Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

2499620558

COMPUTER SCIENCE **0478/13**

Paper 1 Theory **May/June 2017**

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.

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.

The syllabus is approved 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 The memory of a computer contains data and instructions in binary.

The following instruction is stored in a location of the memory.

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

(a) Convert the instruction into hexadecimal.

.....

.....

..... [2]

(b) Explain why a programmer might prefer to read the instruction in hexadecimal rather than in binary.

.....

.....

.....

..... [2]

(c) Give **two** other uses of hexadecimal.

Use 1 .....

.....

Use 2 .....

.....
[2]

2 Programmers can use a high-level language to write a computer program.

(a) Explain what is meant by the term ‘high-level language’.

.....

.....

.....

..... [2]

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(b) A program written in a high-level language is translated into machine code. This is so that it can be processed by a computer.

Name one type of translator that can be used.

..... [1]

(c) Describe how your answer to **part (b)** translates this program.

.....

.....

.....

.....

.....

.....

..... [3]

3 Steffi has a number of files of different sizes that contain her work.

Tick (✓) to show whether each statement is **true** or **false**.

Statement	true (✓)	false (✓)
47KB is larger than 10MB.		
250bytes is smaller than 0.5MB.		
50GB is larger than 100MB.		
1TB is smaller than 4GB.		

[4]

4 Five statements about **serial half-duplex** data transmission are shown in the table below.

Tick (✓) to show whether each statement is **true** or **false**.

Statement	true (✓)	false (✓)
Data is transmitted in one direction only, one bit at a time.		
Data is transmitted in both directions, multiple bits at a time.		
Data is transmitted in one direction only, multiple bits at a time.		
Data is transmitted in both directions, but only one direction at a time. Data is transmitted one bit at a time.		
Data is transmitted in both directions, but only one direction at a time. Data is transmitted multiple bits at a time.		

[5]

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5 **(a)** Parity checks are often used to detect errors that may occur during data transmission.

The received bytes in the table below were transmitted using **odd parity**.

Tick (✓) to show whether each byte has been **corrupted during transmission** or **not corrupted during transmission**.

Received byte	corrupted during transmission (✓)	not corrupted during transmission (✓)
10110100		
01101101		
10000001		

[3]

(b) Another method of error detection is Automatic Repeat reQuest (ARQ).

Explain how ARQ is used in error detection.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

6 Signals are sent to and from the components of a processor using buses.

Identify and describe the purpose of **two** different buses.

Bus 1 .....

Purpose .....

.....

.....

.....

.....

.....

Bus 2 .....

Purpose .....

.....

.....

.....

.....

.....

[6]

7 **Six** security terms and **six** statements are listed below.

Draw a line to match the security term with the most appropriate statement.

Security term	Statement
Encryption	Provides a secure connection between web browsers and websites allowing secure transmission of private data.
Secure Socket Layer (SSL)	Computer that acts as an intermediary between a web browser and the Internet.
Pharming	Legitimate-looking email is sent in the hope of gathering personal information; it requires the user to click on a link in the email.
Phishing	Uses rules and criteria, set by the user, to help protect a network or system from unauthorised access.
Firewall	Malicious code installed on the hard drive of a user's computer; this code will redirect the user to a fake website without the user's knowledge.
Proxy server	Scrambles data for secure transmission.

[5]

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[Turn over

8 Complete the paragraph by choosing **six** correct terms from the list.

- Optical
- On-line
- RAM
- HDD
- Primary
- SSD
- Secondary
- ROM
- Off-line

A computer has two different types of memory. ..... memory is not directly accessed by the CPU, but it allows a user to store data that can easily be accessed by applications. Two examples of this type of memory are ..... and ..... . The second type of memory is ..... memory. This memory is directly accessed by the CPU. It allows the processor to access data and instructions that are stored in this memory. Two examples of this memory are ..... and ..... .

[6]

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9 A supermarket has a system that allows customers to check out their own shopping.

Identify and describe the purpose of **two** input devices and **one** output device used in this system.

Input device 1 .....

Purpose .....

.....

.....

Input device 2 .....

Purpose .....

.....

.....

Output device 1 .....

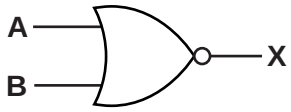
Purpose .....

.....

.....

[6]

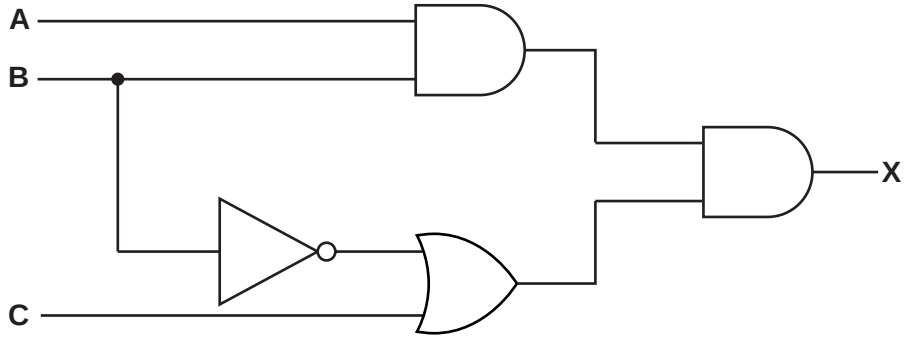
10 **(a)** Complete the truth table for the NOR gate.



A	B	Output (X)
0	0	
0	1	
1	0	
1	1	

[1]

(b) Write a logic statement that corresponds with the following logic circuit.



X = ... [3]

11 State **three** functions provided by an operating system.

Function 1 .....

.....

.....

Function 2 .....

.....

.....

Function 3 .....

.....

.....

[3]

12 The processes in a chemical factory are monitored by sensors connected to a microprocessor.

(a) Identify **two** different sensors used in this application. Give an example of how each sensor could be used in the chemical factory.

Sensor 1 .....

Use .....

.....

Sensor 2 .....

Use .....

.....
[4]

(b) Describe how the sensors and a microprocessor are used to monitor a process.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

13 (a) Gurdeep wants to send a large file to Jennifer over the Internet.

State **two** benefits of compressing the file to send it.

Benefit 1 .....

.....

.....

Benefit 2 .....

.....

.....
[2]

(b) Two types of compression are lossy and lossless.

Choose the most suitable type of compression for the following and explain your choice.

(i) Downloading the code for a computer program:

Type of compression .....

Explanation .....

.....

.....

.....
[3]

(ii) Streaming a video file:

Type of compression .....

Explanation .....

.....

.....

.....
[3]

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