UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

CANDIDATE
NUMBER

COMPUTER STUDIES **0420/13**

Paper 1 **October/November 2010**

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.

UNIVERSITY of CAMBRIDGE
International Examinations

[Turn over

2

Explain, with examples where appropriate, the following **five** computer terms.

(a) interrupt

....

....

.... [2]

(b) optical media

....

....

.... [2]

(c) CAD

....

....

.... [2]

(d) verification

....

....

.... [2]

(e) global positioning system (GPS)

....

....

.... [2]

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iner's

2 **(a)** What is meant by the term *drop-down menu*?

....

.... [1]

(b) Give an example of where a drop-down menu could be used.

....

.... [1]

(c) Give **one** disadvantage of a drop-down menu.

....

.... [1]

3 A typical computer system contains the following **four** components:

- RAM
- ROM
- hard disk
- modem

Describe the function of each of these components.

RAM ....

....

ROM ....

....

hard disk ....

....

modem ....

.... [4]

4 (a) Describe **two** differences between batch processing and real-time tran~~~~ processing.

    1 ....

    ....

    2 ....

    .... [2]

  (b) Give **one** example of the use of each type of processing.

    batch: ....

    ....

    ....

    real-time transaction: ....

    ....

    .... [2]

5

5 Most laptop computers have networking capability.

(a) Describe **two** other desirable features you would look for when choosing a laptop computer.

1 ....

....

2 ....

.... [2]

(b) Describe **two** advantages of using broadband to connect to the Internet rather than using dial-up.

....

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....

....

....

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....

....

.... [4]

6   Complete the following table by writing down the most appropriate data collection for the given application.

Application	Data collection method
Reading information from a credit/debit card	
Choosing an option from a customer information screen at an airport	
Reading the results from a questionnaire where pencil lines were used to choose options	

[3]

7   Name **two** of the common methods used to change over to a new computer system. For each named method, give **one** advantage and **one** disadvantage.

Method 1 ....

Advantage ....

....

....

Disadvantage ....

....

....

Method 2 ....

Advantage ....

....

....

Disadvantage ....

....

.... [6]

8   Describe how computers are used to generate graphics and animation effects for films and arcade games.

   ....

   ....

   ....

   ....

   ....

   ....

   .... [3]

9 Students at a school decide to produce a monthly newsletter to inform parents of eve...
   They could either produce a magazine on paper or arrange for a multimedia presentati...
   the school hall.

   (a) State **two** advantages and **two** disadvantages of producing the magazine on paper.

   Advantage 1 ....

   ....

   ....

   Advantage 2 ....

   ....

   ....

   Disadvantage 1 ....

   ....

   ....

   Disadvantage 2 ....

   ....

   .... [4]

   (b) State **two** advantages and **two** disadvantages of giving a multimedia presentation.

   Advantage 1 ....

   ....

   ....

   Advantage 2 ....

   ....

   ....

   Disadvantage 1 ....

   ....

   ....

   Disadvantage 2 ....

   ....

   .... [4]

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10 (a) What is meant by a *virus*?

....

....

....

.... [2]

(b) What is meant by *encryption*?

....

....

....

.... [2]

(c) (i) A student wrote "*I would make backup copies of my data to guard against viruses*".
Why is the student's statement not necessarily true?

....

....

.... [1]

(ii) The same student also wrote "*Encryption would stop a hacker accessing the data in my computer files*".
Why is the student's statement incorrect?

....

....

.... [1]

11 (a) Which validation methods are being carried out by the following three pseud... statements?

    (i) **if** age > 10 **and** age < 20 **then print** "correct"

    ....

    ....

    (ii) **if** gender = "male" **and** title = "Mr" **then print** "correct"

    ....

    ....

    (iii) **if** field = "" **then print** "input data is missing"

    ....

    .... [3]

(b) Name a **different** validation technique and give an example to show how it works.

Name ....

....

Example ....

.... [2]

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iner's
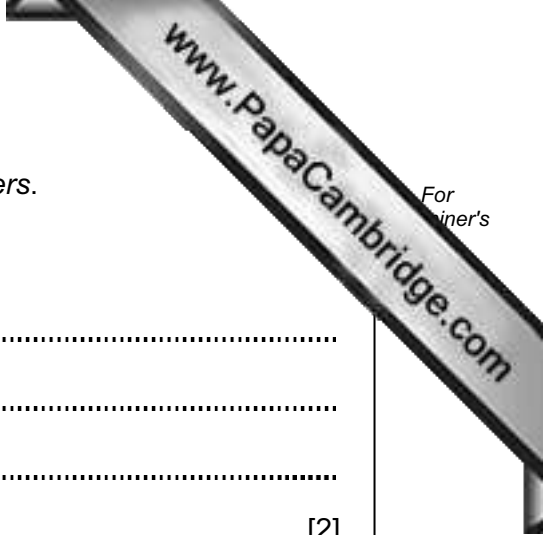
12 (a) A student is trying to find out information about *cloud computers*.

How could he use the Internet to find this information?

....

....

....

.... [2]

(b) Give **two** advantages of using the Internet to find information.

1 ....

....

....

2 ....

....

.... [2]

(c) Give **two** disadvantages of using the Internet to find information.

1 ....

....

....

2 ....

....

.... [2]

13 A spreadsheet has been set up to compare the monthly costs of five mobile networks. Normally a text message costs 2 cents and one minute of talk time 15 cents for all networks (100 cents = $1).

	A	B	C	D	E
1	Network name	Monthly charge ($)	No. of free texts	No. of free talk time minutes	Value of texts + talk time ($)
2	Lemon	65	500	500	85
3	Yodafone	65	1000	280	62
4	C-mobile	65	800	400	76
5	O-3	65	1000	500	95
6	T-world	65	2000	100	55
7				Best network:	

(a) What formula must be in E2 to calculate the value of the *Lemon* network offer?

....

.... [2]

(b) What formula needs to be placed in E7 to find the best offer?

....

.... [1]

(c) The customer actually uses 800 minutes of talk time per month.

How could the spreadsheet be modified so that the customer can find out which network still gives him the best deal?

....

....

....

.... [2]

14 An airport has a number of hotels nearby. A database has been set up to give cus   *For information to allow them to select a hotel.*   *iner's*

Hotel Ref	Name of hotel	No. of stars	No. of rooms	Hotel parking	Price per person ($)	Distance from airport (km)
H41	The Grand	3	45	Y	65	11
K22	Sleepy Inn	2	15	N	45	10
N15	Britannia	5	140	Y	150	4
L44	Beach Hotel	4	62	N	85	8
H30	Sea View	3	38	N	60	4
H21	Pyramid	3	25	N	70	5
N21	Superior	5	120	Y	200	2
K14	Travellers	2	15	N	45	10

(a) How many records are shown in the database?

[1]

(b) Which field in each record must be unique?

[1]

(c) The following search condition was typed in:

(**No. of stars** > 3) **OR** (**Hotel parking** = Y)

Using **Hotel Ref** only, which records would be found?

[2]

(d) Write down the search condition to find which hotels were less than 10 km from the airport and charged under $100 per person.

[2]

(e) The database was sorted into *descending order* using **No. of rooms**.

Using **Hotel Ref** only, write down the sorted order of records.

[2]

15 (a) The following flowchart shows how a burglar alarm system uses light sens[...] determine if an intruder has entered the house and decides to sound an alarm.

Select statements from the list below, **using numbers only**, to complete the flowchart.

List of statements
1 check sensor value with the stored value
2 convert signal to digital
3 has alarm been re-set?
4 is a signal detected?
5 is sensor value nominal?
6 is signal digital?
7 sound an alarm

[4]

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iner's
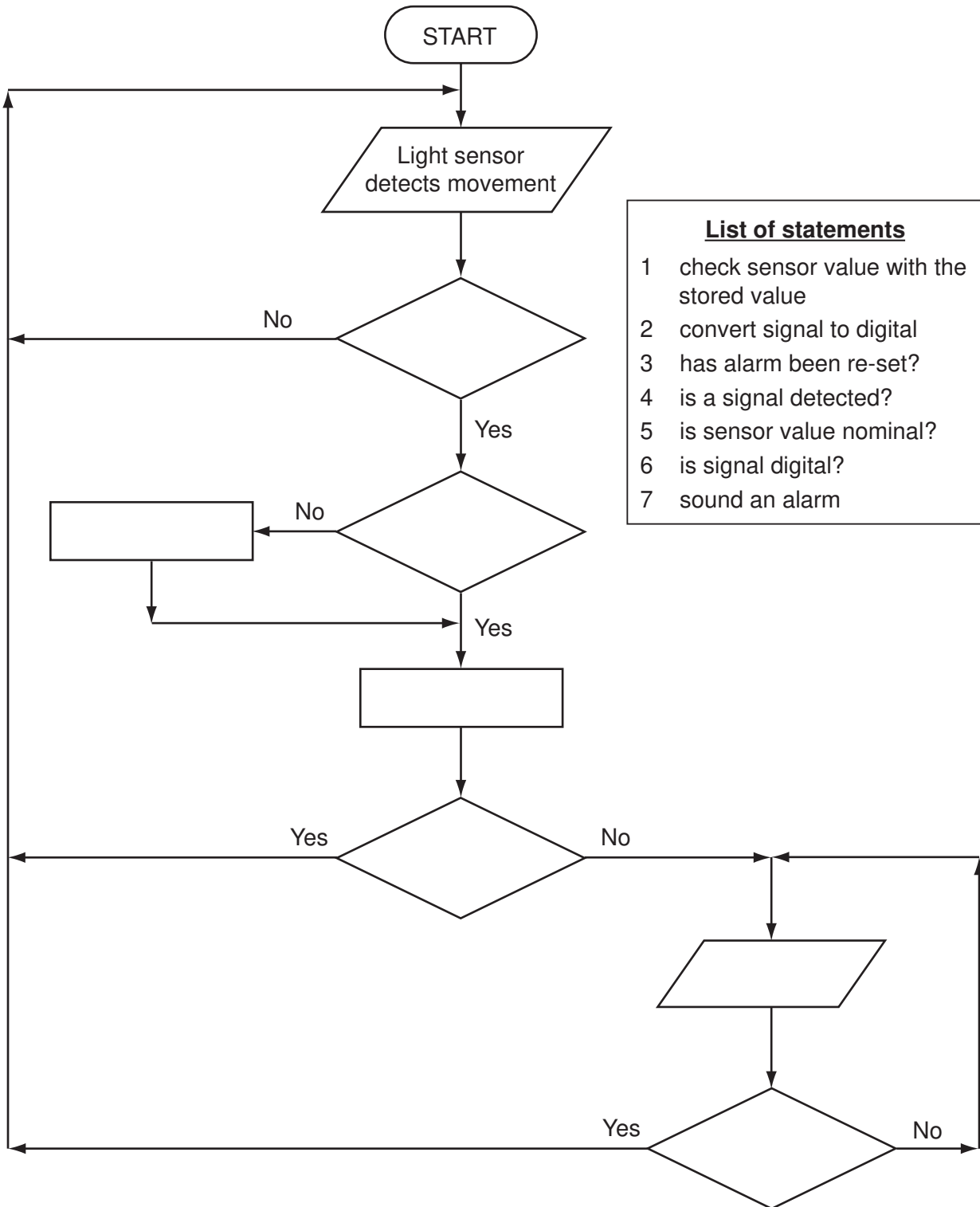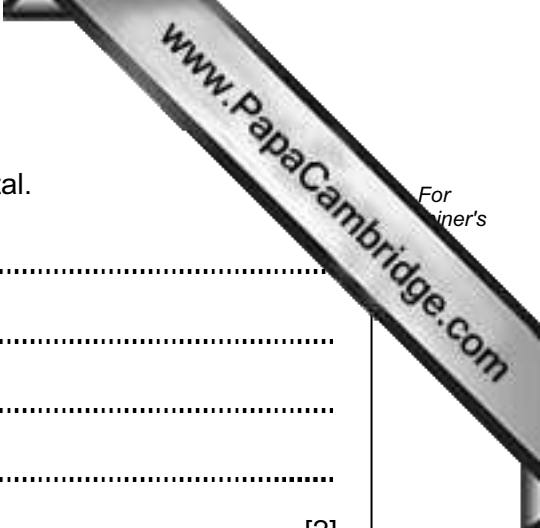
(b) Explain why the sensor signal needs to be converted into digital.

....

....

....

....

.... [2]

(c) Name a **different** sensor and describe an application that uses the named sensor.

Sensor name: ....

Description: ....

....

....

.... [2]

(d) The computer can't directly control items such as motors and heaters.

What additional hardware is needed to allow the computer to control these devices?

....

....

.... [1]

16 A customer logs on to a secure website using a code and a password. The first stag
key in a code which is his date of birth (DDMMYY) followed by 1234. The second stag
to type in the first, third, fourth and seventh character of his password.

The customer last logged on to the website on 15th March 2010.

(a) (i) The customer's date of birth is 15th November 1985. What is the customer's code?

(ii) Why is this code <u>not</u> unique?

....

....

(iii) Suggest how this coding system could be improved.

....

....

.... [3]

(b) (i) The customer's password is PAULO168.
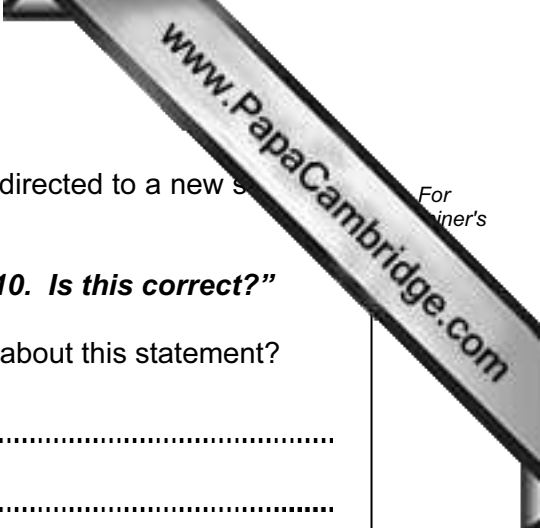
What does the customer need to type at the second stage?

    1st   3rd   4th   7th

(ii) Why are passwords used?

....

....

.... [2]

For
iner's

(c) If the customer gets through the two stages above he is then directed to a new s   page which states:

"You were last logged on to this website on 14th April 2010. Is this correct?"

What could have happened to make the customer concerned about this statement?

....

....

.... [1]

17 (a) Write an algorithm, using pseudocode or a flowchart, which

- inputs a set of positive numbers (which end with -1)
- outputs the average (mean) value of the input numbers
- outputs the value of the largest (highest) number input

[4]

(b) Write an algorithm, using pseudocode or a flowchart, which

- inputs a whole number (which is > 0)
- calculates the number of digits in the number
- outputs the number of digits and the original number

(E.g. 147 would give an output of 3, 147)

[4]

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