**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.

    **(a)**  batch processing

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    **(b)**  interrupt

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

    **(c)**  top down design

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

    **(d)**  laptop computer

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    **(e)**  trackerball

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

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

1 ..........................................................................................................................................

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2 ..........................................................................................................................................

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............................................................................................................................... [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.

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.............................................................................................................................. [1]

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

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.............................................................................................................................. [1]

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

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.............................................................................................................................. [1]

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

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.............................................................................................................................. [1]

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

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.............................................................................................................................. [1]

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

Type 1 ........................................................................................................................

Application 1 ..............................................................................................................

.................................................................................................................................

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Type 2 ........................................................................................................................

Application 2 ..............................................................................................................

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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 .......................................................................................................

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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 .........................................................................................................

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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   ...............................   .......................................................

...............................................   .......................................................

...............................................   .......................................................

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...............................................   .......................................................   [4]

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

<div align="center">COUNTRIES EXPORTS 2007</div>

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?

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.................................................................................................................... [1]

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

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.................................................................................................................... [1]

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

1 ..................................................................................................................................

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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?

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**9** The following flowchart inputs **two** numbers, carries out a calculation and then outp...
result.
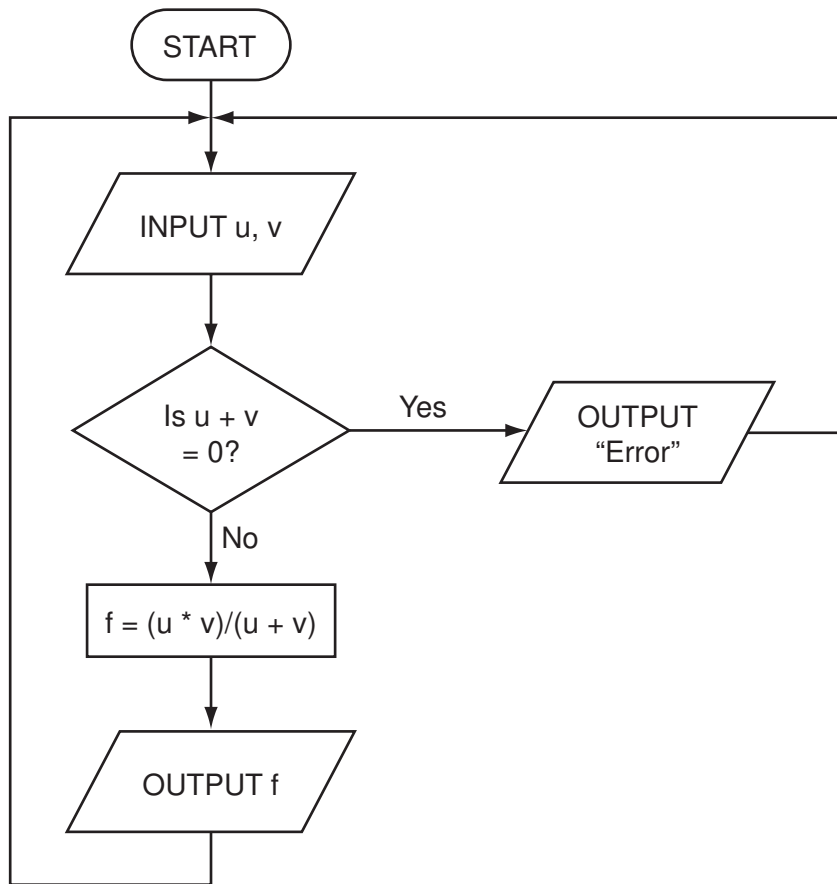
(a) Complete the following table for the **three** sets of input data.

| 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.

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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 ...................................................................................................................

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

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

1 ................................................................................................................................

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2 ................................................................................................................................

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3 ................................................................................................................................

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4 ................................................................................................................................

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.......................................................................................................................... [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**

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        ...........................................................................................................................

        ...........................................................................................................................

        ...........................................................................................................................

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

    **(ii)** **for … to**

        ...........................................................................................................................

        ...........................................................................................................................

        ...........................................................................................................................

        ...........................................................................................................................

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

**(b)** Name another loop structure.

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    ............................................................................................................................... [1]

For
iner's

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

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

1 .......................................................................................................................................

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2 .......................................................................................................................................

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3 .......................................................................................................................................

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

1 .......................................................................................................................................

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2 .......................................................................................................................................

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

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 ............................................................................................................................

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2 ............................................................................................................................

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

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

1 ............................................................................................................................

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2 ............................................................................................................................

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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: ............................................................................................................................

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Method 2: ..............................................................................................................................

Advantage: ............................................................................................................................

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(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 ..................................................................................................................................

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Abnormal ..............................................................................................................................

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Extreme .................................................................................................................................

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

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

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

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

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**17** An expert system is to be written to identify chemical compounds.

**(a)** Describe how the expert system would be created.

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

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

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........................................................................................................... [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?

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

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**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.

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