Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/12**

Paper 1 **March 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.

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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.

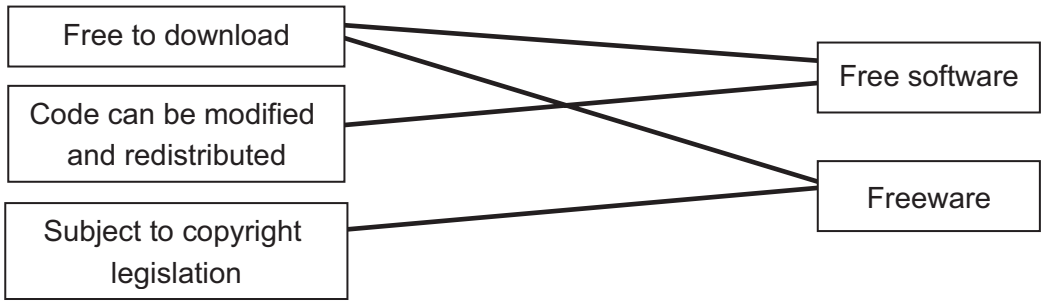
GENERIC MARKING PRINCIPLE 4:

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	**Description** **Type of software**  1 mark for each 'Type of software' if correct lines are attached to it.	**2**

Question	Answer	Marks
2(a)	Any **three** from: Scans files for viruses // detects/identifies a virus Can constantly run in background Can run a scheduled scan Can automatically updating virus definitions Can quarantine a virus Can delete a virus Completes heuristic checking Notifies user of a possible virus	**3**

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Question	Answer	Marks
2(b)	Any **three** from: Use a firewall Use of a proxy server Do not use / download software / files from unknown sources Do not share external storage devices / USB pens Do not open / take care when opening attachments / link Do not connect computer to network / use as stand-alone computer Limiting access to the computer	**3**

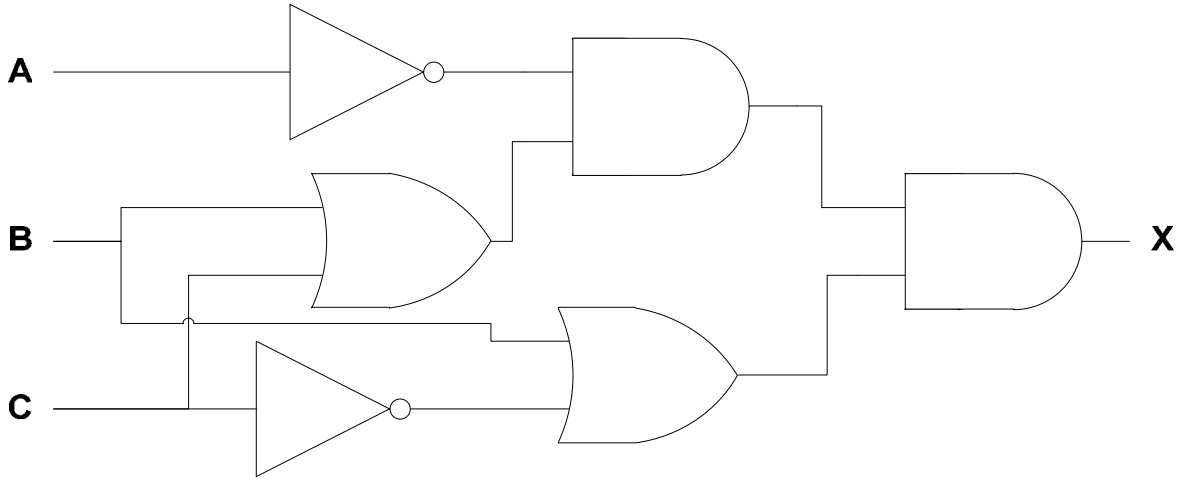
Question	Answer	Marks
3(a)	Byte 3 / 10110100	**1**
3(b)	Odd parity used Counted / added the number 1's // Most Bytes have an odd number of 1's Byte 3 has an even number of 1's // Byte 3 didn't follow odd parity	**3**

Question	Answer	Marks
4	Any **six** from: Sensor(s) send data/signals to the microprocessor Analogue signal/data from sensor is converted to digital (using ADC) Microprocessor compares data value against set boundaries / pre-set data If value between 21 and 24 … … no action taken If value > 24 °C / signal is sent from microprocessor… … to turn conditioning unit ON//Set to cold If value is < 21 °C signal is sent from microprocessor… … to turn conditioning unit ON//Set to warm Process is repeated for a continuous operation	**6**

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Question	Answer	Marks
5(a)	One mark for each correct Hexadecimal value C4 | 10 | FE | 09	**3**
5(b)	Any **two** from: Easier / simpler to remember / write down // quicker to transcribe Less likely to make error Less digits to use	**2**

Question	Answer	Marks
6	1 mark for suitable example and 1 mark for suitable associated use. Primary RAM … … stores OS <u>when running</u> / data <u>currently in use</u> / instructions <u>currently in use</u> ROM … … stores boot instructions / BIOS Cache … … stores frequently used instructions Secondary HDD / SSD… …stores files / applications (by example) Offline CD/DVD/Blu-ray/Flash Memory/USB stick/Removable HDD/Removable SSD… … stores files / applications (by example)	**6**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>7(a)</td><td>4 marks for 8 correct outputs
3 marks for 6 correct outputs
2 marks for 4 correct outputs
1 mark for 2 correct outputs
<table>
<tr><td>A</td><td>B</td><td>C</td><td>X</td></tr>
<tr><td>0</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>0</td></tr>
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</table></td><td>4</td></tr>
<tr><td>7(b)</td><td>1 mark per gate in correct location

</td><td>6</td></tr>
</table>

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Question	Answer	Marks
7(c)	4 marks for 8 correct outputs 3 marks for 6 correct outputs 2 marks for 4 correct outputs 1 mark for 2 correct outputs	**4**

A	B	C	**X**
0	0	0	**0**
0	0	1	**0**
0	1	0	**1**
0	1	1	**1**
1	0	0	**0**
1	0	1	**0**
1	1	0	**0**
1	1	1	**0**

Question	Answer	Marks
8(a)		**3**

Descriptions	**Method**		
	Serial	Parallel	
Multiple bits are sent and received at the same time.		✓	[1]
Bits are sent one at a time in a single direction.	✓		[1]
Bits are sent using a single wire. Data can be sent or received, but not at the same time.	✓		[1]

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Question	Answer	Marks
8(b)		**3**

Descriptions	Type			
	Simplex	Half-duplex	Duplex	
Multiple bits are sent and received at the same time.			✓	[1]
Bits are sent one at a time in a single direction.	✓			[1]
Bits are sent using a single wire. Data can be sent or received, but not at the same time.		✓		[1]

Question	Answer	Marks
9	Max 3 – 1 mark for correct answer and 2 marks for correct calculations. Any **two** from: 16000 × 32 512000 / 1024 Or 16000 × 8 128000 × 32 4096000 / 8 512000 / 1024 **Correct answer:** 500 kB	**3**

Question	Answer	Marks
10(a)(i)	10010	**1**
10(a)(ii)	11110001	**1**
10(b)	Any **four** from: The program is stored on a secondary storage device Data and instructions are moved to memory / RAM Data and instructions are stored in the same memory / RAM Data and instructions are moved to registers to be executed Instructions are fetched one at a time	**4**

Question	Answer	Marks
11(a)	Smaller file size reduces download / display time // reduces upload time	**1**
11(b)	Any **four** from: A compression algorithm is used Permanently deleting some data // file cannot be restored to original Colour depth / palette can be reduced Resolution can be reduced // number of pixels can be reduced Less bits will be required for each pixel / colour	**4**

Question	Answer	Marks
12(a)	Quicker to scan … … rather than type into a system Fewer errors … … no human input	**4**

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Question	Answer	Marks
12(b)	Any **four** from: Uses a barcode reader / scanner Reader shines light / red laser at barcode White lines reflect (more) light Sensors / photoelectric cells detect light reflected back Different reflections / bars will convert to different binary values	**4**

Question	Answer	Marks
13	Any **four** 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 / interrupts • Manages security software • Manages utility software • Manages user accounts • Multitasking // Multiprocessing // Multiprogramming // Time slicing • Batch processing // real time processing	**4**

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