Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

9517397878

COMPUTER SCIENCE **2210/12**

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.

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1 **(a)** Denary values are converted to binary values to be processed by a computer.

Draw **one** line from each denary value to the correctly converted 8-bit binary value.

Denary	8-bit binary
	00100001
41	10100110
	00101001
174	10000110
	10101110
86	01010110

[3]

Working space

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(b) Binary values can also be converted to denary values.

Give the correct denary value for the 12-bit binary value 000101010111
Show all your working.

.....

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Denary value .....

[2]

2 Hexadecimal is used for Hypertext Markup Language (HTML) colour codes.

An HTML colour code is:

#2F15D6

Each pair of digits is stored as binary in an 8-bit register.

(a) Give the 8-bit binary value that would be stored for each pair of hexadecimal digits.

2F								
15								
D6								

[6]

Working space

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(b) HTML colour codes and Media Access Control (MAC) addresses are two examples of where hexadecimal is used in Computer Science.

Give **two** other examples of where hexadecimal can be used in Computer Science.

Example 1 .....

Example 2 .....

[2]

(c) Websites can be created using HTML structure and presentation.

State what is meant by HTML structure and presentation.

Give an example of each in your answer.

Structure .....

.....

.....

.....

Presentation .....

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.....

[4]

(d) Explain why presentation is often separated from structure when creating a web page.

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..... [2]

3 Joelle is a student who uses the Internet.

(a) The table contains **five** terms or definitions that relate to the Internet.

Complete the table by writing each missing term or definition.

Term	Definition
browser	....
.....	this is the company that provides a user with a connection to the Internet
.....	this is a protocol that is used to send data for web pages across the Internet
Uniform Resource Locator (URL)	....
cookie	....

[5]

(b) Joelle uses a firewall to keep her data safe when she uses the Internet.

Tick (✓) to show which statement about firewalls is true.

	Tick (✓)
Firewalls can only be hardware-based	☐
Firewalls can only be software-based	☐
Firewalls can be hardware-based or software-based	☐

[1]

(c) Joelle's parent also uses the firewall to limit the websites that Joelle can access.

Explain how the firewall is used to limit the websites that Joelle can access.

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..... [4]

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4 Jason is a programmer who writes computer programs in a high-level language.

(a) Describe what is meant by a high-level language.

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.....

..... [3]

(b) Jason wants to distribute a computer program he has written. He is considering distributing it to users as freeware or free software.

(i) Explain **one** drawback to a user if the program is distributed as freeware.

.....

.....

.....

..... [2]

(ii) Explain **one** benefit to a user if the program is distributed as free software.

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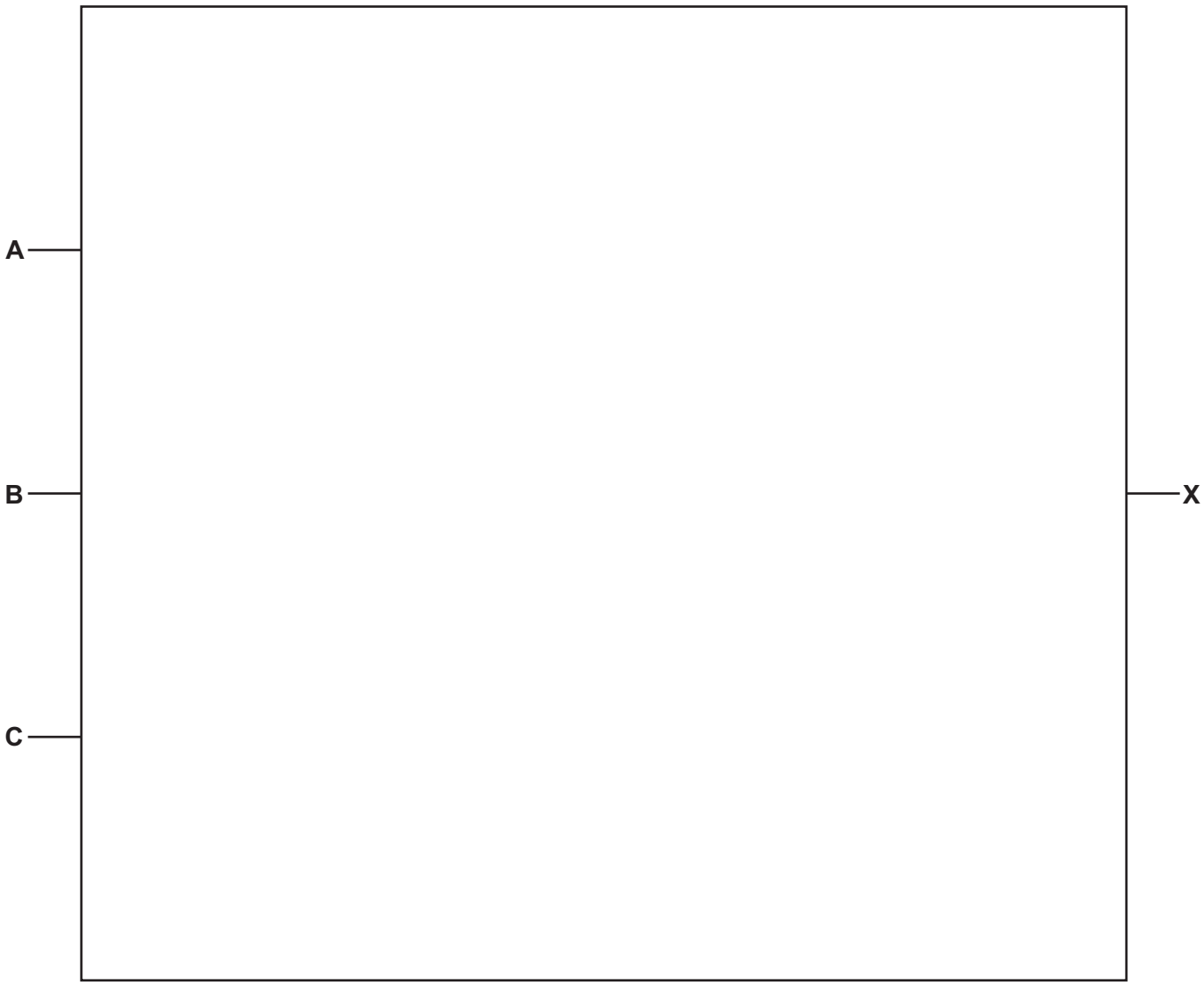
..... [2]

5 Consider the following logic statement:

X = ((**A** OR **B**) AND (NOT (**B** XOR **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.



[5]

(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]

6 Millions of emails are sent between users on a daily basis.

(a) Identify **two** online security attacks that can be carried out using email.

Describe how email is used to enable the attack.

Online security attack 1 .....

Description .....

.....

.....

.....

.....

Online security attack 2 .....

Description .....

.....

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[6]

(b) Online security attacks can maliciously damage data.

One security method to keep data safe from online attacks is a firewall.

Identify **two** other security methods that keep data safe from online attacks.

Security method 1 .....

Security method 2 .....

[2]

(c) Data can also be damaged accidentally.

One example of how data can be damaged accidentally is by shutting down a computer before saving data. To prevent this from happening, a user should make sure they have saved all data before shutting down a computer.

Complete the table by giving **three** other examples of how data can be damaged accidentally.

Give a method of prevention for each example.

Example	Method of prevention
.....	.....
.....	.....
.....	.....
	.....
.....	.....
.....	.....
.....	.....
	.....
.....	.....
.....	.....
.....	.....
	.....

[6]

7 Cassie stores data for her business every day. She stores the data using optical data storage.

(a) Identify **three** examples of optical data storage.

Example 1 .....

Example 2 .....

Example 3 .....

[3]

(b) **Six** statements are given about the operation of three different types of storage.

Tick (✓) to show which statements apply to each type of storage. Some statements may apply to more than **one** type of storage.

	Type of storage		
Statement	**Magnetic (✓)**	**Optical (✓)**	**Solid state (✓)**
this storage has no moving parts			
this storage uses a laser to read and write data			
this storage uses a read/write head			
this storage burns pits onto a reflective surface			
this storage uses NAND and NOR technology			
this storage stores data in tracks and sectors			

[6]

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[Turn over

8 Sam develops a software application. He distributes a version of the software as shareware.

(a) Describe what is meant by shareware.

.....

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..... [4]

(b) Identify **three** ethical issues that may need to be considered when developing and distributing software.

Ethical issue 1 .....

Ethical issue 2 .....

Ethical issue 3 .....

[3]

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