Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

6353612904

COMPUTER SCIENCE **0478/13**

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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1 **Five** hardware devices are given.

Tick (✓) to show if each device is an **Input**, **Output** or **Storage** device.

Device	Input (✓)	Output (✓)	Storage (✓)
Solid state drive (SSD)			
Headphones			
2D cutter			
LCD projector			
Microphone			

[5]

2 Paige has a computer that has a central processing unit (CPU) based on the Von Neumann model for a computer system.

(a) Identify the component within the CPU that controls the flow of data.

..... [1]

(b) Identify the component within the CPU where calculations are carried out.

..... [1]

(c) Identify the component within the CPU that stores the address of the next instruction to be processed.

..... [1]

(d) Identify the register within the CPU that holds an instruction that has been fetched from memory.

..... [1]

(e) Identify the register within the CPU that holds data that has been fetched from memory.

..... [1]

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3 **(a)** **Four** denary to 8-bit binary conversions are given.

Tick (✓) to show if each denary to 8-bit binary conversion is **Correct** or **Incorrect**.

Denary	Binary Conversion	Correct (✓)	Incorrect (✓)
145	10010001		
179	10110101		
11	00010011		
100	01100010		

[4]

(b) Convert the **12-bit** binary number into hexadecimal.

1	1	0	0	0	1	0	0	0	0	0	0

..... [3]

4 Eugene has a web server that stores his online shopping website.

Customers access the website using a browser.

(a) Describe how the webpages are requested and displayed on the customer's computer.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(b) State **three** online security threats to Eugene's web server.

Threat 1 .....

Threat 2 .....

Threat 3 .....

[3]

5 Arjun uses a scanner to create digital versions of some printed documents.

The scanner is attached to his computer using a USB connection.

(a) Tick (✓) to show if the USB connection uses **Parallel** or **Serial** data transmission.

Describe your chosen method of data transmission.

Parallel ☐

Serial ☐

Description

.....

.....

.....

.....

[3]

(b) Give **three** benefits of a USB connection.

Benefit 1 .....

.....

Benefit 2 .....

.....

Benefit 3 .....

.....

[3]

(c) Arjun uses the Internet to send the digital documents to his friend. He wants to make sure the documents are sent securely.

Identify **two** protocols that can be used to transfer data securely.

Protocol 1 .....

Protocol 2 .....

[2]

6 Elsa writes a paragraph in an examination about encryption.

There are several terms missing from the paragraph.

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

Some terms may be used more than once.

- algorithm
- alphanumeric
- cookie
- cypher
- key
- padlock
- plain
- word processed

The data is encrypted using a ..... . This is an ..... that is used to scramble the data. The data before encryption is known as ..... text. When the data has been encrypted it is known as ..... text. To read the encrypted data it needs to be decrypted using a ..... .

[5]

7 **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 (✓)
10000001		
10000010		
00101001		
00101000		

[4]

(b) A parity check may not always detect errors that have occurred in data transmission.

State why a parity check may not detect data transmission errors.

..... [1]

(c) Give **one** other error checking method that could be used to check for errors in data transmission.

..... [1]

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8 Edith is buying a new computer monitor that displays images using LCD technology.

(a) Explain what is meant by LCD technology.

.....

.....

.....

.....

.....

..... [3]

(b) State **three** benefits of LCD technology.

Benefit 1 .....

.....

Benefit 2 .....

.....

Benefit 3 .....

.....

[3]

9 Elle uses both CDs and DVDs to store her school projects.

(a) Give **three** similarities between a CD and a DVD.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(b) State **one** difference between a CD and a DVD.

.....

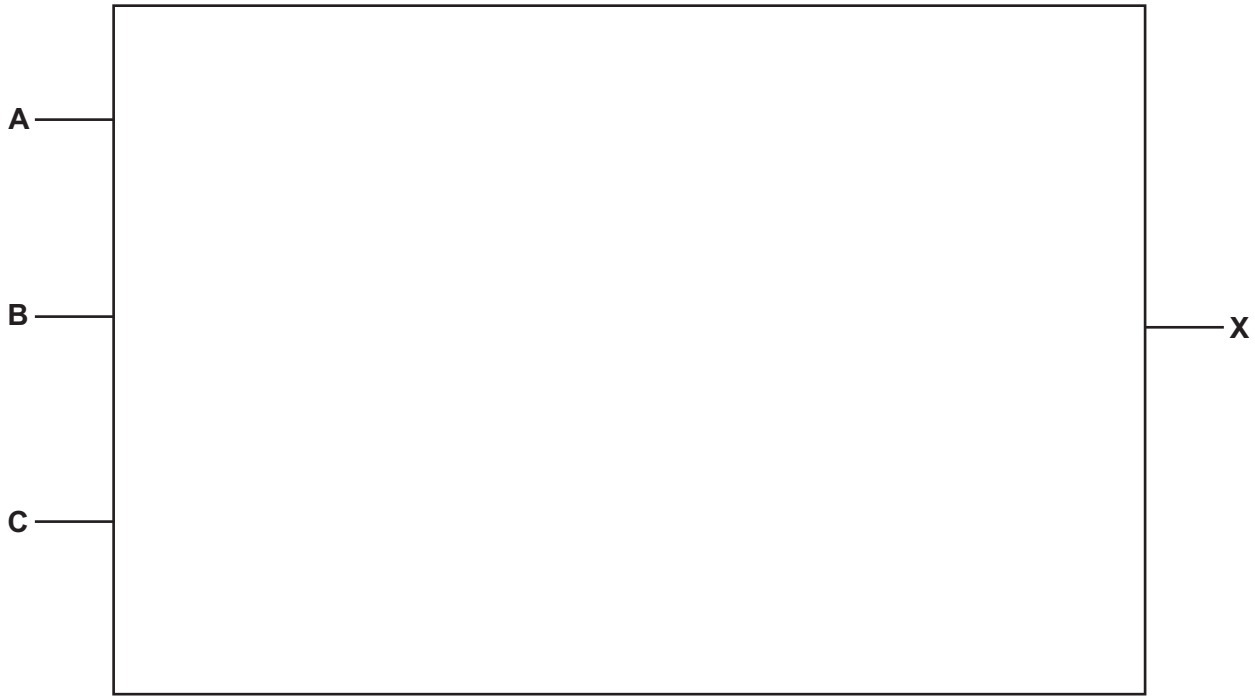
..... [1]

10 Consider the following logic statement:

X = ((**B** AND NOT **A**) XOR (**A** 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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11 A theme park has a game where a player tries to run from the start to the finish without getting wet.

The system for the game uses sensors and a microprocessor to spray water at a player as they run past each sensor.

Describe how the sensors and the microprocessor are used in this system.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

12 Warner says that he has a very good Internet Service Provider (ISP) that provides several services.

Five statements about ISPs are given.

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

Statement	True (✓)	False (✓)
Provides access to the Internet for customers		
Can determine the maximum bandwidth available for customers		
Monitors the volume of data downloaded by customers		
Can provide an IP address for the customer		
Stores the content for all web pages available on the Internet		

[5]

13 Phishing and pharming are two security issues a user should be aware of when using the Internet.

(a) State **one** similarity between phishing and pharming.

.....

..... [1]

(b) Explain **two** differences between phishing and pharming.

Difference 1 .....

.....

.....

Difference 2 .....

.....

.....

[2]

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