Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/13**

Paper 1 Theory **May/June 2019**

MARK SCHEME

Maximum Mark: 75

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

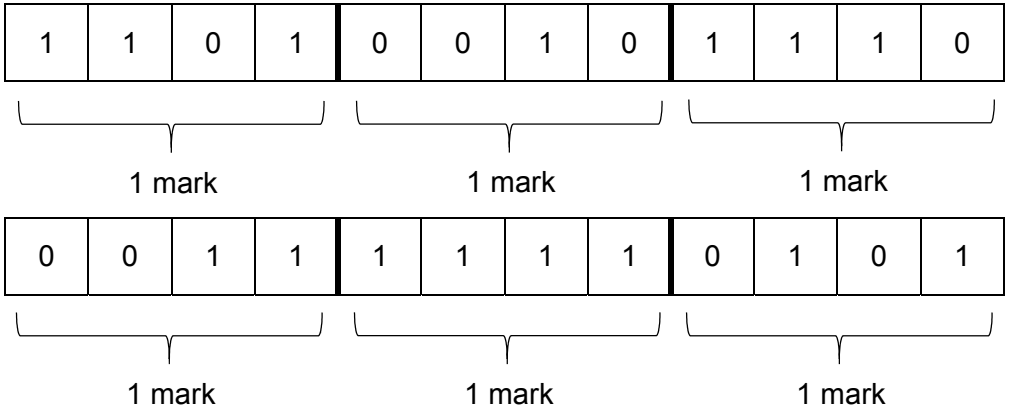
GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1(a)</td><td>


</td><td>6</td></tr>
<tr><td>1(b)</td><td>One from:

– Hypertext Mark-up Language
– A mark-up language used to create webpages</td><td>1</td></tr>
<tr><td>1(c)</td><td>1 mark for each correct row:

<table>
<tr><th>Example</th><th>Structure (✓)</th><th>Presentation (✓)</th></tr>
<tr><td>The colour applied to a text heading on a web page</td><td></td><td>✓</td></tr>
<tr><td>The font style applied to a paragraph of text on a web page</td><td></td><td>✓</td></tr>
<tr><td>The placement of a paragraph of text on a web page</td><td>✓</td><td></td></tr>
<tr><td>The size that an image is set to be displayed at on a web page</td><td></td><td>✓</td></tr>
<tr><td>The placement of an image next to a paragraph of text of a web page</td><td>✓</td><td></td></tr>
</table>
</td><td>5</td></tr>
</table>

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Question	Answer	Marks
1(d)	1 mark for each correct term, in the correct place: – URL – https – Domain name – Web server – Browser – HTML	**6**
1(e)(i)	– Small packets of data – … that are stored by the web browser	**2**
1(e)(ii)	**Four** from: – To store a customer's password … – To store a customer's credit card details … – … so they do not need to be re-entered in future – To track what the customer has viewed on the website … – … so she can send them adverts that match their preferences	**4**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(a)</td><td>1 mark for each correct row:

<table>
<tr><th>Statement</th><th>True (✓)</th><th>False (✓)</th></tr>
<tr><td>A MAC address is unique to a computer on a network</td><td>✓</td><td></td></tr>
<tr><td>Once an IP address has been set it cannot be changed</td><td></td><td>✓</td></tr>
<tr><td>A MAC address is made up of the computer’s serial number and the IP address</td><td></td><td>✓</td></tr>
<tr><td>If a computer does not have an IP address it cannot communicate with another device using the Internet</td><td>✓</td><td></td></tr>
</table></td><td>4</td></tr>
<tr><td>2(b)(i)</td><td>Two from:

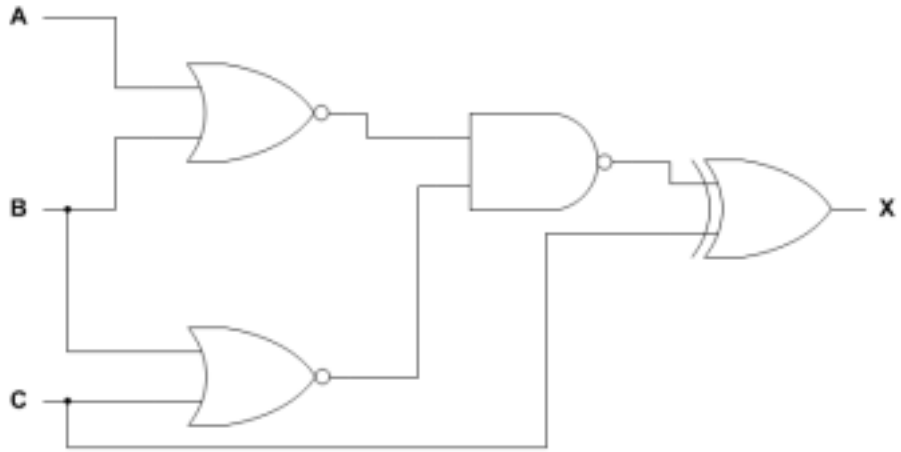
– Programs / instructions are stored in memory
– Data is stored in memory
– Instructions are fetched and executed one after another</td><td>2</td></tr>
<tr><td>2(b)(ii)</td><td>– Carries out calculations
– Carries out logical operations
– Holds temporary / interim values during calculations
– … in a register called the accumulator (ACC)</td><td>4</td></tr>
</table>

Question	Answer	Marks
2(c)(i)	– Interrupt	**1**
2(c)(ii)	**Two** from: – Provides an interface – Loads / opens / installs / closes software – Manages the hardware // manages peripherals // spooling – Manages the transfer of programs into and out of memory – Divides processing time // processor management – Manages file handling – Manages error handling // interrupt handling – Manages security software – Manages utility software – Manages user accounts – Multitasking – Multiprogramming // time slicing – Batch processing	**2**

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Question	Answer	Marks
3(a)	**Four** from: – The company could use the firewall to set criteria – Gaming websites can be listed as blocked websites // ports can be blocked – The firewall would examine any traffic leaving the network – If it detected traffic requesting a listed website, it will block access to it – Keeps a log of all attempts to access blocked websites	**4**
3(b)	**Four** from: – An encryption algorithm is used – … to scramble data – The original data is called the plain text – A key is used to encrypt the data – The key is applied to the plain text – Plain text is encrypted into cypher text	**4**
3(c)	**Six** from: – The user could have been sent an email with an attachment / link containing the spyware – The user could have clicked a link on an untrusted website – When the attachment / link was clicked the spyware was downloaded onto the user's computer – The spyware recorded all the key logs from the user's keyboard – The recorded key logs were sent back to the creator of the spyware – The key logs were analysed – A common pattern / word in the key logs could have allowed a password to be identified	**6**

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Question	Answer	Marks
4(a)	1 mark for each correct logic gate, with correct inputs: 	**4**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>4(b)</td><td>4 marks for 8 correct outputs
3 marks for 6/7 correct outputs
2 marks for 4/5 correct outputs
1 mark for 2/3 correct outputs

<table>
<tr><th>A</th><th>B</th><th>C</th><th>Working space</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td></td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td></td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td></td><td>0</td></tr>
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<tr><td>1</td><td>1</td><td>1</td><td></td><td>0</td></tr>
</table></td><td>4</td></tr>
<tr><td>4(c)</td><td>Two from:

– To carry out a logical operation
– To control the flow of electricity through a logic circuit
– An input is given and the logic of the gate is applied to give an output // to alter the output from given inputs</td><td>2</td></tr>
</table>

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Question	Answer	Marks
5	– B **Three** from: – Added up the number of 1's / 0's in each register – With the parity bit, two registers have an odd number of 1's / 0's – One register has an even number of 1's / 0's – Odd parity must be the parity used	**4**

Question	Answer	Marks
6(a)	**Four** from: – Screen has two / multiple layers – Visitor presses on top layer – Top layer connects to bottom layer – … creating a circuit – Calculation is carried out on where layers are connected	**4**
6(b)	**Two** from: – Speaker – Headphones – Printer	**2**

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Question	Answer	Marks
6(c)	**Four** from (max. 2 marks per type): **Primary** – Memory that is directly accessed by the CPU – An example is RAM / ROM – RAM stores programs and data that are currently in use and ROM stores boot-up instructions – RAM is volatile and ROM is non volatile **Secondary** – Storage that is not directly accessed by the CPU – An example is HDD / SSD – Stores data / files that can be accessed at a later stage – Non volatile	**4**

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