

CANDIDATE  
NAME

CENTRE  
NUMBER

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|--|--|--|--|--|

CANDIDATE  
NUMBER

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|



**COMPUTER SCIENCE**

**0478/13**

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 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.

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 **11** printed pages and **1** blank page.

1 A washing machine has a small display screen built into it.

One use of the display screen is to show an error code when a problem has occurred with a washing cycle.

(a) State whether the display screen is an **input**, **output** or **storage device**.

.....[1]

(b) The display screen shows a hexadecimal error code:

**E04**

This error code means that the water will not empty out of the washing machine.

Convert this error code to binary.

|  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|

[3]

(c) State why hexadecimal is used to display the error code.

.....  
.....  
.....  
.....[1]

(d) Identify **three** sensors that could be used in the washing machine.

State what each sensor could be used for.

Sensor 1 .....

Use .....

Sensor 2 .....

Use .....

Sensor 3 .....

Use .....

[6]



4 Six components of a computer system and six descriptions are shown.

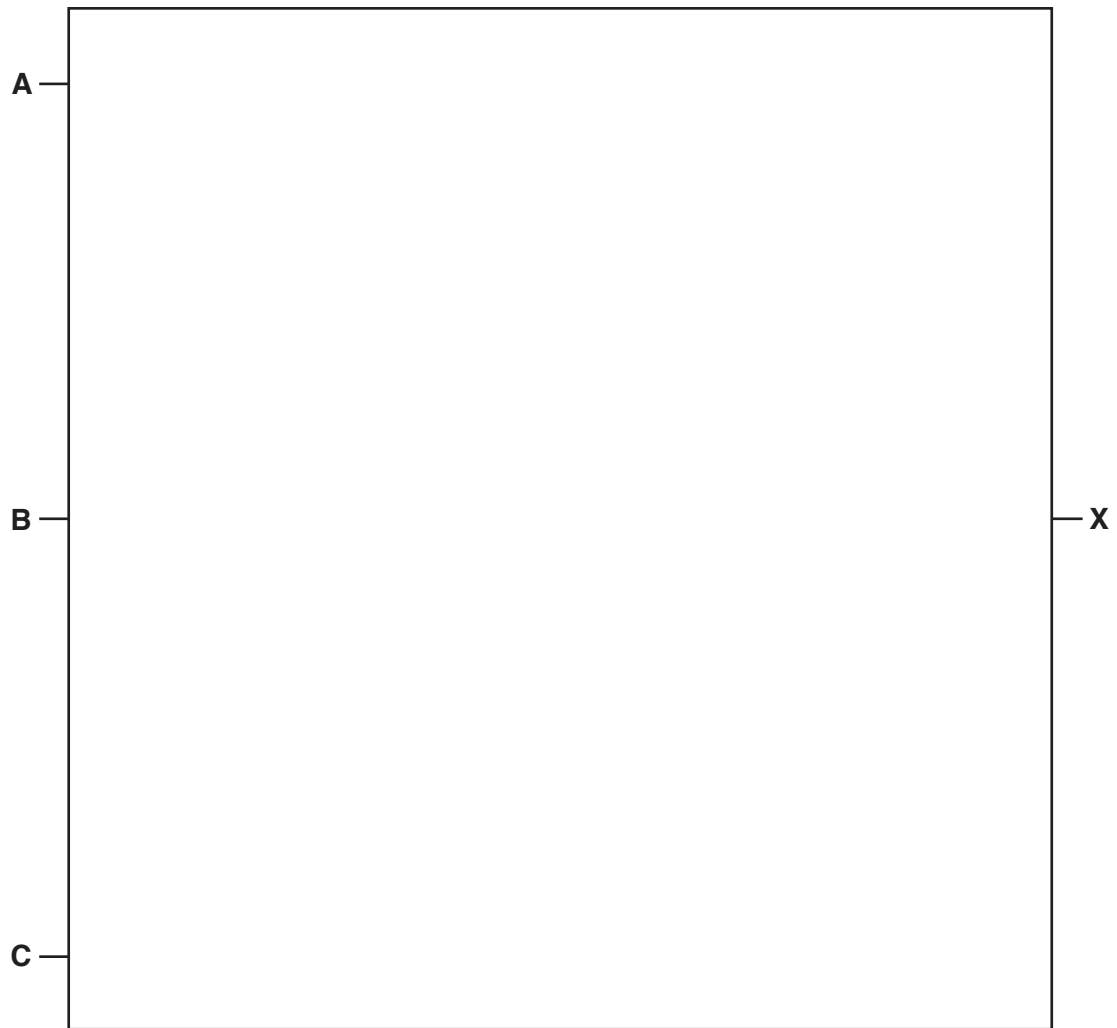
Draw a line to match each component with the most suitable description.

| Component                    | Description   |
|------------------------------|---|
| Arithmetic Logic Unit (ALU)  | Used to connect together the internal components of the CPU.      |
| Buses                        | Used to carry out calculations on data.                           |
| Control Unit (CU)            | Used to temporarily hold data and instructions during processing. |
| Immediate Access Store (IAS) | Used to allow interaction with the computer.                      |
| Input/Output                 | Used to hold data and instructions before they are processed.     |
| Registers                    | Used to manage the flow of data through the CPU.                  |

[5]

5 (a) Draw a logic circuit for the logic statement:

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



[4]



7 Six statements about firewalls are shown.

Tick (✓) to show whether each statement is **true** or **false**.

| Statement   | true<br>(✓) | false<br>(✓) |
|---|-------------|--------------|
| Firewalls can monitor incoming and outgoing traffic.          |             |              |
| Firewalls operate by checking traffic against a set of rules. |             |              |
| Firewalls cannot block access to a certain website.           |             |              |
| Firewalls can be software and hardware.                       |             |              |
| Firewalls can act as intermediary servers.                    |             |              |
| Firewalls can block unauthorised traffic.                     |             |              |

[6]

8 (a) Data is valuable. It needs to be kept secure and it can easily be damaged.

Give **three** different ways that data can be accidentally damaged.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(b) The Secure Socket Layer (SSL) protocol can be used to securely transmit data in online banking.

State **three** other different applications that use SSL.

Application 1 .....

Application 2 .....

Application 3 .....

[3]



(c) Online banking is increasing in popularity.

Online banking can be a risk as it can raise a number of security issues. SSL can be used as a security method to make online banking safer.

Identify and describe **three** other security methods that could be used to make online banking safer.

Security method 1 .....

.....

.....

.....

Security method 2 .....

.....

.....

.....

Security method 3 .....

.....

.....

.....

[6]



10 Six statements about assembly language are shown.

Tick (✓) whether the statement is **true** or **false**.

| Statement   | true<br>(✓) | false<br>(✓) |
|---|-------------|--------------|
| Assembly language uses mnemonic codes.                              |             |              |
| Assembly language programs do not need a translator to be executed. |             |              |
| Assembly language is a low-level programming language.              |             |              |
| Assembly language is specific to the computer hardware.             |             |              |
| Assembly language is machine code.                                  |             |              |
| Assembly language is often used to create drivers for hardware.     |             |              |

[6]

**BLANK PAGE**

---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at [www.cie.org.uk](http://www.cie.org.uk) after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.