Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

6783318617

COMPUTER SCIENCE **2210/12**

Paper 1 Theory **October/November 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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[Turn over

1 Tina is creating a website for charity events. She uses HTML to create the website.

(a) State what is meant by HTML.

.....

..... [1]

(b) She uses the hexadecimal colour code #43B7F0 as the background colour for her website.

(i) State whether background colour is an example of **structure** or **presentation**, in the website.

..... [1]

(ii) The hexadecimal colour code **#43B7F0** is stored in three **8-bit** registers.

Give the **8-bit binary** values for each part of the hexadecimal code.

43								
B7								
F0								

[6]

(c) Tina uses a microphone to record a welcome message for her website.

(i) State whether the microphone is an **input** or **output** device.

..... [1]

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(ii) She wants to compress the recording to make sure that the file is as small as possible for the website.

Identify which type of compression she should use and describe how this would compress the file for the website.

Type of compression .....

Description

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..... [4]

(iii) Give **two** benefits of compressing the file for the website.

Benefit 1 .....

.....

Benefit 2 .....

.....

[2]

(d) Tina will use the TLS protocol in her website when selling tickets to people for different charity events. This makes sure that their personal data is transmitted securely.

(i) Identify the **two** layers that are present in the TLS protocol.

Layer 1 .....

Layer 2 .....
[2]

(ii) Explain how data is sent securely using the TLS protocol.

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..... [6]

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(e) Tina is concerned about security threats to her web server.

(i) Identify **three** security threats to her web server that Tina might be concerned about.

1 .....

2 .....

3 .....

[3]

(ii) Tina installs a proxy server to help protect her website from security threats.

Describe how the proxy server will help protect the website.

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..... [4]

2 **Four** 7-bit binary values are transmitted from one computer to another. A parity bit was added to each binary value creating 8-bit binary values. All the binary values have been transmitted correctly.

(a) Tick (✓) to show whether an **Even** or an **Odd** parity check has been used for each binary value.

8-bit binary value	Even (✓)	Odd (✓)
11111111		
01100110		
01111011		
10000000		

[4]

(b) The data will also be checked using a checksum.

Describe how a checksum can be used to check that the data has been transmitted correctly.

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..... [5]

3 Alessandro has some important data stored on his computer.

He is concerned about accidental damage to his data.

(a) (i) Identify **three** ways that the data could be accidentally damaged.

1 .....

2 .....

3 .....

[3]

(ii) State what Alessandro could do to make sure that he can retrieve his data if it is accidentally damaged.

..... [1]

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(b) Alessandro uses an SSD to store his data.

Describe what is meant by an SSD and how it operates to store data.

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..... [4]

(c) Alessandro also uses off-line storage to store his data.

Three examples of off-line storage are Blu-ray, CD and DVD.

Six statements are given about off-line storage.

Tick (✓) to show if each statement applies to **Blu-ray**, **CD**, or **DVD**.

Some statements apply to more than one example of off-line storage.

Statement	Blu-ray (✓)	CD (✓)	DVD (✓)
A type of optical storage			
Has the largest storage capacity			
Can be dual layer			
Read using a red laser			
Has the smallest storage capacity			
Stores data in a spiral track			

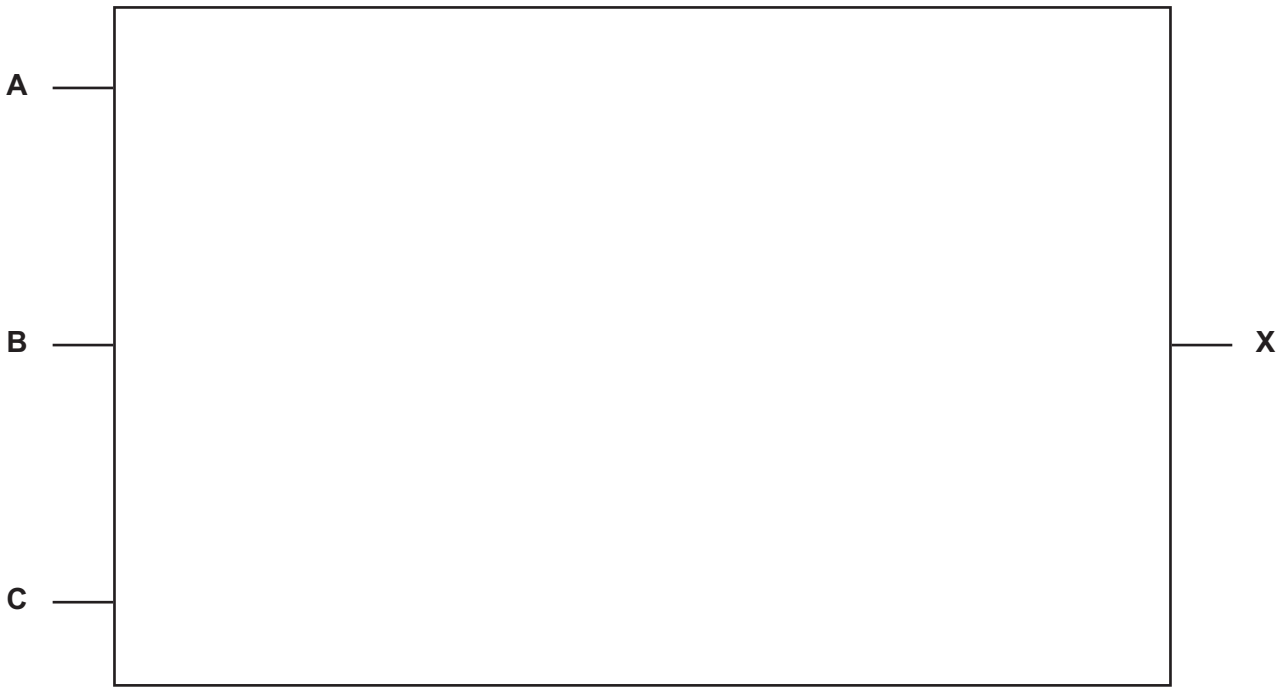
[6]

4 Consider the logic statement:

X = (((**A** NAND **B**) NOR (**B** AND **C**)) OR **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.



[4]

(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]

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5 Tammy is buying a new computer that has an LED display.

(a) **Five** statements about LED displays are given.

Tick (✓) to show if each statement is **True** or **False**.

Statement	True (✓)	False (✓)
It is a flat panel display		
It creates images using red, green and blue diodes		
It is not very energy efficient and gives off heat		
It can be used in mobile devices such as smartphones and tablets		
It is a front-lit display		

[5]

(b) Tammy connects the computer to her home network. The computer has a MAC address and an IP address.

A paragraph is given about MAC addresses and IP addresses.

Complete the paragraph using the list of terms given. Not all terms need to be used.

- compiled
- computer
- control
- dynamic
- identify
- packet
- principal
- protocol
- similar
- unique

A MAC address is a media access …….. address. A network device has a …… MAC address that can help …….. the device in the network. An IP address is an Internet …… address. An IP address can be static or …… .

[5]

(c) Tammy uses a browser when accessing the Internet.

Describe the role of the browser.

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..... [4]

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