Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

COMPUTER SCIENCE **2210/12**

Paper 1 **May/June 2016**

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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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

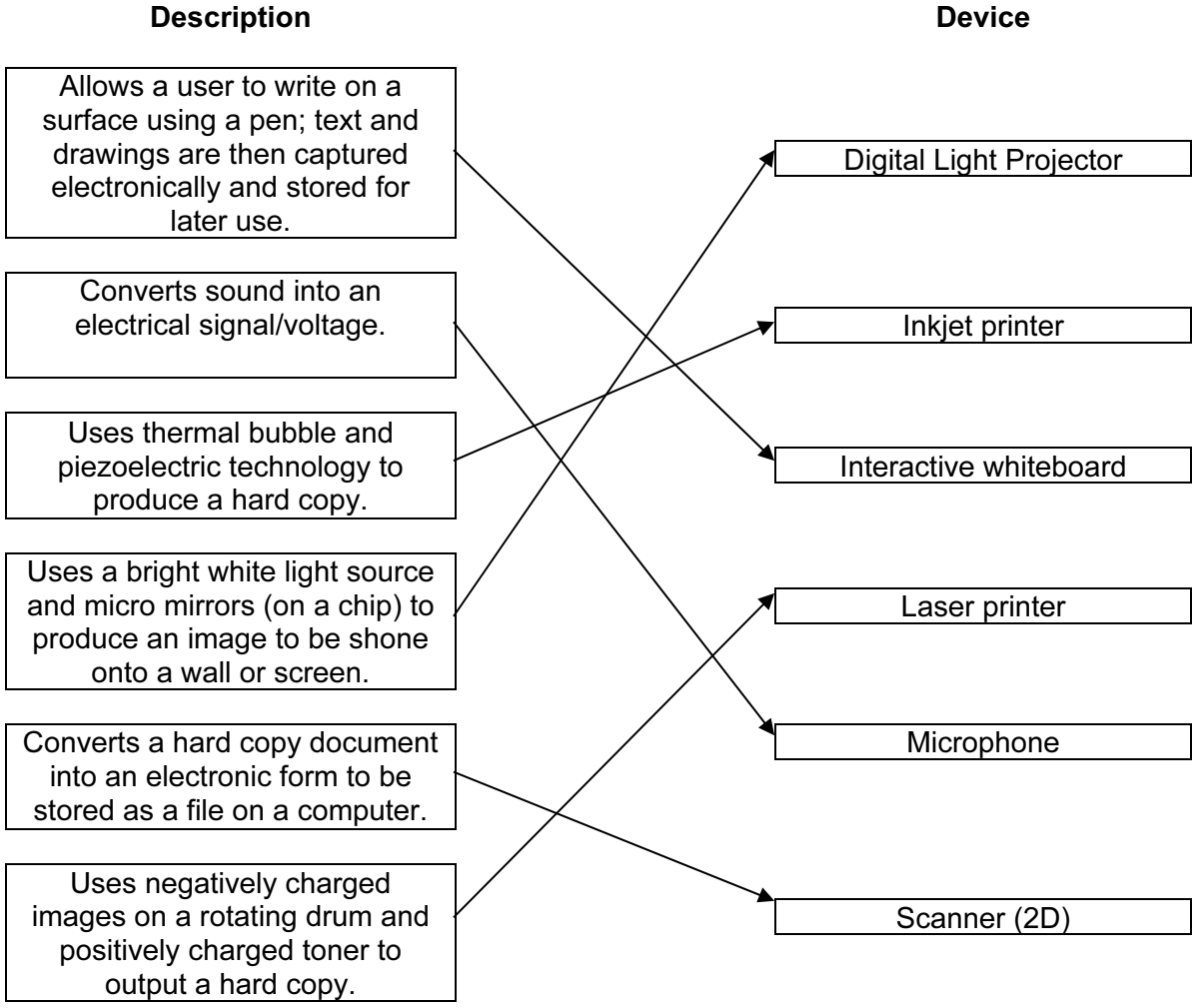
[3]

(ii) 1F [1]

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]

5



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

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]

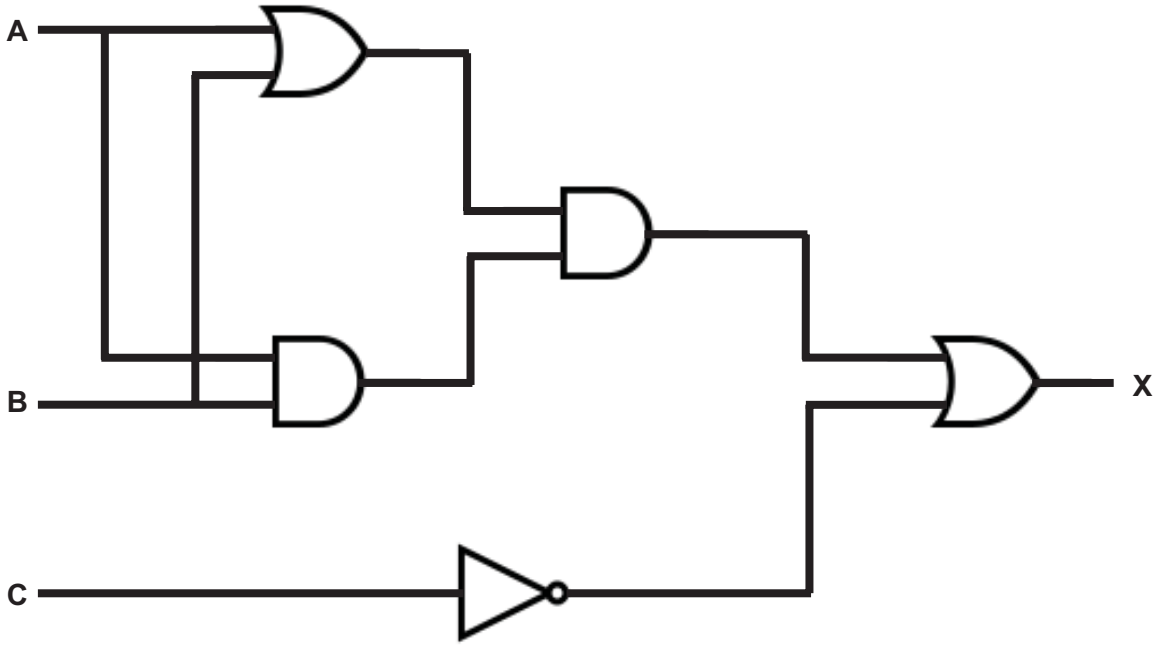
(b) Any **two** from:
- single wire means there is less chance of interference/data corruption
- single wire reduces costs
- more reliable over greater distances
- bits will still be synchronised after transmission [2]

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**

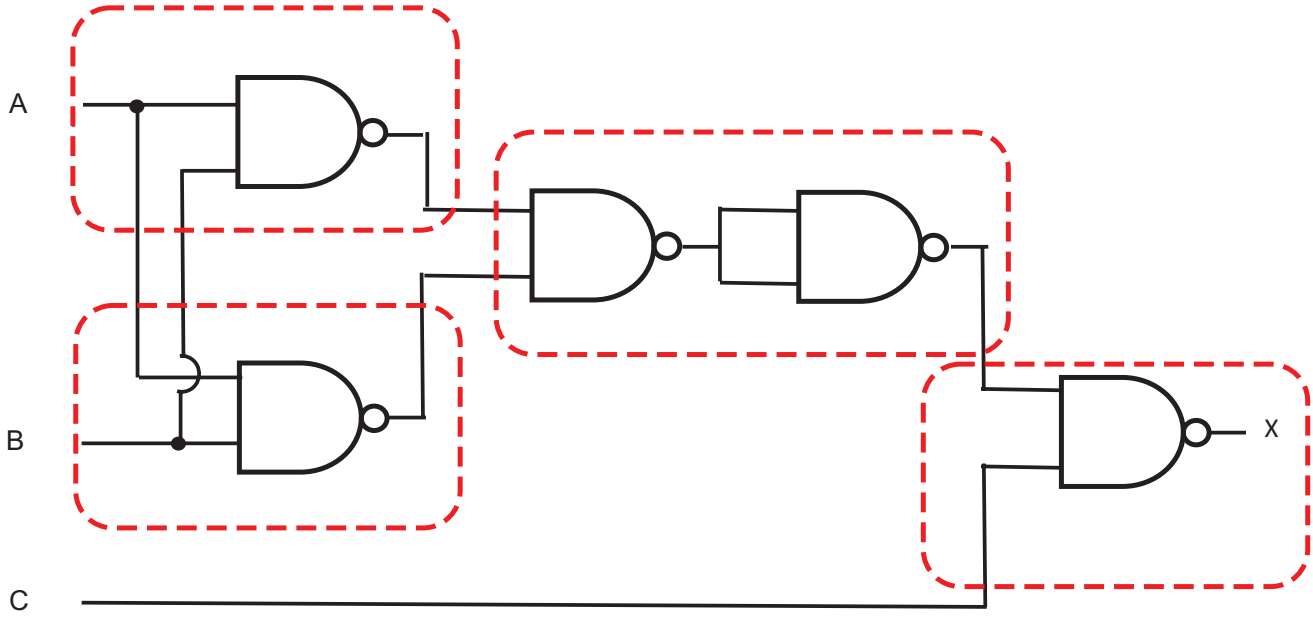
4 marks for 8 correct X bits
3 marks for 6 correct X bits
2 marks for 4 correct X bits
1 mark for 2 correct X bits [4]

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



[5]

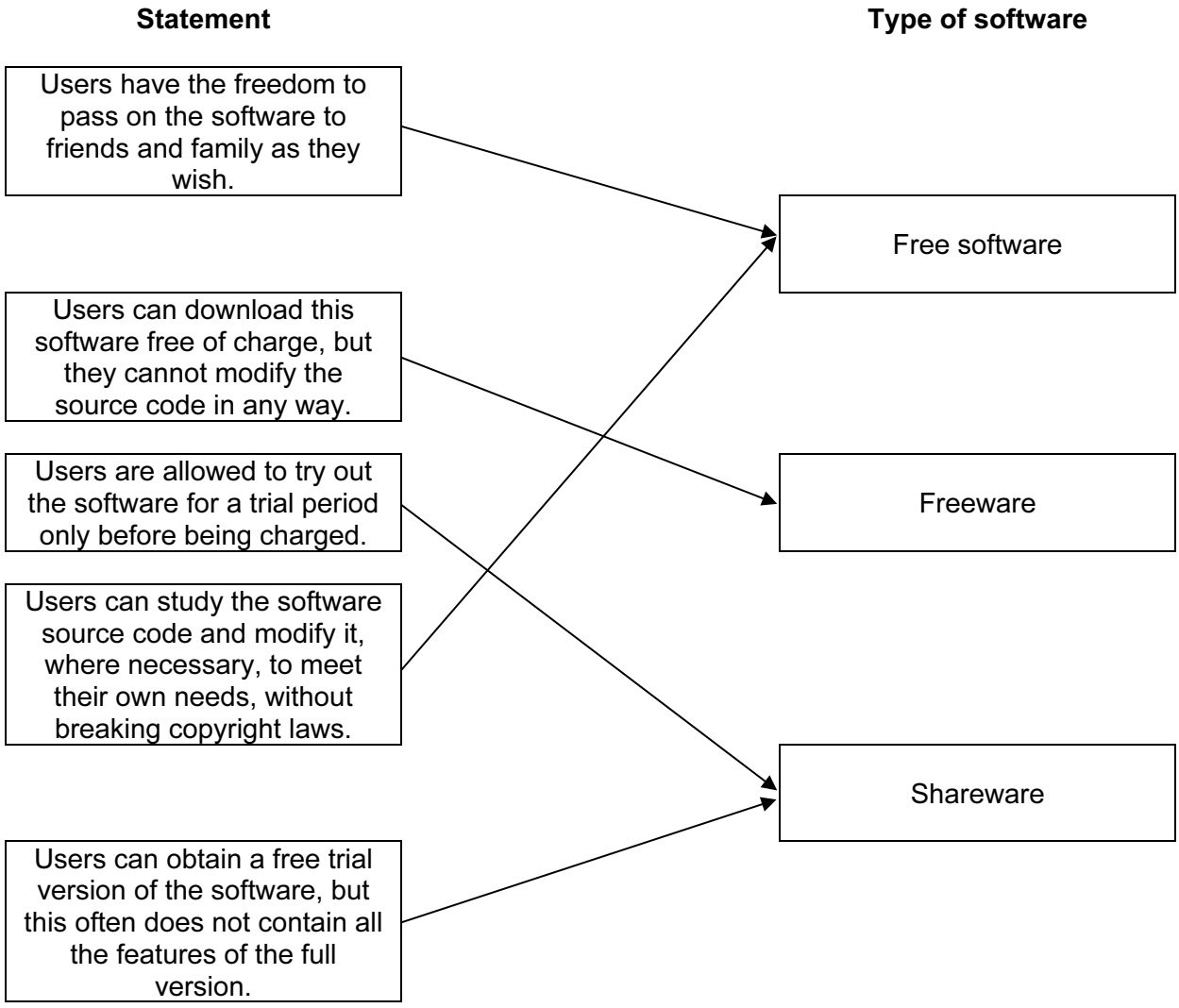
(c) Each dotted area is **1** mark



[4]

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]

(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]

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]