Cambridge
O Level

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Cambridge Ordinary Level

COMPUTER SCIENCE **2210/12**

Paper 1 **October/November 2016**

MARK SCHEME

Maximum Mark: 75

Published

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1 (a) Any **two** from:

- direct access to computer processor / special hardware // machine dependent instructions
- uses up less memory
- can increase the speed of processing a program // executes instructions faster

[2]

(b)

Statements	Interpreter (✓)	Compiler (✓)
Translates the source code into machine code all at once		✓
Produces an executable file in machine code		✓
Executes a high-level language program one instruction at a time	✓	
Once translated, the translator does not need to be present for the program to run		✓
An executable file is produced		✓

[5]

2 Any **four** from:

- Provides a user interface
- Handles interrupts / errors
- Memory management
- File management
- Manages peripherals (inputs/outputs)
- Provides security methods
- Allows multitasking
- Manages multiprogramming
- Enables batch processing
- Manages software installation / removal
- Allows creation of multiple accounts
- Levels of access

[4]

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3 (a) (i) Any **two** from:

serial

– one bit sent at a time // bits sent sequentially
– over a single wire
– synchronous or asynchronous

[2]

(ii) Any **two** from:

parallel

– several bits / a byte sent at a time
– using many / multiple wires
– synchronous

[2]

(b) – serial

Any **two** from:

– serial data transmission more reliable over long distances
– less likely for the data to be skewed/out of synchronisation
– less interference as only a single wire
– it is a cheaper connection as only single wire needed // cheaper to set up
– a fast connection is not required as a printer is limited by its printing speed

[3]

4 (a) Intersection of Row 7 and column 4 circled [1]

(b) – Row (byte number) 7 has an odd number of 1s (five 1s)
– Column (bit number) 4 has an odd number of 1s (five 1s)

[2]

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5 **(a)** 112 [1]

(b) 56 [1]

(c) divided by 2 // value 112 was halved // multiplied by 0.5 [1]

(d) **(i)**

0	**0**	**0**	**0**	**1**	**1**	**1**	**0**

[1]

(ii) 14 [1]

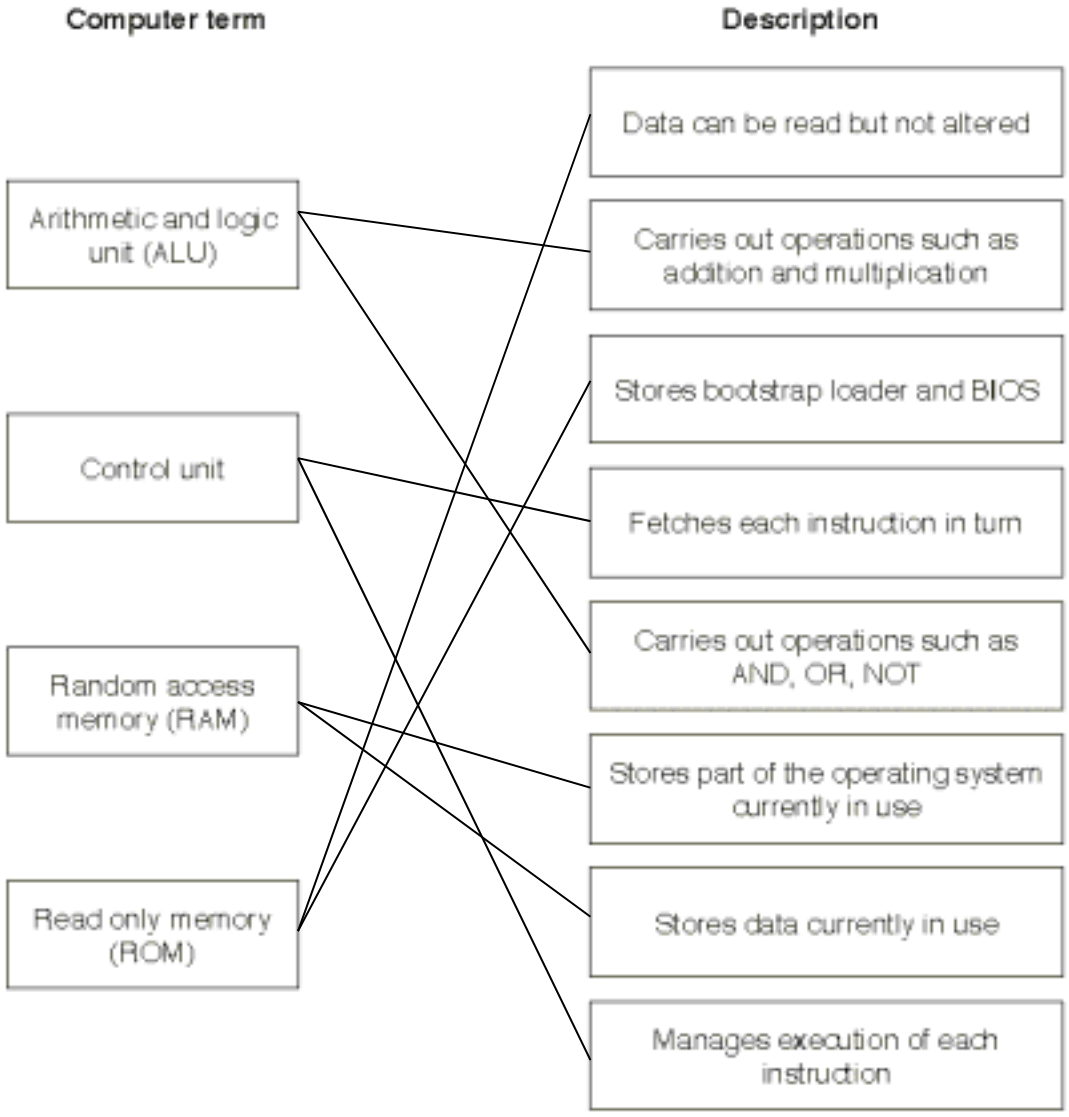
(e) Any **two** from:

- run out of places to the right of register / at the end of register
- right-most 1 would be lost
- number would become 3 instead of 3.5
- loss of precision

[2]

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6 1 mark for **both** correct lines from each computer term.



[4]

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7 (a) (i) 2 marks for 4 correct outputs,
1 mark for 2 correct outputs

1 mark for correct gate

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

AND gate

[3]

(ii) 2 marks for 4 correct outputs
1 mark for 2 correct outputs

1 mark for correct gate

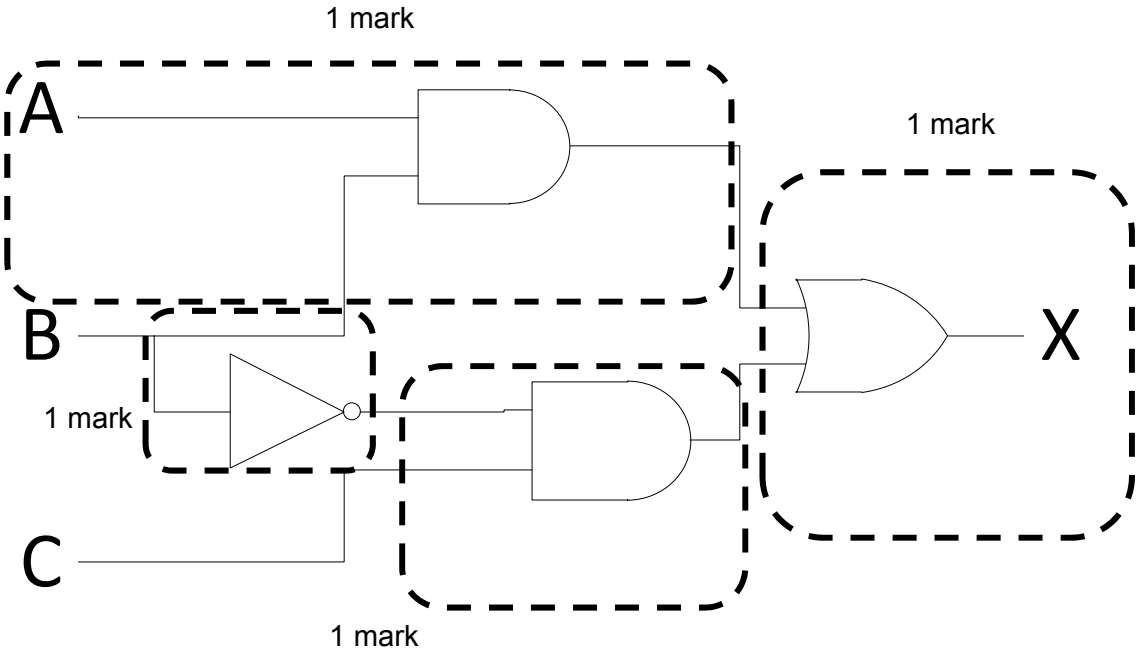
A	B	Working space	X
0	***0***		**0**
0	***1***		**1**
1	***0***		**1**
1	***1***		**1**

OR gate

[3]

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(b)(i) 1 mark per correct section.



[4]

(ii) 4 marks for 8 correct outputs
3 marks for 6 correct outputs
2 marks for 4 correct outputs
1 mark for 2 correct outputs

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

[4]

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8

Statement	TRUE or FALSE
MIDI stores the actual music notes in a compressed format	**FALSE**
JPEG files are examples of lossless file compression	**FALSE**
MP3 files are, on average, 90% smaller than the music files stored on a CD	**TRUE**
MP4 files are examples of lossy file compression	**TRUE**

[4]

9 **(a)** Any **two** from:

- a large number of requests are sent to the network/server all at once
- designed to flood a network/server with useless traffic/requests
- the network/server will come to a halt/stop trying to deal with all the traffic/requests
- prevents users from gaining access to a website/server

[2]

(b) 1 mark for each security threat and 1 mark for matching description

Security threat	Description
Viruses	– software that replicates – causes loss/corruption of data // computer may "crash"/run slow
Hacking/cracking	– illegal/ unauthorised access to a system/data
Phishing	– a link/attachment sends user to fake website (where personal data may be obtained)
Pharming	– malicious code installed on user's hard drive / computer – user is redirected to a fake website (where personal data may be obtained)
Spyware/key logger	– send/relay key strokes to a third party

[4]

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10 (a) Any **three** from:

- hyper text mark-up language
- uses both structure and presentation
- web-authoring language/software // used to create websites/webpages
- uses tags to define e.g. colour / font / graphics / layout

[3]

(b)

File name: ComputerSciencePapers

Protocol: http(://)

Web server name: www.cie.org.uk

[3]

11 (a) 1 mark per nibble

0010 1010 1111

[3]

(b) 1 mark for identification of each sensor, max 2 for each description

Infrared/motion sensor

- Receives infrared rays/heat
- Sends data to microprocessor
- Receives microwaves
- Placed in the corner of a room, across a doorway
- Used to detect the heat of an intruder // used to detect if an infrared beam has been broken by an intruder

Pressure sensor

- Receives current if circuit created // stops receiving current if circuit is broken
- Sends data to microprocessor
- Placed on a window/door, at the entrance
- Used to detect a change in pressure

[6]

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12 Any **four** from:

– Freeware needs owner's permission to share/copy/amend whereas free software can be shared/copied/amended without permission
– Freeware the owner retains copyright / is subject to copyright whereas free software the owner releases copyright/ is not subject to copyright
– Freeware is normally provided without a fee whereas free software a fee may be charged
– Freeware is distributed without the source code whereas free software is distributed with the source code
– Freeware can be restricted in use e.g. non-commercial whereas free software can be used without restriction

NOTE: The question asks candidates to explain the differences, so each mark needs to have a comparison.

[4]

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