Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/11**

Paper 1 **October/November 2018**

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 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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

This document consists of **12** printed pages.

PUBLISHED

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.

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.

Question	Answer	Marks
1(a)	1 mark for each correct line (to a maximum of 3) **File format** → **File type** .jpeg → Image file .mp3 → Audio file .mp4 → Video file .txt → Text file	**3**
1(b)	2 marks for working, 1 mark for correct answer • 150*100 = 15 000 • 15 000/1024 • 14.65kB	**3**
1(c)	**Three** from: • a compression algorithm is used • no data is lost in the process • repeated words/patterns can be indexed // repeated sections of words/patterns can be indexed // given by example • The indexed words/patterns can be replaced with numerical values // given by example	**3**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1(d)</td><td>1 mark for each correct tick (✓)
<table>
<tr><th>File format</th><th>Lossy (✓)</th><th>Lossless (✓)</th></tr>
<tr><td>.jpeg</td><td>✓</td><td></td></tr>
<tr><td>.mp3</td><td>✓</td><td></td></tr>
<tr><td>.mp4</td><td>✓</td><td></td></tr>
<tr><td>.zip</td><td></td><td>✓</td></tr>
</table></td><td>4</td></tr>
</table>

Question	Answer	Marks
2(a)	1 mark for each correct line (to a maximum of 5) **Binary or hexadecimal** → **Denary** 01001011 → 75 4E → 78 11011010 → 218 10011101 → 157 A7 → 167 19 → 25	**5**
2(b)	**Two** from: • It makes the values easier to read/write/understand/debug • It is a shorter way to represent the values	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>3(a)</td><td>

4 marks for 8 correct outputs
3 marks for 6 or 7 correct outputs
2 marks for 4 or 5 correct outputs
1 mark for 2 or 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>1</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td></td><td>1</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>1</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td></td><td>0</td></tr>
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<tr><td>1</td><td>1</td><td>1</td><td></td><td>1</td></tr>
</table>
</td><td>4</td></tr>
<tr><td>3(b)</td><td>Three from:

output of AND is 1 if both inputs are 1
output of AND is 0 if either or both inputs are 0
output of OR is 1 if either input is 1
output of OR is 0 if both inputs are 0
correct example of AND truth table
correct example of OR truth table

</td><td>3</td></tr>
</table>

Question	Answer	Marks
4(a)	**Four** from: Phishing: • A legitimate looking email is sent to a user • The email will encourage the user to click a link/open an attachment • The link will redirect a user to a legitimate looking webpage (to steal personal data) Pharming: • A malicious code is installed on a user's hard drive/server • The code will cause a redirection to a legitimate looking webpage (to steal personal data)	**4**
4(b)	**Two** from: • Hacking • Cracking • Virus • Denial of service • Malware • Spyware	**2**
4(c)	**Two** from: • Firewall • Proxy server • Anti-virus • Anti-malware • Anti-spyware • Username and password	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(a)</td><td>1 mark for the correct tick for each storage
<table>
<tr><th>Storage device or media</th><th>Primary (✓)</th><th>Secondary (✓)</th><th>Off-line (✓)</th></tr>
<tr><td>External HDD</td><td></td><td></td><td>✓</td></tr>
<tr><td>RAM</td><td>✓</td><td></td><td></td></tr>
<tr><td>Internal SSD</td><td></td><td>✓</td><td></td></tr>
<tr><td>ROM</td><td>✓</td><td></td><td></td></tr>
<tr><td>DVD</td><td></td><td></td><td>✓</td></tr>
</table></td><td>5</td></tr>
<tr><td>5(b)</td><td>Four from:
• The disc is rotated/spun
• Laser beam is used
• The laser beam makes indentations on the surface of the disc/pits and lands
• The data is written in a spiral/concentric tracks
• The pits and lands represent binary values/1s and 0s
• It is called burning data to the disc</td><td>4</td></tr>
<tr><td>5(c)(i)</td><td>Solid state</td><td>1</td></tr>
<tr><td>5(c)(ii)</td><td>Two from:
• It has no moving parts so will be durable
• It is small/compact so it can be easily fit onto the device
• It is light so it will not be difficult to lift for the drone
• It can hold the large amount of data needed for the video/film footage
• Uses less power so drone battery will last longer</td><td>2</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>6(a)</td><td>1 mark for the correct ticks (✓) for each statement
<table>
<tr><th>Statement</th><th>3D printer (✓)</th><th>3D cutter (✓)</th></tr>
<tr><td>Outputs a physical 3D product</td><td>✓</td><td>✓</td></tr>
<tr><td>Uses a high powered laser to create the output</td><td></td><td>✓</td></tr>
<tr><td>Creates 3D prototypes</td><td>✓</td><td>✓</td></tr>
<tr><td>Uses layers of material to create the output</td><td>✓</td><td></td></tr>
</table></td><td>4</td></tr>
<tr><td>6(b)</td><td>Computer Aided Design/CAD</td><td>1</td></tr>
<tr><td>6(c)</td><td>Three from:
• Uses a large number of tiny mirrors
• Mirrors are laid out in a grid/matrix
• Each mirror creates a pixel in the image
• Mirrors can tilt toward or away from light source
• The mirrors reflect light toward a (projection) lens
• Colour is produced using a colour wheel // Light passes through colour wheel // filters light into red/green/blue
• Can be used to display an image on a wall/screen</td><td>3</td></tr>
</table>

Question	Answer	Marks
7(a)	1 mark for each correct answer: • uses several/multiple wires • transmits multiple bits at a time	**2**
7(b)	Benefit 1 mark for: • quicker/faster data transfer Drawback **One** from: • More chance of data being skewed due to bits being sent simultaneously/out of order // less safe transmission as bits are sent simultaneously/out of order • More expensive as requires more/several/multiple wires • More chance of interference as more/several/multiple wires are used (than can create crosstalk)	**2**
7(c)	**One** from: • Used in integrated circuits • Used in RAM • Used in connections to peripheral devices (e.g. printer)	**1**

Question	Answer	Marks
8	1 mark for each correct answer, in the given order: • browser • webpages • Internet Service Provider (ISP) • Internet • protocol • IP address	**6**

Question	Answer	Marks
9	**Five** from: • The data is sent to the microprocessor • The analogue data is converted to digital (using ADC) • The microprocessor compares the data to a stored value of 5 kg … – … If the value is greater than 5 kg … – … a counter is added to/incremented • The process is continuous	**5**

Question	Answer	Marks
10	**Four** from: • It performs a number of basic tasks, including controlling hardware/file handling (any other suitable examples) • It allows the user to communicate with the computer using hardware // without it the user would not be able to communicate with the computer using hardware • It provides the user with a user interface // without it the user would not have a user interface to use • PC's are often used to perform many complex tasks at a time … – … the OS is needed to handle this multitasking – … therefore, it provides the ability to handle interrupts	**4**