UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

COMPUTER STUDIES **0420/12**

Paper 1 **May/June 2011**

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 **20** printed pages.

UNIVERSITY *of* CAMBRIDGE
International Examinations

[Turn over

1 (a) Give **two** features you would expect to find in a data protection act.

1 ....

....

....

2 ....

....

.... [2]

(b) Why would this act still not necessarily protect data stored in a computer system?

....

....

....

.... [2]

2 (a) What is meant by the term *user documentation*?

....

....

.... [1]

   (b) Give **three** items you would expect to see in user documentation.

   1 ....

   ....

   2 ....

   ....

   3 ....

   .... [3]

   (c) Rather than supply the user documentation on paper, a company decides to offer online help.

      (i) Give **one** advantage of doing this.

      ....

      ....

      (ii) Give **one** disadvantage of doing this.

      ....

      .... [2]

3 Most operating systems provide a *user interface*.

For
iner's

(a) User interfaces can be either *command line interfaces (CLI)* or *graphical use
interfaces (GUI)*.

Give **one** advantage and **one** disadvantage of both types of interface.

Advantage CLI: ....

....

....

Disadvantage CLI: ....

....

....

Advantage GUI: ....

....

....

Disadvantage GUI: ....

....

.... [4]

(b) Give **three** other tasks carried out by an operating system.

1 ....

....

2 ....

....

3 ....

.... [3]

4   A company has decided to introduce an *intranet* and remove Internet access for its st...

    (a) Describe **two** reasons why the company will not allow its staff Internet access.

    1 ....

    ....

    ....

    2 ....

    ....

    .... [2]

    (b) Apart from removing Internet access, give **two** advantages to the company of using an *intranet*.

    1 ....

    ....

    ....

    2 ....

    ....

    .... [2]

5   The following table shows **four** applications which require specialist **input** devices.

    For **each** application, suggest **one** possible **input** device and give a reason for your choice.

Application	Input device	Reason for choice of device
Virtual reality application		
Disabled person communicating with a computer system		
Automatic stock control system at a supermarket		
Information kiosk at an airport using a GUI interface		

[8]

6   **Five** security or data loss issues are shown on the left hand side.

Five possible methods of data recovery or protection are shown on the right.

Match the definitions/descriptions on the left to the most appropriate method on the right by drawing connecting arrows.

Issues   **Methods**

| Data loss caused by hard disk head crash | Anti-virus software |

| Hacking into files and changing or deleting data | Encryption |

| Introduction of software that self-replicates and can cause data loss | Anti-spyware software |

| Reading of illegally accessed documents | Make back-up files |

| Software that logs/records all key presses on your computer without you knowing | Use of passwords and a firewall |

[5]

7 (a) Read the following section of code that inputs twenty (20) numbers and then
       the largest number input.

```
1    h = 0
2    c = 0
3    repeat
4        read x
5        if x > h then x = h
6        c = c + 1
7        print h
8    until c < 20
```

There are **three** errors in this code.

Locate these errors and suggest a corrected piece of code.

1 ....

....

....

2 ....

....

....

3 ....

....

.... [3]

(b) The above code is an example of a high-level language.

Give **two** features of a high-level language.

1 ....

....

2 ....

.... [2]
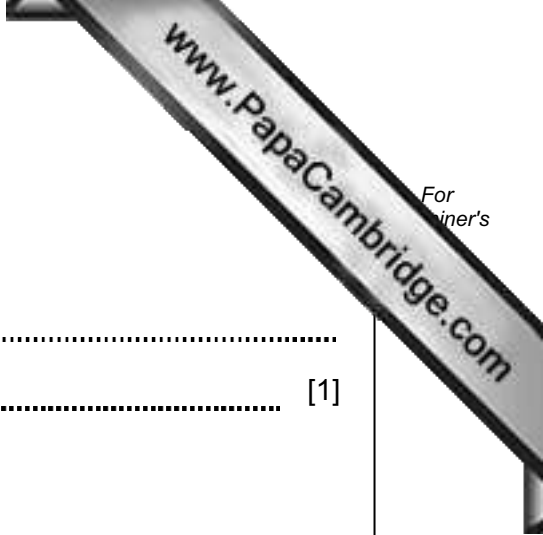
(c) The code is to be *interpreted* rather than *compiled*.

Give **one** difference between these two methods.

....

.... [1]

8 A media sales company has set up a website.

The opening page is:

```
┌─────────────────────────────────────────────────┐
│   ┌─────────────────────────────────────────┐   │
│   │       DVD media sales company           │   │
│   └─────────────────────────────────────────┘   │
│                                                 │
│  Please input your Customer ID  [ ][ ][ ][ ][ ][ ][ ][ ][ ] │
│                                                 │
│  Select your film category    ┌──────────┬────┐ │
│                               │ COMEDY   │ ▽  │ │
│                               └──────────┴────┘ │
│                                                 │
│   ┌──────────┐              ┌──────────────┐    │
│   │   END    │              │  CONTINUE    │    │
│   └──────────┘              └──────────────┘    │
└─────────────────────────────────────────────────┘
```

(a) (i) What **type** of menu is being used for the film category?

....

(ii) Give **one** advantage of this type of menu.

....

.... [2]

(b) (i) Name a validation check that could be used on the *Customer ID* field?

.... [1]

(ii) Describe **two** types of test data, together with examples, that could be used to see whether the validation check named in **(i)** works.

Type 1 ....

Example ....

....

Type 2 ....

Example ....

.... [4]

9 Juan decided to buy 40 tracks online from a music distribution company.
The tracks are all in MP3 format.

(a) What is the benefit of downloading tracks in MP3 format rather than in the normal CD format?

....

.... [1]

Juan uses a company which offers the following Internet broadband transfer rates:

- 56 megabits per second **download**
- 16 megabits per second **upload**

(b) If each music track is 3.5 megabytes in size, how long would it take Juan to download his 40 tracks? (Show your working).
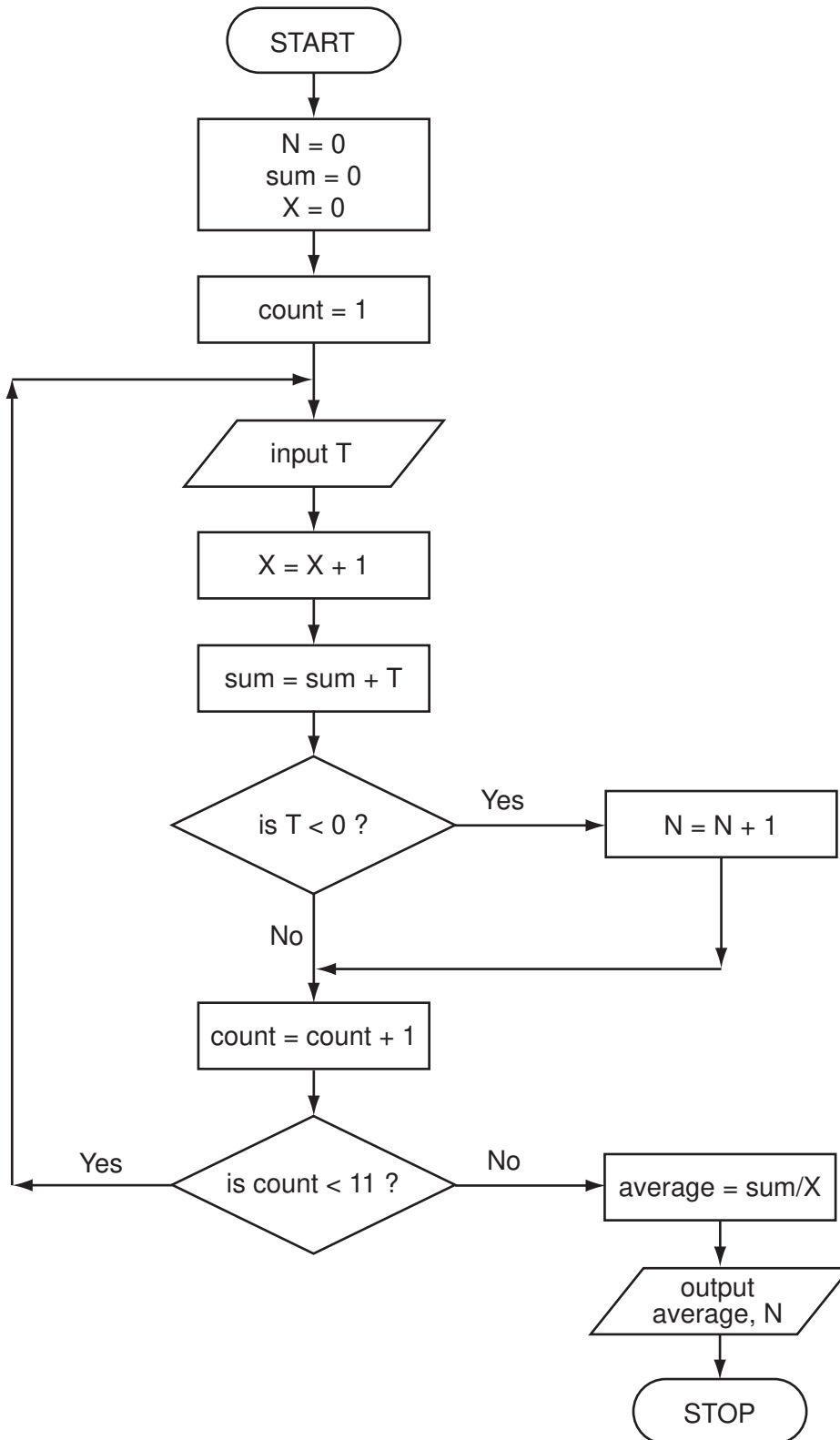
....

....

....

....

.... [2]

(c) He has decided to upload 36 photographs onto his social networking website. Each photograph is 1.8 megabytes in size.

How long would it take to upload his photographs?

....

....

....

....

.... [2]
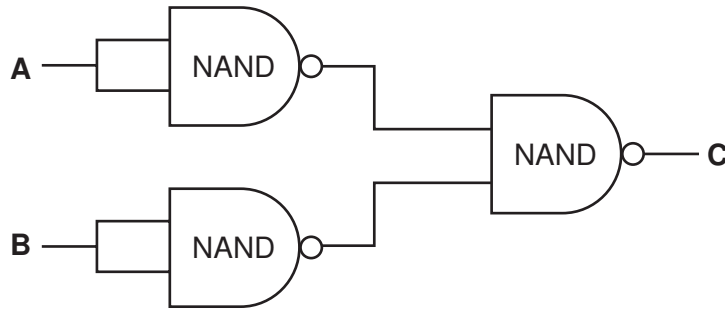
10 The following flowchart inputs ten temperatures and outputs the average temperature and the number of temperatures which were negative (i.e. < 0).

START

N = 0
sum = 0
X = 0

count = 1

input T

X = X + 1

sum = sum + T

is T < 0 ?

Yes → N = N + 1

No

count = count + 1

is count < 11 ?

Yes

No → average = sum/X

output average, N

STOP

(a) Complete the trace table for this flowchart using the following test data:

5,   11,   16,   -4,   -10,   8,   10,   -3,   17,   10

N	sum	X	count	T	average

[6]

(b) What values are output from the flowchart using the above test data?

....

.... [1]

14

11 (a) (i) Complete the truth table for the following logic circuit:

A	B	C
0	0	
0	1	
1	0	
1	1	

[2]

(ii) Which single logic gate has the **same** function as the above logic circuit?

.... [1]

(b) (i) Complete the truth table for the following logic circuit:

A	B	C
0	0	
0	1	
1	0	
1	1	

[2]
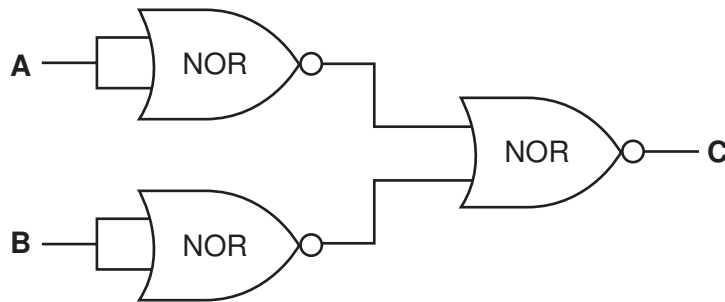
(ii) Which single logic gate has the **same** function as the above logic circuit?

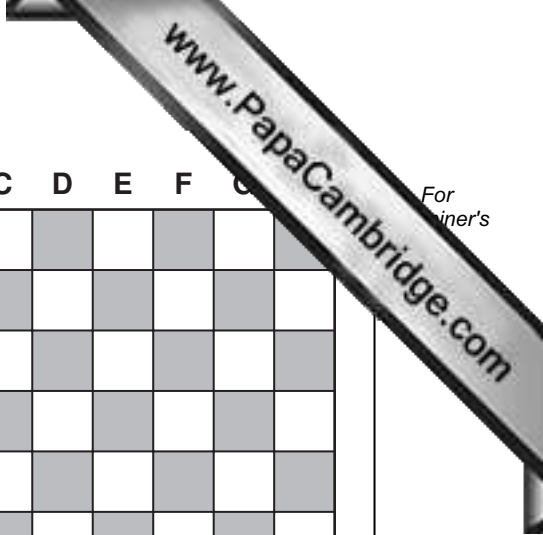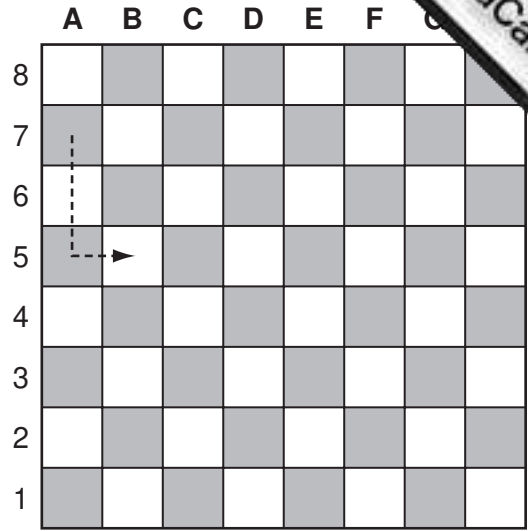... [1]

12 An electronic chess board is connected to a computer. There are sensors under **each** square and **each** chess piece has a magnet in its base.

In a game, one player is the computer and the other player a person.

In the example on the right, a piece has been moved **from** A7 **to** B5.

Each chess piece has pre-programmed legal moves.

For iner's

	A	B	C	D	E	F	G
8							
7							
6							
5							
4							
3							
2							
1							

(a) Describe how the computer knows when or if a chess piece has moved.

....

....

....

....

....

....

.... [3]

(b) A person moves a chess piece when prompted by the computer. How would the computer know if the move made was legal?

....

....

....

....

.... [2]

(c) Name the type of software application that can play chess games in this way.

.... [1]

13 Describe **three advantages** and **two disadvantages** to the general public of using the Internet to do online shopping.

Advantages

1 ....

....

....

2 ....

....

....

3 ....

....

....

Disadvantages

1 ....

....

....

2 ....

....

.... [5]

14 A spreadsheet has been set up to show the size of some model cars.

	A	B	C	D	E
1	name	full length (m)	scale	scale length (m)	Is model > 0.25 m ?
2	Raudi R8	5.22	18	0.29	
3	Monda Civil	4.30	43	0.10	
4	R Skate	6.12	18	0.34	
5	Silly for 2	2.76	12	0.23	
6	Citron C1	3.42	18	0.19	
7	Singer S2	5.20	10	0.52	
8					
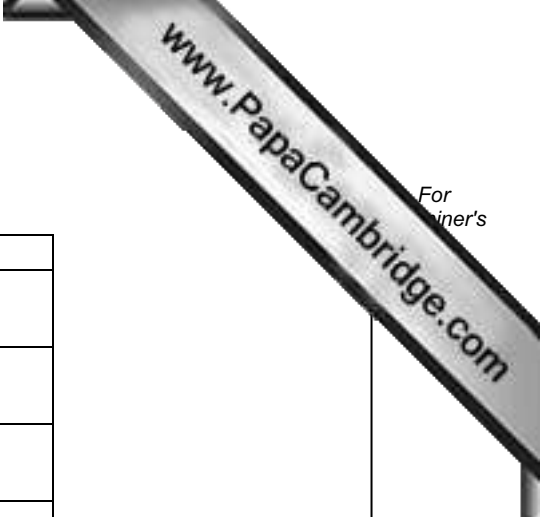
(a) What formulas must be in column D?

	D
1	**scale length (m)**
2	
3	
4	
5	
6	
7	
8	

[2]

(b) (i) The formula **= IF (D2 > 0.25, "Y", "N")** was typed into E2. What output would be shown in E2?

....

(ii) If this formula was replicated all the way down from E3 to E7, what formula would be in E7?

....

.... [2]

(c) Describe a way of filtering out only those models which are scale 18.

....

....

....

....

.... [2]

15 Name **three** different types of storage media and give an example of each.

Type 1 ....

....

Example ....

Type 2 ....

Example ....

Type 3 ....

....

Device .... [3]

16 A book shop uses barcodes for its computerised stock control.

Each book title has a barcode which identifies it.

The data is stored in a table.

(a) A sample of the data stored in the table is shown below:

Barcode	Book title	Author	Copies	Publication date
123456789012	Blue Lagoon	AA Smith	27	10/2001
345678901234	Happy Hour	BJ Cocktail	30	11/1997
567890123456	Young Blood	CM Vein	19	06/2009

(i) Which is the key field?

....

(ii) Give **two** examples of when the data in the table will need to be changed.

1 ....

....

2 ....

.... [3]

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iner's

(b) Each barcode has a *check digit*.

    (i) Explain how the *check digit* is used as a validation check.

       ....

       ....

    (ii) What type of error can the check digit identify?

       ....

       ....

       .... [2]

(c) Name **different** suitable validation checks for **each** of the following fields:

Book title: ....

....

Copies: ....

....

Publication date: ....

.... [3]

17 A school has 1800 students. The start date and leaving date for each student is st~~~~~ file. Dates are in the format YYMMDD (e.g. a student starting on 10th September 2007 ~~~~ leaving on 4th August 2012 has the data 070910 and 120804 on file).

For ~iner's

(a) Write an algorithm, using pseudocode or otherwise, which

- inputs Student ID for all 1800 students
- inputs the start date and leaving date for each student
- carries out a check to ensure the second date is later
- if error, increments error counter
- outputs the number of errors

[5]

(b) Describe, with examples, **two** sets of test data you would use to test your algorithm.

[2]