Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

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6677532764

COMPUTER SCIENCE **0478/12**

Paper 1 Theory **February/March 2019**

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

No calculators allowed.

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name in the spaces at the top of this page.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
No marks will be awarded for using brand names of software packages or hardware.

Any businesses described in this paper are entirely fictitious.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

The maximum number of marks is 75.

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **11** printed pages and **1** blank page.

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[Turn over

1 **(a)** Elle has a file stored on her computer that is 20 MB in size. Jordan has a file that is 10 GB in size.

Tick (✓) to show which is the **larger** file.

File size	Tick (✓)
20 MB	
10 GB	

[1]

(b) Bob has a file stored on his computer that is 3500 kB in size. Gerty has a file that is 3 MB in size.

Tick (✓) to show which is the **larger** file.

File size	Tick (✓)
3500 kB	
3 MB	

[1]

2 Many computer systems have an input device and an output device.

(a) **(i)** State what is meant by an input device.

.....

..... [1]

(ii) Give an example of an input device.

..... [1]

(b) **(i)** State what is meant by an output device.

.....

..... [1]

(ii) Give an example of an output device.

..... [1]

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3 **(a)** A long distance running race uses an electronic counter that counts each competitor who finishes the race.

The count is stored as binary in a **12-bit** register.

A denary value of the count is displayed on a screen above the finish line.

(i) The screen currently displays:

0	0	3	9

State the binary value that is currently stored to display the count shown.

.....

..... [2]

(ii) More competitors cross the finish line and the screen now displays:

0	3	5	0

State the binary value that is currently stored to display the count shown.

.....

..... [2]

(iii) At the end of the race the binary value stored is:

011011000111

Give the denary value that would be displayed on the screen at the end of the race.

Show your working.

.....

.....

.....

.....

Screen display:

[2]

(b) Sensors are used at the finish line to identify the number of competitors who finish the race.

(i) Identify **two** different sensors that could be used to identify the number of competitors.

Sensor 1 .....

Sensor 2 .....
[2]

(ii) The sensors are used with a microprocessor to count how many competitors finish the race.

Explain how the sensor and the microprocessor are used.

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..... [6]

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4 Darius is writing a computer program that allows binary values to be calculated.

Darius chooses to write the program in a high-level language rather than a low-level language.

(a) Explain why Darius chooses to write the program in a high-level language.

.....

.....

.....

..... [2]

(b) Darius will use a translator to translate the program. He could use a compiler or an interpreter.

Five statements are given about compilers and interpreters.

Tick (✓) to show if the statement applies to a **Compiler** or an **Interpreter**. Statements may apply to both.

Statement	Compiler (✓)	Interpreter (✓)
A report of errors is produced at the end of translation.		
The program is translated one line at a time.		
The program is translated from high-level language into machine code.		
An executable file is produced.		
The program will not run at all if an error is detected.		

[5]

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[Turn over

Darius is sending several programs that he has created to his friend Selma.

(c) He wants to compress the files to send them as he needs to attach them to an email.

Darius tells Selma he is going to use lossy compression. Selma tells him that he should use lossless instead.

Explain why Selma tells Darius to use lossless compression instead of lossy.

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.....

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..... [4]

(d) Errors can occur when data is transmitted, stored or entered into a system.

Darius could use an error detection method to find whether errors have occurred.

One error detection method he could use is a checksum.

(i) Describe how a checksum detects errors.

.....

.....

.....

.....

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.....

..... [5]

(ii) State **three** other error detection methods that Darius could use.

Method 1 .....

Method 2 .....

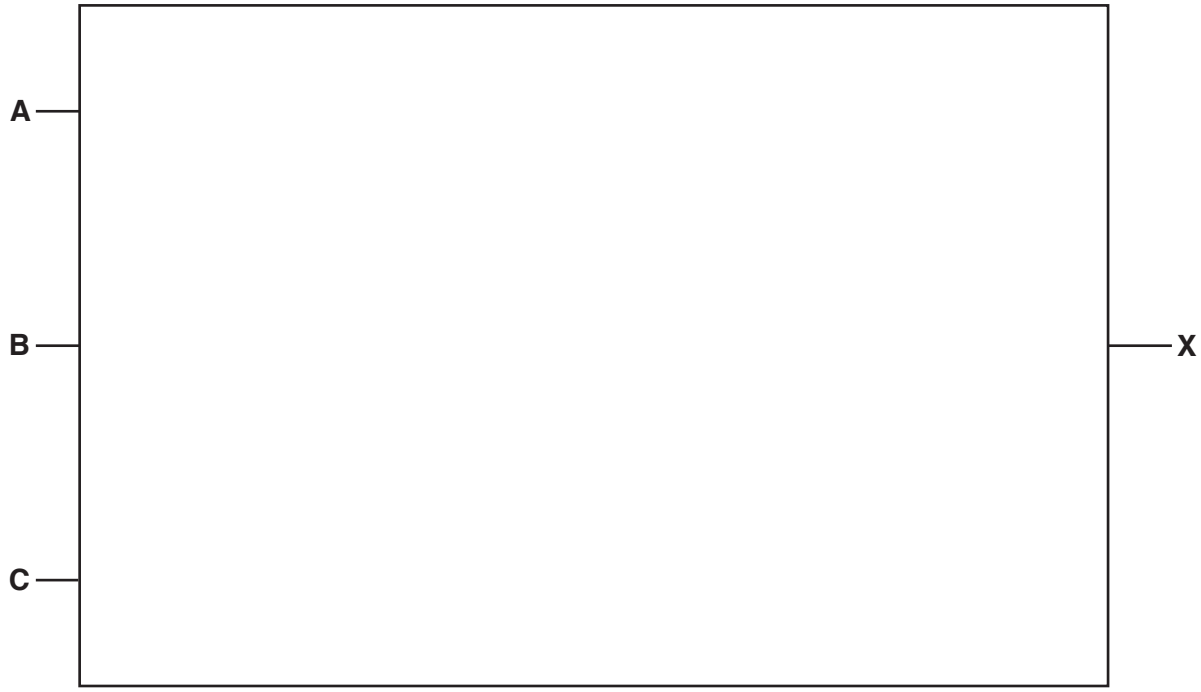
Method 3 .....

[3]

5 Consider the following logic statement:

X = 1 if ((A is 1 NAND C is 1) NOR A is NOT 1) OR (B is 1 AND C is NOT 1)

(a) Draw a logic circuit that represents the given logic statement. Your logic gates must have a maximum of two inputs. Do **not** simplify the logic statement.



[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]

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6 Nadia purchases a printer to print out her homework.

She connects the printer to her computer using USB.

(a) Explain what is meant by USB.

.....

.....

.....

.....

.....

..... [3]

(b) Nadia's printer uses powdered toner rather than liquid ink.

(i) State the type of printer Nadia has purchased.

..... [1]

(ii) Give **two** benefits of using this type of printer.

Benefit 1 .....

.....

Benefit 2 .....

.....

[2]

(iii) Give **one** drawback of using this type of printer.

Drawback 1 .....

..... [1]

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[Turn over

(c) Nadia uses several types of computer storage for her homework and other projects.

(i) **Five** examples of computer storage are given.

Tick (✓) to show if the computer storage is **Primary**, **Secondary** or **Off-line**.

Storage example	Primary (✓)	Secondary (✓)	Off-line (✓)
Solid state drive (SSD)			
Blu-ray disc			
USB flash memory			
Random access memory (RAM)			
Read only memory (ROM)			

[5]

(ii) Nadia is considering purchasing a magnetic storage device.

Describe how a magnetic storage device stores data.

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..... [6]

(iii) Give **two** advantages of using a magnetic storage device rather than a solid state storage device.

Advantage 1 .....

.....

Advantage 2 .....

.....

[2]

7 Arya regularly uses the Internet as a research tool for her school projects.

Identify **and** describe **three** risks to Arya's computer when she is using the Internet for research.

Risk 1 .....

Description .....

.....

.....

Risk 2 .....

Description .....

.....

.....

Risk 3 .....

Description .....

.....

.....

[6]

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