Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMPUTER SCIENCE **0478/12**

Paper 1 **May/June 2016**

MARK SCHEME

Maximum Mark: 75

Published

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1 compiler

assembler

interpreter [3]

2

Application	Sensor
controlling street lights	**Light**
monitoring a river for pollution	**Gas, pH, temperature, light**
controlling traffic lights	**pressure, magnetic field,**

NOTE: The same sensor cannot be given twice [3]

3 **(a)** **1** mark for each nibble

0100 1010 1111 [3]

(b) **(i)**

0 1 1 0 1 0 0 1	105 hours	1 mark
0 0 0 1 1 1 1 1	31 minutes	1 mark
0 0 1 1 0 0 1 0	50 seconds	1 mark

[3]

(ii) 1F [1]

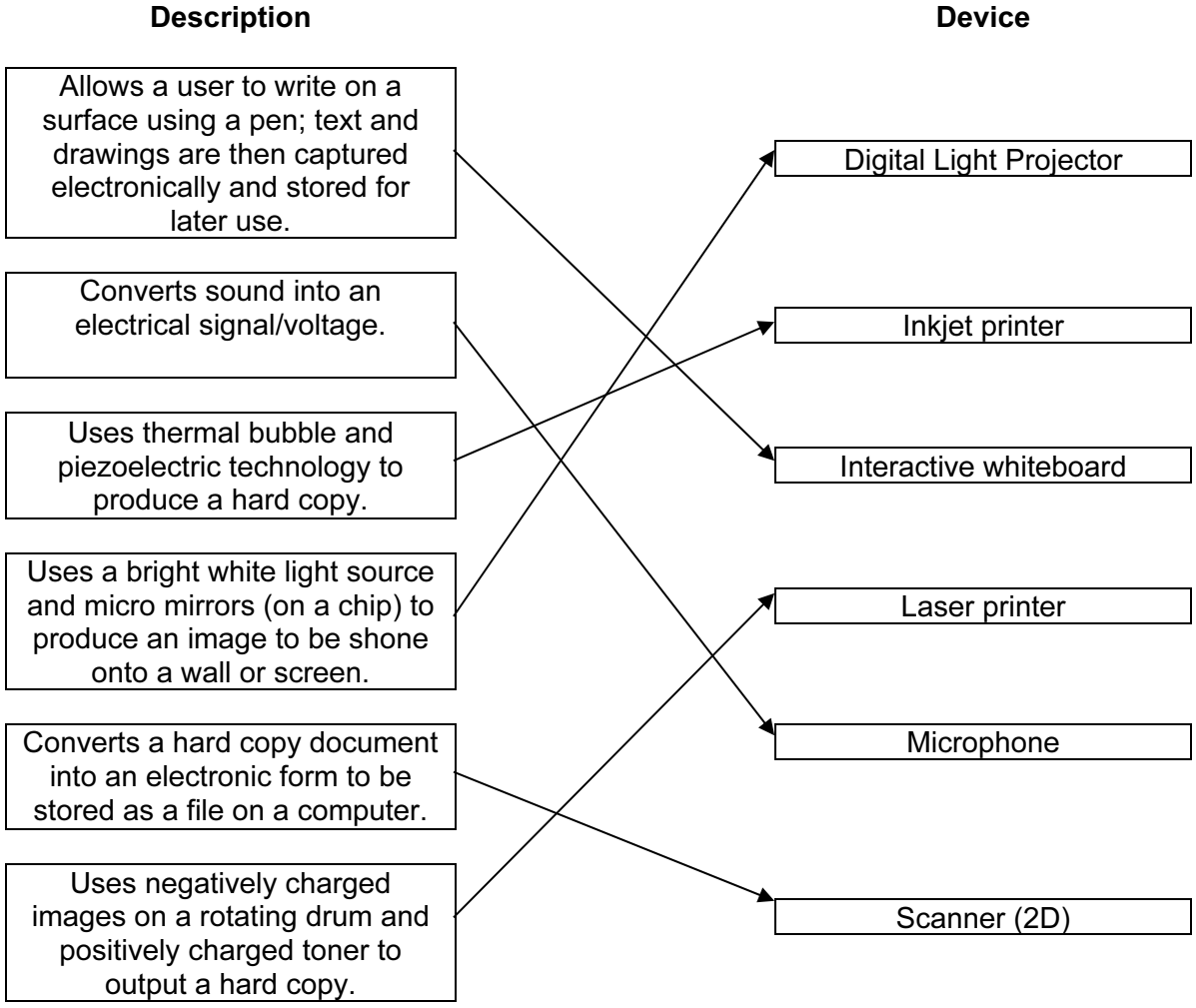
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4 **(a)** Any **three** from:
- The file can be compressed
- The compression that is used is lossless (not lossy)
- use of a compression algorithm
- repeated words can be indexed
- repeated word sections (e.g. “OU”) can be replaced by a numerical value
- reference to zip files
- save file as a pdf/convert to pdf [3]

(b) Any **four** from:
- the checksum for the bytes is calculated
- this value is then transmitted with the block of data
- at the receiving end, the checksum is re-calculated from the block of data received
- the calculated value is then compared to the checksum transmitted
- if they are the same value, then the data was transmitted without any error
- if the values are different, then an error has been found
- if the values are different, then a request is sent for the data to be re-transmitted [4]

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5



5/6 matches – 5 marks
4 matches – 4 marks
3 matches – 3 marks
2 matches – 2 marks
1 match – 1 mark [5]

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6 (a)

Type	Tick (✓)
simplex	
half-duplex	
full-duplex	✓

Method	Tick (✓)
serial	
parallel	✓

Type	Tick (✓)
simplex	✓
half-duplex	
full-duplex	

Method	Tick (✓)
serial	✓
parallel	

Type	Tick (✓)
simplex	
half-duplex	✓
full-duplex	

Method	Tick (✓)
serial	✓
parallel	

[6]

(b) Any **two** from:
- single wire means there is less chance of interference/data corruption
- single wire reduces costs
- more reliable over greater distances
- bits will still be synchronised after transmission [2]

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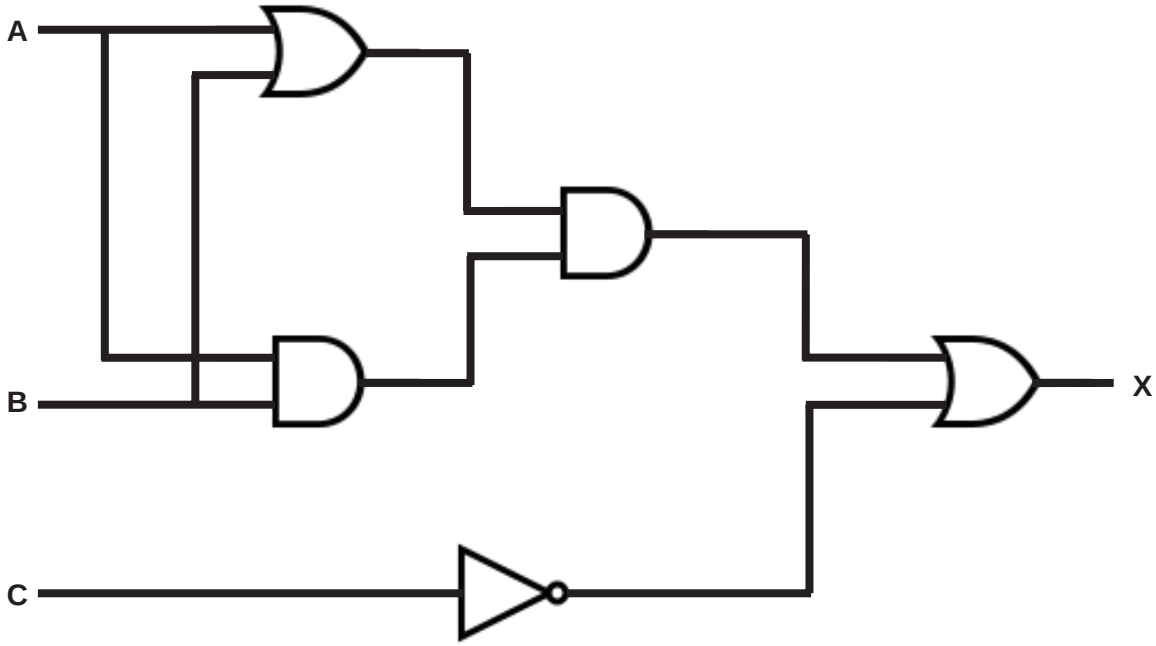
7 (a)

A	B	C	Working space	X
0	*0*	*0*		**0**
0	*0*	*1*		**1**
0	*1*	*0*		**0**
0	*1*	*1*		**1**
1	*0*	*0*		**0**
1	*0*	*1*		**1**
1	*1*	*0*		**1**
1	*1*	*1*		**0**

4 marks for 8 correct X bits
3 marks for 6 correct X bits
2 marks for 4 correct X bits
1 mark for 2 correct X bits [4]

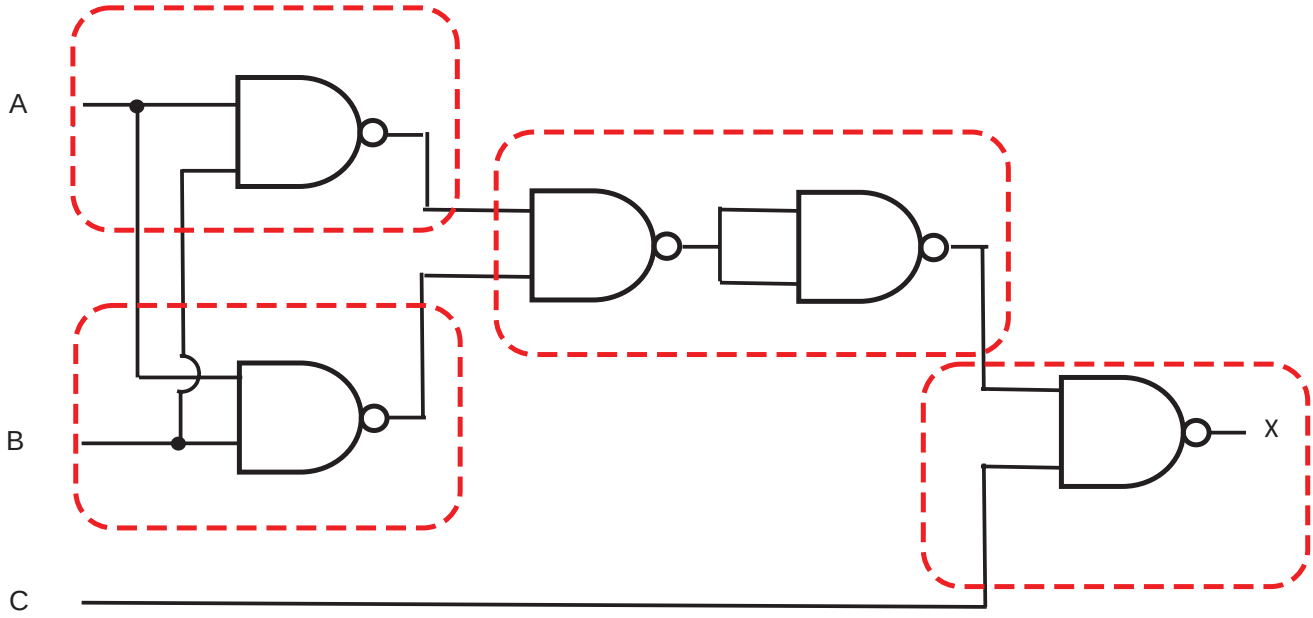
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(b) **1** mark for each correct gate with correct source of input



[5]

(c) Each dotted area is **1** mark

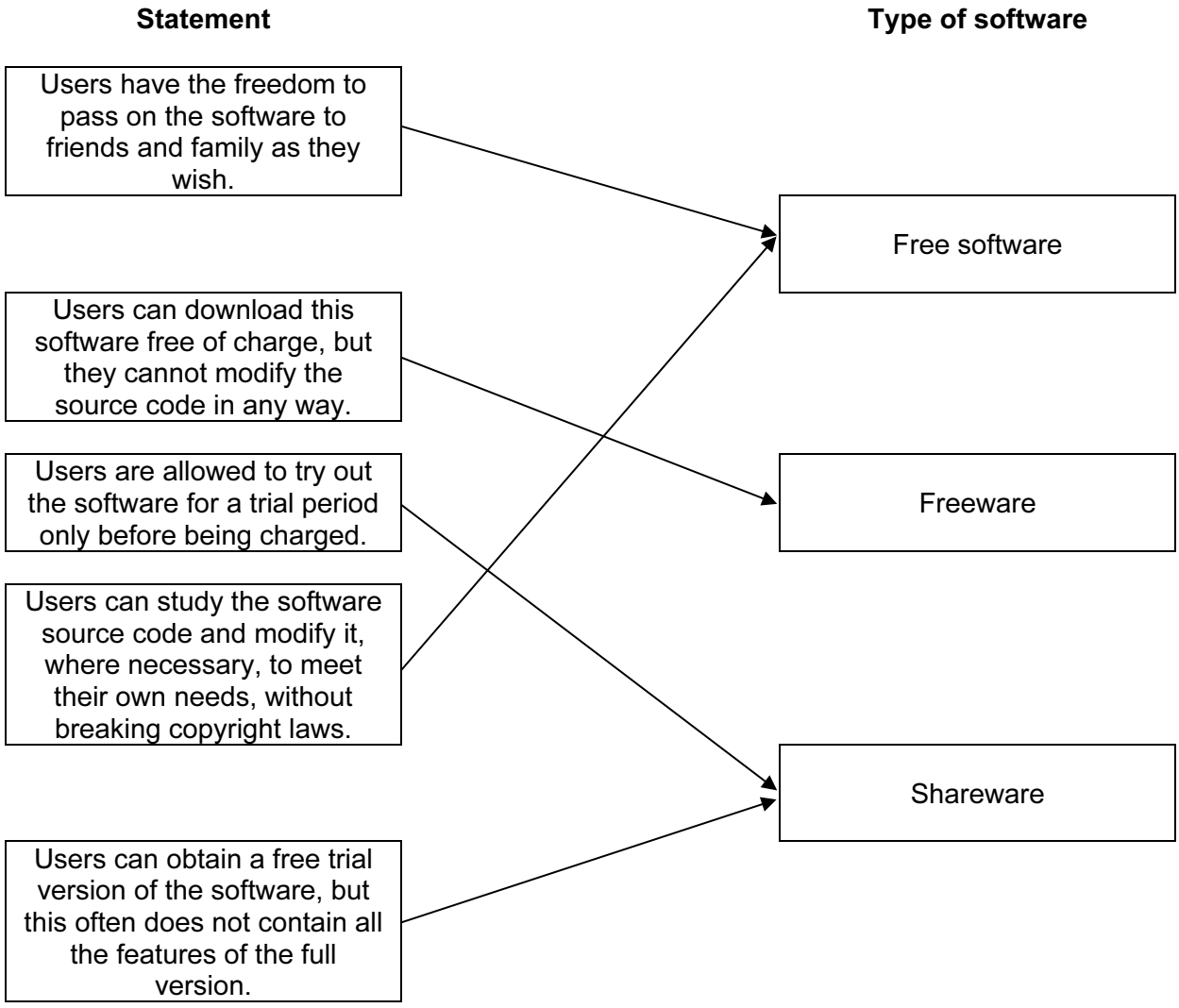


[4]

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8 (a) **1** mark for correct lines from each type of software

NOTE: <u>all</u> statements that are correct must be connected to the correct type of software for the mark to be awarded



[3]

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(b) Any **three** from:
- That we should follow Copyright laws/intellectual property rights/work should not be stolen/plagiarised
- That we should follow Data Protection laws
- That we should not create or distribute malware//description of malware
- That we should not hack/crack other computers//description of hacking
- That we should protect our own computers against malware/hacking
- That we should consider privacy issues (when using social networking)
- That we consider anonymity issues (when using social networking)
- That we should consider environmental impacts when using computers
- Loss/creation of jobs from use of computers/robotics
- We should follow codes of practice (for creation of code e.g. ACM/IEEE) [3]

(c) **2** marks for each term described

Viruses:
- program/software/file that replicates (copies) itself
- intends to delete or corrupt files//fill up hard disk space

Pharming:
- malicious code stored on a computer/web server
- redirects user to fake website to steal user data

Spyware:
- monitors and relays user activity e.g. key presses//key logging software
- user activity/key presses can be analysed to find sensitive data e.g. passwords [6]

(d) Any **three** from:
- examines/monitors traffic to and from a user's computer and a network/Internet
- checks whether incoming and outgoing traffic meets a given set of criteria/rules
- firewall blocks/filters traffic that doesn't meet the criteria/rules
- logs all incoming and outgoing traffic
- can prevent viruses or hackers gaining access
- blocks/filters access to specified IP addresses/websites
- warns users of attempts by software (in their computer) trying to access external data sources (e.g. updating of software) etc. // warns of attempted unauthorised access to the system [3]

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9 (a)

Binary number A:	**1**	**1**	**1**	**0**	**0**	**1**	**0**
Binary number B:	**1**	**0**	**0**	**1**	**1**	**1**	**0**

[2]

(b)

	Parity Bit
Binary number A	**1**
Binary number B	**1**

[2]

10 **1** mark for each correct storage device

ROM (not EPROM/PROM)
Blu-ray disc
RAM
DVD/ DVD-R(+R)/ DVD-RW(+RW)/ DVD-ROM (not CD or DVD-RAM)
SSD/example of a USB storage device
DVD-RAM

[6]

11 **1** mark for each correct point
- Presentation is used to format colour/style
- Structure is used to create layout
- In a HTML document structure and presentation are often kept separate
- By keeping the presentation separate it is easier to update colour/font
- Presentation is often stored in a file called a CSS …
- … the CSS in then linked to the HTML document to implement the presentation requirements
- (Mark-up) tags are used to define the structure of the document …
- … presentation and formatting can also be included within the tags [4]

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