Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/11**

Paper 1 **October/November 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.

Cambridge International is publishing the mark schemes for the October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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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.

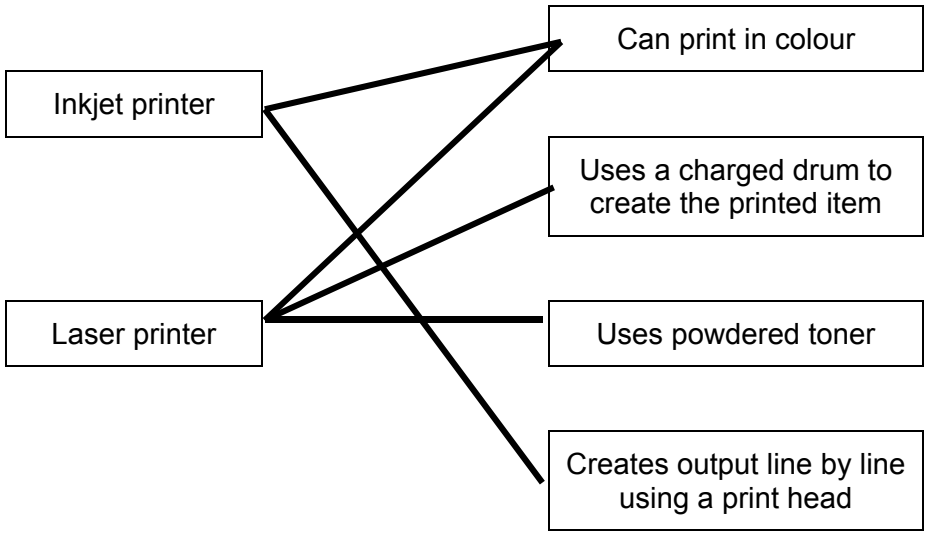
GENERIC MARKING PRINCIPLE 4:

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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Question	Answer	Marks
1(a)	**Printer** **Statement**  **One** mark for correct lines from inkjet **One** mark for correct lines from laser	**2**
1(b)	• Laser	**1**
1(c)	**Two** from: • Design is created on the computer / software / CAD • Material is loaded to cutter • Different types of material can be used • Uses lasers to cut material … • … that use infra-red • … that produces extreme heat • … that is focussed using a special lens • Can work on both the *x*,*y* and *z* axis	**2**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(a)</td><td>One mark for each correct denary value

<table>
<tr><th>Binary</th><th>Denary</th></tr>
<tr><td>0001001110</td><td>78</td></tr>
<tr><td>0110110111</td><td>439</td></tr>
<tr><td>1000000001</td><td>513</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>2(b)</td><td>Two from:
• Uses fewer characters // shorter
• Easier to read / write / understand
• Less likely to make mistakes // less error prone
• Easier to debug</td><td>2</td></tr>
<tr><td>2(c)</td><td>One mark for each correct hexadecimal value in correct order
2 B 5</td><td>3</td></tr>
</table>

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Question	Answer	Marks
3(a)	**Three** from: • Malicious software // type of malware • Tracks / records keypresses // keylogger • Sends data to third party • Collected data is analysed to obtain data	**3**
3(b)	**One** mark for identified method, **one** mark for how it prevents spyware: **Drop-down boxes // onscreen / virtual keyboard** • Means key logger cannot collect data **Only requires part of the password** • Hacker doesn't get the full password **Two-step verification // Two-factor authentication** • Extra data is sent to device making it more difficult for hacker to obtain it • Data has to be entered into the same system // if attempted from a remote location, it will not be accepted **Use a biometric device** • The person's biological data (e.g. their fingerprint) is also required	**2**
3(c)	**Four** from: • Monitors traffic coming into and out of the computer system • Checks that the traffic meets any criteria / rules set • Blocks any traffic that does not meet the criteria / rules set • Allows a set blacklist / whitelist // can block certain IP addresses • Can close certain ports	**4**
3(d)	**Two** from: • Passwords // biometrics • Levels of access • Proxy servers • Physical security methods – e.g. PC's in locked rooms, etc.	**2**

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Question	Answer	Marks
4(a)	**One** from: • Touch screen • Keyboard • Microphone • Mouse	**1**
4(b)	**One** from: • Headphones • Speakers • Printer • Light / LED	**1**
4(c)	**One** from: • HDD • SSD • USB drive	**1**
4(d)	**Four** from: • QR code is scanned using a camera on a mobile device … • … and read / decoded using an application / software • Illuminator shone on code • Squares reflect light differently • Corners of code are used for orientation • Opens document with information // Directs to website with information • QR code can be saved for future reference	**4**

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Question	Answer	Marks
5(a)	• Data is sent down a single wire … • … one bit at a time • Data is sent in both directions … • … but only one direction at a time	**4**
5(b)	**One** mark for correct byte (Byte) 2 // 01010100 **Three** from: • Added up / counted the 1s / 0s • Even parity used // 3 bytes are even • Byte 2 uses odd parity // 1 byte is odd	**4**

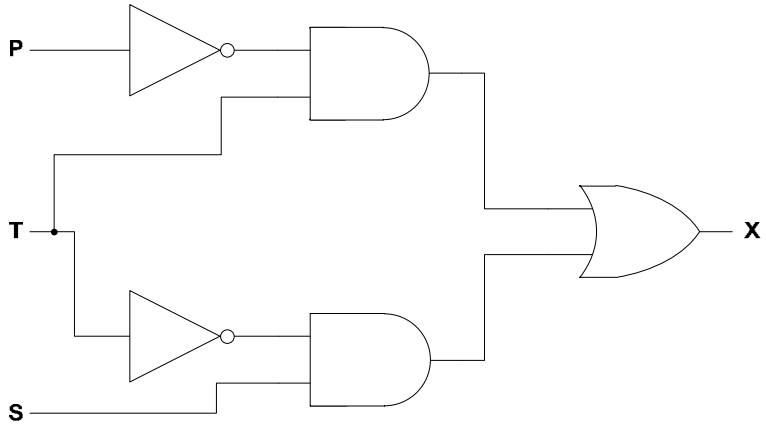
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Question	Answer	Marks
6(a)(i)	**One** from: • Code will run without the need of an interpreter • (Object) Code is platform independent • Source code not available / cannot be modified	**1**
6(a)(ii)	**One** from: • Source code not available / cannot be modified • Comments, etc. not visible • Future changes will require code to be recompiled	**1**
6(b)(i)	**One** from: • Protocol is HTTPS • Padlock icon is locked • Can view website certificate	**1**
6(b)(ii)	**Five** from: • Browser / client sends request to webserver to request identification • Web server sends its digital / security certificate • Browser authenticates certificate … • … if authentic connection, is established • Any data sent is encrypted … • … using public and private keys	**5**
6(c)	**Four** from: • A type of software licence • Free of charge • Normally distributed without the source code • Can legally share / copy • Cannot legally modify code • Cannot resell	**4**

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Question	Answer	Marks
6(d)(i)	**Two** from: • File size is reduced … • … so it uses less storage space • … so faster transmission • … so quicker to download	**2**
6(d)(ii)	• Lossless	**1**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>7(a)</td><td>
<table>
<tr><th>Input A</th><th>Input B</th><th>Output</th></tr>
<tr><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td></tr>
</table>
</td><td>1</td></tr>
<tr><td>7(b)</td><td>• Exclusive OR / XOR / EOR</td><td>1</td></tr>
<tr><td>7(c)</td><td>One mark for each correct logic gate with correct inputs

</td><td>5</td></tr>
<tr><td>7(d)</td><td>Two from:
• Can work continuously
• Avoids human error
• It could be a dangerous environment and will avoid human risk
• Detect errors instantly
• Maintain consistent and correct conditions</td><td>2</td></tr>
</table>

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Question	Answer	Marks
8	**Six** from: • PC holds address of the instruction • The address held in PC is sent to MAR … • … using address bus • MAR goes to location in memory where instruction is stored • Instruction sent to MDR … • … using data bus • Instruction sent to CIR • Control unit sends signals to manage the process … • … using the control bus	**6**
9(a)	**Two** from: • Layout of the webpage • e.g. where a paragraph is placed • Defined using tags	**2**
9(b)	**One** mark for each correct term in the correct order: • browser • IP address • web server • HTML	**4**

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