Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

8107622055

COMPUTER SCIENCE **0478/12**

Paper 1 Computer Systems **May/June 2023**

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.

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1 Output devices are used to output data from a computer.

Circle **three** devices that are output devices.

actuator	digital versatile disk (DVD)	keyboard
microphone	mouse	printer
scanner		
sensor	solid-state drive (SSD)	speaker

[3]

2 Binary numbers can be converted to hexadecimal.

(a) Convert the **two** binary numbers to hexadecimal.

10010011 .....

00001101 .....

[4]

Working space

.....

.....

.....

.....

(b) A value is stored as a binary number in a register.

0	1	1	1	1	0	1	0

A logical right shift of **three** places is performed on the binary number.

(i) Complete the binary register to show its contents after this logical right shift.

[1]

(ii) State **one** effect this logical shift has on the binary number.

.....

..... [1]

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(c) Give **two** reasons why a programmer may use hexadecimal to represent binary numbers.

1 .....

.....

2 .....

.....

[2]

(d) Denary numbers can also be converted to hexadecimal.

Convert the denary number to hexadecimal.

301 ..... [2]

Working space

.....

.....

.....

.....

3 When keys are pressed on a keyboard, the text is converted to binary to be processed by the computer.

(a) Describe how the text is converted to binary to be processed by the computer.

.....

.....

.....

.....

.....

..... [3]

(b) Text that is input into a computer can be stored in a text file.

A text file can be compressed using lossless compression.

(i) State what effect this has on the file size.

.....

..... [1]

(ii) Describe how lossless compression compresses the text file.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(iii) Give **two** reasons why the text file may have been compressed.

1 .....

.....

2 .....

.....
[2]

4 A student uses a mobile phone to take photographs for a school project.

The student needs to transmit the photographs to their computer. They could use serial data transmission or parallel data transmission to transmit the photographs.

(a) (i) Describe how the photographs would be transmitted using serial data transmission.

.....

.....

.....

..... [2]

(ii) Give **two** benefits of transmitting the photographs using serial data transmission.

1 .....

.....

2 .....

.....
[2]

(iii) State **one** benefit of the student using parallel data transmission instead of serial data transmission.

.....

..... [1]

(b) The photographs are also transmitted across a network to cloud storage. A device on the network forwards the data towards its correct destination.

(i) State the name of this device.

..... [1]

(ii) Describe what is meant by cloud storage.

.....

.....

.....

..... [2]

(iii) Give **one** disadvantage of storing the photographs in cloud storage instead of storing them locally.

.....

..... [1]

5 A programmer writes a computer program using a high-level language.

(a) Tick (✓) **one** box to show which statement is correct about writing computer programs in a high-level language.

A Mnemonics are used to create instructions. ☐

B The computer program is harder to debug than a low-level language program. ☐

C The computer program is machine independent. ☐

D The hardware of the computer can be directly manipulated. ☐

[1]

(b) The programmer uses a compiler to translate the computer program.

(i) Describe how the compiler translates the computer program.

.....

.....

.....

.....

.....

..... [3]

(ii) Describe how the compiler reports errors.

.....

.....

.....

..... [2]

(c) The programmer uses an integrated development environment (IDE) to create the computer program.

One function of the IDE is that it has the built-in compiler.

Give **three** other common functions of an IDE.

1 .....

2 .....

3 .....

[3]

6 **(a)** Complete the statements about cookies.

Use the terms from the list.

Some of the terms in the list will **not** be used. Some terms may be used more than once.

compression	executable	hypertext markup language (HTML)
hypertext transfer protocol (HTTP)	image	internet protocol (IP) address
persistent	session	sound
text		
uniform resource locater (URL)	web browser	web server

Cookies are small ..... files that are sent between a ..... and a ..... .

..... cookies are stored in memory and **not** in the user's secondary storage.

When the web browser is closed a ..... cookie is lost, whereas a ..... cookie is **not** lost.

[6]

(b) Give **three** functions of a cookie.

1 .....

2 .....

3 .....

[3]

7 A distributed denial of service attack (DDoS) is a cyber security threat.

(a) Draw and annotate a diagram to represent the process of a DDoS.

[6]

(b) State **two** aims of carrying out a DDoS attack.

1 .....

.....

2 .....

.....

[2]

(c) Give **two** security solutions that can be used to help prevent a DDoS attack being successful.

1 .....

.....

2 .....

.....

[2]

8 A computer is connected to a network and assigned an IPv4 address.

(a) Tick (✓) **one** box to show which device would assign the IPv4 address to the computer.

A Domain name server (DNS) ☐

B Network interface card (NIC) ☐

C Router ☐

D Web server ☐

[1]

(b) Describe the characteristics of an IPv4 address.

.....

.....

.....

.....

.....

.....

.....

..... [4]

9 One component of an expert system is the inference engine.

(a) Identify the **three** other components in an expert system.

1 .....

2 .....

3 .....
[3]

(b) Describe the role of the inference engine in an expert system.

.....

.....

.....

..... [2]

10 A user has both system software and application software installed on their computer.

(a) Describe the difference between system software and application software.

Give an example of each software in your answer.

.....

.....

.....

.....

.....

.....

..... [4]

(b) State which component in the computer would store both types of software when the power is turned off.

..... [1]

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