory card</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Camera</td>
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</table>
3. A laptop computer is supplied with a 5GHz *dual-core* central processing unit (CPU) and 8 gigabytes of RAM.

(a) Briefly explain how a computer makes use of RAM. [2]

(b) Give a reason why a computer with 8 gigabytes of RAM could run several large programs faster than a computer with 2 gigabytes of RAM. [2]

(c) Describe what is meant by a *dual-core* CPU. State a possible benefit of its use. [2]

(d) Describe what is meant by the term 5GHz. [2]
4. There are many different types of network topology, of which Bus and Star are types.

(a) Draw a diagram of a Star topology network. Clearly label all important hardware. [3]
(b) Star topology networks are more commonly used than Bus topology networks. Give two advantages and two disadvantages of a Star topology network compared to a Bus topology network.

Advantages: ............................................................................................................................................................................................
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Disadvantages: ............................................................................................................................................................................................
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5. (a) State the role of *virus checker* software. Identify **three** typical functions carried out by this software. [4]

(b) State the role of *firewall* software. Identify **three** typical functions carried out by firewall software installed on a network. [4]
6. An estate agent stores details about the properties for sale on a computer system.

   For each of the following items name the most suitable data type:

   - the number of bedrooms ........................................................................... [1]
   - the postcode of the property ........................................................................ [1]
   - whether the property is still for sale (e.g. TRUE) ........................................ [1]
   - the council tax band (e.g. A, B, C) ............................................................... [1]

7. Describe the role of a Domain Name System (DNS) server. Explain, in detail, how it is used to access a web site such as www.wjec.co.uk when typed into a web browser. [4]
8. Describe the features of a *Graphical User Interface (GUI)* that are provided by the operating system.

[5]
9. A photograph file uploaded to a social networking website is compressed. This is done using a *lossy compression algorithm*.

(a) State the effect that compression has on the file.  

(b) State two advantages for the social networking website of using compressed photograph files.  

(c) A professional photographer uses a *lossless compression algorithm* when uploading photograph files to his website for customers to download and print. 

Briefly describe why a lossless compression algorithm is the most suitable in this situation.
10. Computer programs can contain different types of error.

(a) State what is meant by a *syntax error*. Give an example. [2]

(b) State what is meant by a *run time error*. Give an example. [2]

(c) State what is meant by a *logical error*. Give an example. [2]
11. (a) State the number of bits in a byte ........................................................................... [1]

(b) Complete the following truth table, for the logical OR operation. Write either False or True in the last column.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>A OR B</th>
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<tbody>
<tr>
<td>True</td>
<td>True</td>
<td>True</td>
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<td>True</td>
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<td>False</td>
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12. Characters are represented in computers using many different methods. **Two** methods of storing characters are **ASCII** and the **Unicode Standard**.

State **one** advantage of using Unicode instead of ASCII. [1]

State **one** disadvantage of using Unicode instead of ASCII. [1]
13. Below is an algorithm.

```
set counter = 0
output “Before the loop”

repeat
    set counter = counter + 1
    output “Count is” counter
until counter = 3

output “Loop has ended”
```

Write down all the outputs produced by the algorithm. [2]
14.  (a) Convert the hexadecimal number $3C$ to binary. [2]

(b) Convert the hexadecimal number $3C$ to denary. [2]

(c) Convert the binary number $1110111$ to hexadecimal. [2]

(d) Explain why hexadecimal numbers are often used to represent binary numbers. [2]
15. State a suitable use for the following protocols:

HTTP (Hypertext Transfer Protocol) [1]

FTP (File Transfer Protocol) [1]

SMTP (Simple Mail Transfer Protocol) [1]
16. A software company has employed several new members of staff. As part of their initial training, the company wants to make sure that they are aware of current legislation (law) relevant to computing.

You have been asked to inform the new employees about their responsibilities under:

- The Data Protection Act
- The Computer Misuse Act
- The Copyright, Designs and Patents Act

Write a clear set of guidelines for the new employees. [12]

*Quality of written communication will be assessed in this question.*
<table>
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<tr>
<th>Question number</th>
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