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Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

3343675457

COMPUTER SCIENCE **0478/11**

Paper 1 Theory **October/November 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 **12** printed pages.

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1 Andrew wants to produce advertising material for his company.

(a) Andrew can use an **Inkjet printer** or a **Laser printer**.

Draw lines to connect each printer to a correct statement. More than one line may be used to connect to each printer or statement.

Printer	Statement
	Can print in colour
Inkjet printer	
	Uses a charged drum to create the printed item
	Uses powdered toner
Laser printer	
	Creates output line by line using a print head

[2]

(b) Andrew wants to print a single page A4 leaflet. He wants to print 10 000 copies.

State whether he should use an inkjet or a laser printer.

..... [1]

(c) Andrew wants to produce small 3D models of the company logo.

Explain how a 3D cutter could be used to produce the models.

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..... [2]

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2 An electronic guessing game compares denary integer values input by a user with pre-stored values. The pre-stored values are held in 10-bit binary format.

(a) Convert the binary values in the table to denary.

Binary	Denary
0001001110	
0110110111	
1000000001	

[3]

(b) When planning the game, the designer decided to use hexadecimal notation to represent the binary values.

Explain why the designer used hexadecimal notation.

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..... [2]

(c) State the hexadecimal equivalent of the binary value 1010110101

..... [3]

3 A company has several offices. It uses the Internet to transfer data between offices. The company also makes payments to staff and suppliers using online banking.

The company are concerned about spyware and other security aspects of using the Internet.

(a) Explain what is meant by spyware **and** how it is used to obtain data.

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..... [3]

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(b) The company uses a web page to log on to the online bank.

Identify **one** method that could be used by the online bank to reduce the impact of spyware when logging on.

State **how** the method prevents the use of spyware.

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..... [2]

(c) The company has installed a firewall as part of its data security.

Describe how a firewall can help protect against unauthorised access to data.

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..... [4]

(d) State **two** other methods the company could use to help prevent unauthorised access to data.

Method 1 .....

Method 2 .....

[2]

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4 A zoo has an information point.

- Visitors use a menu to select information about animals.
- The menu includes 500 different animals.
- The information is provided only using high definition video with an audio track.

(a) State **one** input device that could be used for the information point.

..... [1]

(b) The output is shown on a monitor.

State **one** other output device that could be used for the information point.

..... [1]

(c) The video files are stored at the information point.

State **one** secondary storage device that could be used.

..... [1]

(d) The zoo decides to introduce Quick Response codes in different places in the zoo. These provide further information about the animals.

Describe how customers obtain the information from the Quick Response codes.

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..... [4]

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5 Sonia shares files with her friends. The method of data transmission she uses is half-duplex serial transmission.

(a) Describe how data is transmitted using half-duplex serial data transmission.

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..... [4]

(b) The system uses parity bits to check for errors during data transmission.

The outcome of four bytes after transmission is:

Byte 1	Byte 2	Byte 3	Byte 4
00110011	01010100	10110100	01110111

One of the bytes has been transmitted incorrectly.

Identify the byte that was transmitted incorrectly.

Byte .....

Explain how you identified the byte that was transmitted incorrectly.

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[4]

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6 Ishan is a member of a software community that develops computer games. He has programmed a new feature for one of the community's existing games.

(a) Ishan compiles the program before he issues it to the community.

(i) Explain **one** benefit of Ishan compiling the program.

.....

..... [1]

(ii) Explain **one** drawback of Ishan compiling the program.

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..... [1]

(b) Ishan shares the program with community members over the Internet, using Secure Socket Layer (SSL).

(i) Explain how Ishan will know he is on a secure website.

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..... [1]

(ii) Describe how an SSL connection is established.

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..... [5]

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(c) The community publishes completed games on the Internet as freeware.

Describe what is meant by freeware.

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..... [4]

(d) The program files for the games are compressed before they are published on the Internet.

(i) Describe **one** benefit of compressing the program files.

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..... [2]

(ii) State whether **lossy** or **lossless** compression should be used.

..... [1]

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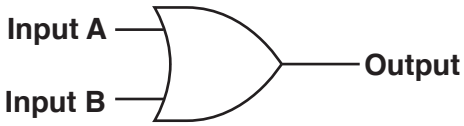
7 A factory manufactures plastic pipes. It uses logic circuits to control the manufacturing process.

(a) Consider the logic gate:



Complete the truth table for this logic gate.

Input A	Input B	Output
0	0	
0	1	
1	0	
1	1	

[1]

(b) Consider the truth table:

Input A	Input B	Output
0	0	0
0	1	1
1	0	1
1	1	0

State the **single** logic gate that produces the given output.

..... [1]

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(c) Plastic pipes of various sizes are manufactured by heating the plastic and using pressure.

The manufacturing system uses sensors to measure the pressure (P), temperature (T) and speed (S) of production.

The inputs to the manufacturing system are:

Input	Binary value	Condition
P	1	pressure is > 5 bar
	0	pressure is <= 5 bar
T	1	temperature is > 200 degrees Celsius
	0	temperature is <= 200 degrees Celsius
S	1	speed is > 1 metre per second
	0	speed is <= 1 metre per second

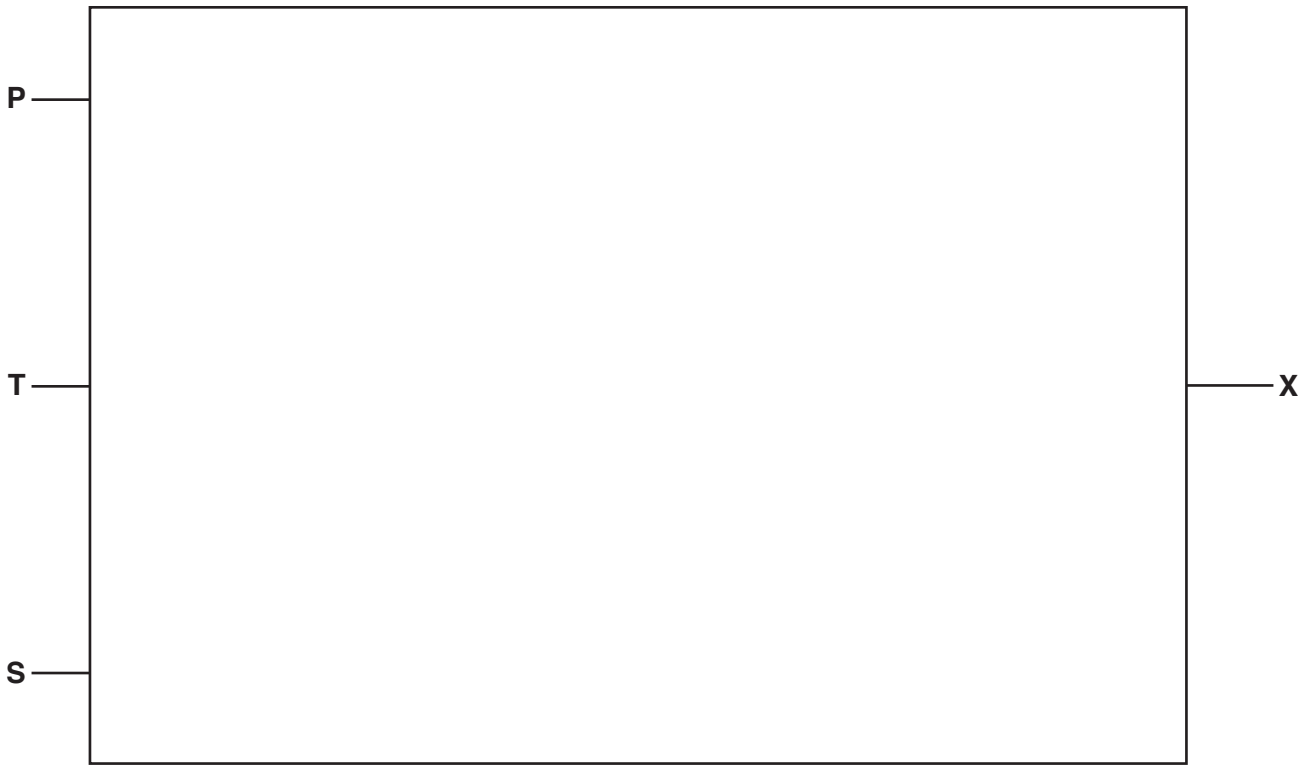
The system will sound an alarm (**X**) when certain conditions are detected.

The alarm will sound when:

Temperature is > 200 degrees Celsius and the pressure is <= 5 bar
or
Speed is > 1 metre per second and Temperature is <= 200 degrees Celsius

Draw a logic circuit to represent the above alarm system.

Logic gates used must have a maximum of **two** inputs.



[5]

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(d) Give **two** benefits of using sensors to monitor the manufacture of plastic pipes.

1 .....

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2 .....

..... [2]

8 Explain how an instruction is fetched in a Von Neumann model computer.

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..... [6]

9 HTML can be used to create the structure and the presentation of web pages.

(a) Describe what is meant by HTML structure.

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..... [2]

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(b) Gloria writes a paragraph as an answer to an examination question about accessing a website.

Use the list given to complete Gloria's answer by inserting the correct **four** missing terms. Not all terms will be used.

- browser
- cookies
- Hypertext Markup Language (HTML)
- hypertext transfer protocol (http)
- hypertext transfer protocol secure (https)
- Internet Protocol address (IP address)
- Media Access Control address (MAC address)
- web server

The user enters the URL of the website. The ..... uses the DNS server to look up the ..... of the website.

The browser sends a request to the ..... to obtain the website files. The website files are sent as ..... that is interpreted by the browser.

[4]

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