Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

7233005583

COMPUTER SCIENCE **0478/11**

Paper 1 Theory **May/June 2022**

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. Any blank pages are indicated.

© UCLES 2022

1 Jack has an MP3 file stored on his computer.

(a) **(i)** Tick (✓) to show which type of data is stored in an MP3 file.

	Tick (✓)
Video	☐
Sound	☐
Image	☐

[1]

(ii) Tick (✓) to show whether the MP3 file is a lossy compressed file or a lossless compressed file or **not** a compressed file.

	Tick (✓)
Lossy compressed file	☐
Lossless compressed file	☐
Not a compressed file	☐

[1]

2 A computer is designed using the Von Neumann model for a computer system.

The computer has a central processing unit (CPU).

(a) Data is fetched from primary storage into the CPU to be processed.

(i) State the name of the primary storage from where data is fetched.

..... [1]

(ii) The CPU performs a cycle to process data. Fetch is the first stage in this cycle.

State the names of the second and third stages in the cycle.

Second stage .....

Third stage .....

[2]

(iii) Identify **two** components within the CPU that are used in the fetch stage of the cycle.

Component 1 .....

Component 2 .....

[2]

3 Three types of storage media are magnetic, optical and solid state.

(a) One example of solid-state storage is a Solid State Drive (SSD).

Identify **one** other example of solid-state storage.

..... [1]

(b) Optical storage uses a laser to store and read data from a disk.

Explain how the laser is used to store and read data from the disk.

.....

.....

.....

.....

.....

..... [3]

(c) A business is creating a new mobile device that has an SSD as secondary storage.

(i) Give **three** reasons why an SSD is the most suitable secondary storage for their mobile device.

Reason 1 .....

.....

Reason 2 .....

.....

Reason 3 .....

.....

[3]

(ii) Identify **two** examples of software that can be stored on the SSD.

Example 1 .....

Example 2 .....

[2]

4 All data needs to be converted to binary data so that it can be processed by a computer.

(a) Explain why a computer can only process binary data.

.....

.....

.....

..... [2]

(b) The denary values 64, 101 and 242 are converted to 8-bit binary values.

Give the 8-bit binary value for each denary value.

64 .....

101 .....

242 .....

[3]

Working space

.....

.....

.....

.....

.....

(c) The hexadecimal values 42 and CE are converted to binary.

Give the binary value for each hexadecimal value.

42 .....

CE .....

[4]

Working space

.....

.....

.....

.....

5 An image is stored on a computer. The image is 16-bit colour and is 100 pixels high and 150 pixels wide.

Calculate the file size of the image in bytes. Show all your working.

.....

.....

.....

.....

.....

Answer ..... bytes

[3]

6 A compiler and an interpreter are two different types of translator.

(a) One similarity between a compiler and an interpreter is that they both translate high-level language into machine code.

(i) Give **one** other similarity between a compiler and an interpreter.

.....

..... [1]

(ii) Explain **two** differences between a compiler and an interpreter.

.....

.....

.....

.....

.....

.....

.....

..... [4]

7 Adele chooses to set a biometric password for her mobile device, instead of a personal identification number (PIN).

(a) State what is meant by a biometric password.

.....

..... [1]

(b) Give **two** reasons why a biometric password is more secure than a PIN.

Reason 1 .....

.....

Reason 2 .....

.....

[2]

(c) Adele has a software-based firewall installed on her mobile device.

The firewall gathers data about the traffic coming into and going out of her mobile device.

Explain how the firewall uses the gathered data to keep the mobile device more secure.

.....

.....

.....

.....

.....

..... [3]

(d) Adele also encrypts the data on her mobile device to keep it more secure.

State how encryption will keep the data more secure.

.....

..... [1]

© UCLES 2022

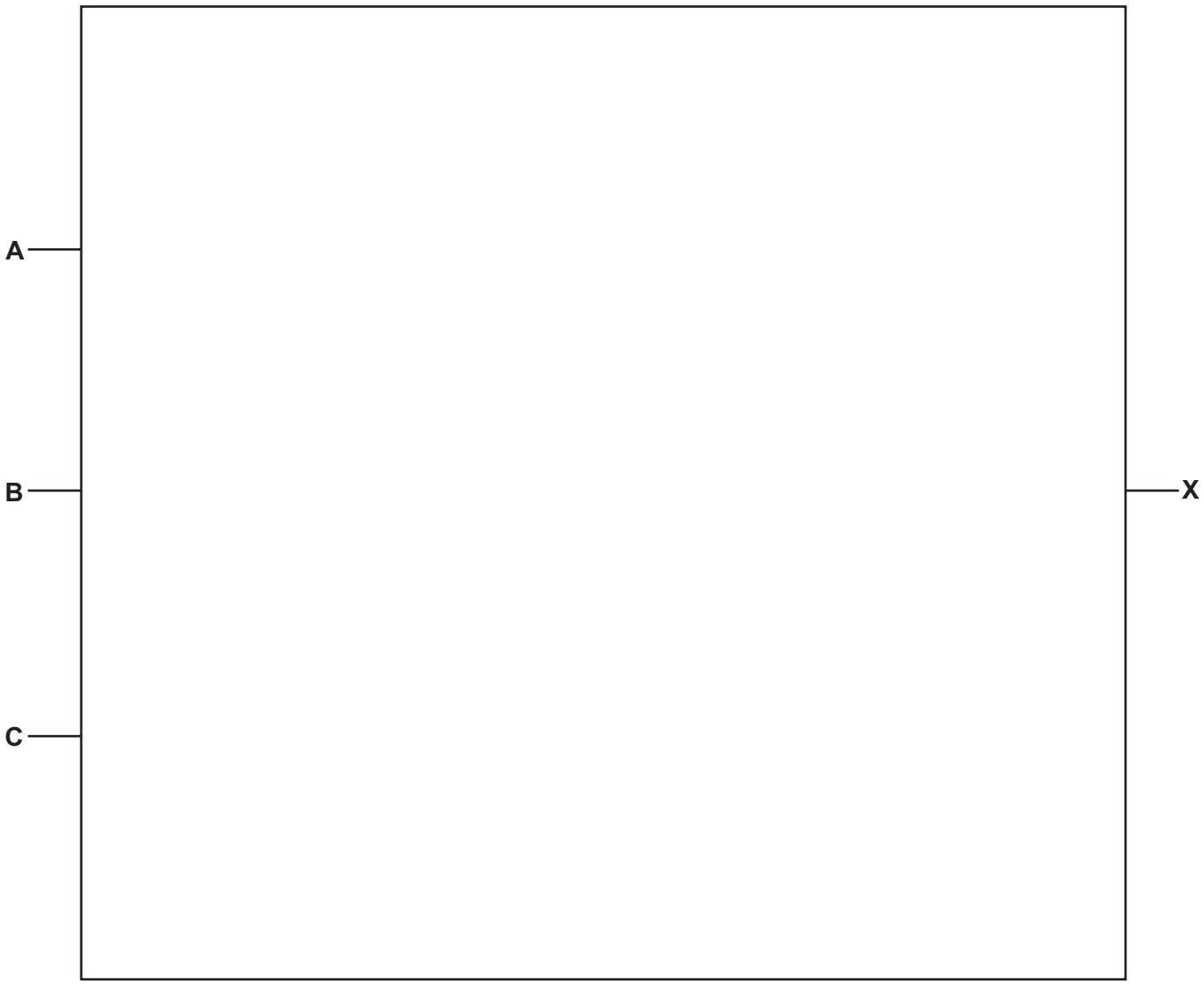
BLANK PAGE

8 Consider the following logic statement:

X = (((**A** AND NOT **B**) OR (NOT (**B** NOR **C**))) AND **C**)

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

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



[6]

(b) Complete the truth table for 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]

9 Three Internet terms are browser, Internet Protocol (IP) address and Uniform Resource Locator (URL).

Five statements are given about the Internet terms.

Tick (✓) to show which statements apply to each Internet term. Some statements may apply to more than **one** Internet term.

Statement	Browser (✓)	IP address (✓)	URL (✓)
it contains the domain name			
it is a type of software			
it converts Hypertext Markup Language (HTML) to display web pages			
it is a type of address			
it stores cookies			

[5]

10 Many devices have a Media Access Control (MAC) address.

Give **three** features of a MAC address.

Feature 1 .....

.....

Feature 2 .....

.....

Feature 3 .....

.....

[3]

11 **(a)** The paragraph describes the process of printing a document using an inkjet printer.

Complete the paragraph using the most appropriate terms from the list. **Not** all of the terms in the list need to be used.

- binary
- buffer
- drum
- information
- interrupt
- laser
- liquid
- nozzles
- operating system
- powder
- thermal bubble
- toner

Data is sent from the computer to the printer. The data is held in a print

..... that is temporary storage until the data is

processed to be printed.

Inkjet printers operate by having a print head that moves

..... side to side across the page. These

spray ..... ink droplets onto the page. These ink

droplets can be created using piezoelectric or .....

technology.

If the paper jams in the printing process, the printing stops and an

..... is sent to the computer.

[5]

(b) A printer is one example of an output device.

Give **three** other examples of output devices.

Example 1 .....

Example 2 .....

Example 3 .....

[3]

(c) Give **three** examples of input devices.

Example 1 .....

Example 2 .....

Example 3 .....

[3]

12 Computer ethics are a concern for any users of the Internet.

Identify and describe **three** ethical issues that could be a concern when using the Internet.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

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 Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

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

© UCLES 2022