Cambridge O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

* 7 2 5 2 4 7 4 5 5 8 *

COMPUTER SCIENCE **2210/12**

Paper 1 Theory **October/November 2018**

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

No calculators allowed.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces at the top of this page.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
No marks will be awarded for using brand names of software packages or hardware.

Any businesses described in this paper are entirely fictitious.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

The maximum number of marks is 75.

This document consists of **11** printed pages and **1** blank page.

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1 Computers use a character set to convert text into binary.

One character set that can be used is ASCII.

Each letter in ASCII can also be represented as a denary value.

(a) The word BUS has the denary values:

B	U	S
66	85	83

Convert the denary values into 8-bit binary.

66								
85								
83								

[3]

(b) Each letter in ASCII can also be represented as a hexadecimal value.

The word KEY has the 8-bit binary values:

K	E	Y
01001011	01000101	01011001

(i) Convert the three 8-bit binary values into hexadecimal.

01001011 .....

01000101 .....

01011001 .....

[3]

(ii) Give **three** other uses of hexadecimal notation in computer science.

1 .....

2 .....

3 .....
[3]

(iii) State **two** benefits of using hexadecimal notation to represent binary values.

Benefit 1 .....

.....

Benefit 2 .....

.....
[2]

2 A computer uses RAM and ROM to store data.

(a) The table contains three statements about RAM or ROM.

Tick (✓) to show whether each statement describes **RAM** or **ROM**.

Statement	**RAM (✓)**	**ROM (✓)**
Stores the programs and data that are currently in use		
Used to boot up the computer when power is turned on		
Contents are retained when power is turned off		

[3]

(b) Circle the storage category that includes both RAM and ROM.

Primary Secondary Off-line
[1]

(c) Explain what is meant by off-line storage.

.....

.....

.....

.....[2]

3 A greenhouse uses a system to monitor the conditions that plants need to grow.

The inputs to the system are:

Input	Binary value	Condition
W	1	Window is open
	0	Window is closed
T	1	Temperature >=26 °C
	0	Temperature <26 °C
H	1	Humidity >=50%
	0	Humidity <50%

The system will sound an alarm when certain conditions are detected.

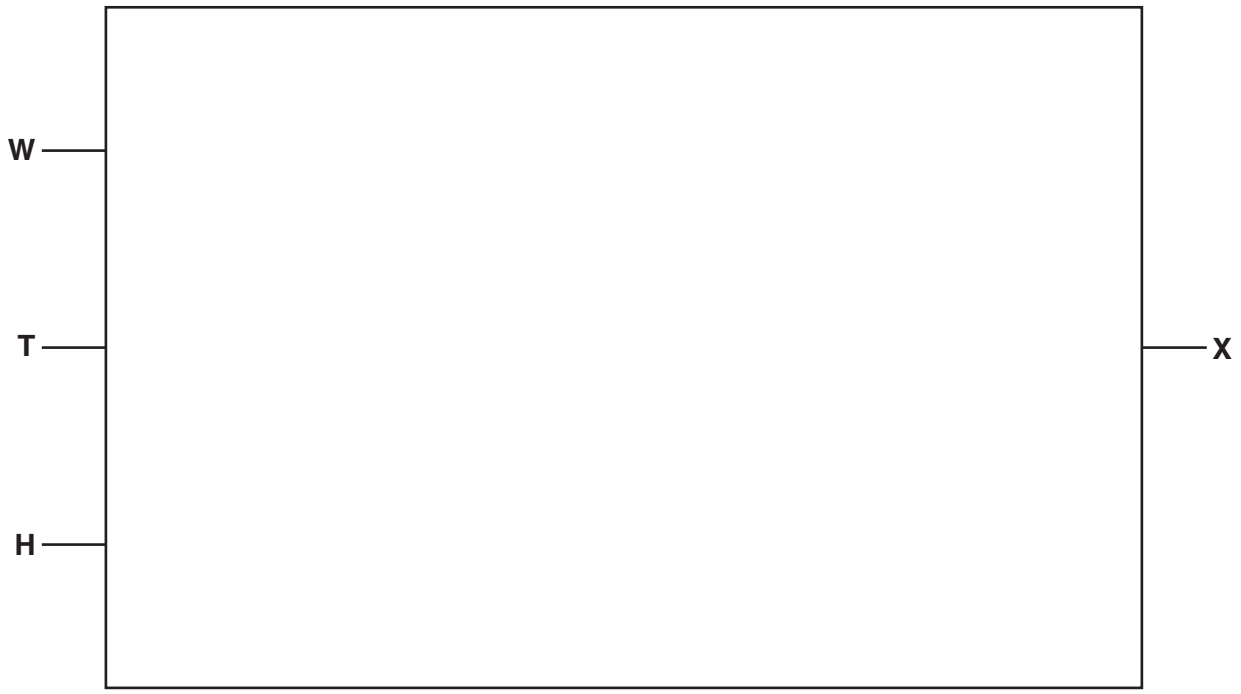
Alarm (X) will sound (=1) when:

window is closed and temperature >=26 °C

or

temperature <26 °C and humidity >=50%

Draw a logic circuit to represent the system.



[5]

4 **(a)** Identify **three** security issues that can put a computer system at risk.

Security issue 1 .....

Security issue 2 .....

Security issue 3 .....
[3]

(b) Explain how a firewall can help to protect a computer system from security issues.

.....

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.....

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.....[4]

5 **(a)** Karina is taking her Computer Science examination. She has **three** questions to answer about output devices.

(i) For the first question she writes the answer:

"It is a high powered laser that cuts materials such as thin metals or wood."

Identify the output device that Karina is describing.

.....[1]

(ii) For the second question she writes the answer:

"The screen is made up of blocks of red, green and blue pixels. The screen uses layers of different types of liquid."

Identify the output device that Karina is describing.

.....[1]

(iii) For the third question she writes the answer:

"It is responsible for powering and moving a motor in machinery, such as a robot arm in a factory."

Identify the output device that Karina is describing.

.....[1]

(b) Karina correctly answers another examination question about some more output devices.

Five different terms have been removed from her answer.

Complete the sentences in Karina's answer, using the list given. Not all terms in the list need to be used.

- 3D
- digital light projector
- inkjet
- interactive whiteboard
- laser
- rotating
- scanning
- sliding
- speaker
- thermal bubble

An ..... allows a user to write on a surface using a pen, the text and drawings can then be captured and stored for later use. An ..... printer produces a hard copy of a document using ..... and piezoelectric technology. A ..... printer uses a ..... drum, and positive and negative charges, to produce a hard copy of a document.

[5]

6 **(a)** Many programmers write computer programs in high-level languages. The programs need to be translated into machine code to be read by the computer.

State **two** types of translator that can be used.

Translator 1 .....

Translator 2 .....
[2]

(b) Explain **two** reasons why a computer programmer may choose to write a program in a high-level language, rather than a low-level language.

Reason 1 .....

.....

.....

.....

Reason 2 .....

.....

.....

.....
[4]

(c) **Three** examples of computer code are given in the table.

Tick (✓) to show whether each example of computer code is **High-level language**, **Assembly language** or **Machine code**.

Computer code	High-level language (✓)	Assembly language (✓)	Machine code (✓)

`10110111`
`11001100`
`01011100`			

`FOR X = 1 TO 10`
`  PRINT X`
`NEXT X`			

`INP X`
`STA X`
`LDA Y`			

[3]

7 **Six** internet terms and **six** definitions are listed.

Draw a line to connect each term to a correct definition.

Internet term	Definition
Browser	A program that allows a user to view webpages
Internet Service Provider (ISP)	The main protocol that governs the transmission of data using the Internet
Hyper Text Transfer Protocol (HTTP)	The website address that is typed into the address bar
Uniform Resource Locator (URL)	An address given to each device on a network. It is provided by the network
MAC address	A unique address given to a device on a network. It is provided by the manufacturer
IP address	A company that provides a connection to access the Internet

[5]

8 Describe the purpose of an interrupt in a computer system.

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.....[4]

9 **(a)** Computers can transmit data using different methods.

Describe the **three** data transmission methods given.

(i) Serial data transmission

.....

.....

.....

.....[2]

(ii) Parallel data transmission

.....

.....

.....

.....[2]

(iii) Duplex data transmission

.....

.....

.....

.....[2]

(b) Data can sometimes be corrupted when it is transmitted from one computer to another, causing errors to be present in the data.

Identify and describe **three** methods of error detection that could be used to see if an error has occurred.

Error detection method 1 .....

Description .....

.....

.....

.....

Error detection method 2 .....

Description .....

.....

.....

.....

Error detection method 3 .....

Description.....

.....

.....

.....

[9]

10 A system uses pH sensors and a microprocessor to help monitor pollution in a river.

The pH of the water should be between 6 and 8. The system outputs an alert if the pH of the water is not in this range.

Explain how the system uses the pH sensors and the microprocessor to help monitor the pollution.

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.....[5]

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