UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

COMPUTER STUDIES **0420/01**

Paper 1 **May/June 2008**

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 then end of each question paper.

For Examiner's Use

This document consists of **17** printed pages and **3** blank pages.

UNIVERSITY *of* CAMBRIDGE
International Examinations

[Turn over

1 Explain, using examples where appropriate, the meaning of these computer terms.

*For
iner's*

(a) batch processing

....

....

.... [2]

(b) interrupt

....

....

.... [2]

(c) top down design

....

....

.... [2]

(d) laptop computer

....

....

.... [2]

(e) trackerball

....

....

.... [2]

For
iner's

2 List **two** tasks carried out by an operating system.

1 ....

....

....

2 ....

....

.... [2]

3 A company has decided to set up call centres in different countries. Regular training sessions, using video conferencing, will be carried out.

(a) Give **one** advantage of having call centres in different countries.

....

.... [1]

(b) Give **one** disadvantage of having call centres in different countries.

....

.... [1]

(c) Give **one** advantage of using video conferencing to carry out the training.

....

.... [1]

(d) Give **one** disadvantage of using video conferencing to carry out the training.

....

.... [1]

(e) Describe another method of training staff using modern computer technology.

....

....

.... [1]

4   Name **two** types of automatic data capture and give **one** application for each type na

Type 1 ....

Application 1 ....

....

....

Type 2 ....

Application 2 ....

....

.... [4]

5   Computer systems can be affected by viruses.

(a) What is a virus?

....

.... [1]

(b) Give **one** effect of a virus.

....

.... [1]

(c) How can a system be protected from viruses?

....

....

.... [1]

(d) Why would backing up data **not** guard against the effect of a virus?

....

.... [1]
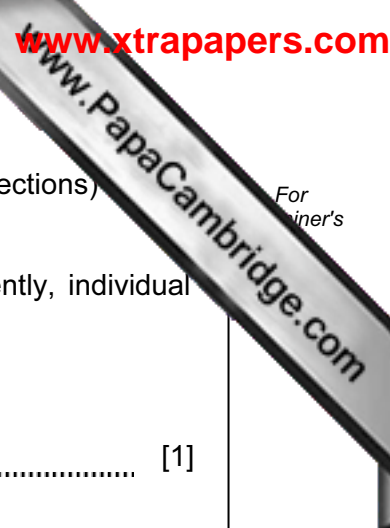
6 Students' records are kept on a stand-alone computer (no network connections) principal's office.

(a) It is sometimes necessary to alter students' records. To do this efficiently, individual records need to be retrieved quickly.

(i) What type of file access should be used?

.... [1]

(ii) What type of magnetic medium allows this type of access?

.... [1]

(b) Give **two** examples of when a student's record would need to be altered.

Example 1 ....

....

Example 2 ....

.... [2]

(c) Students are concerned that their personal data could be misused. Name **two** methods that could be used to ensure personal data is kept secure.

Method 1 ....

....

Method 2 ....

.... [2]

(d) Examination results are stored in students' records as marks out of 100. Give **two** different validation checks that could be performed on students' marks.

Check 1 ....

....

Check 2 ....

.... [2]

7 A floor turtle can use the following instructions:

Instruction	Meaning
FORWARD *n*	Move *n* mm forward
BACKWARD *n*	Move *n* mm backward
LEFT *d*	Turn left *d* degrees
RIGHT *d*	Turn right *d* degrees
PENUP	Lift the pen
PENDOWN	Lower the pen
REPEAT *n*	Repeat the following instructions *n* times
ENDREPEAT	Finish the REPEAT loop

50 mm

70 mm

20 mm

20 mm

40 mm

20 mm

Start   Finish

Complete the set of instructions to draw the above shape.

PENDOWN ....

LEFT 90 ....

FORWARD ....

....

....

....

....

....

.... [4]

8 A student decides to use an Internet search engine at home to help her work on a Geography project. She types in:

COUNTRIES EXPORTS 2007

and gets over 11 million results.

(a) She wanted to know which South American countries exported coffee in 2007. How could her search be refined to reduce the number of results?

....

.... [1]

(b) Give **one** advantage of searching for information on the Internet rather than using books.

....

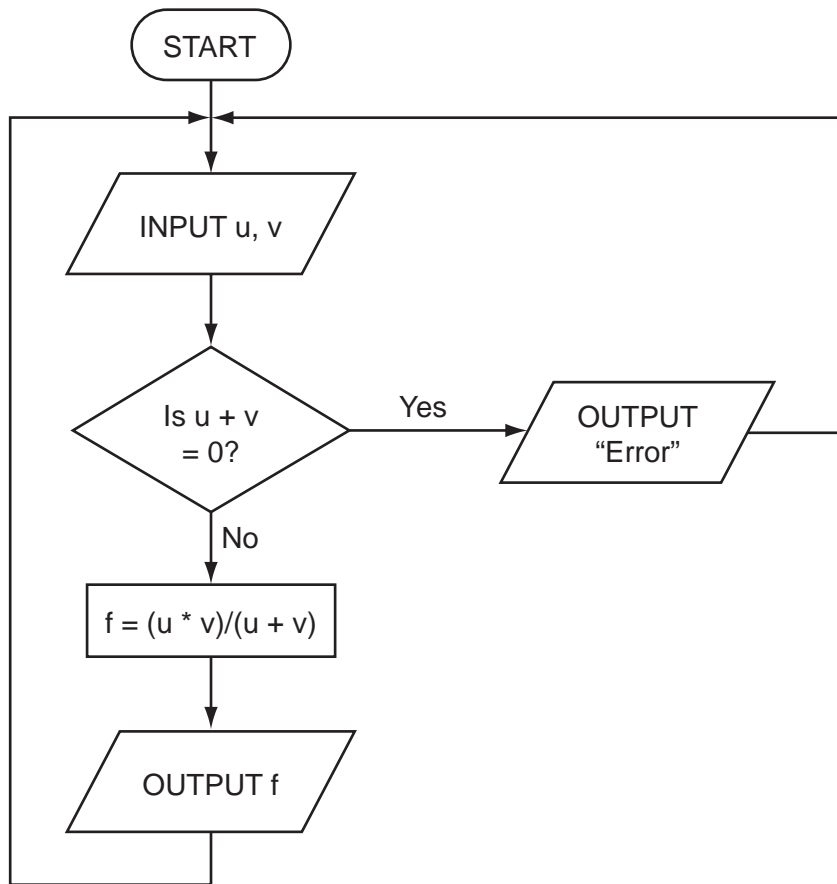... [1]

(c) Many people have fears about searching for information on the Internet. Give **two** reasons for these fears.

1 ....

....

2 ....

.... [2]

(d) The student wishes to use files stored on her home computer when she is back in class using one of the school's computers. How could she do this?

....

....

.... [1]

9 The following flowchart inputs **two** numbers, carries out a calculation and then outputs the result.


```
              START

          INPUT u, v

          Is u + v      Yes      OUTPUT
          = 0?     ───────────►  "Error"

             │ No

          f = (u * v)/(u + v)

          OUTPUT f
```

(a) Complete the following table for the **three** sets of input data.

INPUT		OUTPUT
u	v	
5	5	
6	-6	
12	4	

[3]

(b) The above algorithm has been placed in a library of routines. Give **one** advantage of doing this.

....

....

.... [1]

For
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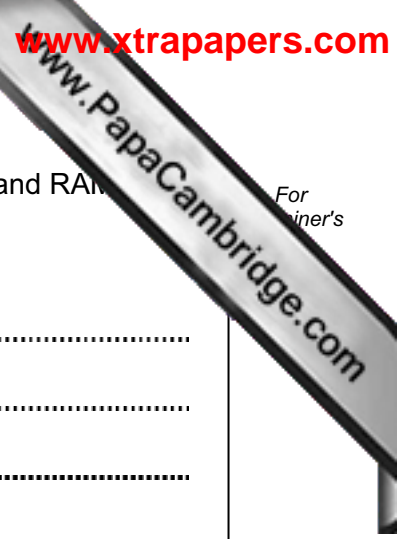
10 A computer system comes equipped with DVD writer/reader, hard disk drive and RAM.

(a) Give a different use for each of these forms of memory.

DVD ....

....

Hard Disk ....

....

RAM ....

.... [3]

(b) Give another example of a memory device and give **one** advantage of the named device.

Example ....

Advantage ....

....

.... [2]

11 Write down **four** requirements of a Data Protection Act.

1 ....

....

....

2 ....

....

....

3 ....

....

....

4 ....

....

.... [4]

12 Algorithms and programs use loops to control the number of times a particular proce____ used.

Two methods are **repeat** … **until** and **for** … **to**.

(a) Write a procedure using both these loop methods to input 20 numbers into a variable called **x**.

   (i) **repeat … until**

   ....

   ....

   ....

   ....

   .... [2]

   (ii) **for … to**

   ....

   ....

   ....

   ....

   .... [2]

(b) Name another loop structure.

   ....

   .... [1]

13 A media retail company has decided to sell CDs and DVDs using an Internet only shop.

For
iner's

(a) Describe **three** features you might expect to see on the shop's website.

1 ....

....

....

2 ....

....

....

3 ....

....

.... [3]

(b) Give **two** advantages to customers of shopping using the Internet.

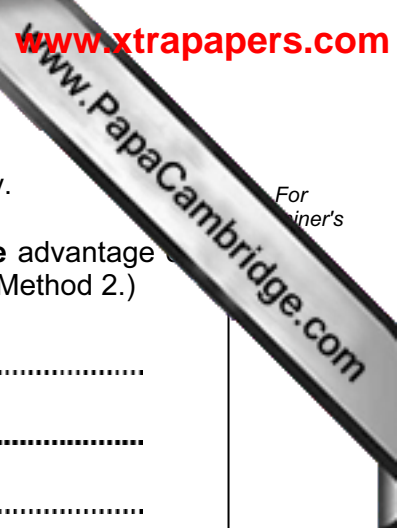1 ....

....

....

2 ....

....

.... [2]

For
iner's

14 (a) Computer systems are widely used now in simulations such as crash testing ne

Give **two** advantages of using simulations rather than carrying out actual testing.

1 ....

....

2 ....

.... [2]

(b) Virtual reality is often used in simulations. Describe **two** man-machine interface devices which allow communication with virtual reality systems.

1 ....

....

2 ....

.... [2]

For
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15 A systems analyst has designed a new computer system for a large company.

(a) Name **two** methods of implementing this new system and describe **one** advantage
using each method. (Do **not** give the same advantage for Method 1 and Method 2.)

Method 1: ....

Advantage: ....

....

....

Method 2: ....

Advantage: ....

....

.... [4]

(b) Before the system is implemented, it needs to be fully tested. One of the tests will be to
check that the company does not pay a worker more than $800 per week.

Use examples of a worker's pay to explain what is meant by normal test data,
abnormal test data and extreme test data.

Normal ....

....

....

Abnormal ....

....

....

Extreme ....

....

.... [3]

16 The washroom in a hotel uses lights controlled by a computer system. If the washr̶o̶o̶m̶ unoccupied for 10 minutes, the lights go out automatically. As soon as someone enters, t̶h̶e̶ lights come on.

For ̶iner's

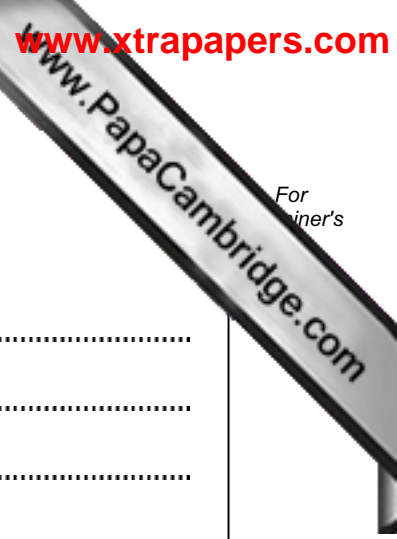(a) How can the system determine if anyone is in the washroom?

....

....

....

.... [2]

(b) Write down a set of instructions which would enable the computer to decide when to turn out the lights.

....

....

....

....

.... [3]

(c) Give **one** advantage of this automatic system.

....

.... [1]

17 An expert system is to be written to identify chemical compounds.
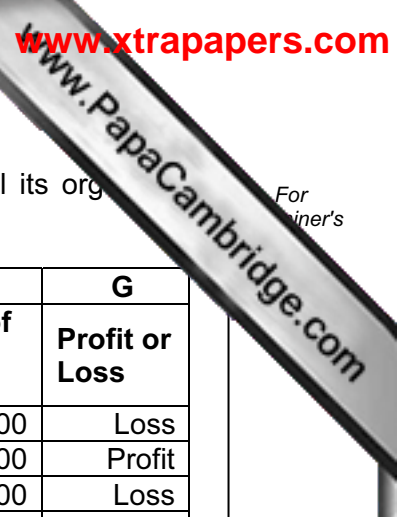
(a) Describe how the expert system would be created.

....

....

....

....

....

....

....

.... [3]

(b) How would a user be confident that the output from this expert system was correct?

....

.... [1]

(c) Give **one** advantage of using an expert system to identify chemical compounds.

....

....

.... [1]

18 An entertainment company keeps monthly records on a spreadsheet of all its org
rock music events. The information for May 2008 is shown below.

	A	B	C	D	E	F	G
1	Event	No. of seats	No. seats sold	Seat price ($)	Total money taken ($)	Cost of event ($)	Profit or Loss
2	The Bugs	4000	1700	45	76500	85000	Loss
3	Static Rocks	3000	3000	50	150000	100000	Profit
4	The Cold Apes	4000	2150	35	75250	90000	Loss
5	Monophonics	5000	4000	35	140000	125000	Profit
6	Human Senses	4000	4000	60	240000	180000	Profit
7	Ice Patrol	3000	1500	50	75000	80000	Loss
8	The Manual	2000	1650	60	99000	115000	Loss
9							

(a) (i) What formula is in cell E2 to work out the total money taken for *The Bugs* event?

.... [1]

(ii) Complete the following statement for cell G4:

=IF (E4 > ...., "Profit", ...)   [2]

(iii) Total cost of all events is to be shown in cell F9. What formula needs to be placed in F9?

.... [1]

(b) If the value in C7 was changed to 2000, which cells would be automatically updated?

.... [2]

(c) Describe how to find the *break even point* for any given event (i.e. when cost of event = total money taken).

....
....
....
....
.... [2]

19 Customers can withdraw cash from an Automatic Teller Machine (ATM).

- withdrawal is refused if amount entered > current balance
- withdrawal is refused if amount entered > daily limit
- if current balance < $100, then a charge of 2% is made
- if current balance ≥ $100, no charge is made

Write an algorithm which inputs a request for a sum of money, decides if a withdrawal can be made and calculates any charges. Appropriate output messages should be included.

[5]

18

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19

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20

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