Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/13**

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.

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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:

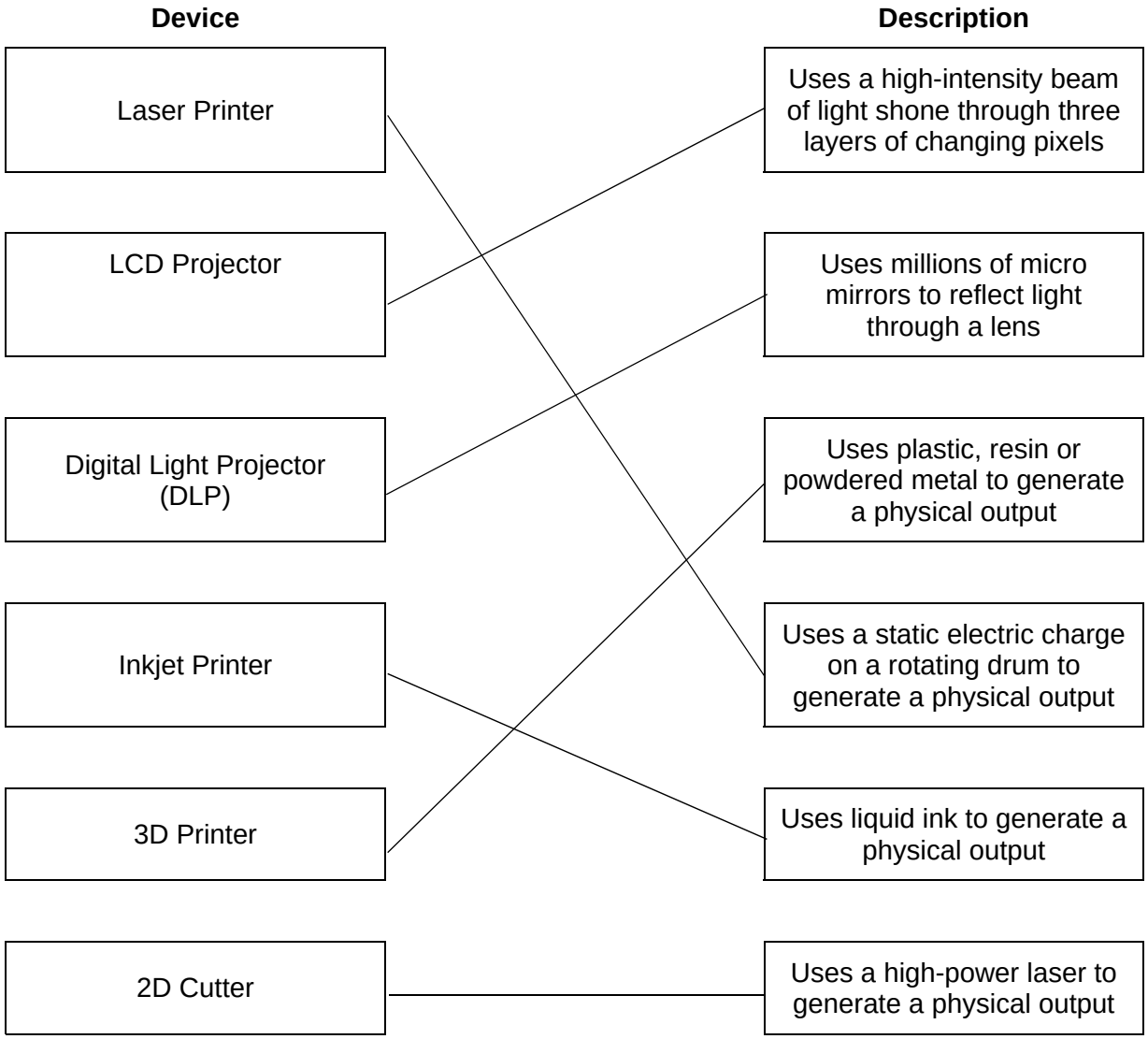
Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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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	1 mark for each correct line, maximum 5 marks	**5**



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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(a)</td><td>2 marks for 3 correct bits, 1 mark for 2 correct bits

<table>
<tr><td>Parity Bit</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td></tr>
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<tr><td>1</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr>
</table></td><td>2</td></tr>
<tr><td>2(b)</td><td>Two from:
• Set of rules for controlling error checking/detection // it’s an error detection method // used to detect errors
• Uses acknowledgement and timeout
• Request is sent (with data) requiring acknowledgement
• If no response/acknowledgment within certain time frame data package is resent
• When data received contains an error a request is sent (automatically) to resend the data
• The resend request is repeatedly sent until packet is received error free/limit is reached/acknowledgement received</td><td>2</td></tr>
<tr><td>2(c)</td><td>Checksum</td><td>1</td></tr>
</table>

Question	Answer	Marks
3	**Six** from: • A pressure sensor is used • The sensor sends data/signals to the microprocessor • Data is converted to digital format • Microprocessor compares data value against set **value** • If value <= 2400 Kg/under weight limit lift is permitted to operate • If value > 2400 Kg/over weight limit **signal is sent from the microprocessor** to deliver warning message to passengers • If value > 2400 Kg **signal is sent from the microprocessor** to lift mechanism to stop lift operating • Weight continuously monitored	**6**

Question	Answer	Marks
4(a)	1 mark for each correct conversion *01101010* | **11111111** | **00001000** | **10010011**	**3**
4(b)	• Computers use switches / logic gates • Only uses 2 states / On or Off / 1 or 0	**2**

Question	Answer	Marks
5(a)	• Bits sent one at a time • Uses a single wire	**2**
5(b)	USB / SATA / Wifi /PCI Express / Any appropriate serial device	**1**
5(c)	• Data is transferred in two directions • Data is sent in only one direction **at a time**	**2**

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Question	Answer	Marks
6	1 mark for method name, 1 mark for description e.g. **Backups** • Make a copy of the data • Copy stored away from main computer • Data can be restored from backup **Anti-virus** • Scans computer for viruses • Software to detect/remove viruses • Can prevent data being corrupted by viruses **Firewall** • Hardware or software that monitors network traffic • To help prevent hackers gaining access / deleting data **Password/Biometrics** • To help protect files / computer from unauthorised access **Restricted access** • To stop users downloading/installing software that could harm **Verification** • Message e.g. to ask if definitely want to delete **Physical methods** • Locks/alarms/CCTV to alert/deter unauthorised access	**6**

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Question	Answer	Marks
7(a)	**Three** from: • It is a translator • Translates (high level language) to low level language • Executes one line at a time • Translates source code line by line • Runs error diagnostic • Produces error messages to tell user location of error • Stops execution when encounters errors • Continues translating when an error is fixed	**3**
7(b)	**Four** from (Max three per benefit): • Produces executable file … • … this creates a smaller file size • … more saleable • Program will be machine independent / portable … • … this means it can be used on any hardware • No need for compiler to run executable file … • … this means it will be quicker to run • … customers can just execute the program • Source code cannot be accessed … • … therefore, code cannot be stolen / plagiarised	**4**
7(c)	**Three** from: • Uses compression algorithm / by example e.g. RLE • Repeating words / phrases / patterns identified… • … replaced with value • File / dictionary / index of phrases created • Index will store word/phrase with value	**3**

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Question	Answer	Marks
8(a)	Uniform Resource Locator	**1**
8(b)	**Four** from: • The web browser sends URL to DNS • DNS stores an index of URL and matching IP address • DNS searches for URL to obtain the IP address • IP address sent to web browser, (if found) • Web browser sends request to IP of webserver • Webserver sends web page to web browser • Web browser interprets HTML to display web page • If URL not found DNS returns error	**4**

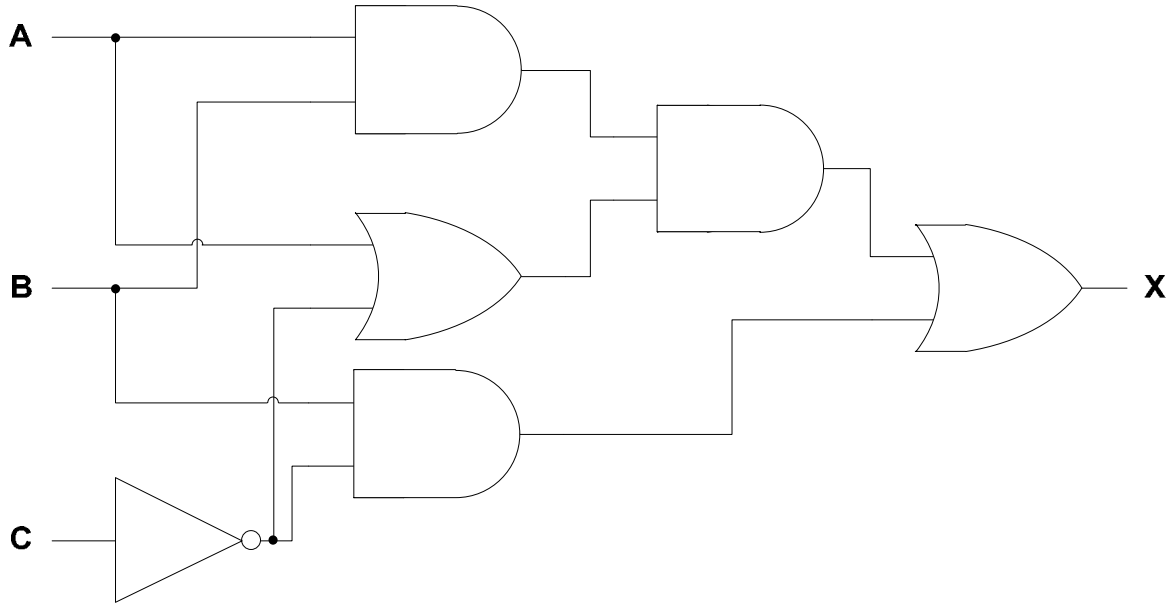
Question	Answer	Marks
9	**Four** from: • ROM is permanent … • … RAM is temporary • ROM is non-volatile • … RAM is volatile … • ROM is read only … • … RAM can have read/write operations • ROM holds instructions for boot up … • … RAM holds files / instructions **in use**	**4**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>10(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>X</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>1</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td><td>0</td></tr></table></td><td>4</td></tr>
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Question	Answer	Marks
10(b)	1 mark per correct gate with correct inputs.  	**6**

Question	Answer	Marks
11(a)	• Holds address of next/current instruction … • … to be fetched/processed/executed	**2**
11(b)	• Stores data/instruction **that is in use …** • … from address in MAR	**2**

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Question	Answer	Marks
12	**Four from (**Max three from each): **MP3** • Digital recording of sound • Produced by recording software / microphone • Used when distributing sound files • Compressed file format **MIDI** • Instructions of how to make sound • Non-audio recording • File created using **digital** musical instruments • Produced by synthesizer • Used when composing music • Individual notes/instruments can be changed	**4**

Question	Answer	Marks
13(a)	1 mark for storage, 1 mark for justification • External/Removable HDD // External/Removable SSD // Large capacity USB Flash Drive • Backups must be stored separately • Will hold sufficient data • Faster write abilities (SSD/USB drive only)	**2**

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Question	Answer	Marks
13(b)	1 mark for storage, 1 mark for justification • SSD // SD card // Flash memory • Small physical size • Lightweight • Low heat production • Low power consumption • It's quiet • Fast read/write times	**2**
13(c)	1 mark for storage, 1 mark for justification • DVD // Blu-ray // USB Flash Drive // SD card • Easy to distribute • Small in size • Cheap to buy • Universal storage therefore compatible with many devices	**2**

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