Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

4401451422

COMPUTER SCIENCE **0478/11**

Paper 1 Theory **May/June 2020**

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- Calculators must **not** be used in this paper.

INFORMATION

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [ ].
- No marks will be awarded for using brand names of software packages or hardware.

This document has **12** pages. Blank pages are indicated.

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1 An image of a smartphone is shown.



(a) Identify **one** input device that is part of the smartphone.

..... [1]

(b) Identify **two** output devices that are part of the smartphone.

1 .....

2 .....
[2]

(c) All smartphones have a MAC address.

(i) State what is meant by the term MAC address.

.....

..... [1]

(ii) Describe the structure of a MAC address.

.....

.....

.....

.....

.....

..... [3]

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(d) A smartphone needs both RAM and ROM.

State why a smartphone needs RAM and ROM.

RAM .....

.....

ROM .....

.....
[2]

(e) Modern smartphones can be secured with a biometric system that is built into the phone.

(i) Identify **two** biometric systems that would be suitable for securing a smartphone.

1 .....

2 .....
[2]

(ii) Explain why modern smartphones are secured with a biometric system.

.....

.....

.....

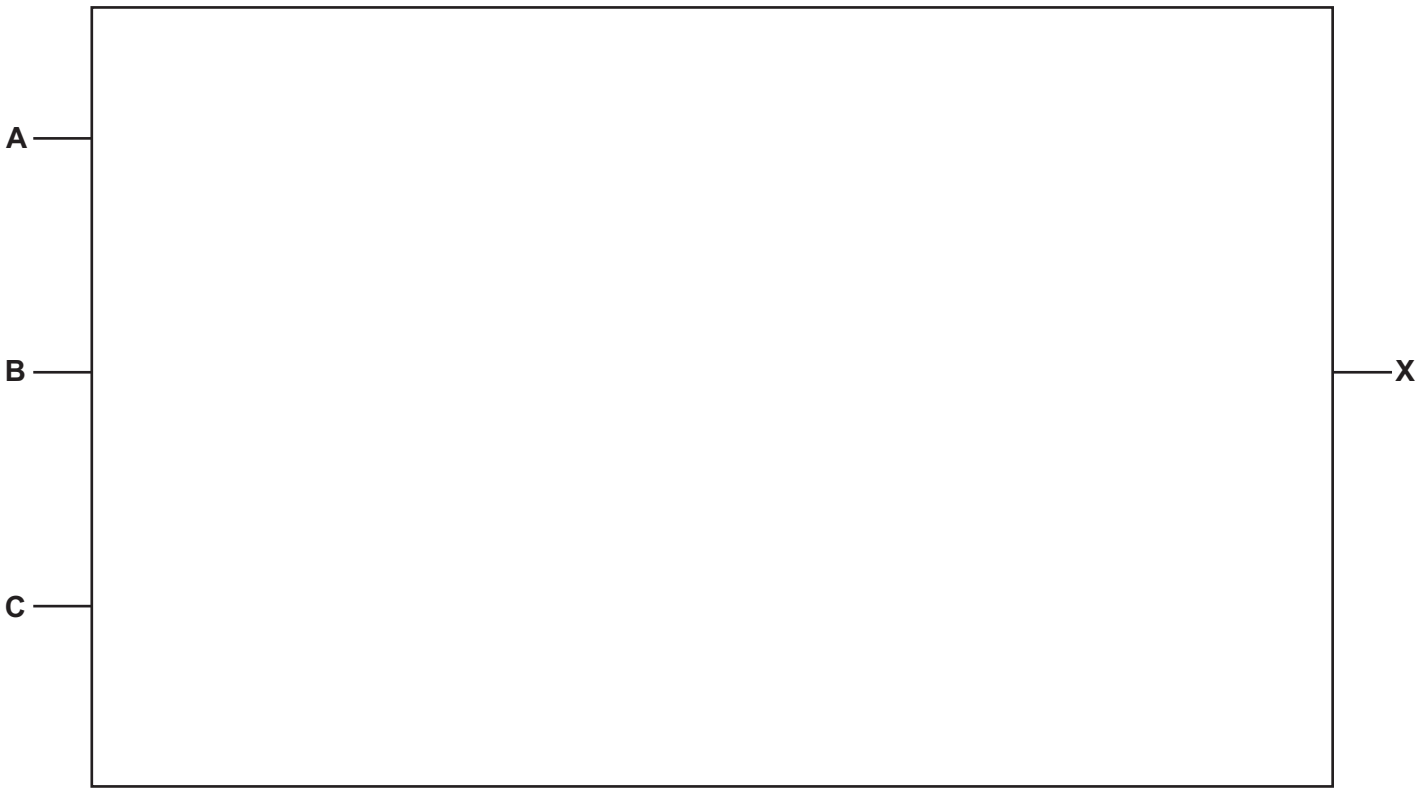
..... [2]

2 Consider the logic statement:

X = (((**A** NAND **B**) OR (**B** XOR **C**)) AND NOT **C**)

(a) Draw a logic circuit to match the given logic statement.

All logic gates must have a maximum of **two** inputs. Do **not** attempt to simplify the logic statement.



[5]

(b) Complete the truth table to represent the given logic statement.

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

[4]

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3 Carla's computer has a USB port.

Carla uses the USB port to connect her mobile device to her computer, to transfer her photos.

(a) Give **three** benefits of using a USB port to connect the mobile device to the computer.

Benefit 1 .....

.....

Benefit 2 .....

.....

Benefit 3 .....

.....

[3]

(b) State the type of data transmission used when transferring data using a USB port.

..... [1]

(c) Carla wants to reduce the file size of the photos she has transferred to her computer. She does not want the quality of the photos to be reduced, so she uses lossless compression.

Describe how lossless compression reduces the file size of the photos.

.....

.....

.....

.....

.....

.....

.....

..... [4]

4 Two error detection methods that Allison's computer uses are check digit and checksum.

(a) Give **two** similarities between the check digit and checksum methods.

1 .....

.....

2 .....

.....

[2]

(b) Identify **one other** error detection method that Allison's computer could use.

Describe how the method checks for errors.

Method .....

Description .....

.....

.....

.....

.....

.....

[4]

5 **Six** components of a computer are given.

Some are part of the central processing unit (CPU) of the Von Neumann model for a computer system.

Tick (✓) to show if each component is a **CPU component** or is **Not a CPU component**.

Component	CPU component (✓)	Not a CPU component (✓)
Arithmetic logic unit (ALU)		
Hard disk drive (HDD)		
Memory address register (MAR)		
Random access memory (RAM)		
Solid state drive (SSD)		
Control unit (CU)		

[6]

6 **Four** scenarios are given.

Identify the most suitable sensor for each scenario.

A **different** sensor must be used for each scenario.

Sensor	Scenario
	Detecting when a person is approaching an automatic door system
	Monitoring the pollution level in a river
	Checking if a tropical aquarium is 25 degrees Celsius
	Counting the number of cars that cross a bridge

[4]

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[Turn over

7 Hans has a website selling comic books. Customers can create an account to buy the comic books.

Customers enter a username and password to log in to their account.

(a) Customers may worry about keylogging software being used to gain unauthorised access to their account.

(i) Describe how keylogging software can be used to gain unauthorised access to a customer's account.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(ii) Identify a feature that Hans can add to the website to limit the threat of keylogging software.

..... [1]

(b) Hans makes sure data transmission for his website is secure.

(i) State how customers can check that the personal details they enter into the website will be transmitted securely.

.....

..... [1]

(ii) Explain how a customer's browser checks that the website is secure.

.....

.....

.....

.....

.....

.....

.....

..... [4]

8 Benny is a photographer and prints his photos using an inkjet printer.

(a) Benny is printing some photos and the paper gets jammed in the printer.

A signal is sent to alert the computer about the paper jam.

State the name of this type of signal.

..... [1]

(b) Identify **one** benefit and **two** drawbacks of Benny using an inkjet printer, instead of a laser printer, to print his photos.

Benefit .....

.....

Drawback 1 .....

.....

Drawback 2 .....

.....

[3]

(c) **Four** statements are given about printers.

Tick (✓) to show whether the statement applies to an **Inkjet** printer or a **Laser** printer.

Statement	Inkjet (✓)	Laser (✓)
Uses a rotating drum to transfer the image to the paper		
Uses powdered toner		
Uses nozzles to spray droplets on to the paper		
Uses a print head mechanism that moves side to side		

[4]

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9 Programs can be written in a low-level language.

(a) Identify **three** features of a low-level language.

Feature 1 .....

Feature 2 .....

Feature 3 .....

[3]

(b) Give **two** examples of a low-level language.

Example 1 .....

Example 2 .....

[2]

(c) Give **one** drawback of writing programs in a low-level language, instead of a high-level language.

.....

..... [1]

(d) A low-level language needs to be converted to binary before it can be processed by a computer.

(i) Give the **8-bit binary** value of the two denary values:

180 .....

201 .....

[2]

Working space

.....

.....

.....

.....

(ii) Give the **12-bit binary** value of the denary value **250**.

..... [1]

Working space

.....

.....

.....

.....

(iii) Binary can be represented as hexadecimal to make it easier to read.

Give the **hexadecimal** values of the 8-bit binary values:

10010011 .....

00011101 .....
[2]

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