UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

2168604339

COMPUTER STUDIES **7010/12**

Paper 1 **October/November 2012**

2 hours 30 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

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 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.

For Examiner's Use

This document consists of **19** printed pages and **1** blank page.

© UCLES 2012

For Examiner's Use

1 Give **three** features of a data protection act.

1 .....

.....

2 .....

.....

3 .....

..... [3]

2 Describe **four** of the stages in the creation of an expert system.

1 .....

.....

2 .....

.....

3 .....

.....

4 .....

..... [4]

For Examiner's Use

3 For each of the following five groups of hardware items, write down a computer application that would need those items.

List of hardware items	Application
webcam, microphone, speakers	
barcode reader, POS terminal	
pressure sensor, ADC, lights, siren	
data gloves, data goggles	
light pen, plotter, 3D printer	

[5]

4 A company has decided to introduce robots into its manufacturing process.

Give **three** benefits and **one** drawback to the company management.

Benefits

1 .....

.....

2 .....

.....

3 .....

.....

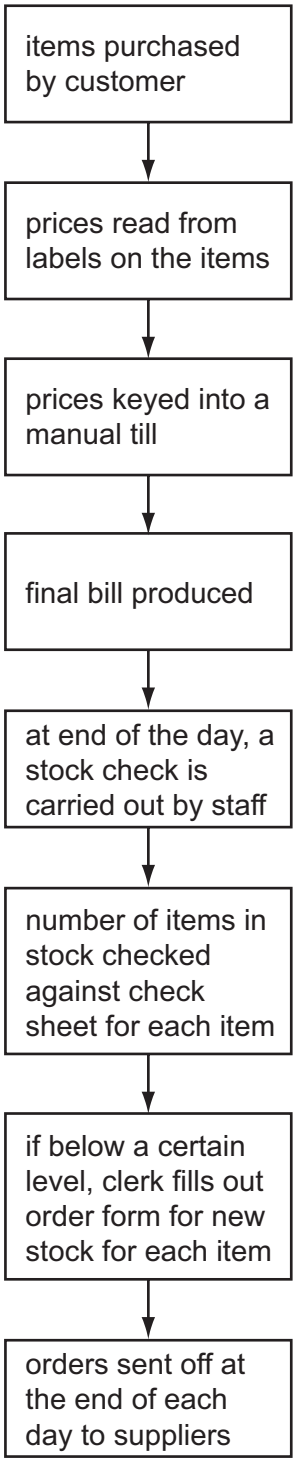
Drawback

.....

..... [4]

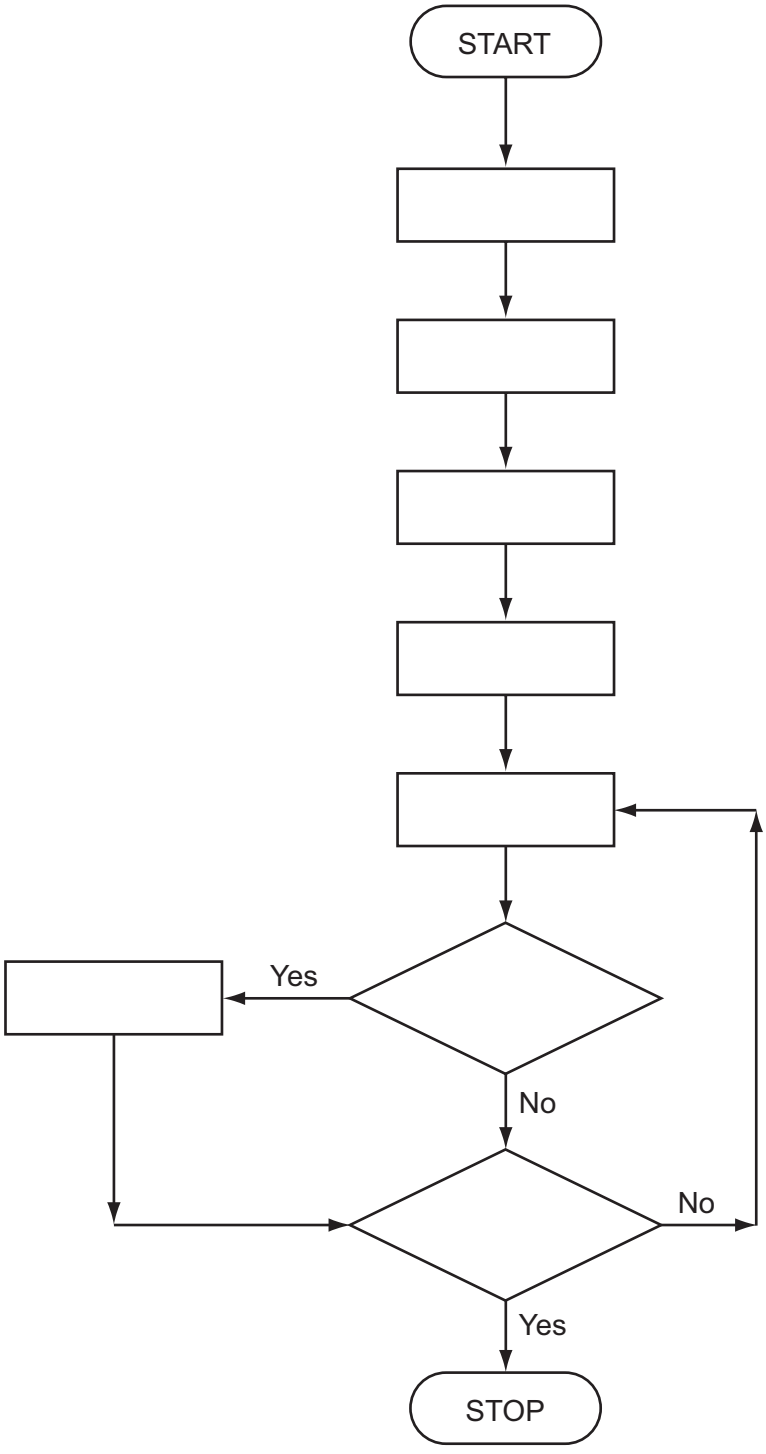
5

Flowchart A
shows an existing manual system used by a shop to calculate a customer's bill and carry out stock control.



existing manual system

Flowchart B
shows the intended automatic computer-controlled system.



intended automatic computerised system

For Examiner's Use

Using item numbers only from the following list, complete **Flowchart B**.

For Examiner's Use

Item Number	Description
1	each item quantity reduced by 1 on the database
2	is stock level of item < = re-order level?
3	item price found on database
4	quantity of stock item checked against re-order level at end of the day
5	order for new stock of each item automatically sent out
6	barcode on each item scanned
7	have all items been checked?
8	an itemised bill is produced

[4]

6 State **three** different methods that allow people to communicate using the Internet.

In **each** case, give a different benefit for the stated method.

Method 1 .....

Benefit .....

.....

.....

Method 2 .....

Benefit .....

.....

.....

Method 3 .....

Benefit .....

.....

..... [6]

For Examiner's Use

7 **(a)** Lucy wrote: *"I should validate the input into my database by typing in the same data twice"*.

Why was her statement incorrect?

.....

.....

.....

..... [2]

(b) She lost all her photographs when her computer crashed.

(i) What is meant by the term *crashed*?

.....

.....

(ii) How could she have avoided losing all her photographs?

.....

..... [2]

(c) Lucy was sent an important attachment in an email, but couldn't open it.

Give a reason why she couldn't open the attachment.

.....

.....

..... [1]

(d) She decided to invest in a wireless (Wi-Fi) mouse and keyboard for her computer.

Give **one** benefit and **one** drawback of using wireless devices.

Benefit .....

.....

.....

Drawback .....

.....

..... [2]

© UCLES 2012

For Examiner's Use

8 The following 2 pictures are images of the letter 'R' stored as bitmap files:

X

Y

(a) Why is picture **X** fuzzy?

.....

.....

..... [2]

(b) Even the sharp image in picture **Y** would become fuzzy if enlarged. Why would this happen?

.....

.....

..... [2]

(c) Name an output device that makes use of this imaging method.

..... [1]

(d) State a drawback of storing sharp quality bitmap image files.

.....

..... [1]

© UCLES 2012

[Turn over

For Examiner's Use

9 A large company has decided to replace some of its European technical call centres. The new call centres will be located in three developing countries around the world.

(a) Give **two** benefits of opening these new call centres.

1 .....

.....

.....

2 .....

.....

..... [2]

(b) Give **two** drawbacks of opening these new call centres.

1 .....

.....

.....

2 .....

.....

..... [2]

(c) Give **two** ways in which the workforce in the European call centres could be affected.

1 .....

.....

.....

2 .....

.....

..... [2]

For Examiner's Use

(d) The staff at these new call centres use computers for long periods of time.

Give **two** potential health and safety risks to these staff.

1 .....

.....

.....

2 .....

.....

..... [2]

10 A computer system is to have access to the Internet.

Name and describe **three** potential security issues.

Security issue 1 .....

Description .....

.....

.....

Security issue 2 .....

Description .....

.....

.....

Security issue 3 .....

Description .....

.....

..... [6]

For Examiner's Use

11 An alarm sounds when certain conditions occur in a nuclear reactor.

The output, X, of a logic circuit that drives the alarm must have a value of 1 if:

either carbon dioxide pressure too low **and** temperature < = 300°C

or water pressure > 10 bar **and** temperature > 300°C

The inputs to the system are:

Input	Binary	Condition
P	**0**	carbon dioxide pressure too low
	1	carbon dioxide pressure acceptable
T	**0**	temperature > 300°C
	1	temperature < = 300°C
W	**0**	water pressure > 10 bar
	1	water pressure < = 10 bar

(a) Draw the required logic circuit using AND, OR and NOT gates only.

[5]

(b) Complete the truth table for the above system.

P	T	W	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 2012

For Examiner's Use

12 **(a)** What is meant by the term *bit streaming*?

.....

.....

.....

..... [2]

(b) John uses bit streaming to watch films from websites.

(i) Give **two** advantages of using bit streaming for this purpose.

1 .....

.....

2 .....

..... [2]

(ii) Give **two** potential problems of using bit streaming for this purpose.

1 .....

.....

2 .....

..... [2]

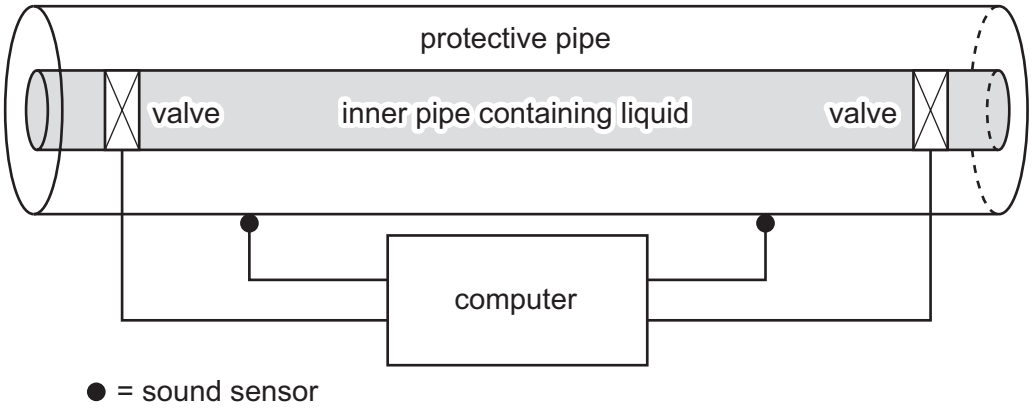
(c) Describe another application of bit streaming.

.....

..... [1]

13 A chemical company uses pipes to transfer hazardous liquids. To protect the workforce, each pipe is inside a protective pipe.

For Examiner's Use



Sensors are used to detect the sound of any liquid dripping into the protective pipe. Actuators operate the valves that regulate the flow of liquid through the inner pipe.
This system is controlled by a computer.

(a) Describe how the sensors, actuators, valves and computer are used to monitor and control the liquid in the pipe.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

(b) Give **two** advantages of using this computer-controlled system rather than visual checks by the workforce.

For Examiner's Use

1 .....

.....

.....

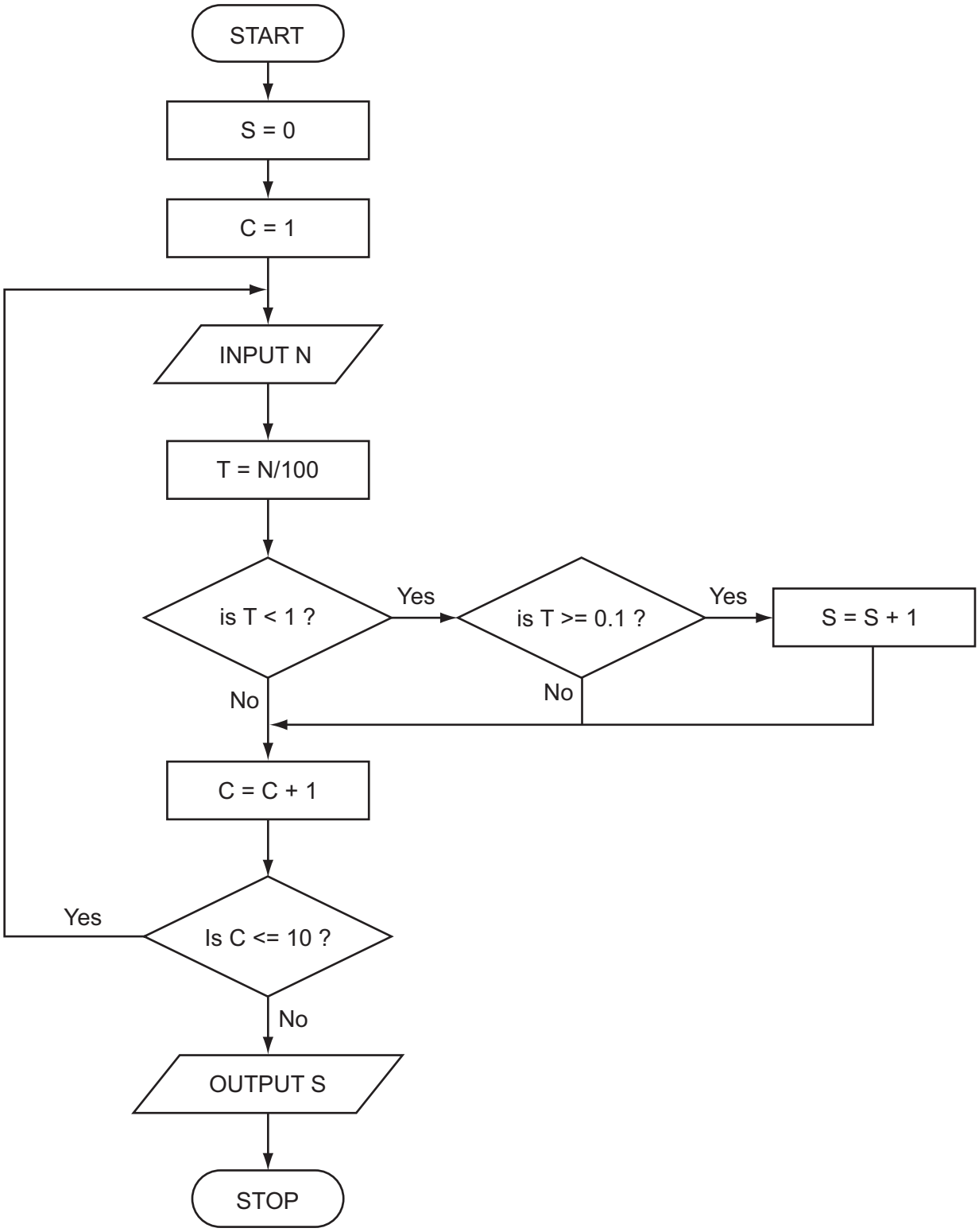
2 .....

.....

..... [2]

14 Study the following flowchart very carefully.

For Examiner's Use



Complete the trace table for the following data:

For Examiner's Use

15, 8, 251, 35, 60, 3, 2, 1516, 19, 55

S	C	N	T	OUTPUT

[5]

For Examiner's Use

15 A company organises music concerts. It has been decided to use a spreadsheet to find out how many nights each band must play at a venue to make a profit.

	A	B	C	D	E
1	**Name of band**	**Booking fee ($)**	**Cost per seat ($)**	**Venue capacity**	**Minimum number of nights**
2	Goo Goo Guys	300 000	20.00	10 000	1.5
3	Frozen Primates	1 520 000	40.00	20 000	1.9
4	The Cinnamon Girls	500 000	25.00	15 000	1.3
5	U235	2 400 000	50.00	20 000	2.4
6	Steal That	1 400 000	40.00	15 000	2.3
7					

(a) The minimum number of nights needed to make a profit is found by dividing the booking fee by the total nightly takings (assuming the venue is always full to capacity).

What formulas must be in column E?

	E
1	**Minimum number of nights**
2	
3	
4	
5	
6	

[2]

(b) What formula could be placed in cell C7 to find the average cost per seat?

.....

..... [1]

(c) To make a profit possible, it is necessary to **increase** the values in column E to the next whole number.

Describe how this could be done.

.....

.....

.....

.....

..... [2]

For Examiner's Use

16 The following statistics refer to a music track being recorded on a CD:

- music is sampled at 44 100 times per second
- each sample is 16 bits
- each track requires separate sampling for left and right speakers of a stereo recording

(8 bits = 1 byte, 1 megabyte = 1 048 576 bytes)

(a) (i) How many bytes are required to represent **one** second of sampled music?

.....

[2]

(ii) If a typical music track is 3 minutes long, how much memory is used on the CD to store one track? (Give your answer in megabytes.)

.....

.....

.....

.....

[2]

(b) When using MP3 format, the size of the above music track will be reduced by a factor of 10 (i.e. the size is reduced by 90%).

How is the music quality retained?

.....

.....

.....

.....

.....

.....

[2]

17 (a) Write an algorithm, using pseudocode or a program flowchart only, that:

- inputs a series of positive numbers (-1 is used to terminate the input),
- outputs how many numbers were less than 1000 and
- outputs how many numbers were greater than 1000.

For Examiner's Use

[4]

(b) Write an algorithm, using pseudocode or a program flowchart only, that

- inputs fifty numbers each as 4 separate digits, for example: **1 5 4 1**
- outputs the percentage of numbers that were *palindromes*.

(note: a *palindrome* reads the same way backwards or forwards. For example, 1331 is a *palindrome* but 1541 is not).
Use separate variables to store the separate digits of a number (for example D1, D2, D3, D4).

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

For Examiner's Use

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.

University of 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 2012