**Cambridge International Examinations**
Cambridge International General Certificate of Secondary Education

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|---|---|---|---|---|---|---|---|---|---|
| CANDIDATE NAME | | | | | | | | | |
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**COMPUTER SCIENCE** **0478/12**

Paper 1 Theory **October/November 2017**

**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 on all the work you hand in.
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.

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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **12** printed pages.


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CAMBRIDGE International Examinations

**[Turn over**

**1** A robot arm in a factory is programmed to move products.

The binary instructions to operate the robot arm are:

| Operation | Binary Instruction | | | |
|---|---|---|---|---|
| UP | 1 | 1 | 1 | 1 |
| DOWN | 0 | 0 | 0 | 1 |
| LEFT | 1 | 0 | 0 | 1 |
| RIGHT | 0 | 1 | 1 | 0 |
| OPEN | 1 | 1 | 0 | 0 |
| CLOSE | 0 | 0 | 1 | 1 |

The instructions are entered as hexadecimal values.

An operator enters the values:

**9 1 C 3 F**

Convert the values and write down the operation (e.g. RIGHT) carried out by the robot arm.

9 .....

1 .....

C .....

3 .....

F .....

[5]

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**2** Storage devices and storage media can be categorised as primary, secondary or off-line.

Write **primary**, **secondary** or **off-line** next to each storage device or medium to indicate its most suitable category.

HDD .....

RAM .....

ROM .....

CD-ROM .....

SSD .....

DVD-RAM .....

[6]

**3** **(a)** Explain the differences between the binary number system and the denary number system.

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.....[4]

**(b)** Explain the process of converting the binary number 1010 into a denary number.

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.....[5]

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**[Turn over**

**4** A file server is used as a central data store for a network of computers.

Rory sends data from his computer to a file server that is approximately 100 metres away.

It is important that the data is transmitted accurately. Rory needs to be able to read data from and write data to the file server at the same time.

**(a) (i)** Use ticks (✓) to identify the most suitable data transmission methods for this application.

| **Method 1** | Tick (✓) | **Method 2** | Tick (✓) |
|---|---|---|---|
| Serial | | Simplex | |
| Parallel | | Half-duplex | |
| | | Duplex | |

[2]

**(ii)** Explain why your answer to **part (a)(i)** is the most suitable data transmission.

.....

.....

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.....

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.....

.....

.....[4]

**(b)** Identify and describe **two** methods of error checking that can be used to make sure that the data stored after transmission is accurate.

Method 1 .....

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.....

.....

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Method 2 .....

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[6]

**5** Raj is using the Internet to do some online shopping. He visits a website that tells him that it uses cookies.

**(a)** Explain what is meant by the term **cookies**.

.....

.....

.....

.....

.....

.....

.....

.....[4]

**(b)** Give **two** examples of the use of cookies.

Example 1 .....

.....

.....

Example 2 .....

.....

.....

[2]

**6** Selma writes the following **four** answers in her Computer Science examination.

State which computer terms she is describing.

"It is a signal. When the signal is received it tells the operating system that an event has occurred."

Selma is describing .....

"It takes source code written in a high level language and translates it into machine code. It translates the whole of the source code at once."

Selma is describing .....

"The part of the central processing unit (CPU) that carries out calculations."

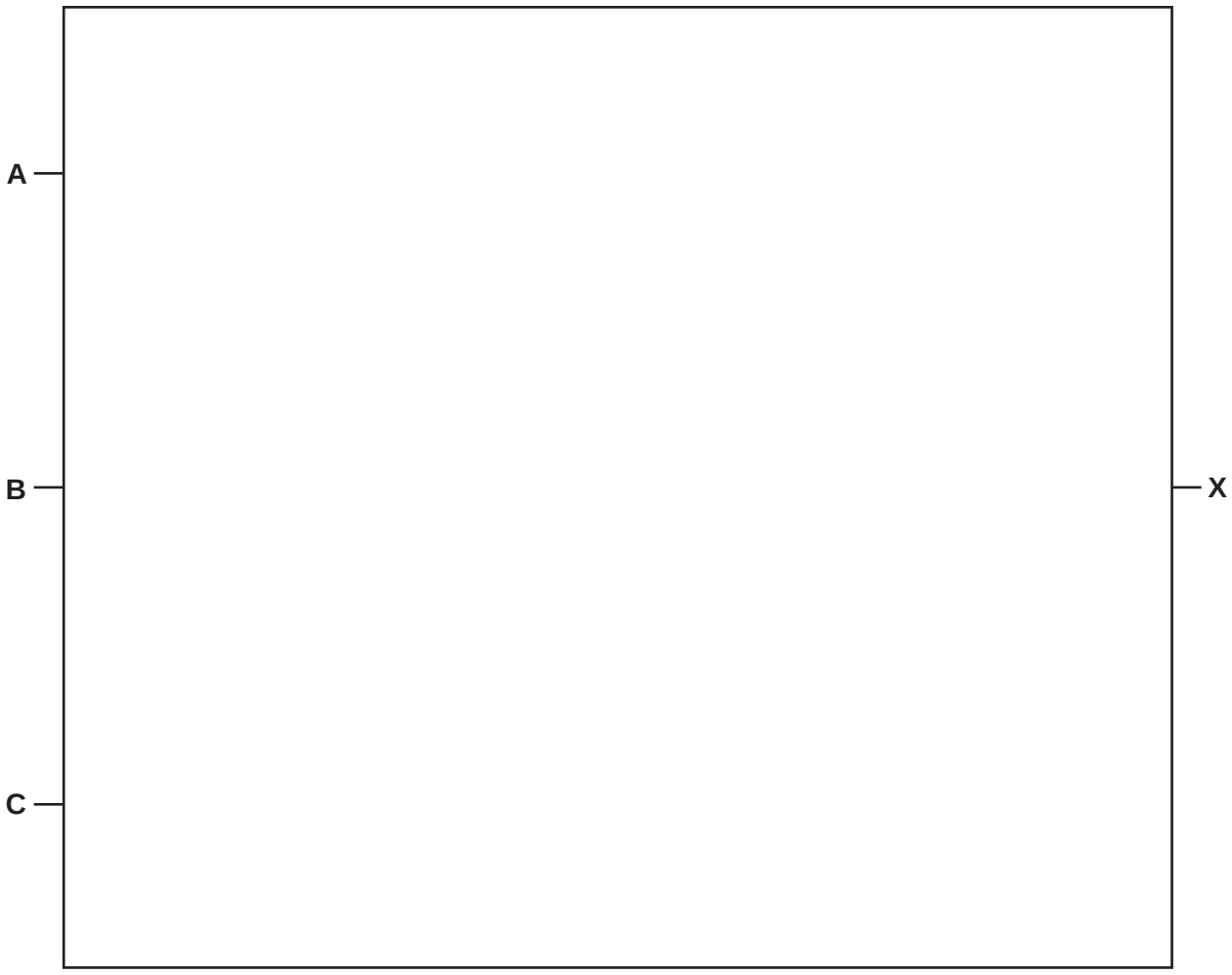
Selma is describing .....

"When data is transmitted, if an error is detected in the data received a signal is sent to ask for the data to be retransmitted. This continues until the data received is correct."

Selma is describing .....
[4]

**7** Draw a logic circuit to represent the logic statement:

X = 1 if (A is NOT 1 AND B is 1) AND (A is NOT 1 AND C is NOT 1) OR (B is 1 AND C is 1)




[7]

**8** **(a)** A computer has 2048 MB of RAM.

How many GB of RAM does the computer have?

Show your working.

.....

.....

.....

.....GB [2]

**(b)** Describe **one** item that is stored in RAM.

.....

.....

.....[2]

**(c)** Explain **three** ways that RAM is different to ROM.

1 .....

.....

.....

2 .....

.....

.....

3 .....

.....

.....

[3]

**9** Anna has a farm that grows fruit.

She has a system that monitors the conditions for growing the fruit.

Sensors are used in this system.

**(a)** Explain what is meant by the term **sensor**.

.....

.....

.....

.....[2]

**(b)** State **two** sensors that could be used in this system and describe how they could be used.

Sensor 1 .....

Use .....

.....

.....

.....

.....

Sensor 2 .....

Use .....

.....

.....

.....

.....

[6]

**10** **(a)** Describe what is meant by Transport Layer Security (TLS).

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.....

.....[3]

**(b)** Name **three** different applications of TLS.

1 .....

2 .....

3 .....

[3]

**11** Complete the paragraphs choosing the correct five terms from the list. Each term can only be used once:

- Ethics
- Freeware
- Free Software
- Hacking
- Malware
- Plagiarism
- Shareware
- Virus

Taking another person's work from the Internet and claiming it as your own is called ..... . It is possible to protect your work online with copyright.

One product that people may want to protect is software. ..... does allow a person to share, copy and change software freely, but ..... does not allow a person to do this legally. Software that has a licence allowing free use for a trial period is called ..... . The name given to this area of Computer Science is ..... .

[5]

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