UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

COMPUTING **9691/13**

Paper 1 **October/November 2013**

1 hour 30 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 on all the work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
No marks will be awarded for using brand names for 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.

This document consists of **13** printed pages and **3** blank pages.

UNIVERSITY *of* CAMBRIDGE
International Examinations

[Turn over

1 **(a)** Define the terms hardware and software.

hardware ....

....

software ....

.... [2]

(b) A cinema allows its customers to buy tickets from an automatic dispensing machine. Payment can be made either with cash, or by debit or credit card.

State **two** input and **two** output devices that would be needed and give reasons for your choice of device.

Input device 1 ....

Reason ....

....

Input device 2 ....

Reason ....

....

Output device 1 ....

Reason ....

....

Output device 2 ....

Reason ....

.... [8]

2 **(a) (i)** A positive integer is represented in binary as **10101101**.

What is the denary value?

....

.... [1]

(ii) How would the denary value **73** be represented as a positive binary integer?

....

.... [1]

(b) Explain what is meant by the character set of a computer.

....

....

....

.... [2]

(c) Explain how a character is represented in a computer.

....

....

....

.... [2]

3   A company uses software to design bathroom taps.

   (a) Name a suitable type of software. Give **two** reasons to justify your choice.

   Type of software ....

   Reason 1 ....

   ....

   ....

   Reason 2 ....

   ....

   .... [3]
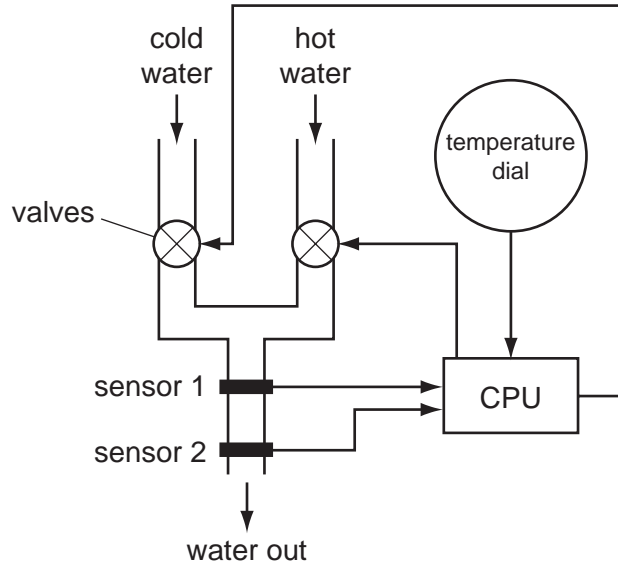
(b) The water temperature and water flow will be controlled by a microprocessor.

The user selects a temperature and sensor 1 interacts with the microprocessor to control the temperature of the water coming from the tap. Water flows from the tap when sensor 2 detects hand movement.

(i) Describe how the sensor 1 and microprocessor control the water temperature. Include any safeguards that should be built into the system.

....

....

....

....

....

....

(ii) Describe how the sensor 2 and microprocessor start and stop the water flow.

....

....

....

....

....

.... [6]

4 Magnetic is one type of storage medium used by secondary storage devices.

(a) Name **two** other **different** types of storage medium.

Give **two** devices that use **each** type of named medium.

Medium type 1 ....

Device 1 ....

....

Device 2 ....

....

Medium type 2 ....

Device 1 ....

....

Device 2 ....

.... [6]

(b) Describe how buffers and interrupts are used when sending data from main memory to one of these secondary storage devices.

....

....

....

....

....

....

....

....

....

.... [4]

5 A new sales and stock control system has been developed for a large toy shop.

(a) When the software was installed, user documentation was provided.

List **four** items that were supplied as part of the user documentation.

1 ....

....

2 ....

....

3 ....

....

4 ....

.... [4]

(b) Customers can select toys they want to buy from computer terminals situated throughout the shop.

Discuss the use of colour and layout in the design of the human computer interface (HCI) so that customers can easily use the system.

....

....

....

....

....

....

....

.... [4]

                                                             [Turn over

6 (a) There are 3 network topologies on the left and 7 statements about networks on the right.

Draw a line connecting each statement to the appropriate network topology.

	If the central hubs fails, the whole network fails
Bus	Works well under heavy loading
	Poor performance under heavy loading
Star	If one connection fails, the other terminals are not affected
	Less cabling required
Ring	Different communication media can be used for different nodes
	Can be used for wide area networks

[7]

(b) Explain what is meant by packet switching in networks.

....

....

....

....

....

....

....

.... [4]

7 (a) A large engineering company has made available for the first time off-the-shelf word processors, spreadsheets and communication software.

Describe the impact on the company and its staff following the introduction of all of this software.

....

....

....

....

....

....

....

.... [4]

(b) The company has decided to purchase some new software to extend its use of computer technology across the company.

The management is considering either off-the-shelf packages or custom-written software.

Discuss the benefits and drawbacks of each type of software.

Off-the-shelf

Benefit ....

....

Drawback ....

....

Custom-written

Benefit ....

....

Drawback ....

.... [4]

8 **(a)** Complete the truth table for the following logic circuit.
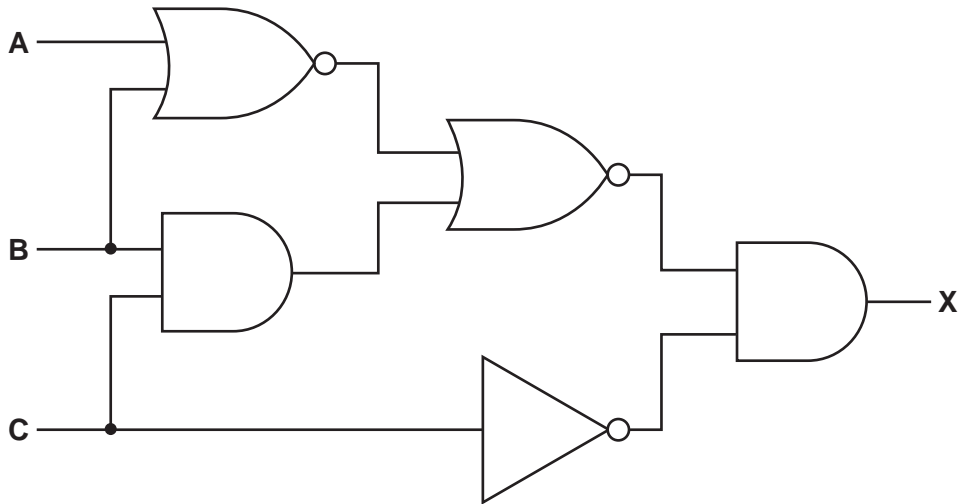
A	B	C	Working space	X
0	0	0		0
0	0	1		0
0	1	0		1
0	1	1		0
1	0	0		1
1	0	1		0
1	1	0		1
1	1	1		0

[4]

(b) Draw the logic circuit which corresponds to the following logic statement.

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

A —

B — X

C —

[5]

     [Turn over
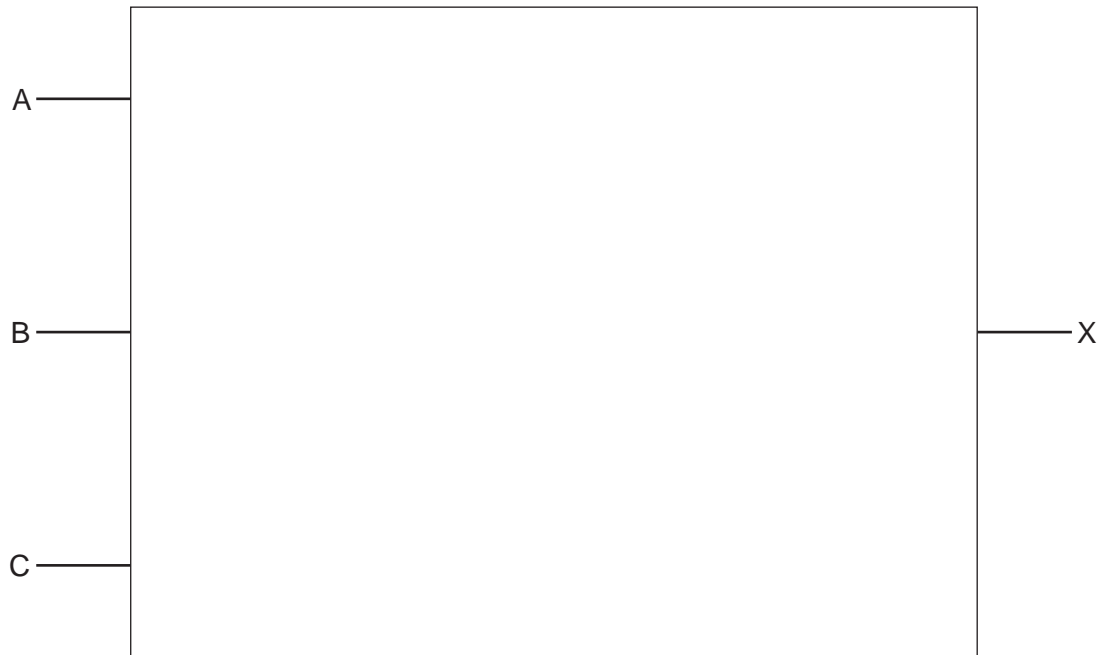
9 The array `Colour` stores colours typed in by the user.

(a) The array is treated as a stack. The first three colours entered are BLACK, RED, GREEN in this order.

Colour

7	
6	
5	
4	
3	GREEN
2	RED
1	BLACK

(i) A colour is then removed.

Which colour is removed first?

.... [1]

(ii) A new colour, BLUE, is then added.

Into which array element would BLUE be stored?

.... [1]

(b) The array is treated as a queue. The first four colours entered are YELLOW, PURPLE, WHITE, PINK in this order.

Colour

7	
6	
5	
4	PINK
3	WHITE
2	PURPLE
1	YELLOW

(i) A colour is then removed.

Which colour is removed first?

.... [1]

(ii) A new colour, ORANGE, is then added.

Into which array element would ORANGE be stored?

.... [1]

BLANK PAGE

BLANK PAGE

BLANK PAGE