Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0557422193

COMPUTER SCIENCE **0478/13**

Paper 1 Theory **May/June 2018**

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 approved 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.

© UCLES 2018

1 State **five** sensors that could be used in the following applications.

Give a **different** type of sensor for each application.

Application	Sensor
Weighing a baby in a hospital	
Turning off a kettle when the water boils	
Controlling an automatic door	
Monitoring the air quality in an aeroplane	
Counting cars crossing a bridge	

[5]

2 Draw a line to connect each term to the correct application.

Term	Application
Simplex	A telephone that can receive and transmit audio signals simultaneously.
Duplex	A two-way radio (walkie-talkie) that can receive and transmit messages, but not at the same time.
Half-duplex	A microphone that transmits data to a MIDI system.

[2]

© UCLES 2018

3 Three security issues that could affect users online are **phishing**, **pharming** and **spam**.

Explain what is meant by each security issue.

Phishing .....

.....

.....

.....

Pharming .....

.....

.....

.....

Spam .....

.....

.....

.....

[6]

4 A company transmits data to external storage at the end of each day.

(a) Parity checks can be used to check for errors during data transmission.

The system uses **odd parity**.

(i) Tick (✓) to show for each of the received bytes whether they have been **transmitted correctly** or **transmitted incorrectly**.

Received byte	**Transmitted correctly (✓)**	**Transmitted incorrectly (✓)**
10001011		
10101110		
01011101		
00100101		

[4]

(ii) State **one** other method that could be used to check for transmission errors.

..... [1]

(b) Data can be transferred using parallel or serial data transmission.

(i) Describe what is meant by parallel data transmission.

.....

.....

.....

..... [2]

(ii) Give **one** application of parallel data transmission.

.....

..... [1]

© UCLES 2018

(iii) Explain why serial data transmission is normally used for transferring data over a long distance.

.....

.....

.....

..... [2]

(c) Data transferred over a network is encrypted to improve data security.

The system uses 64-bit symmetric encryption.

(i) Explain how encryption improves data security.

.....

.....

.....

..... [2]

(ii) Explain **one** method that could be used to increase the level of security provided by the encryption.

.....

.....

.....

..... [2]

© UCLES 2018

5 **(a)** Convert the denary number 107 to binary.

..... [1]

(b) Represent the denary number 300 as it would be stored in a 12-bit binary register.

..... [2]

(c) Convert the denary number 179 to hexadecimal.

..... [2]

6 One of the roles of an operating system is to deal with interrupts.

(a) Explain the term interrupt.

.....

.....

.....

..... [2]

(b) Identify **three** devices that make use of interrupts.

Device 1 .....

Device 2 .....

Device 3 .....

[3]

© UCLES 2018

7 A train station uses large touch screens to allow passengers to search for train information and buy tickets.

(a) State **three** benefits of using a touch screen in the train station.

Benefit 1 .....

.....

Benefit 2 .....

.....

Benefit 3 .....

.....

[3]

(b) The touch screens at the station use resistive touch technology.

Describe how resistive touch technology works.

.....

.....

.....

.....

.....

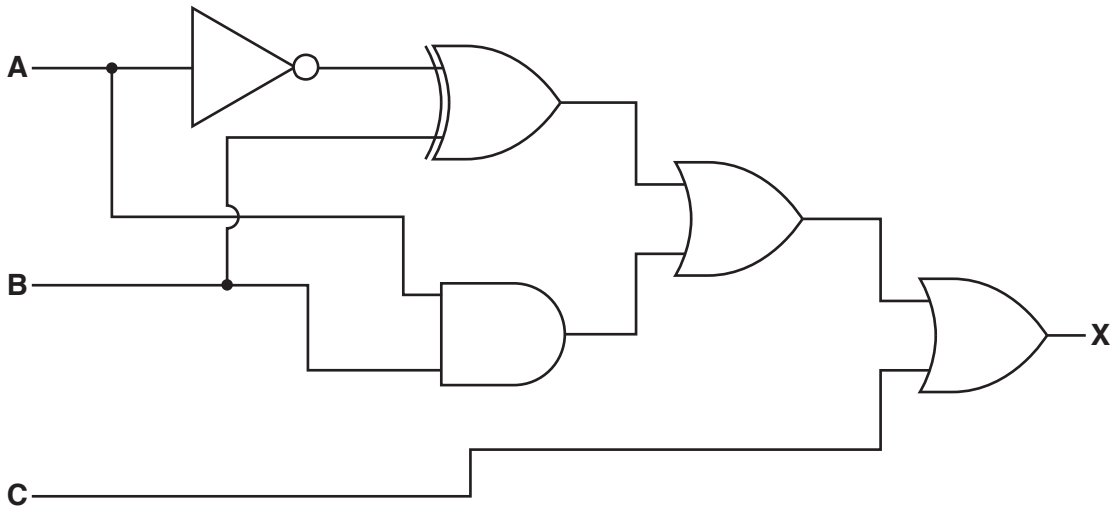
.....

.....

..... [4]

© UCLES 2018

8 A logic circuit is shown below.



(a) Complete the truth table for the given logic circuit.

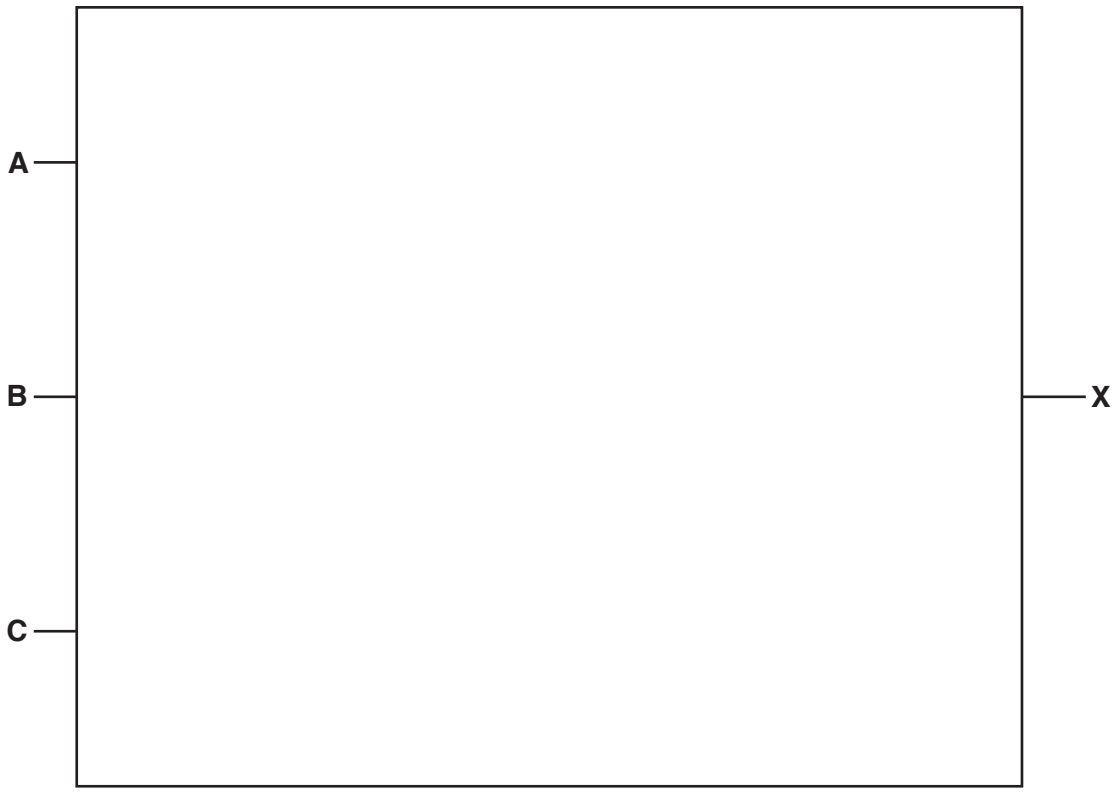
A	B	C	Working space	X
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[4]

© UCLES 2018

(b) Draw a logic circuit corresponding to this logic statement:

X = 1 if (A is NOT 1) OR ((B is 1 OR C is 1) AND (B is NOT 1 OR A is NOT 1))



[6]

9 Three types of translators are **assemblers**, **compilers** and **interpreters**.

Tick (✓) the appropriate boxes to show which statements apply to each type of translator.

Statement	**Assembler (✓)**	**Compiler (✓)**	**Interpreter (✓)**
Translates high-level language into machine code			
Provides error diagnostics			
Translates whole program to object code in one operation			
Translates and executes one line of code at a time			

[3]

10 Explain how an instruction is fetched in a computer based on the Von Neumann model.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

11 Identify **three** similarities between CDs and DVDs.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

12 An image is to be stored electronically.

The image is 256 pixels high by 200 pixels wide with a 16-bit colour depth.

Calculate the file size of the image. **You must show all of your working.**

File size ..... kB [3]

13 Describe the role of an Internet Service Provider (ISP).

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© UCLES 2018